

Market Analysis
Program (MAP)

**Industry Sector
Markets
1988-1993**

Retail Distribution
Sector

INPUT[®]

the 'information' and 'communication' fields, and the 'information science' field.

It is important to note that the 'information science' field is not a new field, but a field that has been developing since the 1960s. It is a field that is concerned with the study of the nature and use of information, and the development of methods for the collection, organization, storage, retrieval, and dissemination of information.

The 'information science' field is a multidisciplinary field, and it draws on knowledge from a variety of disciplines, including library science, communication studies, sociology, psychology, and computer science.

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INDUSTRY SECTOR MARKETS 1988-1993

RETAIL DISTRIBUTION SECTOR

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**Market Analysis Program
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Industry Sector Markets, 1988-1993
Retail Distribution Sector

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Introduction

A

Environment/ Overview

The retail industry is composed of four distinct industry subsectors: food stores, eating and drinking places, merchandise retailers, and automotive retailers. Each of these subsectors is described in Section B.

Overall sales in the retail industry are estimated to increase 6% during 1988, which is approximately the same as the 1987 increase. The eating and drinking places subsector showed the largest percent increase of all the retail subsectors in 1987 and is expected to increase sales approximately 9% in 1988.

The retail marketplace is diversifying in order to meet the demands of consumers. Specialty retail stores are offering more services and an increasing array of new products. Warehouse-type outlets with minimal services and very low mark-ups are prospering. Shopping at home by ordering goods seen on computer screens or televisions hooked up to cable systems appears to be on the rise, although these sales are not tabulated by the U.S. Bureau of the Census. One nonstore retailer, Comp-U-Card International, reportedly has over two million subscribers paying \$25 per year to shop this way.

Franchising is big business in the retail industry. U.S. franchise sales are estimated to reach \$632 billion in 1988. Businesses that dominate the franchise field are automobile and truck dealers, gasoline service stations, soft drink bottlers, building materials and hardware, apparel and accessories, and furniture and home furnishings. Many factors have led to the growth of franchising. These factors include the distribution requirements of many companies, the increased number of individuals seeking to own their own businesses, and consumer spending patterns. In addition, franchising provides the small, financially limited company with a means of rapid entry into the marketplace without large-scale capital, management, and personnel requirements.

Much consolidation has occurred in recent years in the retail industry. For example, many regional department stores have united. The outcome has been strengthened local management, a regional approach to the selection of merchandise, and economies of scale in advertising and purchasing for the combined companies; the sellers often use the proceeds from the sale to expand their primary businesses. Such was the case when Carter Hawley Hale Stores sold the Wanamaker Department Stores in the Philadelphia area to the Woodward and Lothrop Corporation of Washington in 1987.

U.S. retailers are buying more products directly from manufacturers in foreign countries, such as Taiwan, that have low labor costs. Also, some retailers are operating their own foreign factories solely for the purpose of shipping products to the U.S. In these cases, the small Asian nations involved have essentially become international subcontractors for U.S. manufacturers and retailers, often excluding the wholesale distributor.

B

Industry Trends

1. Food Stores

The food stores subsector of the retail industry sector includes grocery, meat and fish, fruit and vegetable, and candy stores, as well as bakeries and other food stores.

Increases in real disposable income and low food prices produced a good year for food retailers in 1987. Total retail food and grocery store sales rose approximately 4% over 1986 to \$308 billion; total 1988 retail food store sales are forecast to increase 5% over 1987. Data on public food stores indicates that profitability for this subsector also improved substantially during 1987.

The retail food industry is one of the retail subsectors experiencing consolidation. In recent years, major grocery retailers have been closing smaller, less-efficient stores and replacing them with fewer but larger stores, offering a wider selection of merchandise and more service departments. Information services are being used to handle the wider selection of merchandise and increased services.

Although the number of retail food outlets declined during 1987, the number of employees in the industry subsector rose. Between 1986 and 1987, total employment increased from approximately 2.9 billion to approximately 3.0 billion. More often than not, these employees are using information services, including scanning systems and electronic data interchange (EDI).

Because scanner operations generate data on product movement on a store-by-store basis, retailers are able to tailor their product mix more effectively to maximize revenue, turnover, and profit.

2. Eating and Drinking Places

The eating and drinking places subsector includes restaurants, soft drink and ice cream stands, caterers, bars and nightclubs, and other eating and drinking establishments.

The eating and drinking places subsector grew a substantial 10.7% during 1986 and was expected to be the biggest gainer of all retail subsectors in 1987. However, growth for the subsector fell below expectations, primarily due to increased competition. Traditional eating and drinking establishments face competition from each other, as well as from supermarkets, specialty food stores, department stores, and hotels.

In order to compete more effectively, eating and drinking establishments are providing home delivery service, broadening their menus, and developing and maintaining good customer relations.

Restaurant computer systems have simplified the job of food servers and given management new tools for controlling costs and measuring sales. In many cases, customer orders are transmitted via terminal to the kitchen and the bar, allowing waiters to improve service by staying near the customers, as well as increase the number of people served. Orders are clearer to the chefs, and undercharges and overruns can be eliminated. Computer systems used in restaurants are also used for accounting and inventory control.

3. Merchandise Retailers

Merchandise retailers include general merchandise retailers, such as department stores; apparel and accessory stores; home furnishing retailers that sell furniture, appliances, and consumer electronics; hardware stores; garden supply stores; and miscellaneous retailers, such as drug and liquor stores.

Apparel and accessory store sales were estimated to increase 7% in both 1987 and 1988. For several years, imported apparel has been a controversial issue with manufacturers and retailers of apparel. Textile manufacturers and clothing workers want limits on imported apparel; retailers favor free and unlimited imports. However, there has been some restructuring of the clothing retail and manufacturing industries in recent years. The retail sector has become more multistore in nature, and manufacturers have grown larger to take advantage of economies of scale. These changes have sometimes favored domestic rather than offshore sources of supply, due to the fact that retailers want to be supplied quickly with merchandise for certain sales campaigns.

Sales by drug and proprietary stores increased 7.5% during the first half of 1987; sales are forecasted to increase 8% during 1988. This subsector



of the retail industry is expanding, mostly from the opening of new outlets. Drug stores continue to increase their use of computers and wand readers in order to exert tighter control over sales and inventories, improve productivity, and maintain better customer accounts. With current merchandise controls, stores that are not performing well can be identified quickly and phased out, if necessary.

Furniture store sales rose an estimated 8% during 1987 and are forecasted to increase another 8% during 1988. Consolidation is apparent in this subsector of the industry, with a trend toward large furniture retail chains. This consolidation runs parallel to the consolidation occurring within the furniture manufacturing industry.

Variety stores continue to increase sales despite tough competition from discount drug and proprietary stores. During the past several years, the trend has been for many variety stores to relocate to suburban shopping centers and malls. The older buildings in which they were previously located have been replaced by higher rent structures. Computer systems have provided variety store merchants the ability to identify the best selling and most profitable merchandise. Sometimes, due to this ability, merchants can relocate again to small stores in central business areas for a high return on investment.

Department store sales are expected to rise approximately 6% during 1988. Sales stem from increased services as well as the sale of merchandise. Services offered by department stores include dry cleaning, alterations, jewelry repair, and engraving. Department stores attempt to provide consistent-quality merchandise while offering a broad array of products, ranging from house-brand products to products found abroad. Many large U.S. retailers maintain corporate buying offices in Europe and the Far East to select merchandise for sale in the U.S. and, to a limited extent, to sell domestically produced merchandise abroad. The department store subsector of the retail industry is currently undergoing the same consolidation process as are other retailers selling general merchandise.

4. Automotive Retailers

Automotive retailers include motor vehicle dealers (which sell cars, trucks, motorcycles, recreational vehicles, motor homes, and boats), auto supply stores, and gasoline service stations.

Total motor vehicle dealership sales in the U.S. increased only 2% during 1987. The profitability situation for these dealers has been improving slowly, as dealers turn to departments other than new sales (such as service and parts sales) for increased business.

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7. The seventh part of the document is a list of names and titles, including the names of the authors and the titles of their works.

This subsector of the retail industry has not been characterized by the same consolidation occurring in other retail subsectors. The increase in the number of foreign car dealerships within the U.S. in 1987 was offset by the decrease in the number of dealerships handling only domestically produced models.

C

Driving Forces

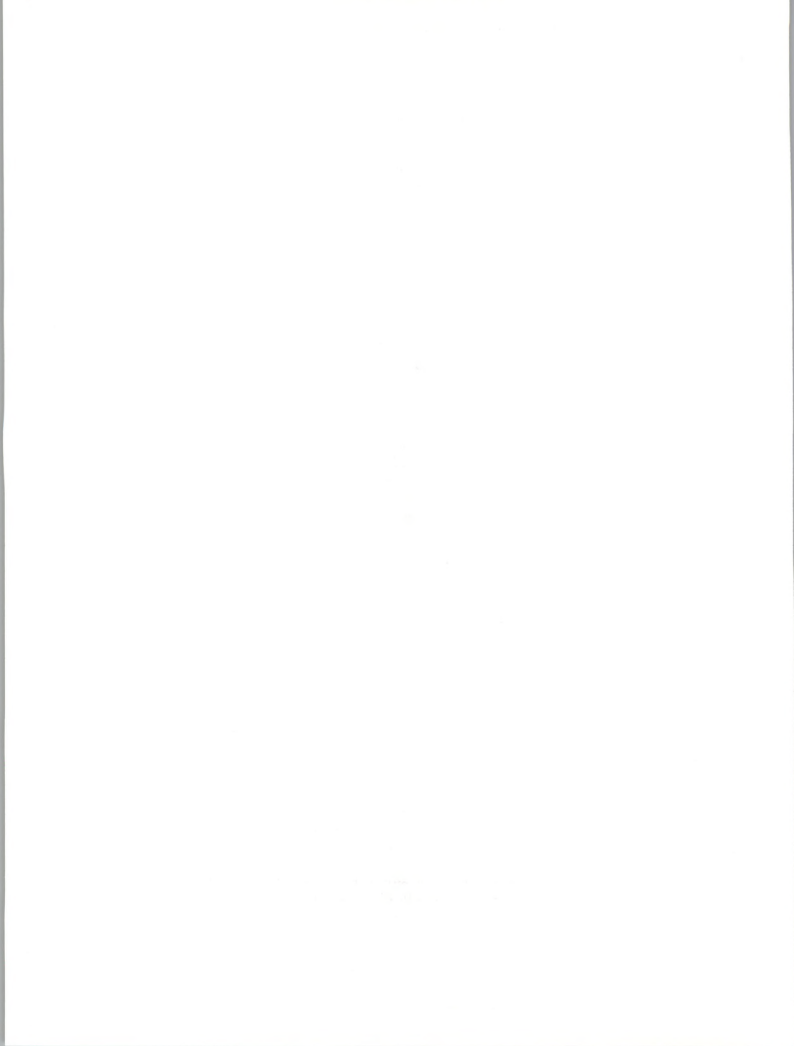
The extremely competitive environment in which retailers operate has led to a consolidation in the number of companies operating within the industry and expansion in the size of companies continuing to operate in the industry. This consolidation is apparent in many subsectors of the retail industry (including restaurants, and grocery, drug, and department stores) as increased merger and acquisition activity occurs. The trend is to expand the remaining operation by closing the smaller, inefficient stores and opening new, larger stores. In addition, franchising is being used to expand retail operations. Franchising allows expansion with relatively little capital investment.

Low foreign labor costs have prompted many U.S. retailers to seek sources of supply outside the United States. Often, U.S. retailers operate their own manufacturing plants overseas to supply products for U.S. markets, or set up foreign operations to distribute products manufactured by foreign companies. However, the long lead time required to manufacture apparel in some Asian countries has forced retailers to use U.S. and European manufacturers as suppliers.

The levels of revenue generated and profits earned by retailers depend on numerous factors. One major factor is the amount of disposal income available to consumers for spending, which is tied closely to general economic conditions. Another major factor, also tied to economic conditions, is costs incurred by the retailers, including costs for merchandise sold, distribution, store locations, personnel, and more. To reduce costs, retailers can improve efficiency and economies of scale, and investigate new sources of supply and new distribution channels.

A clear driving force in the retail industry is consumer needs. One reason for the unacceptability of the long lead time required for the manufacture of apparel in some Asian countries is that merchandise selling fast today may not be as popular in the near future. Retailers realize that there is a window of time in which these products can be sold. When the window closes, the products are no longer in demand. Consumer needs have also been responsible for retailers entering nontraditional business lines, such as providing services.

The technology available to retailers dictates, to a large extent, how efficient they can be and what services they can provide. Systems currently available allow restaurants to serve more people and provide better service, while making the jobs of accounting and inventory control much



easier. Similarly, grocery stores can use technology to stock the best-selling, most-profitable merchandise; reorder inventory and update pricing automatically; determine the least-efficient store locations; and offer services such as debit card payment to their customers.

Exhibit I-1 summarizes forces driving the retail distribution industry.

EXHIBIT I-1

RETAIL DISTRIBUTION INDUSTRY DRIVING FORCES

- Competitive environment
- Sources of supply
- Consumer disposable income
- Retailer costs
- Customer needs
- Technology available

D

Major Issues and Inhibiting Factors for Vendors

Information services vendors are faced with developing software and providing services that will meet the challenges of the retail industry. Operating in an extremely competitive environment, retailers need ways to accurately measure sales, improve productivity and the level of customer service, and control costs.

Inventory control systems are important to all subsectors of the retail distribution industry. Systems are available to alert managers that inventory in stock is at the reorder level. In order to maintain consistent-quality merchandise, the appropriate lead times and other factors involving suppliers must be taken into consideration.

Retailers also want to identify the best-selling and most-profitable merchandise, and eliminate the "dogs." Many information services vendors have begun offering systems to make such a judgement. Retailers are looking for sophisticated systems that will help them tailor their product mix in a way that will maximize revenue, merchandise turnover, and profits.

Information services vendors are also developing systems that will allow retailers to improve and expand services offered to their customers. For example, managing customer accounts can include tagging the departments in which a customer makes purchases and notifying that customer of new shipment arrivals and special sales events in those departments.

Because of the trend toward expansion of individual retail businesses, vendors are also developing systems for outlet and franchise management. Networked systems that tie outlets together allow management to track information on sales and inventory levels, and much more. In addition, many retailers are doing business with their trading partners via electronic data interchange (EDI) systems, which process orders and invoices electronically.

For a summary of the major issues for information services vendors, see Exhibit I-2.

EXHIBIT I-2**ISSUES FOR
INFORMATION SERVICES VENDORS**

- Measure sales
- Improve productivity
- Identify best-selling/most-profitable merchandise
- Tailor product mix to maximize revenue/turnover/profit
- Manage inventory
- Control costs
- Expand/improve customer services
- Manage chain and franchise outlets

E**Major Issues for
Information Systems
(IS) Managers**

Managers of information systems (IS) departments within retail organizations are dedicated to meeting end-user requirements for information systems. New applications development or enhancement of existing applications can be performed internally by IS staff, or applications can be purchased or developed on a custom basis by a professional services vendor.

Many issues concerning IS vendors are the same as the issues facing the end users and the retail industry as a whole—for example, improving productivity, containing costs, and improving and expanding customer services.

In addition, IS managers are involved with maintaining a certain level of experienced IS staff, training end users and IS staff, developing disaster recovery systems, procuring computer hardware that will be viable in the long run, implementing EDI, designing networks, and standardizing applications and communications systems.

Exhibit I-3 outlines the major issues for IS departments in the retail distribution industry.

EXHIBIT I-3

ISSUES FOR IS DEPARTMENTS

- Improve productivity/cut costs
- Improve/expand customer services
- Develop/enhance applications
- Design networks
- Implement EDI
- Standardize applications and communications systems
- Maintain required level of quality in IS staff
- Make hardware decisions
- Develop disaster recovery systems
- Train end users to use computer systems

F

Major Issues for End Users

End users are concerned primarily with remaining competitive with respect to their subsector in the retail industry. In order to remain competitive, end users must use information to provide better and more products and services to customers, increase sales, reduce costs, and thereby improve profitability. Achieving economies of scale is also important because of the way the industry is evolving, with fewer and larger retailers.

End users must maintain reliable sources of supply, that can accommodate the needs of their customers. Any special requirements for obtaining merchandise, such as the seasonal demands of the manufacturer or lead time involved, must be considered. In addition, end users in the retail industry must maintain proper inventory levels, that will allow them to meet customer demand but not result in an excess of obsolete inventory.

End users want to identify the best-selling and most-profitable merchandise, concentrating on the sales of "cash cows" and "star" products and eliminating "dogs." Information is even being made available to end users regarding the best product display strategies. The goal is to tailor the product mix to maximize product turnover, sales, and profits.

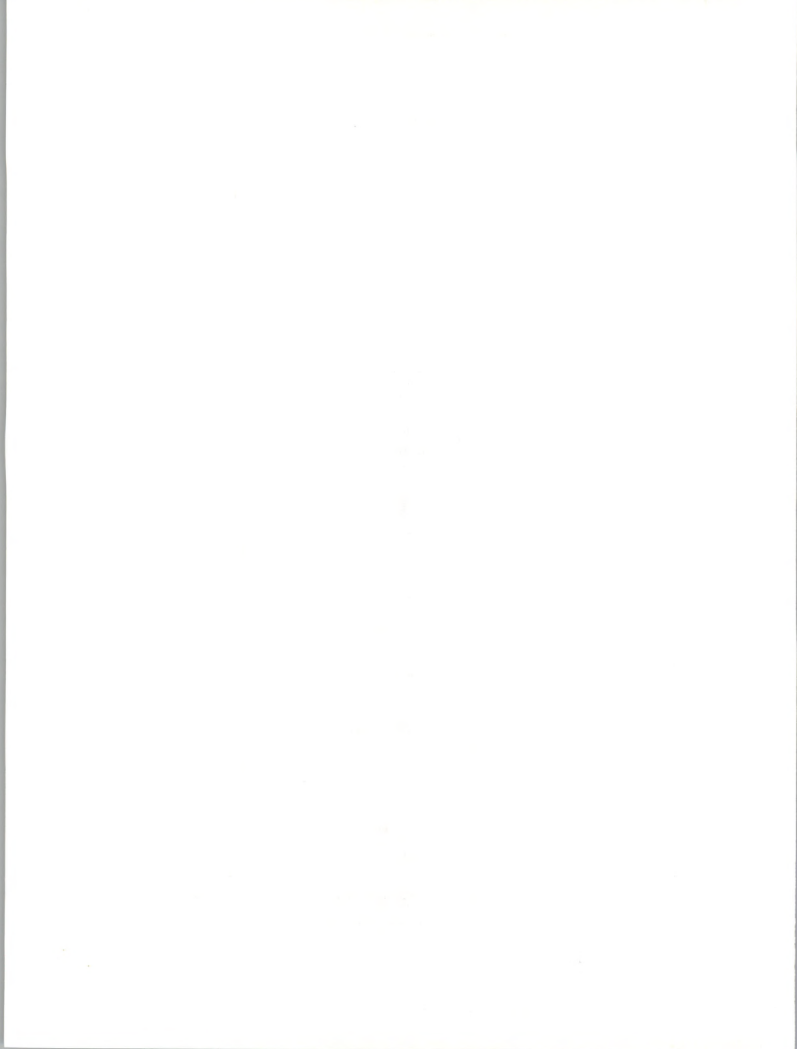
End users in retail organizations also need to manage chain store outlets and franchise operations, which is more important now than ever, because of the enormous expansion efforts going on in the industry. Any unprofitable or costly outlets will have to be closed or relocated.

For a synopsis of the major issues for end users in the retail distribution industry, see Exhibit I-4.

EXHIBIT I-4

ISSUES FOR END USERS

- Measure sales/control costs
- Achieve economies of scale
- Maintain sources of supply
- Control inventory levels
- Identify best-selling/most-profitable merchandise
- Tailor product mix to maximize revenue/turnover/profit
- Improve/expand customer services
- Manage outlets/franchises
- Identify low-performance stores





Market Forecasts

A

Introduction

The retail distribution industry is intensely competitive and relies on information services for support in the areas of distribution, marketing, customer service, inventory control, sales analysis and management, invoicing, accounting, and much more. Expenditures for information services by the industry are expected to grow at a compound annual growth rate (CAGR) of 22% during the period 1988-1993, reaching approximately \$3.8 billion by 1993.

During the next five years, projected growth will be highest in the areas of network services, application software, and systems integration. For more market forecast information on the retail distribution industry sector, see Exhibits II-1 and II-2 and Appendix Exhibit B-1.

B

Retail Distribution Sectors

1. Food Stores

Growth in information services for the food stores subsector will average 21% during 1988-1993, which is slightly below the overall retail industry average of 22% during the period. Due to increases in real disposable income and low food prices, food retailers experienced a good year in 1987, and the results of public food stores indicate that the profitability for this subsector has improved. However, revenue growth in the food stores subsector is running slightly lower than growth in the retail industry overall. Growth for the food stores subsector was 4% in 1987 and is expected to be 5% in 1988; overall growth for the retail industry is estimated at 6% for both 1987 and 1988. Relatively stable consumer needs preclude substantial growth in the food stores subsector from one year to the next.

The retail food industry is one of the retail subsectors experiencing consolidation. In recent years, major grocery retailers have been closing smaller, less-efficient stores and replacing them with fewer but larger

Table 1. Mean (SD) age, height, weight, and body mass index (BMI) of the 100 children in the study

Measure	Mean (SD)
Age (years)	10.2 (0.5)
Height (cm)	145.2 (10.1)
Weight (kg)	38.5 (10.2)
BMI (kg m ⁻²)	18.6 (3.2)

children were given a verbal explanation of the procedure and then asked to sign a written consent form.

The children were then randomly assigned to one of two groups: the 'control' group, which received no intervention, and the 'intervention' group, which received the intervention.

The children in the control group were given a verbal explanation of the procedure and then asked to sign a written consent form.

The children in the intervention group were given a verbal explanation of the procedure and then asked to sign a written consent form.

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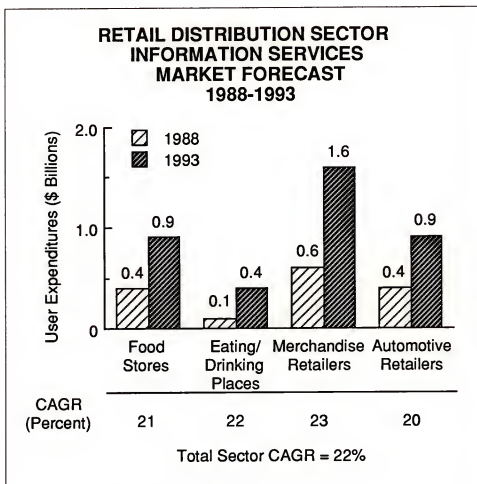
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EXHIBIT II-1



stores that offer a wider selection of merchandise and more service departments. Information services are being used to handle the wider selection of merchandise and increased services, as well as to determine which stores are most efficient.

Although the number of retail food outlets declined during 1987, the number of employees in the industry subsector rose. Most of these employees are using information systems, including point-of-sale systems, inventory control systems, and EDI. In addition, the introduction of information systems to many food store employees has increased the need for professional services, such as training.

The most significant growth areas in the food stores subsector include systems integration, application software, and electronic information and network services. Network services include EDI, which is increasingly being used by grocery retailers. Electronic information services (EIS) used by food stores include on-line data bases available on consumer buying patterns, shelving strategies, and more. Application software is available for distribution management, inventory control, order entry, and sales analysis.

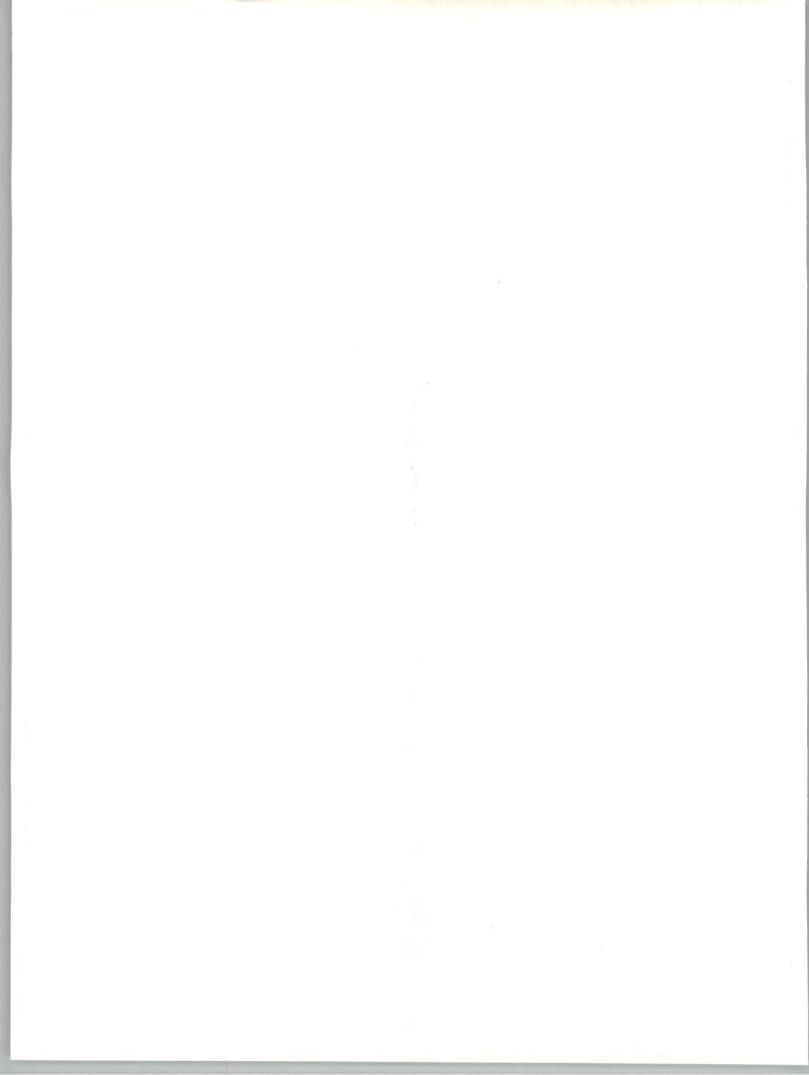
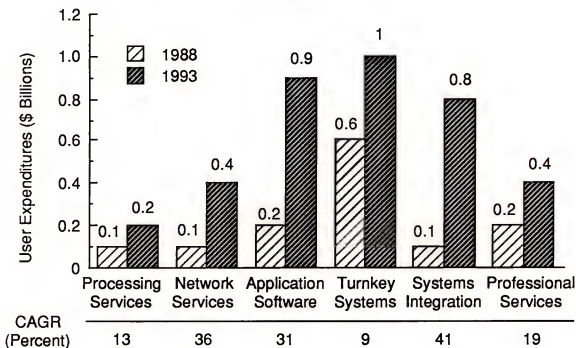


EXHIBIT II-2

**RETAIL DISTRIBUTION SECTOR
INFORMATION SERVICES MARKET
FORECAST BY DELIVERY MODE
1988-1993**



Systems integration is definitely on the rise in the food retailing subsector. Systems are designed to transmit data between food stores and warehouses—the data can be sales records, delivery schedules, and employee work schedules—to a mainframe computer generally located at the chain's headquarters. The data can then be used to make decisions regarding what products to sell, how to display them, and how to make their storage and delivery more efficient.

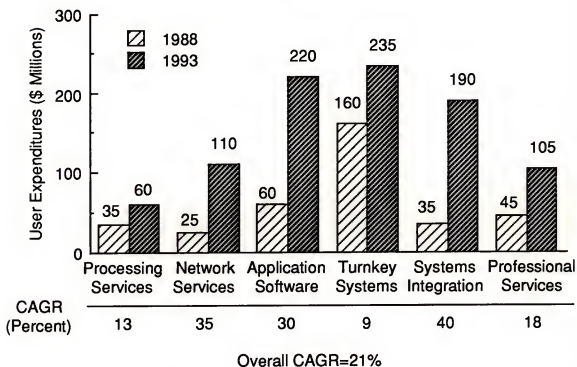
For more information on market sizes and growth rates, see Exhibits II-1 through II-3 and Appendix Exhibits A-1 and A-2.

2. Eating and Drinking Places

Information services purchased by eating and drinking places represent a smaller portion of information services than all other subsectors. INPUT breaks out the group separately because of the unique nature of some of

EXHIBIT II-3

FOOD STORES SUBSECTOR INFORMATION SERVICES MARKET FORECAST 1988-1993



the applications used by the subsector and because information services spending is on the rise in restaurants, bars, and other eating and drinking places. INPUT forecasts that annual growth for information services spending during 1988 to 1993 will be 22% for the group.

After substantial growth during 1986, the eating and drinking places subsector's growth has slowed. INPUT estimates that revenue growth for the group will be 8% during 1988, which is slightly above average for the retail industry as a whole. The slowdown in growth is primarily attributed to increased competition within the subsector, as well as from supermarkets, specialty foods stores, department stores, and hotels.

In order to compete more effectively, eating and drinking establishments are providing home delivery service, broadening their menus, and developing and maintaining good customer relations. Information services

the 1990s, the number of people in the world who are undernourished has increased from 600 million to 800 million (FAO 1996).

There is a growing awareness of the need to improve the nutritional status of the world's population. The United Nations World Food Programme (WFP) has been instrumental in the development of the concept of 'nutritional security' (WFP 1992). This concept is defined as 'the availability of food and the ability of people to obtain it' (WFP 1992, p. 1). It is a concept that is closely related to the concept of 'food security' (WFP 1992, p. 1).

The concept of 'nutritional security' is a concept that is closely related to the concept of 'food security' (WFP 1992, p. 1). It is a concept that is closely related to the concept of 'food security' (WFP 1992, p. 1). It is a concept that is closely related to the concept of 'food security' (WFP 1992, p. 1). It is a concept that is closely related to the concept of 'food security' (WFP 1992, p. 1).

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have been the key to providing these services. For example, applications are being used to analyze the cost of preparing a meal versus its price and popularity in order to develop new menus.

Restaurant computer systems have simplified the job of food servers and given management new tools for controlling costs and measuring sales. In many cases, customer orders are transmitted via terminal to the kitchen and the bar, allowing waiters to improve service by staying near the customers, as well as increase the number of people served. Orders are clearer to the chefs, and undercharges and overruns can be eliminated.

As in the other retail subsectors, growth for the eating and drinking subsector is highest in the areas of systems integration, network services/EIS, and application software. The systems integration activities are generally provided to the large chain restaurants, including fast-food restaurants. EDI represents the bulk of network services.

More details on information services spending by the eating and drinking places subsector are provided in Exhibits II-1 and II-4 and Appendix Exhibit A-3.

3. Merchandise Retailers

Merchandise retailers are growing at a slightly higher rate than average for retailers. Apparel and accessory store sales were estimated to increase 7% in both 1987 and 1988. Sales by drug and proprietary stores increased 7.5% during the first half of 1987; sales are forecasted to increase 8% during 1988. Furniture store sales rose an estimated 8% during 1987 and are forecasted to increase another 8% during 1988. Variety stores continue to increase sales, despite tough competition from discount drug and proprietary stores. Department store sales are expected to rise approximately 6% during 1988.

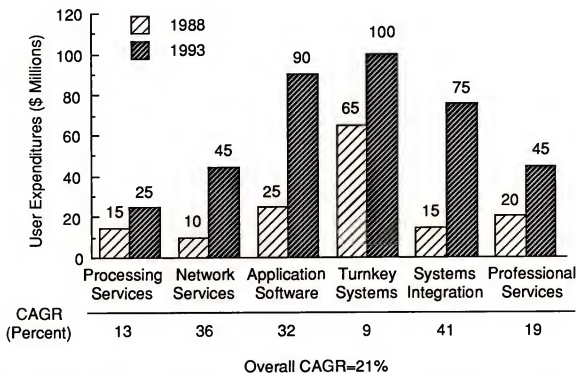
Merchandise retailers represent the largest and fastest growing retail subsector for information services. INPUT estimates that information services spending by the group will reach \$550 million during 1988 and forecasts that annual growth during 1988-1993 will average 23%.

Information services are used by merchandise retailers to gain a competitive edge by improving employee productivity, reducing paperwork, exerting tighter control over sales and inventories, maintaining better customer accounts, and assisting in decision making.

Department stores provide many computer-supported services to their customers. In addition to credit card processing, the department store chains offer telephone ordering services and mail order processing. They

EXHIBIT II-4

EATING AND DRINKING PLACES SUBSECTOR INFORMATION SERVICES MARKET FORECAST 1988-1993



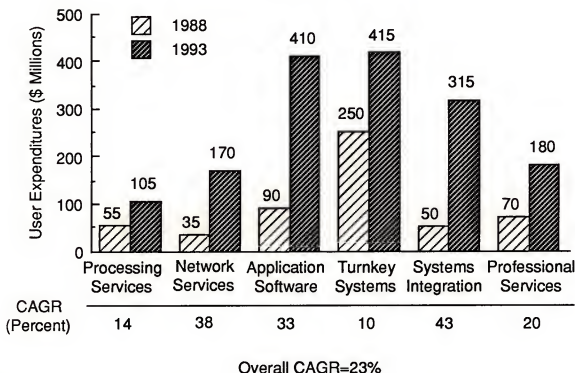
also require information systems for personnel and payroll functions. Interestingly, these types of services force department stores and other merchandise retailers to invest a large portion of their IS budgets in hardware and communications links.

In addition, stores in the merchandise retailing subsector are expanding through acquisitions and the opening of new outlets. Information services are used to tie these outlets together, consolidate the operations of merged companies, and identify stores that are not performing well. Expenditures by this subsector for standardized applications are expected to increase substantially over the next five years as a result of increased acquisition activity.

Detailed forecast information including market sizes and growth rates for the merchandise retailing subsector is provided in Exhibits II-1 and II-5 and Appendix Exhibit A-4.

EXHIBIT II-5

MERCHANDISE RETAILERS SUBSECTOR INFORMATION SERVICES MARKET FORECAST 1988-1993



4. Automotive Retailers

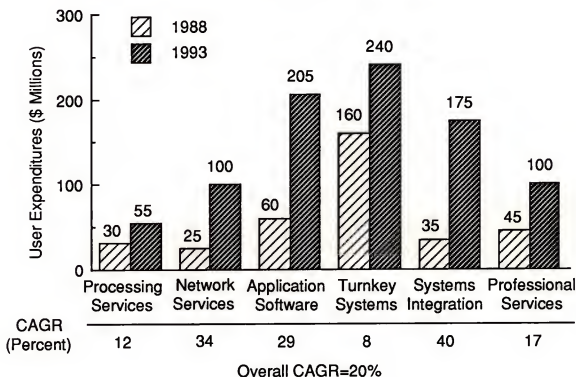
INPUT forecasts that information services spending by automotive retailers will increase an average of 20% per year. Total motor vehicle dealership sales in the U.S. increased only 2% during 1987, which is well below the average for the retail industry. However, profitability for these dealers has been improving, as dealers turn to departments other than new sales—such as service and parts sales—for increased business. Often, information services play a role in offering these services.

Information services used by automotive retailers include on-line data bases containing the locations and prices of spare parts for automotive parts retailers; EDI used by automobile, truck, motorcycle, boat, and motor home retailers for ordering and invoicing; and integrated systems that handle distribution, inventory control, and customer billing for gasoline service stations.

For INPUT's forecasts on the automotive subsector's information services spending during 1988-1993, see Exhibits II-1 and II-6 and Appendix Exhibit A-5.

EXHIBIT II-6

AUTOMOTIVE RETAILERS SUBSECTOR INFORMATION SERVICES MARKET FORECAST 1988-1993



C

Information Services Industry Sectors

1. Processing Services

Processing services include remote/batch processing services and systems operations processing services. Remote/batch processing services include transaction processing services, utilities services, and other processing services.

- Transaction processing services utilize vendor equipment and software, at either the vendor or customer site, and may be interactive or

remote-batch-oriented. Transaction processing involves manipulation of customer-owned data.

- Utilities services provide access to basic software tools, enabling the users to develop their own problem solutions.
- Other processing services include carry-in batch processing, computer output microfilm (COM) services, data entry services, and disaster recovery/backup services.

Systems operations (formerly termed facilities management) vendors provide a complete operating information system for customers including equipment, software, personnel, and facilities.

Although processing services represent a mature segment of the information services industry, expenditures made by retailers for processing services continue to grow steadily, although at a lower rate than for most of the other delivery modes.

Transaction processing services continue to grow at a higher rate than systems operations processing services, due to the fact that many of the larger retail organizations, which in the past might have used systems operations services, now have the resources to run their own operations in-house without the use of an outside firm.

Retailers still using processing services are either small- or medium-sized retailers without their own IS operation or retailers supplementing their own IS operation.

Retailers use processing services for all types of applications including mail list management, merchandise management, inventory control, stock replenishment, purchase order, sales analysis and reporting, accounting, payroll, and more.

Exhibit II-7 projects growth for transaction processing and systems operations within the retail distribution industry during the period 1988-1993. For more information, see Appendix Exhibits A-1 through A-4.

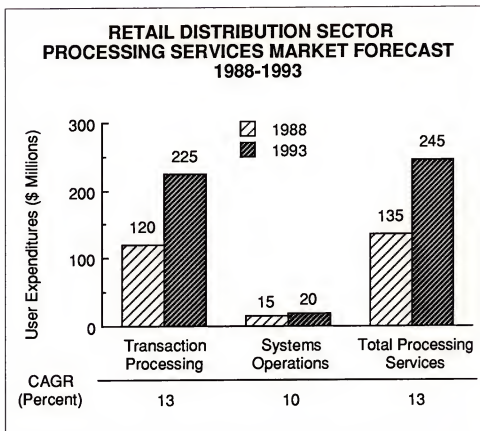
2. Network and Electronic Information Services

Network services includes value-added networks (VANs), electronic data interchange (EDI), and electronic mail.

- VANs are network transmission facilities, augmented with computerized switching and features such as packet switching, terminal interface, and error detection and correction.



EXHIBIT II-7



- EDI is application-to-application electronic communication, based on established business document standards.

Electronic information services (EIS) include data bases, new services, and videotex services.

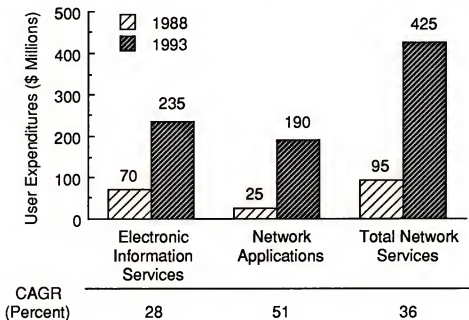
- Data bases provide specific information via terminal-based inquiry such as stock prices, legal precedents, and economic indicators.
- News services offer current information, either general or for a specific category.
- Videotex services provide interactive access to data bases and offer the inquirer the capability to send as well as receive information.

The retail distribution industry is relying more on EDI and EIS to conduct business, gather information, and make decisions. In some cases extensive satellite networks are also being used to link more than 1,000 stores to their company headquarters. Expenditures on these areas are expected to increase substantially during the next five years.

Exhibit II-8 outlines growth expected in network services, including a breakdown between electronic information services and network applications for the retail distribution sector during 1988-1993. Additional information is provided in Appendix A.

EXHIBIT II-8

**RETAIL DISTRIBUTION SECTOR
NETWORK AND EIS SERVICES MARKET FORECAST
1988-1993**



3. Application Software

For the purposes of this report, INPUT included only industry-specific application software sold to the retail distribution industry in its sizing of the application software market. Cross-industry applications used by the retail distribution industry were not included.

Expenditures for application software by the retail sector are expected to grow significantly (approximately 31% each year) during the next five years. Although many retail companies have IS departments that develop, enhance, and maintain applications in-house, they often purchase packaged software solutions that meet specific requirements rather than

Table 1. Mean values of the dependent variables for the three groups of subjects. Values are given as mean (SD) for the whole sample and as mean (SD) for each group

Variable	Whole sample	Group 1	Group 2	Group 3
Age (years)	20.2 (1.1)	20.2 (1.1)	20.2 (1.1)	20.2 (1.1)
Height (cm)	176.2 (6.1)	176.2 (6.1)	176.2 (6.1)	176.2 (6.1)
Weight (kg)	72.5 (10.5)	72.5 (10.5)	72.5 (10.5)	72.5 (10.5)
Pre-exercise heart rate (b min ⁻¹)	72.5 (10.5)	72.5 (10.5)	72.5 (10.5)	72.5 (10.5)
Pre-exercise blood pressure (mmHg)	118.5 (12.5)	118.5 (12.5)	118.5 (12.5)	118.5 (12.5)
Pre-exercise blood glucose (mmol L ⁻¹)	5.5 (0.5)	5.5 (0.5)	5.5 (0.5)	5.5 (0.5)
Pre-exercise plasma insulin (mU L ⁻¹)	12.5 (2.5)	12.5 (2.5)	12.5 (2.5)	12.5 (2.5)
Pre-exercise plasma glucose (mmol L ⁻¹)	5.5 (0.5)	5.5 (0.5)	5.5 (0.5)	5.5 (0.5)
Pre-exercise plasma insulin (mU L ⁻¹)	12.5 (2.5)	12.5 (2.5)	12.5 (2.5)	12.5 (2.5)

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the three groups. The mean values of the dependent variables for the three groups are given in Table 1.

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developing them from scratch. These applications can be modified or used "as is".

The types of industry-specific application software products available to retailers is varied. Point-of-sale (POS) systems are available that handle remote data collection and register management, gas pump management, item pricing, sales reporting, financial analysis, and purchasing. Software is available for supermarkets that maintains sales records from checkout stands, data on product delivery schedules, employee work schedules, energy use, and the amount of time products spend in chain warehouses before they are shipped to stores.

Within the retail distribution sector, expenditures for microcomputer applications will grow faster than expenditures for mainframe and minicomputer applications or any other type of information service. In this information-intensive industry, the penetration of microcomputers is very high.

Microcomputers have many uses in the retail industry. For example, many PC-based in-store processing (ISP) systems permit retailers to control and monitor their location, while acting as a channel for centralized credit authorization, payroll tracking, and other functions. PCs are also being used in restaurants for inventory control, menu analysis, payroll and scheduling, and revenue analysis. Consumers can even shop at home via PCs.

Exhibit II-9 forecasts growth for mainframe, minicomputer, and microcomputer application software in the retail distribution industry during the next five years. Further details are provided in the exhibits in Appendix A.

4. Professional Services

Professional services include information systems consulting, custom software development, education and training, and systems operations (formerly termed facilities management) of client-owned systems. Systems integration activities, which in the past have been reported as part of professional services, are broken out separately in the next section of the report.

Professional services will continue to grow at a steady rate during the next five years. Expertise in custom software development and systems consulting will be required mostly to supplement internal IS resources.

Professional services growth in the retail distribution industry is included in Exhibits II-2 through II-5 and Exhibits A-1 through A-4.

the 1990s, the number of people in the UK who are aged 65 and over has increased by 1.5 million (1990–1999) and is projected to increase by a further 1.5 million by 2010 (Office of National Statistics 2000).

There is a growing awareness of the need to develop strategies to meet the needs of the ageing population. The Department of Health (1999) has identified the need to develop a 'new paradigm' for the care of the elderly, one that is based on the concept of 'active ageing'. This paradigm is based on the idea that older people should be able to live independently, to be active and to participate in society. It is a paradigm that is based on the idea that older people should be able to live independently, to be active and to participate in society.

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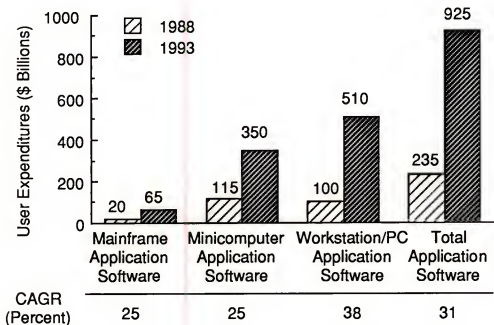
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EXHIBIT II-9

RETAIL DISTRIBUTION SECTOR SOFTWARE PRODUCTS MARKET FORECAST 1988-1993

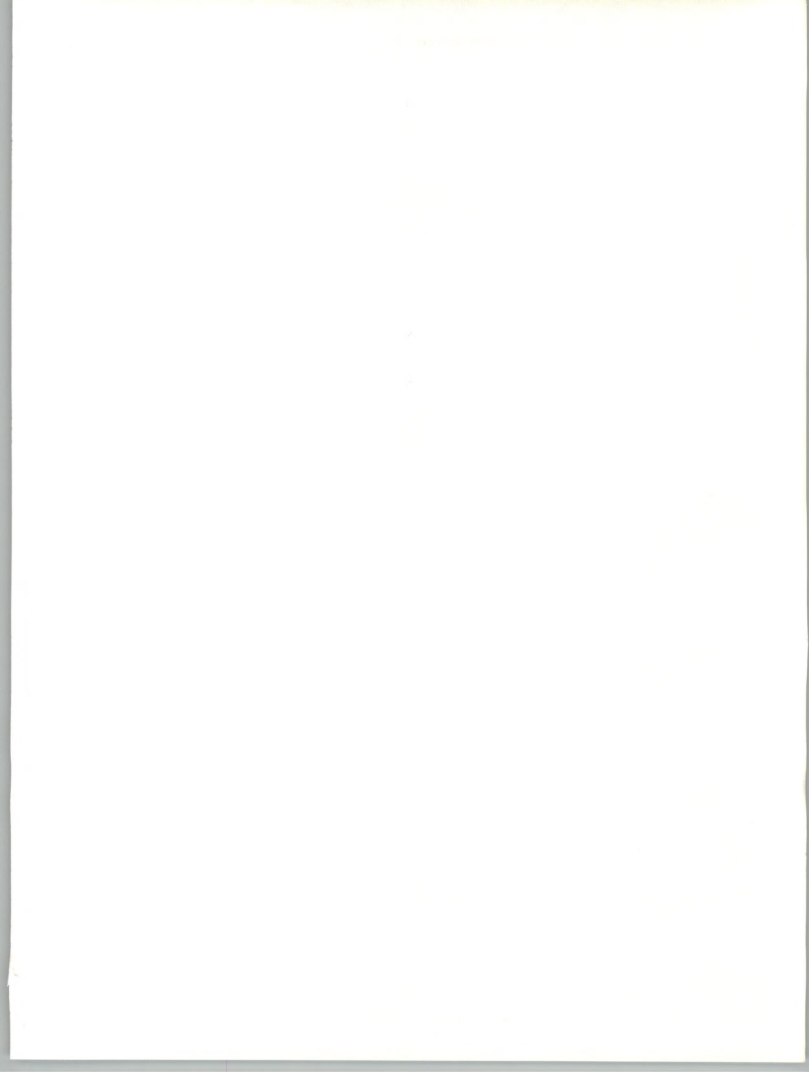


5. Systems Integration

Systems integration is the delivery of large, multidisciplinary, multivendor systems, incorporating some or all of these functions: systems design, programming, integration, equipment, networks, installation and acceptance. Systems can encompass multiple product delivery modes.

In the past, INPUT excluded the hardware portion of systems integration expenditures from its market estimates and forecasts. These hardware expenditures are now included.

The retail industry presents a tremendous opportunity to systems integrators. The industry is large, very competitive, and in the process of consolidation. Expertise in both systems integration and the retail industry is required to put together systems that use different hardware, software, and communications products.



Growth in systems integration expenditures made by the retail industry are shown in Exhibits II-2 through II-5 and Exhibits A-1 through A-4.

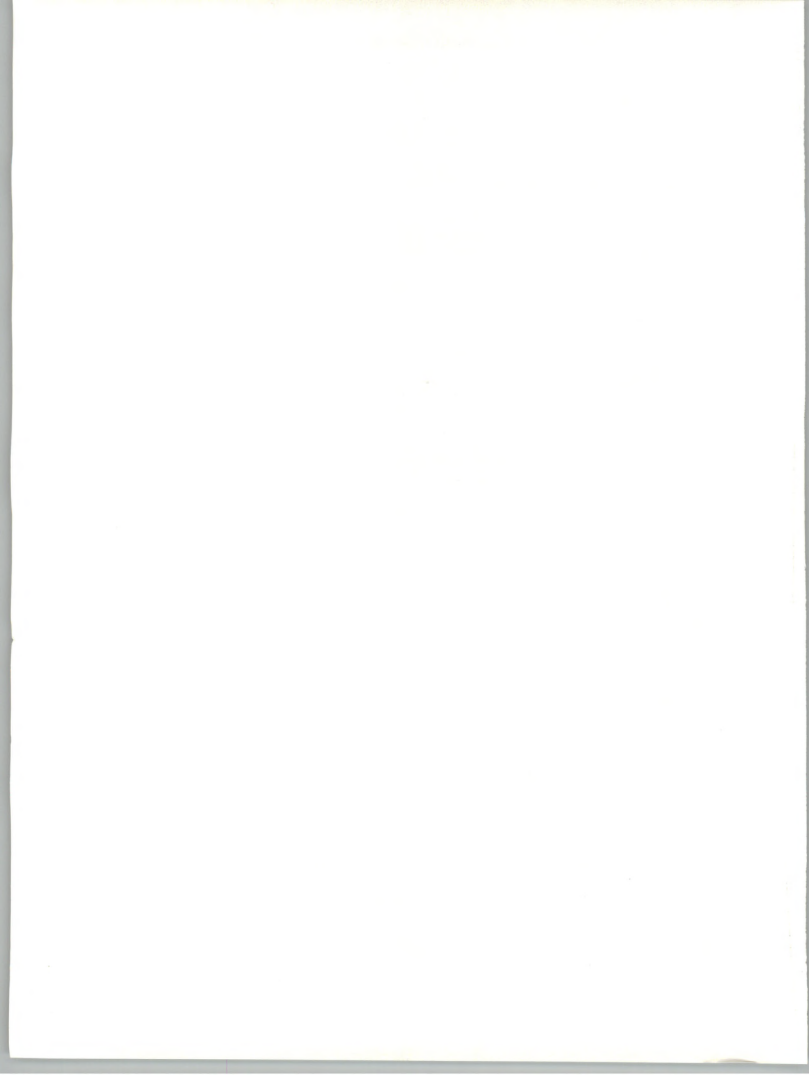
6. Turnkey Systems

Turnkey systems provide the integration of systems software and packaged and customized application software with CPU, equipment, and peripherals. Turnkey systems are packaged and delivered as complete applications solutions. Turnkey systems are available for many applications. For example, automobile dealerships use turnkey systems to schedule repair work, track inventories, process orders, and arrange financing.

The turnkey systems market in the retail industry is much like that in other industries. Expenditures are projected to grow at a fairly low rate over the next five years, although expenditures made by the retail industry for turnkey systems will increase at a higher rate than those made by other industries.

There are many reasons for the relatively low growth rate. Large retailers with their own IS departments handle many requirements of their organization in-house. If they do go outside the organization, it is more often for packaged or custom software, since they would prefer to utilize the computer equipment they already own. In addition, the installed base of turnkey systems is already higher for retailers than for companies in other industries. Therefore, even a slightly higher growth rate represents significantly higher expenditures by the sector.

Turnkey systems growth in the retail sector is shown in Exhibits II-1 through II-4 and Exhibits A-2 through A-5.





Competitive Developments

A

Market Characteristics

As an intensely information-oriented industry, the retail sector provides an excellent target market for all types of information services vendors—processing and network services, applications software products, professional services and systems integration, and turnkey systems vendors.

The retail distribution industry is characterized by several medium-sized processing services, network services, and systems integration companies; many small- and medium-sized professional services and application software companies; and several large turnkey systems companies. For market share information and more details on retail information services vendors, see Exhibit III-1 and the vendor profiles below.

B

Vendor Profiles

1. American Software, Inc. (Atlanta, GA)

a. Products/Services

American Software develops, markets, and supports application software products used primarily in the areas of forecasting and inventory management, purchasing and materials control, and order processing and receivables control. The company's products are available for IBM and compatible mainframes and IBM System/38 minicomputers. American software also provides a range of professional services through its Services Division.

b. Markets Served

The primary target market for American Software's mainframe products is Fortune 1000 companies in the manufacturing, distribution, utilities, health care, and banking industries.

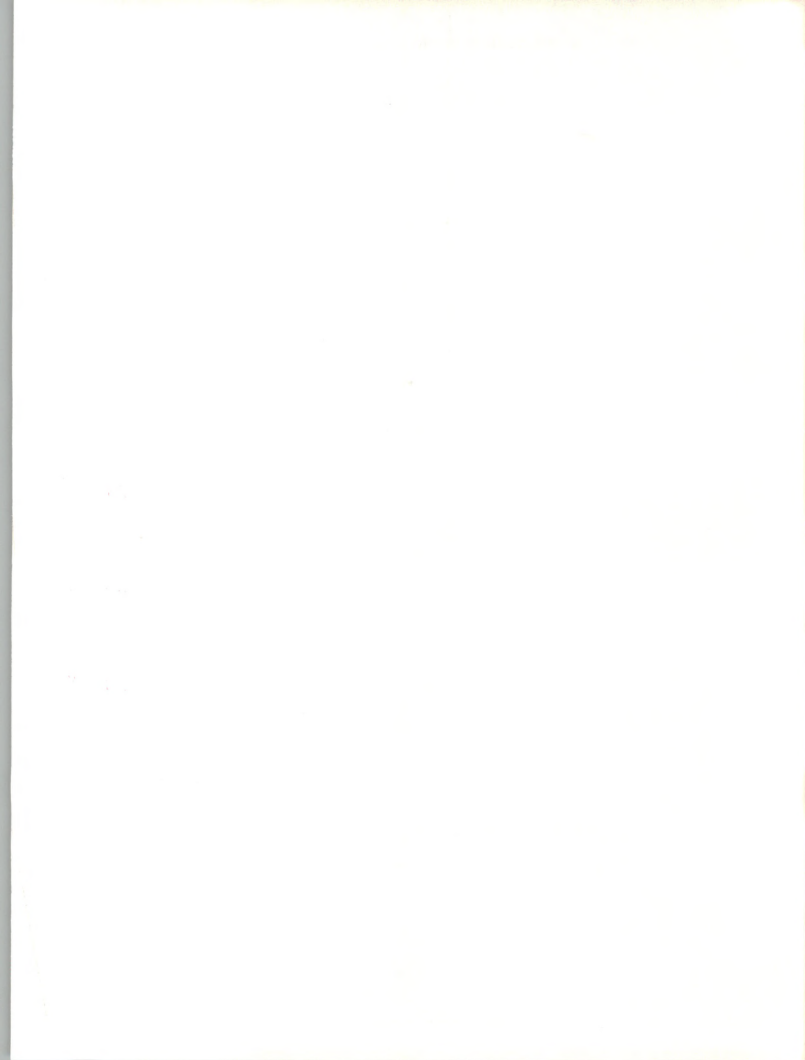
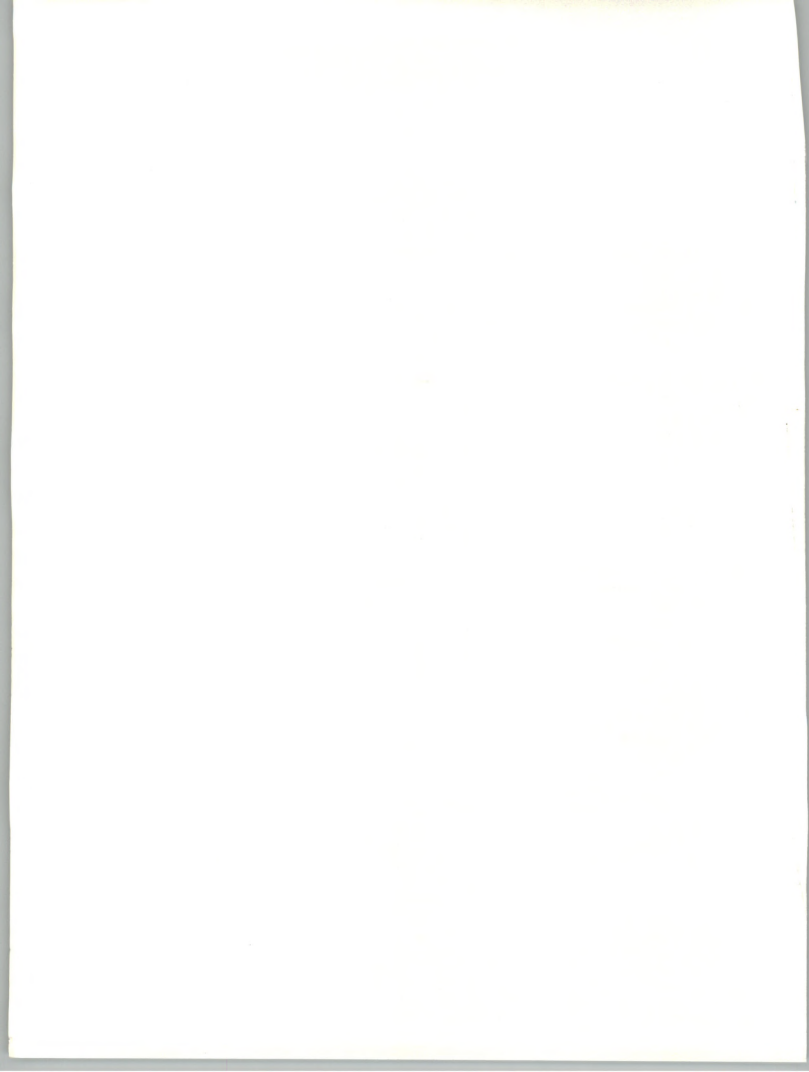


EXHIBIT III-1

**INFORMATION SERVICES REVENUE AND MARKET SHARES
BY DELIVERY MODE, 1987
(\$ Millions)**

Company Name	Proc	Net	Appl	Prof	SI	Turn	Total	Market Share (%)
ADP	62					93	155	13.0
Advanced Cybernetics			1	1		4	6	0.5
American Software			4	3			7	0.6
APL Group			2				2	0.2
ATV Systems					3		3	0.3
Comdata Holdings	18						18	1.5
Centel Business					5		5	0.4
Computer Assistance				2			2	0.2
Computer Task Group				2			2	0.2
Cornell Computer				3			3	0.3
CSC				10			10	0.9
EDS					32	26	58	5.0
GSI Transcomm			4				4	0.3
Hewlett-Packard			3				3	0.3
MPSI Systems			4	1			5	0.4
MTech		4					4	0.3
Price Waterhouse	7						7	0.6
Reynolds & Reynolds	14					131	145	12.0
Santa Cruz Operation		5	4		5		14	1.2
Systems & Programming				3			3	0.3
Teradata						15	15	1.3
Transkirt			5				5	0.4
Triad		1		11		31	43	4.0
Urban Data Processing	2						2	0.2
Wang Laboratories			5				5	0.4
Wiland Services	4						4	0.3
TOTALS	107	10	32	36	45	300	530	45.0



c. Company Strategy

The company's strategy has been to create an integrated line of standard application software products, designed to be used either singly or in combination, which meet unique customer requirements. To help increase its market share in certain vertical markets, American Software has expanded its basic software to support specific industry functions.

d. Recent Activities

American Software increased the size and experience level of its support staff at its Atlanta Customer Support Center and throughout its network of support branches. The company also made a significant capital investment in a new company-wide telecommunications system.

American Software also introduced a line of departmental systems for IBM's 9370 processor as well as intelligent workstation products for PCs.

e. Future Directions

Research and development activities will continue for the development of flexible, integrated software solutions in a variety of information processing environments. American Software will move further toward establishing a global presence, after making initial investments in Australia and Southeast Asia during 1988. The company expects benefits of the expansion to accrue as early as 1989.

2. The APL Group, Inc. (New Canaan, CT)

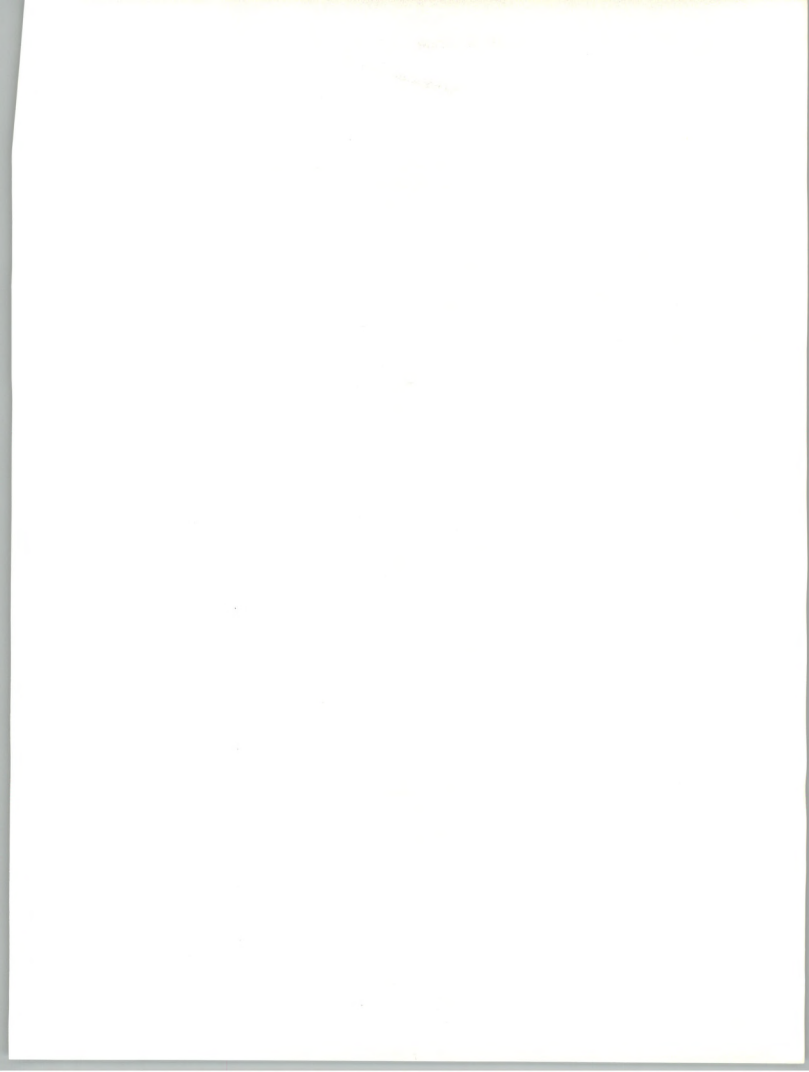
a. Products/Services

The APL Group provides electronic data interchange (EDI) software for IBM PC, XT, AT, and compatible computers. The package, called APL Computer-to-Computer Document Interchange (ACDI), front-ends to a host mainframe for translations and related EDI functions.

ACDI is a generic package designed for virtually any Transportation Data Coordination Committee/American National Standards Institute (TDCC/ANSI) standard application.

b. Markets Served

Primary markets include the grocery, transportation, and distribution industries, although the software is suitable for other applications.



c. Company Strategy

The company's micro strategy appeals to those seeking economical EDI solutions. ACDI reportedly costs 60-80% less than user-developed mainframe EDI software. The micro orientation also supports migration to larger standalone systems, or integration into a mainframe environment.

d. Recent Activities

The APL Group has formed a strategic alliance with CAP3 Computer Assisted Purchasing. The alliance is intended to provide a complete EDI capability for purchasing professionals.

e. Future Directions

The APL group is pursuing customers in other industry markets, including the electronics and chemical industries.

3. Automatic Data Processing, Inc. (Roseland, NJ)

a. Products/Services

Automatic Data Processing (ADP) provides payroll and accounting services, as well as brokerage, banking, and thrift services, services to automotive dealers, and collision estimating services for the insurance industry. The company provides information and processing services to more than 150,000 clients worldwide.

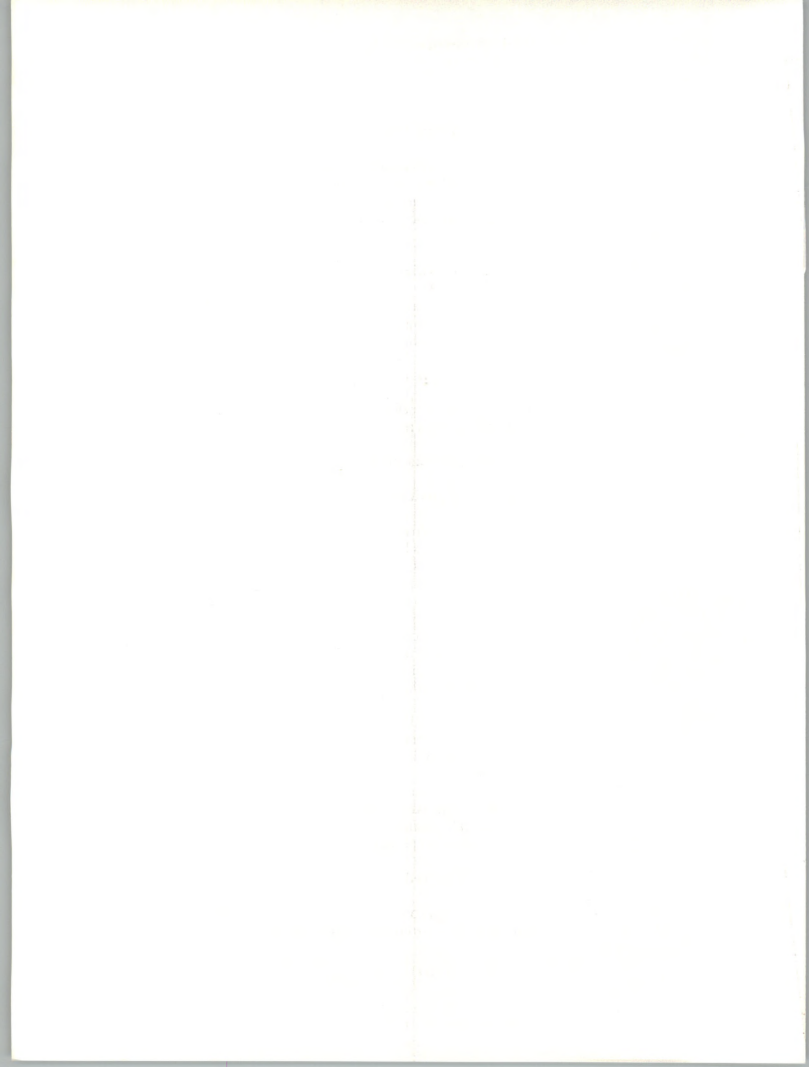
ADP Dealer Services provides batch, on-line, and on-site accounting and management information services to over 8,000 dealers and manufacturers in the automobile, truck, industrial equipment, farm equipment, and related industries throughout the U.S. and Canada.

ADP provides turnkey computing systems for car dealerships and factory-dealer communications systems to provide more effective new car and parts availability data between the auto manufacturer and its dealers.

Applications available include inventory control, general accounting control, lease management, parts invoicing, service merchandising, finance and insurance, repair order billing, accounts payable check writing, and word processing.

b. Markets Served

ADP's revenue is primarily derived from banking and thrift institutions, brokerage firms, insurance companies, and automotive dealers.



c. Company Strategy

For the past five years, ADP Dealer Services has increased its revenues and profits as it expanded both its dealership business and communications-based applications services. ADP augments its internal growth through selective acquisitions that focus on the expansion of existing and planned services. ADP's objective is to have a primary market share as an independent service provider in each major market served. The company generally does not pursue small business niches and avoids markets where it might only have a minor market share.

d. Recent Activities

In August 1987, ADP acquired InstantTeller, a proprietary, shared automatic teller machine network, located primarily in California. In 1988, the company acquired several payroll processing services from banks, including BancOhio, National Bank, and PNC Financial Corporation.

e. Future Directions

ADP plans to grow its existing businesses, disposing of lesser activities which no longer fit strategic objectives.

4. Comdata Holdings Corporation (Nashville, TN)

a. Products/Services

Comdata Network, a subsidiary of Comdata Holdings, provides funds transfer services to the trucking industry and bank credit card holders and offers check verification processing services for retail establishments.

b. Markets Served

Comdata's revenue is derived from the transportation and retail distribution industries, as well as credit card holders.

c. Company Strategy

Comdata Holdings' strategy is to increase market share by improving service and leveraging the company's technological capabilities and diverse product lines, in addition to developing new products and services for its current customer base that utilize the existing computer network.

d. Recent Activities

Comdata Holdings had no operations until September 1987, when it acquired Comdata Network and its subsidiaries. The total acquisition cost of Comdata Network was approximately \$320 million.

参考文献

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e. Future Directions

Comdata will continue to acquire companies that contribute to the company's primary business in transportation, payment services, and cash advance services.

5. Computer Sciences Corporation (El Segundo, CA)

a. Products/Services

Computer Sciences Corporation (CSC) is the largest independent professional services company in the industry. CSC provides requirements analysis, software development, systems engineering and integration, communications, turnkey computer-communications systems, and systems operations services.

In addition, CSC provides industry-specific proprietary products and services for credit reporting, claims processing, health maintenance organizations, income tax preparation, and manufacturing and distribution applications. The company also provides value-added communications and remote-computing services via INFONET, CSC's international data communications network.

b. Markets Served

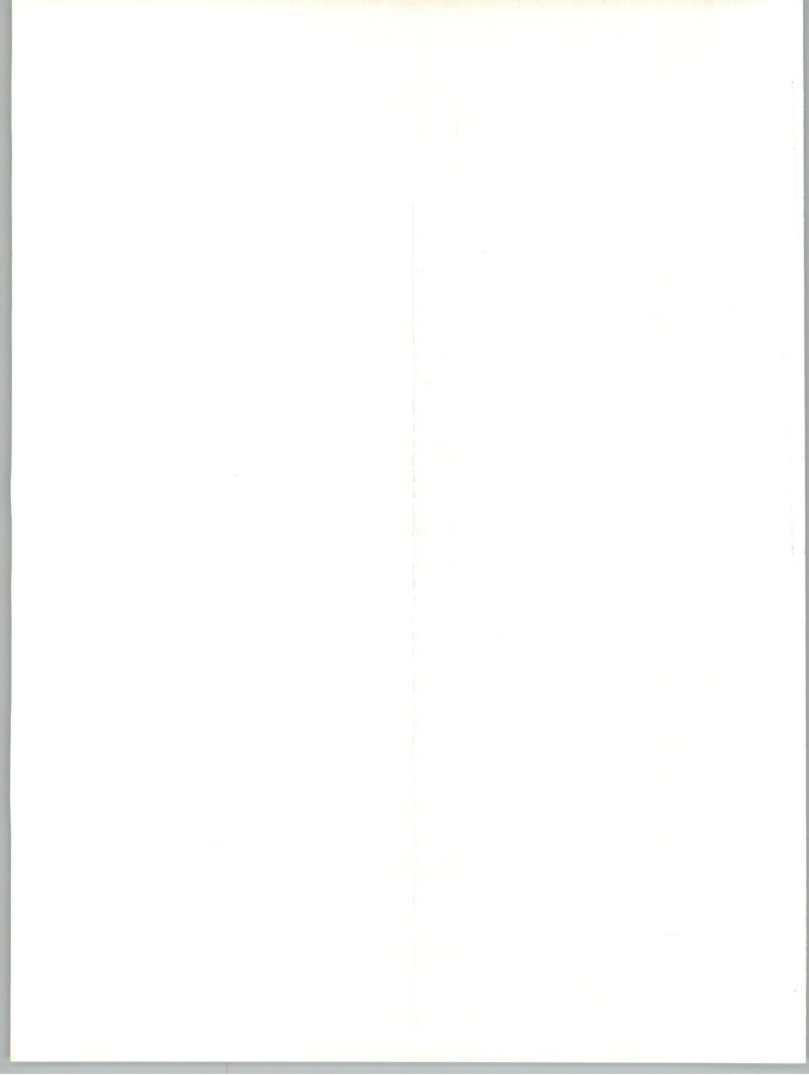
CSC provides professional services to the federal government, state and local government, commercial and international markets. Commercial markets include retail/wholesale distribution, medical, utilities, and services, and Fortune 500 companies in manufacturing, insurance, banking and finance. International markets include foreign governments, financial institutions, transportation companies, and manufacturers.

c. Company Strategy

CSC's strategy is to increase the percent of revenue contribution from commercial markets, including retail and wholesale distribution, through internal growth and acquisitions, while maintaining its leadership position in the federal government market.

d. Recent Activities

CSC's strategy has produced excellent financial results during the past two years. The company's emphasis on large contract opportunities in the past three years has resulted in ten contracts with an aggregate value of \$2.6 billion, including options, and another \$1.3 billion in smaller contract orders.



e. Future Directions

The company is giving major attention to the emerging commercial and international markets for systems integration services, drawing on its experience in large federal systems integration programs.

6. Electronic Data Systems Corporation (Dallas, TX)

a. Products/Services

Electronic Data Systems (EDS), a subsidiary of General Motors Corporation, is a leading communications and information services company providing information processing, systems integration and management, turnkey systems and communication services.

b. Markets Served

EDS provides services to the banking, manufacturing, retail, and telecommunications industries. Other major markets include insurance companies, government-funded health insurance, credit union processing services, government professional services, and health care systems.

c. Company Strategy

EDS' strategy is to build its base businesses through teamwork with customers and within EDS, while acquiring companies that offer fast and cost-effective entrance into new markets.

d. Recent Activities

In late 1987, EDS completed a global communications network linking EDS customers and computing facilities on six continents.

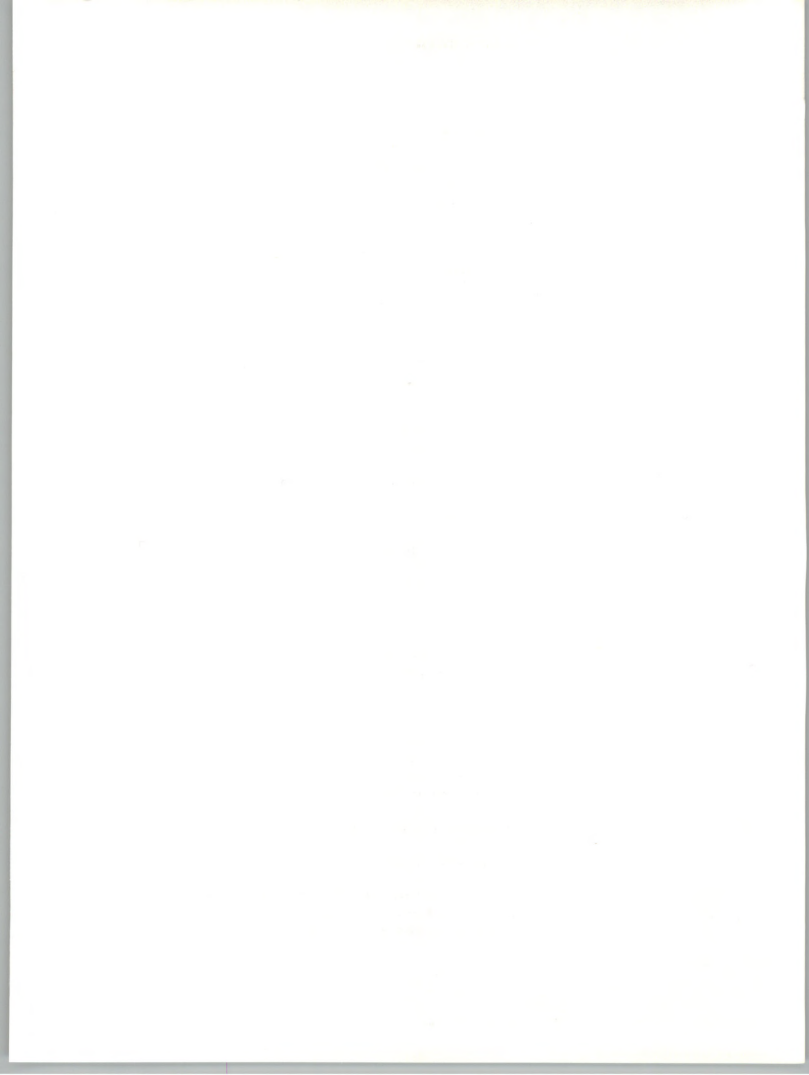
e. Future Directions

EDS plans to continue making acquisitions that provide entry into new, growing markets, as well as to form joint ventures, such as its international contracts in China, Japan, and Italy, and to continue to organize the company to meet the demands of a growing global business.

7. GSI Transcomm (Pittsburgh, PA)

a. Products/Services

GSI Transcomm, a subsidiary of Generale de Service Informatique (GSI), was founded as Transcomm Data Systems Inc. to provide timesharing facilities on DEC PDP-11 series equipment. GSI Tran-



scomm currently provides a distribution management and financial control application software package for DEC minicomputers called TOLAS™. The company also offers professional services and processing services.

b. Markets Served

The TOLAS system has been installed in medium- to large-sized companies, including Fortune 500 corporations. Approximately 90% of the installations are in companies in the distribution industries, with the balance in a variety of industries, including banking and international trade.

c. Company Strategy

GSI Transcomm markets TOLAS through the U.S., Canada, and Western Europe, specializing in multilocation environments. GSI Transcomm can also customize TOLAS for each installation.

d. Recent Activities

During 1988, GSI Transcomm established a regional sales office in Toronto, Canada, reportedly in response to the request of certain business partners.

e. Future Directions

GSI Transcomm plans to become an international leader in the distribution management software market. The opening of the Toronto office brings the number of locations the company has in North America to four. In addition, TOLAS™ is marketed throughout Europe by the Business Management Division of GSI Transcomm's parent, GSI.

8. MPSI Systems, Inc.

a. Products/Services

MPSI Systems was founded to develop and market application software for site selection and evaluation of retail outlets for major petroleum companies. Currently, MPSI offers application software packages and processing services and provides market area studies for its clients.

b. Markets Served

MPSI provides retail systems to the petroleum and retail food industries and financial and decision support systems to government, financial institutions, and other industries.

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c. Company Strategy

MPSI's strategy is to adapt its software for various retail industries including convenience food outlets, restaurants, financial institutions, and supermarkets. MPSI has adapted or is currently adapting its software and data bases for these industries. MPSI has also made acquisitions providing services in its newer target markets.

d. Recent Activities

In 1988, MPSI acquired Execucom of Austin (TX), which provides financial planning and decision support software to the petroleum industry, banking, government, and other industries.

e. Future Directions

Through acquisitions and investments in research and development, MPSI plans to expand in terms of not only employees and customers, but also geographic areas, industries served, and services offered.

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

a. Products/Services

The Reynolds and Reynolds Company (Reynolds), which was originally formed in 1866 to manufacture and distribute business forms, now also provides batch and remote computing services, turnkey systems, and microprocessor-based terminals primarily to automobile dealerships.

b. Markets Served

In addition to automobile dealerships, Reynolds also markets products and services to accountants, medical practices, and hospital-based physicians.

c. Company Strategy

Reynolds is concentrating its efforts on core products and key business opportunities. During 1988, the company sold off its tax processing unit, its direct marketing catalog operation, its specialty printing operation, and its South African subsidiary.

d. Recent Activities

The Computer Systems Division was reorganized in May 1988, resulting in the reduction of 250 positions. Also during 1988, the Business Forms Division substantially completed the integration of the Arnold Corporation, acquired in May 1986, with the Business Systems Division.

the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million, from 2.5 million in 1980 to 4 million in 1999. The public sector has become a major employer in the UK, and its growth has been a key factor in the overall growth of the economy.

The public sector has also become a major provider of social services, and its growth has been a key factor in the overall growth of the economy. The public sector has become a major provider of social services, and its growth has been a key factor in the overall growth of the economy.

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e. Future Directions

Reynolds is confident that the changes it made during 1988 will lay the foundation for long-term growth and profitability.

10. Triad Systems Corporation (Livermore, CA)**a. Products/Services**

Triad Systems develops, manufactures, markets, and supports turnkey systems in three vertical markets: the automotive parts aftermarket, retail hardgoods dealers, and dentists. The company also provides automotive parts pricing and catalog-updating data base services.

Triad provides lease financing to many of its turnkey system clients through its wholly owned subsidiary, TSC Leasing Corporation.

Triad also provides on-site third party maintenance services for Altos Computer value-added resellers and their customers.

b. Markets Served

Triad Systems' primary markets include the automotive parts aftermarket, retail hardgoods dealers, and dentists.

c. Company Strategy

Triad's strategy is to bring new products to the market while continually enhancing earlier introductions.

d. Recent Activities

During 1988, Triad introduced a number of products and services, including two IBM 9370 automotive warehousing systems and the LaserCat standalone electronic workstation. In addition, the company opened its new headquarters in Livermore (CA).

e. Future Directions

Triad plans to introduce more new products and invested approximately \$8 million in research and development during 1988; the company plans to invest another \$11 million during 1989. In addition, the company is stepping up marketing activities in its Alliance program.

IV

User Issues and Directions

A

Major Forces in Retail Distribution

Retailers operate in an extremely competitive environment, which has led to consolidation within the industry and expansion of companies remaining in the industry. Expansion occurs from opening new stores, franchising, and acquiring other companies.

Low foreign labor costs have prompted some U.S. retailers to seek sources of supply outside the U.S. These retailers either operate their own manufacturing plants overseas or distribute products manufactured by foreign companies. However, the long lead time required to manufacture goods in some Asian countries has forced retailers to use U.S. and European manufacturers as suppliers.

Revenues and profits are determined by the amount of disposable income available to consumers for spending and costs incurred by the retailers. To reduce costs, retailers can improve efficiency and economies of scale and investigate new supply sources and distribution channels.

A clear driving force in the retail distribution industry is consumer need. What is "hot" today may not be tomorrow—one reason long manufacturing lead times may be unacceptable. Consumer need has also contributed to retailers entering nontraditional business lines, such as services.

In addition, the technology available to retailers dictates, to some degree, how efficient they can be and what services they can provide.

For a list of driving forces that impact IS groups within the retail distribution industry, see Exhibit IV-1.

Managers of information systems (IS) departments within retail organizations are dedicated to meeting end-user requirements for information systems. Development of new applications or enhancement of existing applications can be performed internally by IS staff, or applications can

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EXHIBIT IV-1

DRIVING FORCES IMPACTING IS

- Competitive environment
- Sources of supply
- Consumer disposable income
- Retailer costs
- Customer needs
- Technology available

be purchased or developed on a custom basis by a professional services vendor.

Many issues concerning IS vendors are the same issues facing the end users and the retail industry as a whole—for example, improving productivity, containing costs, and improving and expanding customer services.

In addition, IS managers are involved in maintaining an experienced IS staff, training end users and IS staff, developing disaster recovery systems, procuring computer hardware that will be viable in the long run, implementing EDI, designing networks, and standardizing applications and communications systems.

Exhibit IV-2 provides a synopsis of critical issues facing IS managers.

Many factors affect the IS budget. Companies that grow as a result of acquisitions or by hiring new personnel increase their requirements for information systems. More end users need systems, and in the case of acquired or merged companies, systems must be integrated and redundancy eliminated. Depending on top management's level of commitment to end-user as well as customer needs, IS budgets can be increased accordingly. The increased sales and profits generated by these growing companies allow the IS budgets to be increased.

Another factor is the competitive environment, especially strong in the retail industry. Competing more effectively—for example, making the right products available at the right time or offering more new services to the customer—often requires an increased level of IS spending.

EXHIBIT IV-2

CRITICAL ISSUES FACING IS MANAGERS

- Improve productivity/cut costs
- Improve/expand customer services
- Develop/enhance applications
- Design networks
- Implement EDI
- Standardize applications and communications systems
- Maintain required level of quality IS staff
- Make hardware decisions
- Develop disaster recovery systems
- Train end users to use computer systems

While developing new applications to meet the demands of a changing marketplace, IS managers are also heavily involved in maintaining existing systems. In addition, they must replace obsolete systems; depending on the cost of new technology, the initial outlay for new systems may be significant.

Managers must also adjust their budgets when expense items—such as rent, personnel, communications, and maintenance—increase. Also, company policies mandated by top-level management can impact IS budgets significantly, because the IS department must often find ways to implement the new procedures.

Exhibit IV-3 provides an overview of factors that affect an IS budget.

B**IS Budget Analysis**

During 1988, IS spending represented approximately 2% of total revenues for the retail distribution sector. As expected based on the results of INPUT's last budget survey, growth in retailer IS spending between 1987 and 1988 was essentially flat. IS managers interviewed in 1988 projected a 5% increase in IS spending during 1989.

The largest areas of the budget in 1988—personnel and hardware—will continue to represent the bulk of IS department budgets in 1989, al-

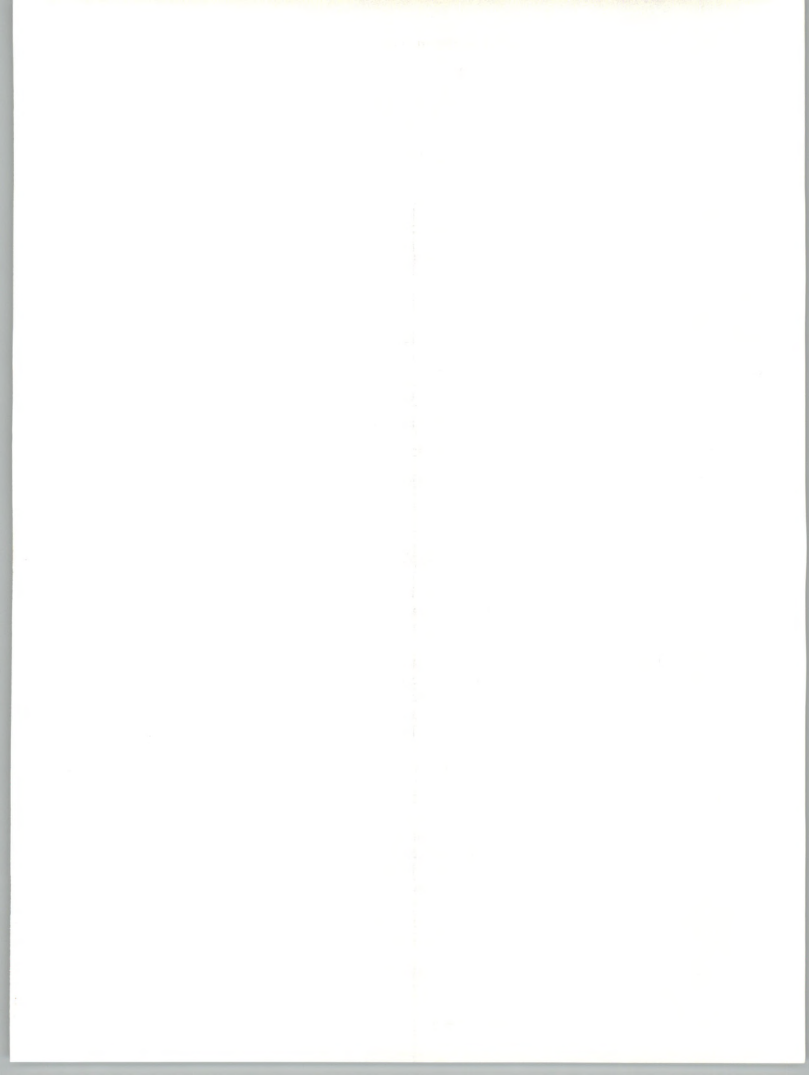


EXHIBIT IV-3

FACTORS AFFECTING IS BUDGET

- Company growth/sales
- Competitive environment/changing marketplace
- Increased expense items
- New applications/major projects
- Ongoing projects
- Replacement of obsolete systems
- Cost of new technology
- Commitment to customer/user needs
- New company policies

though expenditures for external products and services will increase by a higher percentage. Spending for external products and services is projected to increase 15% in 1989.

Within the hardware category, 1989 budgets demonstrate the shift of resources the industry is making toward the use of more PCs and workstations.

Expenditures for application software in 1989 will increase at a higher rate than expenditures of any other type. Systems software, software maintenance, and professional services will also increase significantly during 1989.

For a detailed breakdown of 1987 and 1988 budgets, as well as expected changes in 1989, see Exhibit IV-4.

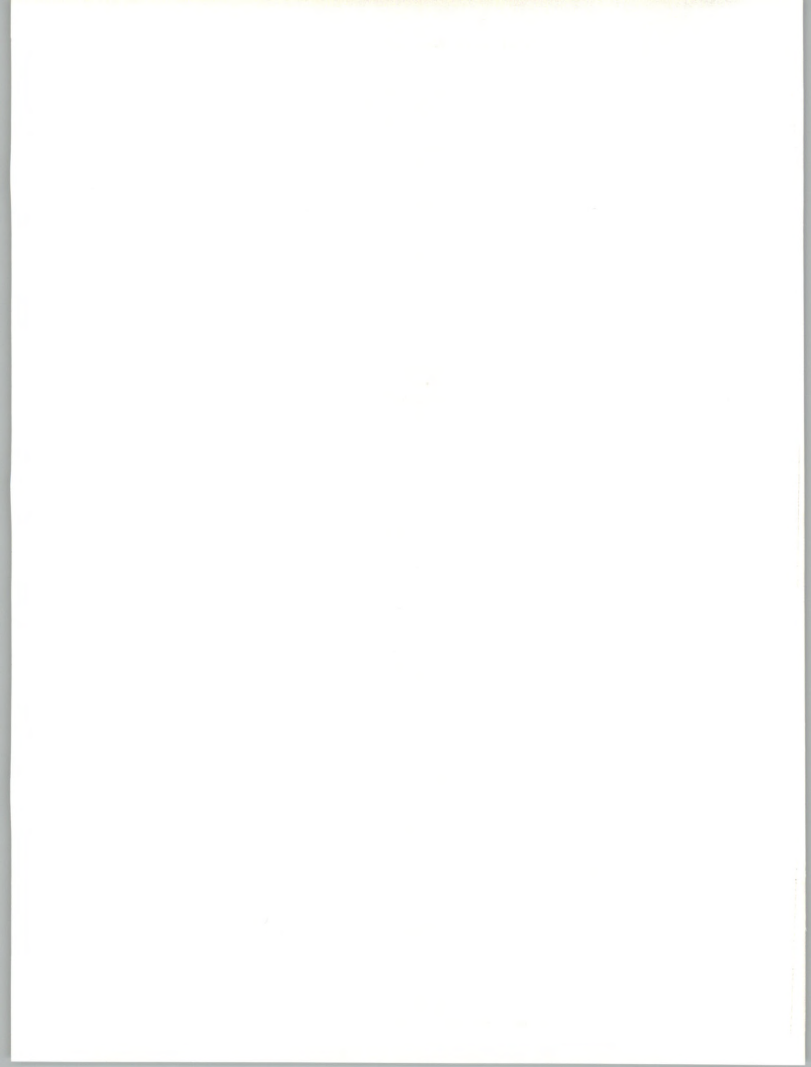


EXHIBIT IV-4

IS BUDGET—DISTRIBUTION AND GROWTH

Category	1987 Budget (%)	1988 Budget (%)	Expected Change 1989 (%)
Personnel	36	39	5
Computer Hardware	27	26	4
Mainframes	40	35	3
Minicomputers	25	25	1
Microcomputers	20	25	10
Mass Storage Devices	10	10	0
Other	5	5	0
Communications	18	20	0
Voice Communications	52	50	0
Data Communications	48	50	0
External Products/Services	14	11	15
Professional Services	20	18	15
Processing Services	1	1	5
Application Software	11	11	24
Systems Software	31	32	16
Turnkey Systems	3	3	3
Hardware Maintenance	20	21	6
Software Maintenance	14	14	20
Other	5	4	3
Total	100	100	5

C**Application
Development Trends**

IS managers consistently report having a backlog of planned application development projects. None of the respondents reported the situation improving in any way during 1988; application backlog either remained the same or increased. For more information, see Exhibit IV-5.

the same species. The results of this study suggest that the *Phylloniscus* species found in the study area are not new to the region.

Phylloniscids are important components of the benthic macroinvertebrate community in coastal and estuarine environments. They play a role in the breakdown of organic matter and the recycling of nutrients. The results of this study suggest that the *Phylloniscus* species found in the study area are not new to the region.

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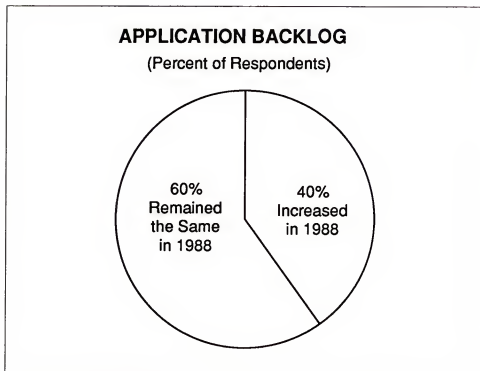
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EXHIBIT IV-5



Regarding major applications development projects planned by INPUT's respondents for 1989, 69% of the projects will utilize internal resources only—i.e., internal staff will enhance existing systems or develop new systems. Some projects planned will utilize external resources, such as professional services and application software products, combined with internal resources. Only a very small number of projects will utilize external resources only. See Exhibit IV-6.

In addition, 31% of these projects will utilize packaged software solutions, whereas 69% will involve custom software development or modification/customization of packaged software products.

INPUT's respondents reported that IS application development staff are involved with not only developing or enhancing systems, but also with maintaining existing systems. For an allocation of application development staff assignments at respondent companies, see Exhibit IV-7.

In many cases (60%), IS managers reported that end users are currently developing some production applications utilizing PCs, minicomputers, and mainframes. Respondents estimated that about 20% of the application development performed within their organizations was done by users.



EXHIBIT IV-6

**APPLICATION DEVELOPMENT
SOURCE OF RESOURCES**

(Percent of Application
Development Projects)

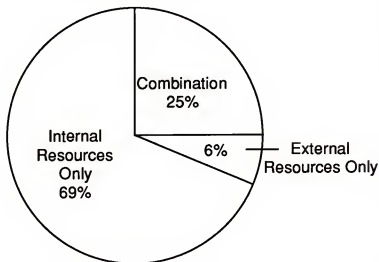
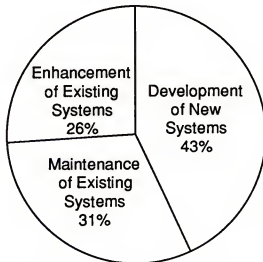
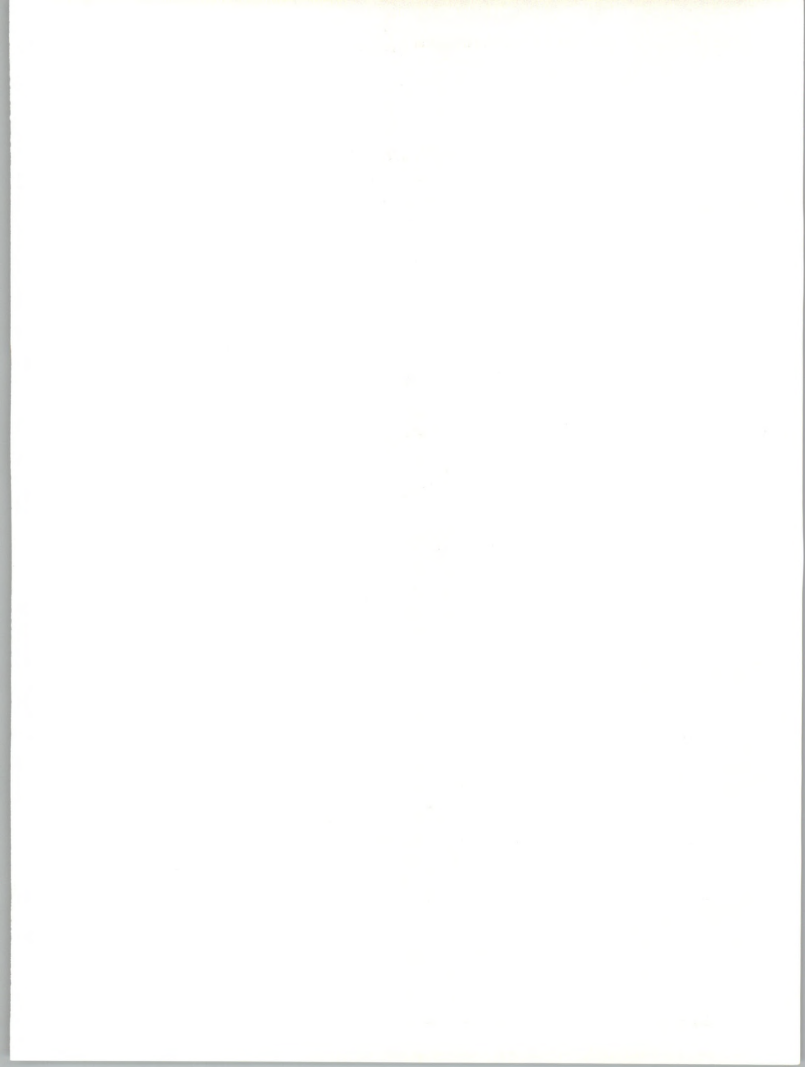


EXHIBIT IV-7

**ALLOCATION OF INTERNAL
APPLICATION DEVELOPMENT STAFF**

(Percent of Application
Development Staff)





In these cases, 50% reported that end users develop applications using mainframes only. Seventeen percent of IS managers surveyed reported that end users at their companies use only PCs to develop production applications. The remaining respondents reported that a combination of microcomputers and either a mainframe or minicomputer were used for this purpose.

For all major mainframe projects developed in 1987, 23% utilized relational data base management systems (DBMSs). In comparison, 37% of major mainframe projects planned for 1989 will utilize relational DBMSs. Thirty-eight percent of minicomputer projects planned for 1989 will also utilize these systems.

The retail distribution industry respondents in INPUT's survey reported having a moderate to high level of knowledge regarding EDI. Sixty percent are currently using or in the process of implementing EDI. The remaining 40% are considering EDI implementation.

D

Objectives and Plans

A primary objective for IS managers interviewed by INPUT is to meet new end-user requirements using information systems, and to do so in a timely manner. End users want these sometimes very complex systems as soon as possible, because they will enable them to provide competitive products and services to their customers. At the same time, IS managers need to reduce their backlog of applications development projects and maintain ongoing operations.

Meeting user requirements can mean developing new systems or enhancing or expanding existing systems. Projects identified by INPUT's respondents for 1989 include implementing EDI, improving processing speed, providing better sales information, and implementing decision support systems.

Integrating systems is also a priority for most IS managers. Sometimes, the need to integrate systems stems from an acquisition or a company reorganization. Sometimes, it just makes sense for systems and applications to be integrated for better use of information.

The types of applications that IS managers are developing range from general retail applications, such as sales analysis, to subsector-specific applications, such as those for department stores. Some of the applications planned for development by IS managers in 1989 are outlined in Exhibit IV-8.

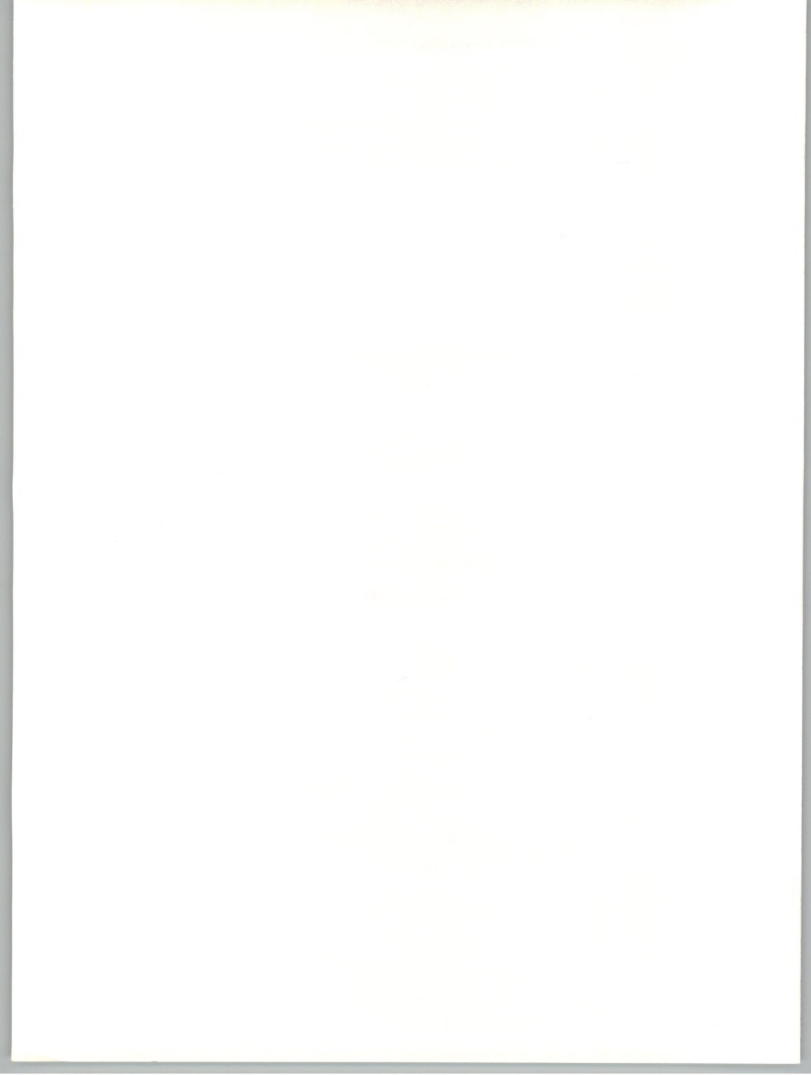


EXHIBIT IV-8

NEW APPLICATION AREAS

- EDI
- Inventory management
- Sales tracking and analysis
- Decision support systems
- Price look-up at point-of-sale
- Mail order referral in the store

Many new technologies are available for information services vendors to provide or incorporate into their product/service offerings. Those technologies that IS managers plan to implement in 1989 are shown in Exhibit IV-9.

EXHIBIT IV-9

NEW TECHNOLOGY PLANNED

- Artificial intelligence
- Relational data base management
- Computer-aided software engineering (CASE)
- Satellite communications
- Optical scanners/POS/bar coding
- Laser printers
- End-user development tools
- Advanced publishing systems
- Hand-held computers
- Voice computers
- X.12 business formats



Some of the applications planned for development by IS managers in 1989 are outlined in Exhibit IV-8. New technologies that information services vendors have available to offer and IS managers plan to implement in 1989 are shown in Exhibit IV-9.

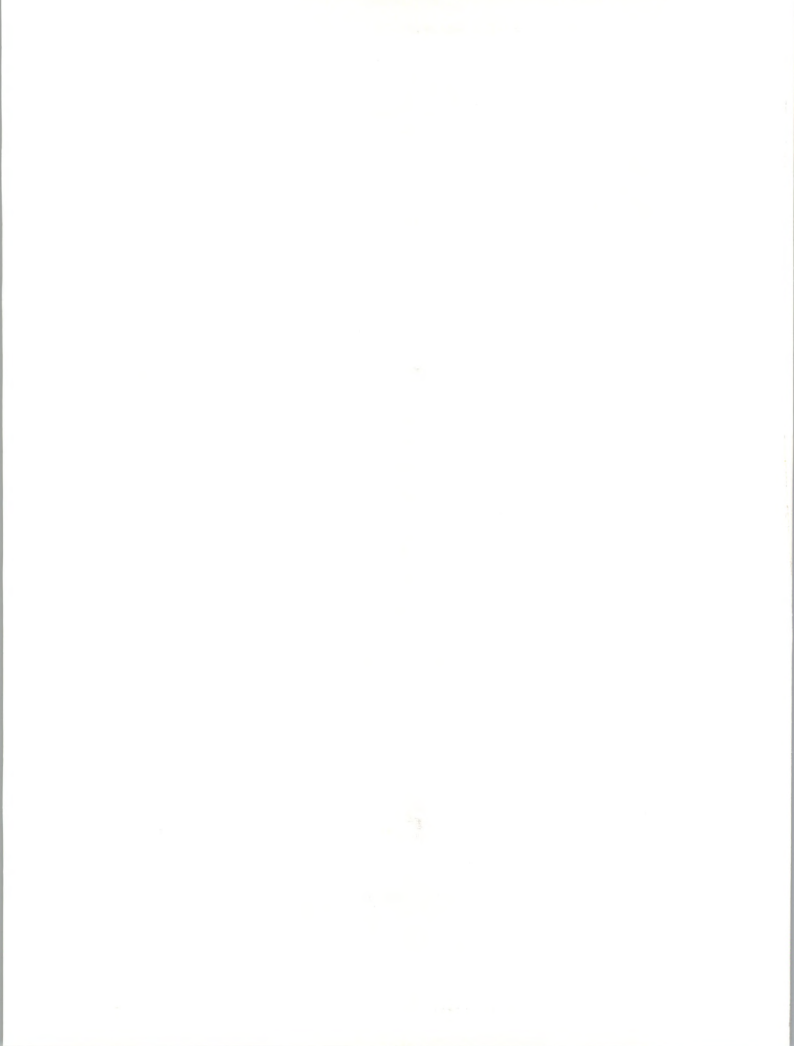
Another objective for 1989 that INPUT's respondents identified is the procurement of computer hardware, software products, and professional services required for the applications they intend to develop. Hiring and training staff required for internal applications development and systems maintenance is another objective.

Exhibit IV-10 provides an overview of the 1989 IS objectives identified by INPUT's respondents.

EXHIBIT IV-10

IS OBJECTIVES

- Meet end-user requirements
- Develop new systems
- Enhance/maintain existing systems
- Integrate systems
- Improve information processing speed
- Buy/install new hardware and software
- Procure professional services
- Hire/train personnel





Opportunities

Opportunities for retail distribution companies relate to their ability to provide products and services, improve management, increase efficiency, increase revenues, and reduce expenses—i.e., become more competitive and more profitable.

Opportunities for information services vendors selling to the retail distribution industry include providing systems that enable competitive product/service offerings and providing expertise in systems integration and the latest technologies. Retailers reported that vendors are not as innovative as they should be and do not always use the latest available technology.

For large-scale systems development and integration, retailers will look for systems integrators with expert knowledge and experience in developing complex systems for the retail distribution industry. Retailers are looking for more customization of products to meet their specific subsector requirements.

Retailers use many network services, including on-line data bases, electronic mail, and EDI. This segment of the information services market is expected to grow rapidly during the next five years. Also expected to grow substantially during the next few years is the use of microcomputers and microcomputer applications, although they are already in widespread use throughout the industry.

Most IS departments within the retail distribution industry plan to develop their own applications and use external resources only as a supplement to internal resources. Even end users are developing their own applications. Therefore, the industry provides an excellent opportunity for application development productivity tools.

Areas of opportunity for information services vendors and retail distribution companies are shown in Exhibit V-1.

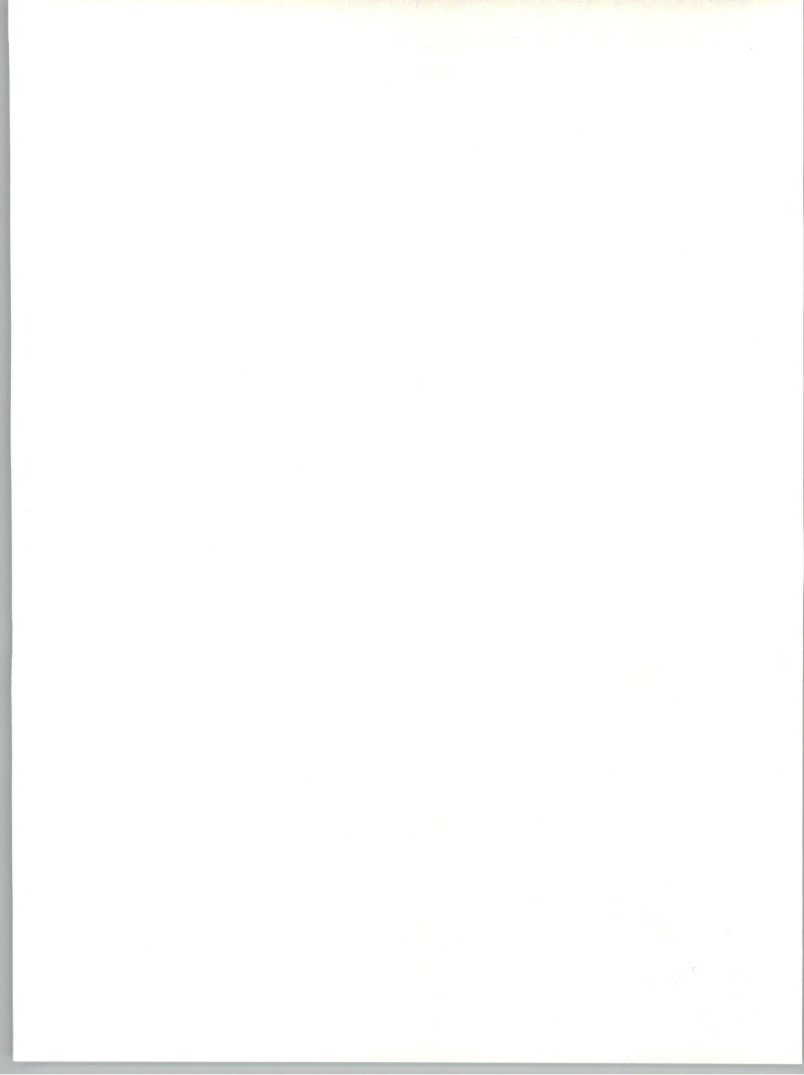
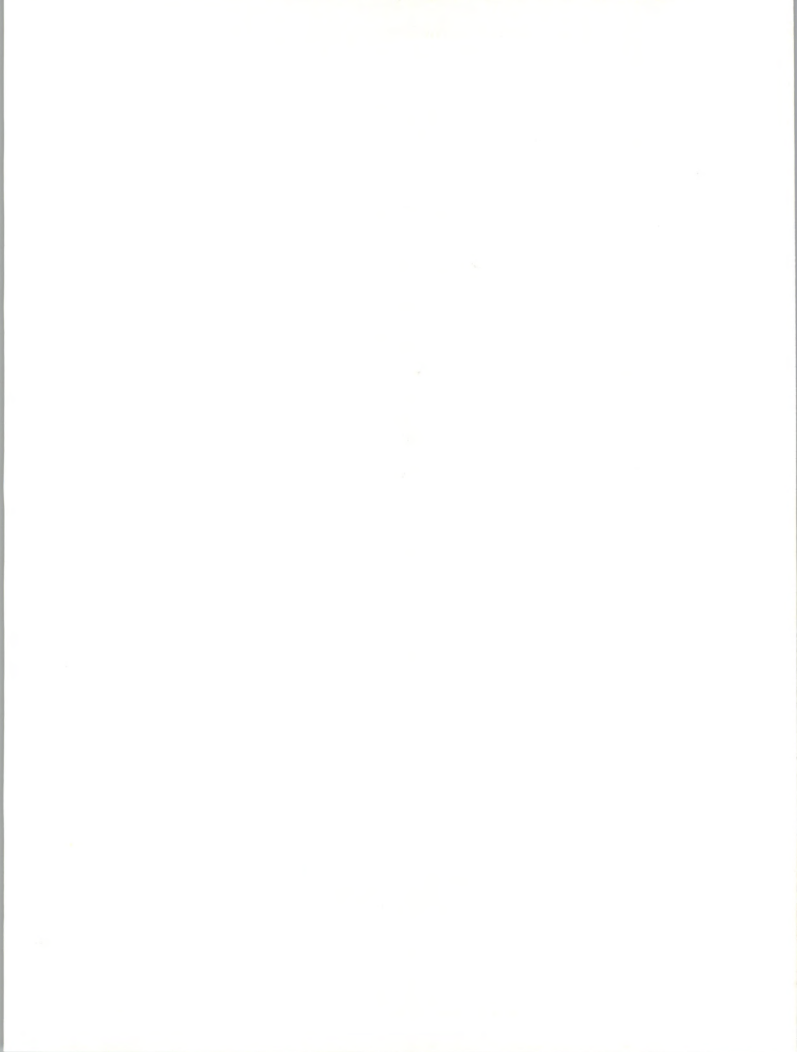


EXHIBIT V-1

OPPORTUNITIES

- Products/services that enable retailers to be more competitive
- New technologies
- Large-scale systems development and integration
- Customization of products to meet specific industry subsector requirements
- Network services
- Microcomputer applications
- Productivity tools





Appendix: Retail Distribution Industry Forecast Data Base

This appendix contains the following forecast information, as shown in Exhibits A-1 through A-5.

- Market size by delivery mode for each year from 1987 through 1993
- Market growth rates for 1987-1988
- Compound annual growth rate (CAGR) for each delivery mode for the five-year period 1988-1993
- Market size and growth rates for each subsector of the retail distribution industry, 1987-1993

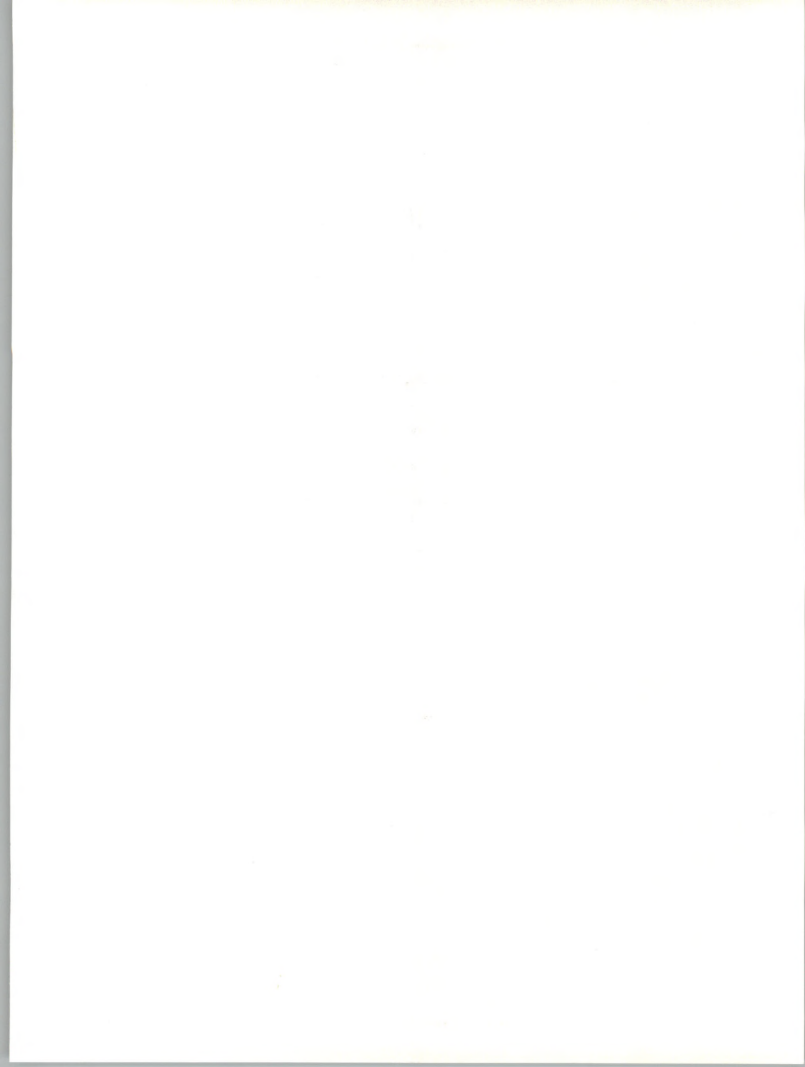


EXHIBIT RD-A-1

**RETAIL DISTRIBUTION INDUSTRY SECTOR
FORECAST DATA BASE
User Expenditures (\$ Millions)**

	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Total Retail Sector	1180	20	1415	1700	2055	2495	3055	3770	22
Processing Svcs	120	15	135	150	170	195	215	245	13
Transaction Proc	105	15	120	135	155	175	195	225	13
Systems Operations	15	8	15	15	15	20	20	20	10
Network/EIS	70	31	95	125	170	230	315	425	36
EIS	50	36	70	90	115	155	190	235	28
Network Applications	20	20	25	35	55	75	125	190	51
Application Software	180	32	235	320	410	540	705	925	31
Mainframe	15	38	20	30	35	45	55	65	25
Minicomputer	90	29	115	145	180	225	285	350	25
Workstation/PC	75	35	100	145	195	270	375	510	38
Turnkey Systems	575	10	635	700	770	840	915	990	9
Systems Integration	95	45	135	190	275	385	540	755	41
Professional Svcs	140	29	180	215	260	305	365	430	19

EXHIBIT RD-A-2

**FOOD STORES INDUSTRY SUBSECTOR
FORECAST DATA BASE
User Expenditures (\$ Millions)**

	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Food Stores Sub.	300	19	360	420	505	610	740	920	21
Processing Svcs	30	14	35	40	45	50	55	60	13
Network/EIS	20	30	25	30	40	60	80	110	35
Application Software	45	31	60	80	100	130	170	220	30
Turnkey Systems	145	9	160	170	185	200	215	235	9
Systems Integration	25	44	35	45	70	95	130	190	40
Professional Svcs	35	28	45	55	65	75	90	105	18

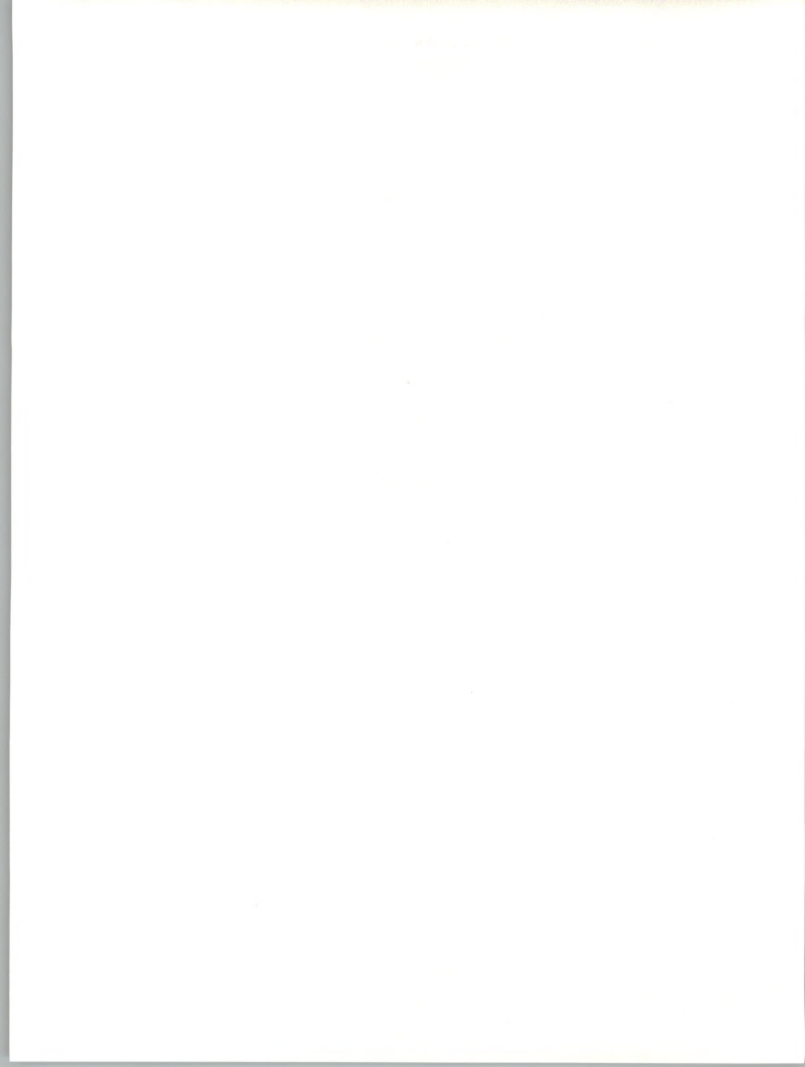


EXHIBIT RD-A-3

**EATING AND DRINKING PLACES INDUSTRY SUBSECTOR
FORECAST DATA BASE
User Expenditures (\$ Millions)**

	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Eating/Drinking Subs.	125	20	150	170	205	250	300	380	22
Processing Svcs	15	15	15	15	15	20	20	25	13
Network/EIS	5	31	10	15	20	25	30	45	36
Application Software	20	32	25	30	40	55	70	90	32
Turnkey Systems	60	10	65	70	75	80	90	100	9
Systems Integration	10	45	15	20	30	40	55	75	41
Professional Svcs	15	29	20	20	25	30	35	45	19

EXHIBIT RD-A-4

**MERCHANDISE RETAILERS INDUSTRY SUBSECTOR
FORECAST DATA BASE
User Expenditures (\$ Millions)**

	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Merchandise Sub.	460	21	550	700	845	1040	1300	1595	23
Processing Svcs	50	16	55	60	70	80	90	105	14
Network/EIS	25	32	35	50	70	90	130	170	38
Application Software	70	33	90	135	170	230	305	410	33
Turnkey Systems	225	11	250	290	320	355	390	415	10
Systems Integration	35	46	50	80	110	160	230	315	43
Professional Svcs	55	30	70	85	105	125	155	180	20

EXHIBIT RD-A-5

**AUTOMOTIVE RETAILERS INDUSTRY SUBSECTOR
FORECAST DATA BASE
User Expenditures (\$ Millions)**

	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Automotive Subsector	295	18	355	410	500	595	715	875	20
Processing Svcs	25	13	30	35	40	45	50	55	12
Network/EIS	20	29	25	30	40	55	75	100	34
Application Software	45	30	60	75	100	125	160	205	29
Turnkey Systems	145	8	160	170	190	205	220	240	8
Systems Integration	25	43	35	45	65	90	125	175	40
Professional Svcs	35	27	45	55	65	75	85	100	17

the 1990s, the number of people in the UK who are aged 65 and over has increased by 1.5 million, and the number of people aged 75 and over has increased by 1.2 million (Office of National Statistics 1999). The number of people aged 85 and over has increased by 0.5 million.

There is a growing awareness of the need to address the needs of the ageing population. The Department of Health (1999) has published a strategy for ageing, which sets out the government's commitment to improve the lives of older people. The strategy is based on three main principles: (1) to ensure that older people have the opportunity to live independently and actively; (2) to ensure that older people have access to the services and support they need; and (3) to ensure that older people are treated with respect and dignity. The strategy is being implemented through a range of measures, including: (1) increasing the number of people who are employed or volunteering; (2) improving the quality of care in residential care homes; and (3) increasing the number of people who are able to live in their own homes.

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Appendix: Retail Distribution Industry Forecast Reconciliation

The significant difference between the 1987 and 1988 estimates of the 1987 processing/network services market stems primarily from the many cross-industry applications used by the retail industry (e.g., credit authorization services) that were included in the 1987 retail processing/network services estimate. These applications are now included in the cross-industry processing/network services market. In addition, the processing services portion of processing/network services, which is now broken out separately, has not grown as fast as previously forecasted.

The 1988-1993 CAGR projected for processing/network services is significantly higher in the 1988 report than in the 1987 report. The most significant gains will be in network services.

The application software products market has been increased to represent a higher-than-expected growth rate for 1987. This market continues to build momentum, as shown in the higher CAGR forecasted for 1988-1993. The highest growth in this area is forecasted for microcomputer applications.

The turnkey systems market was underestimated in 1987 and earlier years—this is shown in the large discrepancy between the estimates in the 1987 and 1988 reports. A major portion that has now been captured represents turnkey systems used by the automotive retail subsector.

The 1988-1993 CAGR has been modified to show a slower growth rate for this delivery mode. The lower growth rate has resulted from slow growth of turnkey systems overall, although expenditures made by the retail industry for turnkey systems will increase at a higher rate than those made by other industry sectors. In addition, the installed base of turnkey systems is already larger for retailers than companies in other industry sectors; therefore, even a slightly higher rate represents significantly higher expenditures by retailers.

the 1990s, the number of people in the UK who are aged 65 and over has increased by 1.5 million (1990–2000) and is projected to increase by a further 1.5 million by 2020 (Office for National Statistics 2001).

There is a growing awareness of the need to improve the health and well-being of older people, and the importance of preventing and reducing the burden of disease and disability. The World Health Organization (WHO) has identified the need for a 'new paradigm' in health care for older people, one that is based on a holistic approach to health and well-being, and that takes into account the social, cultural, and psychological factors that influence health (WHO 1999).

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The difference between the 1987 professional services market estimates reported in INPUT's 1987 and 1988 reports is, for the most part, due to the fact that in 1987 INPUT included the systems integration market in the professional services market. In 1988, INPUT broke out systems integration activities separately and included hardware expenditures, which were not included in 1987.

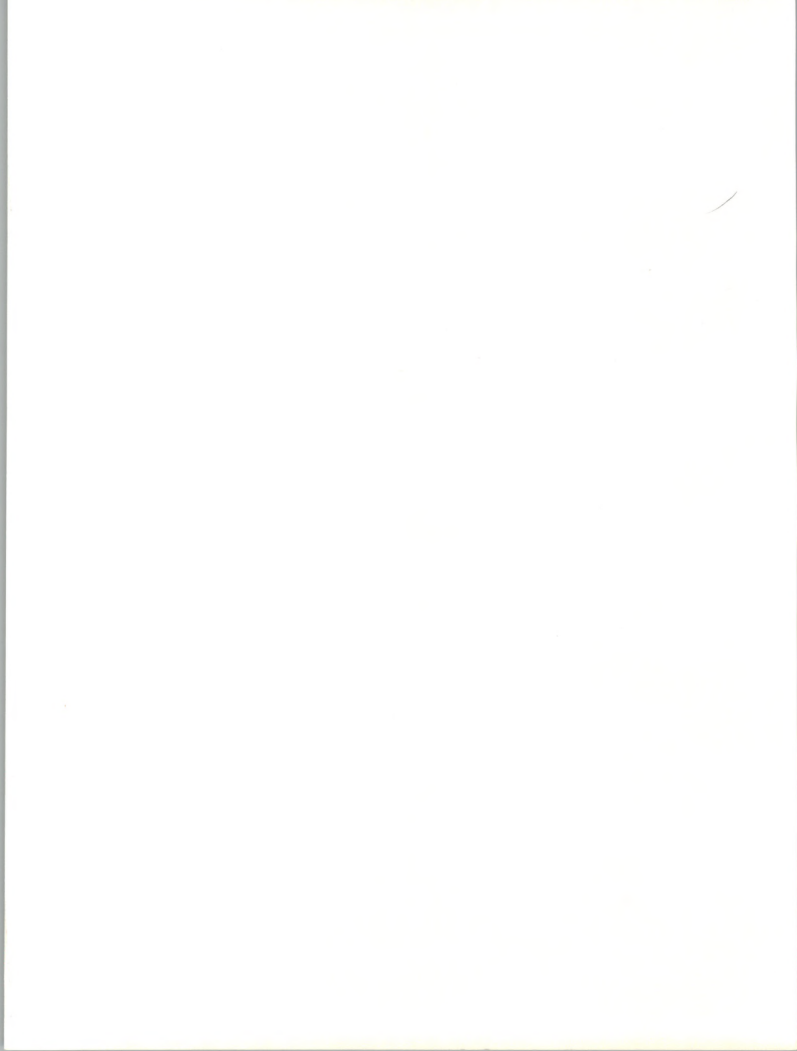
EXHIBIT RD-B-1

**RETAIL DISTRIBUTION SECTOR
DATA BASE RECONCILIATION OF
MARKET FORECAST BY DELIVERY MODE
(\$ Millions)**

Industry Sector	1987 Market			1992 Market			CAGR	CAGR
	1987 Forecast	1988 Forecast (%)	Variance	1987 Forecast	1988 Forecast (%)	Variance (%)	87-92 1987 Forecast (%)	87-92 1988 Forecast
Total Retail Distribution Sector	1378	1085	27	3142	2525	24	18	18
Processing/Network Services	677	190	256	1360	530	157	15	23
Application Software Products	142	180	-21	501	715	-30	29	32
Turnkey Systems	295	575	-49	630	915	-31	16	10
Professional Services	264	140	89	651	365	78	20	21

Note: INPUT's 1987 Professional Services forecast includes Systems Integration software revenues.





About INPUT

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

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

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

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

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