T
TRI

CUSTOM STUDY

AUTHOR

Opportunities for Computer

TITLE

Equipment Sales in the U.S.

RI

OPPORTUNITIES FOR COMPUTER EQUIPMENT SALES IN THE UNITED STATES

Prepared For:

TRW

JULY 1979

OPPORTUNITIES FOR COMPUTER EQUIPMENT SALES IN THE UNITED STATES

TABLE OF CONTENTS

OPPORTUNITIES FOR COMPUTER EQUIPMENT SALES IN THE UNITED STATES

LIST OF EXHIBITS

1 INTRODUCTION

I INTRODUCTION

- The purpose of this study is to examine the opportunities for EDP equipment by determining the expenditures for this equipment, and the growth of these expenditures. The expenditures are analyzed by industry sector and user company size.

- Industry sectors examined are:

  - Discrete manufacturing.
  - Process manufacturing.
  - Transportation.
  - Utilities.
  - Wholesale distribution.
  - Retail distribution.
  - Banking and finance.
  - Insurance.
  - Service and other industries.

- User company size was defined by number of employees. The categories are:
  - 1-19 employees.
  - 20-99 employees.
  - 100-499 employees.
  - 500-999 employees.
- These company sizes were chosen so that a balanced comparison could be made among opportunities for microcomputers, minicomputers, and mainframe computers.
- Not included were expenditures in establishments of over 1,000 employees. However, this can be compensated for by multiplying the expenditures in the 500-999 employee category by 1.9 and treating these expenditures as an additional fifth market segment.
- Not included in the analysis is the federal government because it is a unique market.
- This report is derived entirely from three other INPUT reports which have been delivered to TRW and are:
  - Annual Report, 1978 from the User Planning Service.
  - Annual Report 1978 from the Small Establishment Service.
  - Distribution Channels Report from the Small Establishment Service (1978).

- This report combines and compares expenditures, growth, demographics, and needs for each of the industry sectors as discussed in the three reports from which it was derived.

- However, it is not intended to be a summary of the original reports. Those reports should be read for a full understanding of EDP expenditures, needs, and applications.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- By any measure by which the market for computer equipment is examined it is a huge market. In the sectors discussed in this report (Federal Government and some other sectors are not included), in 1978 $12 billion was spent for computer equipment.

- When these expenditures are divided into segments by employee size (see Exhibit II-1), it is seen that opportunities exist in all sizes of establishments. In fact, each of the employee size segments are close to or over $2 billion in market size.

- The growth rates for specific types of products are different and key opportunities exist in the areas of peripherals and small computer systems (see Exhibit II-2). However, new methods of distribution such as dealers, system houses, and computer stores will have to be considered in the marketing of this equipment.

- Expenditures per employee can be used to estimate potential markets in specific user companies and to indicate the relative importance of the market by industry sector. When expenditures per employee are combined with geographic data, regional markets can be estimated. The average expenditure per employee for all sectors was $140 per year. However, the most highly automated sectors of banking and finance and insurance are almost three times greater than average while retail at $90 per year is almost half of the average (see Exhibit II-3).

EXHIBIT II-1

OVERVIEW OF EXPENDITURES FOR COMPUTER EQUIPMENT (1978)

ESTABLISHMENT EMPLOYEE SIZE	EXPENDITURES (MILLIONS)
1 - 19	$ 1,970
20 - 99	$ 2,360
100 - 499	$ 2,624
500 - 999	$ 1,731
1000 plus	$ 3,289
	$11,974

EXHIBIT II-2

KEY EQUIPMENT OPPORTUNITIES

- Computing Equipment
  - Small business computers/mini computers
  - Mass memory
  - Terminals
  - DDP equipment
- Also for information processing
  - Test processing
  - "Electronic Mail" equipment

EXHIBIT II-3

RANKING EXPENDITURES/EMPLOYEE

- Sectors spending the most/employee on computer equipment

-	Banking and finance	$450
-	Insurance	$400

- Sectors spending the least/employee on computer equipment

-	Retail	$ 90

- Average expenditure/employee on EDP equipment

-	Average, all sectors	$140

- Absolute expenditure size is another way to compare industry sectors. In Exhibit II-4, where this data is shown, the manufacturing sectors have the largest in expenditures for the larger establishments. The retail and wholesale sectors are the most significant for smaller establishments basically because there are so many of these small firms.

- Growth is another way in which sectors can be compared. Sectors with the highest growth are where the most opportunity is and where new products will be accepted. Exhibit II-5 lists the highest growth sectors. Note that there are many high growth sectors particularly in the smaller establishment area where small business equipment is being introduced.

- Because a large high growth sector represents a greater opportunity than a small high growth sector, a ranking of sectors by growth rate multiplied by sector size (employees) was made (Exhibit II-6). Retail and discrete manufacturing rank highest because their large size compensates for slightly slower growth.

EXHIBIT II-4

RANKING EXPENDITURES/SECTOR

- Sector spending the most money on computer equipment

  - 500-1000 employees

    - Discrete manufacturing $525 M
    - Process manufacturing $272 M

  - 100-499 employees

    - Discrete manufacturing $651 M
    - Process manufacturing $451 M

  - 20-99 employees

    - Discrete manufacturing $398 M
    - Retail $373 M

  - 1-19 employees

    - Retail $405 M
    - Wholesale $257 M

EXHIBIT II-5

RANKING GROWTH/SECTOR ALL EQUIPMENT

- Growth rates for all computer equipment

  - 500-1000 employees

    - Utilities 17%

    - Banking and finance 15%

  - 100-499 employees

    - Process manufacturing, discrete manufacturing, utilities, wholesale, banking and finance, insurance 25%

  - Less than 100 employees

    - Discrete manufacturing, process manufacturing, utilities, wholesale banking and finance, insurance 30%

EXHIBIT II-6

RANKING FACTORED GROWTH

- Factored growth rates for all computer equipment

  - Employee number X growth rates

    - Retail

    - Discrete manufacturing

III COMPARATIVE ANALYSIS

III USER ANALYSIS

- The user analysis section of this report consists of:

  - The basic assumptions used in the analysis.

  - User expenditure analysis, 1978.

  - Changes in the user expenditures by 1980.

  - A growth analysis.

  - Industry sector summaries.

- This data is shown mostly in the form of exhibits because the data is to be provided to TRW in the form of a presentation as well as a report. The results of the presentation are easier to remember if the exhibits of the report are identical to the presentation.

- The basic assumption used in this study (see Exhibits III-1 and III-2) is that an analysis by expenditures per employee should be used. This indicator was chosen instead of expenditures per industry parameter (such as sales, assets, or office employees) because establishment employees are the most available demographic statistic, and cross industry comparisons can be made. A conversion from employees to industry parameters is provided in Appendix A. Average expenditures per employee include establishments which use

EXHIBIT III-1

- Demographics taken from county business patterns.

- Average employee sizes chosen based upon INPUT research, but held constant for each sector.

  - Establishments over 500 employees 700 employees (to avoid excessive analysis of very few very large establishments).
  - Establishments 100-499 employees 200 employees
  - Establishments 20-99 employees 40 employees
  - Establishments 1-19 employees 5 employees

EXHIBIT III-2

AVERAGE EXPENDITURES/EMPLOYEE/YEAR

- Expenditures to outside vendors only, not internal staff.
- Computed from results of two INPUT programs and over 1,000 interviews.
- Computed as a ratio of total employees in the industry sector (to be used for demographic analysis) whether the company has a computer or not.
- Expenditures/employee tend to rise in smaller establishments as efficiencies are lost.
- Average expenditures for all employees in the U.S. - $140/year.
- Average expenditures if only the establishments using computers are included - $220/year.

computers as well as establishments which do not use computers. This allows for direct use of demographic data.

- Standard size of an average establishment is always toward the lower end of the establishment size interval because the number of establishments decreases rapidly with establishment size. Size parameters were chosen as 1-19, 20-99, 100-499, and 500-999 because roughly equal numbers of employees are in each of the chosen intervals.

- Average expenditures per employee vary by almost four to one (see Exhibit III-3). The average is $140 because the sectors with the least expenditures/employee are the largest sectors.

- Expenditures by industry sector and establishment size are shown for all computer equipment and for small business computers and terminals (see Exhibits III-3, III-4, III-5 and III-6).

  - The small business computer and terminal markets are considered easier to enter than the mainframe market. The market for small equipment is also growing much faster than the mainframe market.

- Note, the key parameter of equipment expenditures is the size of the sector. Thus, manufacturing provides a much larger "opportunity" than banking (a highly automated sector). Also note, the increasing importance of small computers and terminals.

- The market is large for all establishment sizes. Thus, other issues such as distribution channels and method of market entry become significant in a decision as to which market to enter. Major market considerations include market size and market growth. Size is important to insure that there is "room" for a major entrant. Growth is important because it is a measure of opportunity.

EXHIBIT III-3

AVERAGE EXPENDITURES FOR COMPUTER EQUIPMENT

PER YEAR PER EMPLOYEE

SECTOR	EXPENDITURES/YEAR/EMPLOYEE
DISCRETE MANUFACTURING	$ 210
PROCESS MANUFACTURING	$ 160
TRANSPORTATION	$ 140
UTILITIES	$ 280
WHOLESALE	$ 140
RETAIL	$ 90
BANKING AND FINANCE	$ 450
INSURANCE	$ 400
SERVICES AND OTHER	$ 175

NOTE: THE AVERAGE EXPENDITURE IS $ 140/YEAR

EXHIBIT III-4

TOTAL EXPENDITURES IN MILLIONS FOR
ALL COMPUTER EQUIPMENT 1978

ESTABLISHMENT SIZE BY EMPLOYEES

SECTOR	499-1000	100-499	20-99	1-19
DISCRETE MANUFACTURING	$ 525M	$ 651M	$ 398M	$ 131M
PROCESS MANUFACTURING	$ 272M	$ 451M	$ 208M	$ 72M
TRANSPORTATION	$ 31M	$ 73M	$ 84M	$ 62M
UTILITIES	$ 104M	$ 92M	$ 62M	$ 23M
WHOLESALE	$ 4M	$ 6M	$ 179M	$ 161M
RETAIL	$ 68M	$ 138M	$ 373M	$ 253M
BANKING AND FINANCE	$ 117M	$ 194M	$ 207M	$ 135M
INSURANCE	$ 76M	$ 128M	$ 128M	$ 160M
SERVICES AND OTHER	$ 534M	$ 891M	$ 721M	$ 974M
	$ 1731M	$ 2624M	$ 2360M	$ 1970M

EXHIBIT III-5

PERCENT OF EXPENDITURES SPENT ON SMALL BUSINESS COMPUTERS
(UNDER $100,000 COST), AND TERMINALS

- FOR ESTABLISHMENTS WITH 500 - 999 EMPLOYEES

SECTOR	PERCENT OF EXPENDITURES
DISCRETE MANUFACTURING	18%
PROCESS MANUFACTURING	23%
TRANSPORTATION	16%
UTILITIES	18%
WHOLESALE	18%
RETAIL	13%
BANKING AND FINANCE	19%
INSURANCE	10%
SERVICES AND OTHER	16%

- FOR ESTABLISHMENTS WITH 100 - 499 EMPLOYEES, ASSUMED 50% ALL SECTORS.

- FOR ESTABLISHMENTS WITH 20 - 99; 1 - 19 EMPLOYEES, ASSUMED 100% ALL SECTORS.

EXHIBIT III-6

TOTAL EXPENDITURES IN MILLIONS FOR
SMALL BUSINESS COMPUTERS AND TERMINALS 1978

ESTABLISHMENT SIZE BY EMPLOYEES

SECTOR	499-1000	100-499	20-99	1-19
DISCRETE MANUFACTURING	$ 95M	$ 326M	$ 378M	$ 131M
PROCESS MANUFACTURING	$ 63M	$ 226M	$ 208M	$ 72M
TRANSPORTATION	$ 8M	$ 37M	$ 84M	$ 62M
UTILITIES	$ 19M	$ 46M	$ 62M	$ 23M
WHOLESALE	$ 1M	$ 3M	$ 179M	$ 161M
RETAIL	$ 9M	$ 69M	$ 373M	$ 253M
BANKING AND FINANCE	$ 22M	$ 97M	$ 207M	$ 135M
INSURANCE	$ 8M	$ 64M	$ 128M	$ 160M
SERVICES AND OTHER	$ 139M	$ 446M	$ 721M	$ 974M
	$ 364M	$1,314M	$2,340M	$1,970M

- Market size in 1980 is compared with 1978 in Exhibits III-7, III-8, III-9, and III-10. The year 1980 was chosen because the expenditure data was directly obtained from user plans. However, growth data shown in Exhibits III-11 and III-12 can be used to extrapolate the data until 1983.

- The most significant points of the exhibits are:

  - The much higher growth rates which are in the areas of small computers and terminals.

  - The much higher growth rates which are in the markets for computer equipment in smaller establishments.

- Exhibit III-13 combines the factors of industry sector size and growth rate by deriving a measure called "factored growth rates." This factor was derived by multiplying the growth rate by the number of employees in the sector.

  - As expected, the largest sectors (manufacturing, wholesale, and retail) predominate.

- Descriptions of each of the industry sectors are shown in Exhibits III-14 through III-30.

  - Please note that these are extremely brief summaries of the industry sector analysis which are in the reports provided to TRW.

- Trends which exist in all sectors are:

  - The rapid increase in concentration of expenditures into fewer establishments as establishment size increases.

  - The concentration of 30-40% of the market in five states in each sector.

  - The need for both industry specific and financial/administrative applications in all of the sectors.

EXHIBIT III-7

ESTABLISHMENTS 500 - 1000 EMPLOYEES

EXPENDITURE CHANGES 1978 TO 1980 FOR COMPUTER EQUIPMENT
EXPENDITURES IN MILLIONS OF DOLLARS

SECTOR	1978 MAIN COMPUTERS	1978 SMALL BUSINESS COMPUTERS	1980 MAIN COMPUTERS	1980 SMALL BUSINESS COMPUTERS
DISCRETE MANUFACTURING	$ 430M	$ 95M	$ 456M	$ 200M
PROCESS MANUFACTURING	$ 209M	$ 63M	$ 253M	$ 132M
TRANSPORTATION	$ 23M	$ 8M	$ 24M	$ 8M
UTILITIES	$ 85M	$ 19M	$ 107M	$ 35M
WHOLESALE	$ 3M	$ 1M	$ 3M	$ 2M
RETAIL	$ 59M	$ 9M	$ 57M	$ 11M
BANK AND FINANCE	$ 95M	$ 22M	$ 105M	$ 29M
INSURANCE	$ 68M	$ 8M	$ 69M	$ 18M
SERVICES AND OTHERS	$ 395M	$ 139M	$ 395M	$ 338M
	$ 1,367M	$ 364M	$ 1,469M	$ 778M

EXHIBIT III-8

ESTABLISHMENTS 100 - 499 EMPLOYEES

EXPENDITURE CHANGES 1978 TO 1980 FOR COMPUTER EQUIPMENT
EXPENDITURES IN MILLIONS OF DOLLARS

SECTOR	1978 MAIN COMPUTERS	1978 SMALL BUSINESS COMPUTERS	1980 MAIN COMPUTERS	1980 SMALL BUSINESS COMPUTERS
DISCRETE MANUFACTURING	$ 326M	$ 326M	$ 446M	$ 551M
PROCESS MANUFACTURING	$ 226M	$ 226M	$ 325M	$ 382M
TRANSPORTATION	$ 37M	$ 37M	$ 46M	$ 39M
UTILITIES	$ 46M	$ 46M	$ 67M	$ 78M
WHOLESALE	$ 3M	$ 3M	$ 4M	$ 5M
RETAIL	$ 69M	$ 69M	$ 82M	$ 99M
BANK AND FINANCE	$ 97M	$ 96M	$ 133M	$ 164M
INSURANCE	$ 64M	$ 64M	$ 86M	$ 108M
SERVICES AND OTHER	$ 446M	$ 446M	$ 536M	$ 642M
	$ 1,314M	$ 1,314M	$ 1,728M	$ 2,068M

INP

EXHIBIT III- 9

ESTABLISHMENTS 20 - 99 EMPLOYEES

EXPENDITURE CHANGES 1978 TO 1980 FOR COMPUTER EQUIPMENT
EXPENDITURES IN MILLIONS OF DOLLARS

SECTOR	1978 SMALL BUSINESS COMPUTERS	1980 SMALL BUSINESS COMPUTERS
DISCRETE MANUFACTURING	$ 378M	$ 639M
PROCESS MANUFACTURING	$ 208M	$ 325M
TRANSPORTATION	$ 84M	$ 120M
UTILITIES	$ 62M	$ 104M
WHOLESALE	$ 179M	$ 303M
RETAIL	$ 373M	$ 537M
BANK AND FINANCE	$ 207M	$ 350M
INSURANCE	$ 128M	$ 216M
SERVICES AND OTHER	$ 721M	$ 1,038M
	$ 2,340M	$ 3,659M

EXHIBIT III-10

ESTABLISHMENTS 1 - 19 EMPLOYEES

EXPENDITURE CHANGES 1978 TO 1980 FOR COMPUTER EQUIPMENT

EXPENDITURES IN MILLIONS OF DOLLARS

SECTOR	1978 SMALL BUSINESS COMPUTERS	1980 SMALL BUSINESS COMPUTERS
DISCRETE MANUFACTURING	$ 131M	$ 222M
PROCESS MANUFACTURING	$ 72M	$ 121M
TRANSPORTATION	$ 62M	$ 89M
UTILITIES	$ 23M	$ 39M
WHOLESALE	$ 161M	$ 272M
RETAIL	$ 253M	$ 364M
BANKING AND FINANCE	$ 135M	$ 228M
INSURANCE	$ 160M	$ 270M
SERVICES AND OTHER	$ 974M	$ 1,646M
	$ 1,970M	$ 3,251M

EXHIBIT III-11

GROWTH RATES FOR EQUIPMENT EXPENDITURES
ALL COMPUTER EQUIPMENT

SECTOR	ESTABLISHMENT SIZE IN EMPLOYEES		
	500-1000	100-499	LESS THAN 100
DISCRETE MANUFACTURING	12%	24%	30%
PROCESS MANUFACTURING	12%	25%	30%
TRANSPORTATION	14%	16%	20%
UTILITIES	17%	26%	30%
WHOLESALE	10%	24%	30%
RETAIL	9%	15%	20%
BANKING AND FINANCE	15%	24%	30%
INSURANCE	12%	24%	30%
SERVICES AND OTHER	6%	15%	20%

EXHIBIT III-12

GROWTH RATES FOR EQUIPMENT EXPENDITURES
SMALL BUSINESS COMPUTERS AND TERMINALS

SECTOR	ESTABLISHMENT SIZE IN EMPLOYEES		
	500-1000	100-499	LESS THAN 100
DISCRETE MANUFACTURING	45%	30%	30%
PROCESS MANUFACTURING	45%	30%	30%
TRANSPORTATION	1%	20%	20%
UTILITIES	35%	30%	30%
WHOLESALE	27%	30%	30%
RETAIL	10%	20%	20%
BANKING AND FINANCE	15%	30%	30%
INSURANCE	48%	30%	30%
SERVICES AND OTHER	56%	20%	20%

INF

EXHIBIT III-13

FACTORED GROWTH

GROWTH RATES FOR EQUIPMENT

EXPENDITURES FACTORED BY SECTOR SIZE

SECTOR	ALL COMPUTER EQUIPMENT	SMALL BUSINESS COMPUTERS AND TERMINALS
DISCRETE MANUFACTURING	119	189
PROCESS MANUFACTURING	92	147
TRANSPORTATION	24	20
UTILITIES	24	32
WHOLESALE	80	110
RETAIL	173	196
BANKING AND FINANCE	35	38
INSURANCE	22	36
SERVICES AND OTHER	148	340

EXHIBIT III-14

DISCRETE MANUFACTURING

- Consists of:
  - Apparel
  - Furniture
  - Publishing and printing
  - Leather
  - Fabricated Metal
  - Non electric equipment
  - Electric equipment
  - Transportation equipment
  - Instruments
  - Misc. Manufacturing
- Employment 11 million
- Ratios $50,000 sales/employee
- Numbered of establishments

		Percent of establishments
1-19 employees	128,000	66.8%
20-99 employees	45,000	23.3%
100-499 employees	16,000	8.1%
Over 500 employees	4,000	1.9%
	193,000	100%

- Top 5 states

California	12.6%
Illinois	8.4%
New York	8.1%
Ohio	7.4%
Michigan	7.5%
	44%

EXHIBIT III-15

DISCRETE MANUFACTURING

- Key applications to be delivered - large companies
  - Accounting/finance
  - Inventory control
  - Order entry/billing
  - Industry specific
- Key needs - small establishments
  - Data base
  - Forms output automation
  - Industry specific

EXHIBIT III-16

PROCESS MANUFACTURING

- Consists of:

- Metal mining	- Lumber products
- Anthracite mining	- Paper products
- Bituminous mining	- Chemical products
- Oil and gas extraction	- Petroleum refining
- Food products	- Rubber and plastic products
- Tobacco	- Stone, glass, and concrete
- Textile mill	- Primary metal industries

- Employment 8 million

- Ratios $110,000 sales/employee

- Number of establishments

		Percent of establishments
1-19 employees	90,000	64.3%
20-99 employees	35,000	24.0%
100-499 employees	14,000	10.0%
Over 500 employees	3,000	1.7%
	140,000	100%

- Top 5 states

- California	11.9%
- Illinois	7.1%
- New Jersey	8.3%
- New York	7.8%
- Texas	6.7%
	41.8%

EXHIBIT III-17

PROCESS MANUFACTURING

- Key applications to be developed - large companies

  - Accounting/finance
  - Order entry/billing
  - Personnel/payroll
  - Inventory control
  - Industry specific

- Key needs - small establishments

  - Order entry
  - Better output
  - Process text on the computer

EXHIBIT III-18

TRANSPORTATION

- Consists of:

  - Local, suburban, and highway passenger transportation
  - Motor freight and warehousing
  - U.S. Postal Service
  - Water transportation
  - Air transportation
  - Pipelines except natural gas
  - Transportation services

- Employment 3 million

- Ratios $25,000 sales/employee

- Number of establishments

		Percent of establishments
1-19 employees	87,000	82.8%
20-99 employees	15,000	14.4%
100-499 employees	3,000	2.5%
Over 500 employee	300	0.3%
	105,300	100%

- Top 5 states

California	9.4%
Illinois	5.5%
New Jersey	4.2%
New York	7.5%
Texas	5.4%
	32%

INF

EXHIBIT III-19

TRANSPORTATION

- Key applications to be developed - large companies
  - Accounting/finance
  - Personnel/payroll
  - Inventory control
  - Industry specific
- Key needs - small establishments
  - Initial automation
  - Finances
  - Industry specific

EXHIBIT III-20

UTILITIES

- Consists of:

  - Communications services
  - Electric, gas, and sanitary services

- Employment 2 million

- Ratios $67,000 sales/employee

- Number of establishments

		Percent of establishments
1-19 employees	16,000	67.4%
20-99 employees	6,000	23.5%
100-499 employees	2,000	6.9%
Over 500 employees	500	2.2%
	24,500	100%

- Top 5 states

- California	9.1%
- Florida	3.8%
- New York	3.3%
- Pennsylvania	5.7%
- Texas	9.1%

IN

EXHIBIT III-21

UTILITIES

- Key applications to be developed - large companies
  - Accounting/finance
  - Inventory control
  - Personnel/payroll
  - Data base
  - Industry specific
- Key needs - small establishments
  - Increased capacity

EXHIBIT III-22

WHOLESALE

- Consists of:
  - Durable goods
  - Non-durable goods
- Employment 3.8%
- Ratios $87,000 sales/employee
- Number of establishments

		Percent of establishments
1-19 employees	226,000	87%
20-99 employees	31,000	12.1%
100-499 employees	2,500	.8%
Over 500 employees	500	.015%
	260,000	100%

- Top 5 states

California	9.3%
Michigan	5.7%
New York	9.1%
Pennsylvania	5.1%
Texas	6.4%
	36%

INP

EXHIBIT III-23

WHOLESALE DISTRIBUTION

- Key applications to be developed - large companies
  - Accounting/finance
  - Inventory control
  - Order entry/billing
  - Industry spcific
- Key needs - small establishments
  - Inventory control
  - Order entry
  - Increased capacity

EXHIBIT III-24

RETAIL

- Consists of:

  - Building materials, hardware garden supply, mobile home dealers
  - General merchandise stores
  - Food stores
  - Automotive dealers and
  - Gasoline service stations
  - Apparel and accessory stores
  - Furniture, home furnishing, and equipment
  - Eating and ordering places

- Employment 14 million

- Ratios $53,000 sales/employee

- Number of establishments

		Percent of establishments
1-19 employees	979,000	89%
20-99 employees	103,000	9.5%
100-499 employees	7,000	.7%
Over 500 employees	1,000	.1%
	1,090,000	100%

- Top 5 states

California	6.8%
Texas	6.4%
New York	6.1%
Pennsylvania	4.5%
Florida	3.9%
	28%

EXHIBIT III-25

RETAIL DISTRIBUTION

- Key applications to be developed - large companies
  - Accounting/finance
  - Inventory control
  - Order entry/billing
  - Personnel/payroll
  - Industry specific
- Key needs - small establishments
  - Cash registers/point of sales
  - Initial automation

EXHIBIT III-26

BANKING AND FINANCE

- Consists of:
  - Banking
  - Credit agencies
  - Security and commodity dealers, exchanges, services
  - Holding and other investment offices
- Employees 2 million
- Ratios $1,281,000 assets/employee
- Number of establishments / Percent of establishments

1-19 employees	61,000	81.3%
20-99 employees	11,000	15.3%
100-499 employees	2,000	2.9%
Over 500 employees	400	0.5%
	74,400	100%

- Top 5 states

California	9.7%
Illinois	4.8%
Michigan	3.7%
New York	9.7%
Texas	3.7
	32%

EXHIBIT III-27

BANKING AND FINANCE

- Key applications to be developed - large companies
  - Accounting finance
  - Industry specific
- Key needs - small establishments
  - Interactive systems
  - Word processing on the computer

EXHIBIT III-28

INSURANCE

- Consists of:
  - Insurance carriers
  - Insurance agencies and brokers
- Employees 2,000,000
- Ratios $106,000 receipts/employee
- Number of establishments — Percent of establishments

1-19 employees	80,000	88.9%
20-99 employees	8,000	9.0%
100-499 employees	2,000	1.8%
Over 500 employees	300	.3%
	90,300	100%

- Top 5 states

California	8.6%
Illinois	5.6%
New York	7.7%
Pennsylvania	5.8%
Texas	6.8%
	35%

EXHIBIT III-29

INSURANCE

- Key applications to be developed - large companies
  - Accounting/finance
  - Data base
  - Industry specific
- Key needs small establishments
  - Policy writing automation
  - Word processing

EXHIBIT III-30

SERVICES AND OTHER

- Consists of:

  - Health
  - Business services
  - Hospitals
  - Government

- In these sectors:

Health has	224,000	establishments
Education has	37,000	establishments
Local government has	160,000	establishments
Other services have	827,000	establishments
	1,248,000	

- Employees 8,500,000

- Number of establishments (approximately)

1-19 employees	1,158,000
20-99 employees	80,000
100-499 employees	11,000
Over 500 employees	1,000
	1,248,000

IV METHODOLOGY

IV METHODOLOGY

- The basic methodology for the two annual subscription programs from which the information in this study was derived was to combine user needs, attitudes, and plans with vendor capabilities and intentions.

  - Over 1,000 interviews with users were performed.

  - Over 200 interviews with vendors were performed.

- Detailed methodology sections in each of the reports discuss the analysis and interview process in detail.

- The synthesis of information into a combined analysis presented in this report is shown in Exhibit IV-1. The basic approach was to develop expenditure and growth rate data on a per employee basis by industry sector. This information was converted into an industry sector and establishment size analysis by the use of demographic data. Industry sector needs, applications, and demographics were obtained directly from the INPUT reports which were combined and summarized for this report.

EXHIBIT IV-1

METHODOLOGY

- Obtain 1978 average expenditures/user as a function of industry sector from:
  - Small establishment service program
  - User planning service
- Convert average expenditure data to total industry expenditures by using demographic data.
- Separate expenditures for main computers and small business computers and terminals.
  - User response
  - Small establishment analysis
- Obtain growth data for main computers and small business computers by combining results of:
  - Small establishment service
  - User planning service
- Compute 1980 expenditures from 1978 data and growth rates

INF

APPENDIX A: CONVERSION OF EMPLOYEE NUMBERS TO INDUSTRY PARAMETERS

APPENDIX A

CONVERSION BETWEEN EMPLOYEES
AND OTHER INDUSTRY PARAMETERS

INDUSTRY SECTOR	PARAMETER	FACTOR
DISCRETE MANUFACTURING	SALES/EMPLOYEE	$ 50,000
PROCESS MANUFACTURING	SALES/EMPLOYEE	$ 110,000
TRANSPORTATION	SALES/EMPLOYEE	$ 24,500
UTILITIES	SALES/EMPLOYEE	$ 67,000
WHOLESALE	SALES/EMPLOYEE	$ 87,000
RETAIL	SALES/EMPLOYEE	$ 53,000
BANKING AND FINANCE	ASSETS/EMPLOYEE	$ 1,281,000
INSURANCE	RECEIPTS/EMPLOYEE	$ 106,000
EDUCATION	STUDENTS/EMPLOYEE (FULL TIME EQUIVALENTS)	61
STATE GOVERNMENT	POPULATION/EMPLOYEE	64
ACCOUNTING	SALES/EMPLOYEE	$ 33,000
HOSPITALS	BEDS/EMPLOYEE	0.28

APPENDIX B: EXECUTIVE SUMMARY ANNUAL REPORT 1978 FROM THE USER PLANNING SERVICE

ROUTE:

1. _____

2. _____

3. _____

4. _____

USER PLANNING SERVICE

1978 ANNUAL REPORT

EXECUTIVE SUMMARY

NOVEMBER 1978

INPUT

II EXECUTIVE SUMMARY

A. KEY CONCLUSIONS

- Among the organizations interviewed for this study, EDP budgets will grow an average of 12.4% in 1979. Little or no concern was displayed toward the possibility of worsening business conditions impacting EDP budgets and there was virtually no indication of contingency planning for a 1979 recession.

  - It should be noted, however, that the research for this study was conducted from March to September 1978, a period in which a much more bullish business outlook existed than the fourth quarter of 1978 supports.

- As anticipated, the budget "line items" related to main computers are expected to decline as a percentage through 1980, while other hardware-related items associated with small computers, programmable and non-programmable terminals, and communications are expected to increase as a percentage of the total EDP budget.

- The main reasons for the continuing increase in the installation of terminal devices have shifted during the past few years away from remote job entry and interactive timesharing to source entry and a wider range of inquiry applications.

- Personnel costs will decline as a percentage of the total EDP budget from 46% to 44% between 1978 and 1980. This expected decrease as foreseen by respondents to this study is contrary to the popular notion that personnel costs are soaring out of control. While there is more than ample evidence that the salaries and labor rates for EDP personnel are increasing and that the economics of supply and demand are driving up the "going rates," the forecasted decreases in this category are explainable in part by the following:

  - The use of outside services and software continues to grow at a rate well in excess of the overall information industry, suggesting a greater "buy" than "make" attitude.

  - Application development time is improving through the use of data base, on-line programming, structured programming, and various automated application techniques.

  - Many more "specialist" categories have evolved in both development and operations areas thereby consolidating skills and providing improved levels of efficiency.

  - With the more widespread acceptance of distributed processing, the funding for remote source data entry and other operations functions will increasingly appear in end user budgets.

- Reading between the lines, however, EDP managers have a serious set of personnel-related concerns stemming from a situation which occurs cyclically every six to eight years, namely the need to support multiple data processing environments.

- In 1965 and 1966, EDP managers struggled to install 360s while deciding between retaining some earlier applications in "emulation mode" and converting others to run in "native mode." Also, several fundamental operational changes were prompted by the new found ability to operate multiple job streams using multiprogramming techniques.

- In 1971 and 1972, the advent of 370 systems brought a similar situation as more advanced operating systems permitted widespread ability for remote processing and the implementation of certain applications using early data base management concepts. EDP managers found themselves having to support the "old" while moving to the "new," intensifying the need for critical personnel resources.

• Again in 1978, with the first installations of 303X systems, the building of a dual environment support capability is once again taxing and frustrating EDP managers. However, the situation in this cycle is somewhat more complex.

- The 303X is not a full-fledged, new family but rather a late life "kicker" for the 370 series. Economic decisions, therefore, must consider the availability of improved price/performance equipment in the 1980-1981 time frame.

- Plug-compatible mainframes, with already high price/performance characteristics, were not available in earlier cycles and are adding to the decision making complexity, especially with respect to long-term residual value considerations.

- The acceptance of data base management techniques and on-line methods together with the trend toward distributed processing add new dimensions to the implementation and continuing support aspects of the EDP organization.

- The availability of higher speed and improved performance terminals dictates a higher level of sophistication in the communications area,

requiring improved planning and support, and possibly the introduction of value added network services.

- With these changes in progress, the single most important concern that shows through in the questioning of senior EDP management is the concern over the availability and productivity of qualified personnel, rather than concern with technical issues.

- This concern about personnel is the main driving force behind a number of other anticipated changes in EDP budgets.

  - Expenditures for outside software products, both systems and applications packages, are expected to grow by approximately 20% in 1979. This conclusion has been tested several different times and in several different ways by INPUT's research programs throughout 1978.

  - Two-thirds of study respondents indicated that they are looking for outside software products at the present time.

  - The increase in expenditures for outside training and maintenance services is expected to be in the 20-25% range for the next several years.

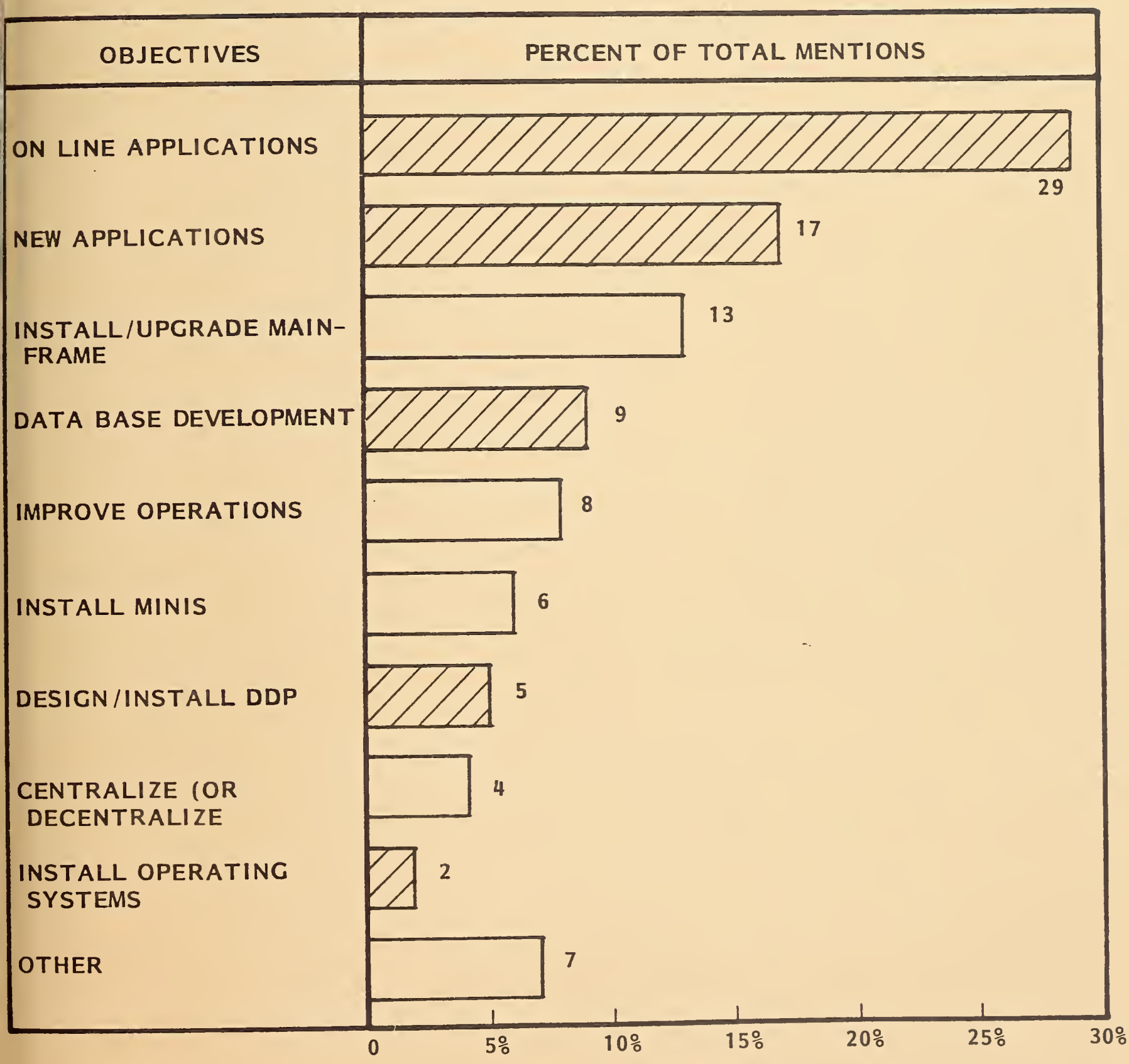
- The development of on-line applications is the most highly cited EDP objective for 1979. As indicated in Exhibit II-1, this objective accounts for an average of 29% of the total mentions in all industry categories.

  - In certain industry groups such as retail distribution and services, this percentage reaches 50%.

- It should also be noted that 1979 objectives which are primarily software oriented (shaded bars in Exhibit II-1) account for nearly two-thirds of all mentions (nearly 400 in total).

EXHIBIT II-1

1979 EDP OBJECTIVES
AVERAGE FOR ALL INDUSTRY SECTORS



- According to survey respondents, the use of programming personnel is divided almost equally between new program development and existing program maintenance. However, these statistics can be misleading.

  - Discrete manufacturing indicated a 3:2 relationship in favor of new program development.

  - The banking/finance and utility sectors reported an almost identical split.

  - The insurance industry results showed a 2:3 relationship with existing program maintenance being higher.

- INPUT views the latter two sectors, both of which computerized earlier and have more mature EDP systems, as indicative of a trend toward personnel distribution.

  - This trend will accelerate as on-line data base management systems become imbedded in corporate business.

  - The importance of this shift and its effect on the EDP organization cannot be ignored as more staff will be devoted to program maintenance and enhancement.

- Data Base Management Systems (DBMS) are becoming an increasingly important issue at the user level where these systems are being used in application development. Current users anticipate DBMS based applications to go from 10% at present to 30% by 1981. Users want systems that are easy to use as a means of accelerating application development. Some important aspects of DBMS from INPUT research include:

  - At large sites, DBMS price is relatively unimportant.

- Non-technical users are growing in importance and represent a large requirement for training.

- Less expensive communications, particularly from satellites and value added network vendors, will allow the distribution and transmission of large data bases, thereby accelerating the implementation of DDP.

- Systems and application dictionaries will become the main control tools for data and will increasingly implement privacy and security features.

- "Back-end" processors, the implementation of all or part of a DBMS in hardware, will emerge in the next few years although INPUT does not anticipate that IBM will implement this approach. It is more likely that they will incorporate DBMS processors in future mass storage devices.

- Data will increasingly merge with text and graphics, and information based management systems will emerge in the early 1980s.

• To place distributed data processing in perspective, it is important to recognize that the concept's acceptance has been largely limited to the Fortune class of industrial companies and major firms in banking, insurance, and retail. Although DDP appears to have been employed by a select number of users for ten or more years, it has only been over the last two or three that widespread implementation has begun.

• The current lack of communications expertise by users, particularly within smaller companies, is a major deterrent to the wider acceptance of DDP.

  - Over the long-term, services such as AT&T's ACS and new offerings such as ADP's Onsite represent methods for alleviating these difficulties, especially those related to a lack of hardware and protocol standards.

- INPUT's studies of DDP reveal a lack of hard quantitative measures among users for substantiating cost/performance benefits. Nonetheless, INPUT concludes that DDP does solve more problems than it creates and that its acceptance is growing although not at the rate suggested by the media or by vendor pronouncements.

- To summarize the relative importance of certain key EDP/communications factors, Exhibit II-2 provides a ranking of these factors as extracted from the telephone and on-site interviews conducted for this study. Respondents were asked to rank each of nine factors on a scale of 1 to 5 with 1 being most important and 5 being least important.

  - As indicated, personnel availability and productivity was considered the most important factor while hardware costs and technology developments were considered least important.

B. VENDOR OBSERVATIONS

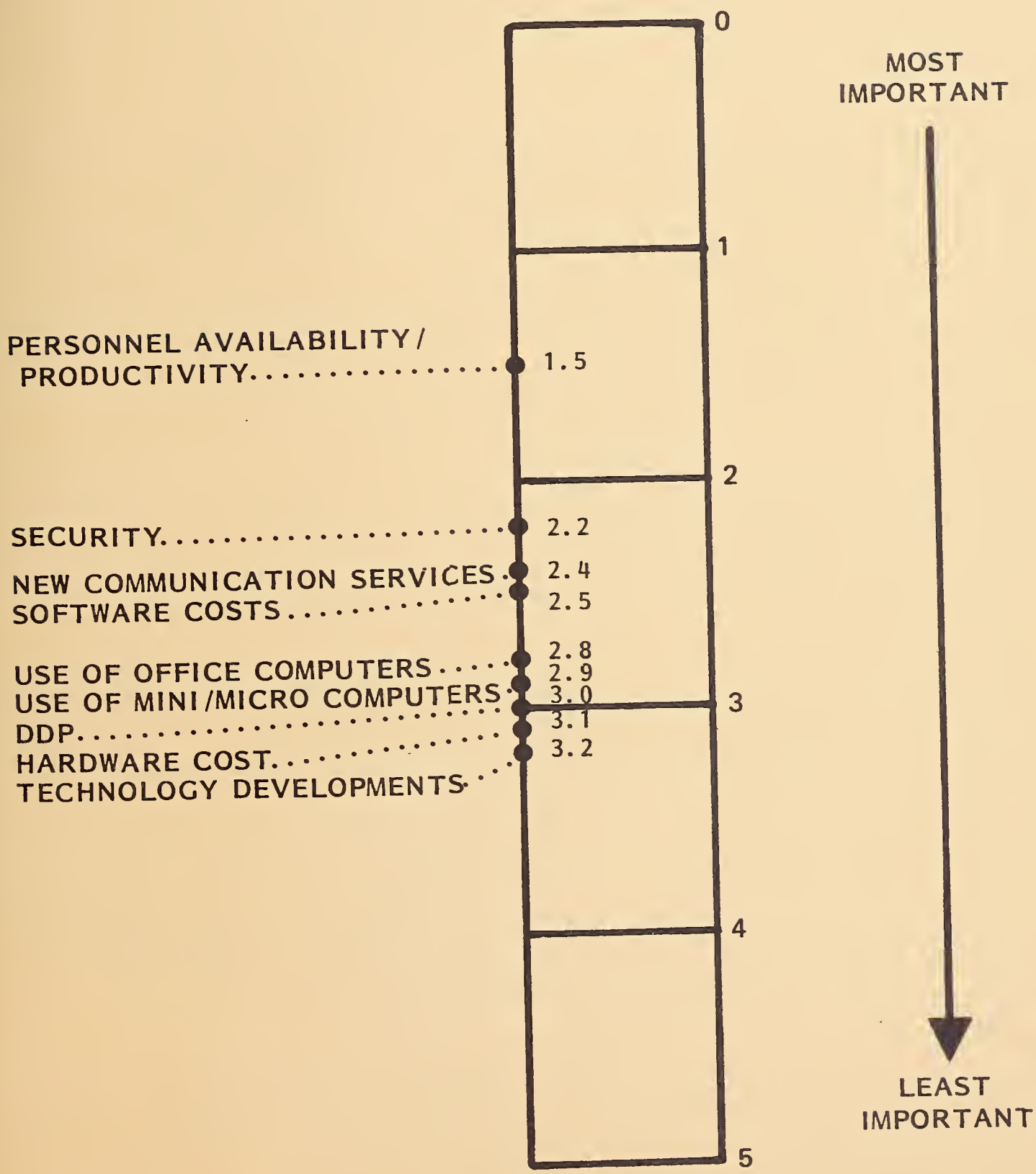
- The year 1978 for EDP industry participants has been a period characterized by its relative stability with respect to dramatic technological announcements. Basically, at least into the last quarter of the year, EDP managers and planners have been able to focus on improved service and the continued and more thorough integration of computer and communication systems into the normal operation of their respective businesses.

- Mainframe manufacturers provided little in the way of unexpected surprises and have generally followed a pattern of gradual, orderly expansion dictated by marketing rather than technological forces.

  - The possible exception came late in 1978 in the form of IBM's 8100 which was reasonably accurately anticipated by informed industry participants.

EXHIBIT II-2

RELATIVE IMPORTANCE OF SELECTED
EDP/COMMUNICATION FACTORS



- It appears that the intensifying competition in the plug-compatible mainframe arena will continue to provide, at least in the short-term, some valuable benefits to many large users as the phenomenal growth of these devices more than doubles in 1978.

  - The total of nearly 140 PCMs from Amdahl, Itel, and CDC installed at the end of 1977 will increase by at least 250 systems to over 400 by the 1978 year end.

  - The PCM vendors claims of performance, reliability, and compatibility appear to have been substantiated by current users.

  - The apparent early successes registered by initial PCM vendors have enticed new vendors such as Magnuson, Two Pi, CITEL, and Nanodata into offering even more claims of benefits and potential benefits for users.

- The current world of the highly successful minicomputer extends from the micro world of single board sets up to the powerful and versatile "super minis" offered by some of the most successful vendors in the industry.

  - 1978 was marked by a strong attempt on the part of mini manufacturers to shed their traditional OEM images and deliver products that satisfy a wide range of "total business solutions."

  - The mini market is also showing signs of growing up to provide more serious competition to traditional mainframe vendors by supporting significant software including data base management systems and full fledged communications networks.

  - The unbundling of the IBM 8100 software must also be viewed as a policy which paves the way for a wide spectrum of pricing alternatives in the future for users to evaluate.

- Arriving as a new competitive force, the microcomputer manufacturer has entered the marketplace and appears to be positioned where the mini manufacturer was some three to five years ago. However, the gap is closing fast as software, well beyond the primitive stage, and even storage and peripheral devices become available.

- As the price of mainframes drop and the numbers, types, and sizes of ancillary devices increase, the area of peripherals is becoming more significant for EDP planners.

  - Through the use of Winchester type fixed disks, there appears to be a growing trend back to non-removable storage.

  - There is currently a substantial demand for add-on bulk memory which is resulting in benefits to users through the entrance of a multiplicity of vendors.

  - The declining cost of electronics is influencing the trend in product development for a wide variety of printers, and providing a wide range of new alternatives for both large high speed devices as well as teleprinters.

- The major factor in the terminal marketplace for the next five years will be the growing improvement in and use of microcomputers in terminal systems and devices. Complementary improvements in storage technology and printing devices will further enhance the role of the terminal.

- The role of software becomes increasingly important as users devote more attention to software in an effort to control costs.

  - Based on IBM's experience with program product revenues, other hardware vendors can be expected to adopt a similar strategy.

- The need for improved cost control in the software area is also responsible for a growing list of software design methodologies such as stuctured design, walk-through, logical construction, and stepwise refinement.

- The number of IBM MVS users is expected to double by the end of 1979 from early 1978 in the drive to take advantage of 303X features.

- The software products market continues to be one of the fastest growing segments of the EDP industry.

  - This market is aided by the "unbundling" policy of IBM and other manufacturers who now make it easier for users to evaluate the merits of optional software.

  - Also contributing to the growth is the scarcity of experienced programmers and the rising labor rate.

- Data communications use is growing at a 20% rate and is playing a prominent role in virtually every sector of the U.S. industry. As more alternatives become available, and as the economics of these alternatives are better understood, many of the frustrations expressed by today's EDP managers and planners will disappear.

- Despite the intense pressure from in-house systems and freestanding minicomputers, the services segment of the industry is prospering and pushing forward with value added contributions and cost effective solutions.

  - INPUT believes that the ADP and NCSS minicomputer announcements of early 1978, and some others which have followed, add a new dimension to the remote computing marketplace, enhance the use of distributed computing, bring effective proven software to the mini marketplace, and afford data processing managers an opportunity to bring remote computing back under their control.

- The packaging of hardware, software, communications, and support service presages IBM's position in the 1980s.

C. RECOMMENDATIONS

- This report clearly points to a shortage of qualified systems analysts and programmers. INPUT believes that those firms who recognize this problem and take remedial action will enjoy a distinct advantage in future years.

  - Recruiting and training of EDP personnel should be established as a full-time function of the EDP department.

  - Formal programs for personnel development in the areas of data base management, communications, testing, and non-procedural languages should be established.

  - Evaluation of available training aids and courses should be made and maintained so that they can be used to the best advantage as needs arise.

- The push to on-line applications is causing significant "out of capacity" and "sluggish response" problems at peak periods. The tendency to upgrade for attaining additional capacity should be carefully reviewed.

  - Caution is urged for long-term equipment decisions being made in the next 18 months due to the high probability of change expected in the industry.

  - Offloading by means of DDP techniques should be considered where possible.

- Because peripheral devices are now a more significant cost factor in the overall hardware configuration, users must devote more attention to their selections. This is necessary because of the potential economic and performance rewards stemming from throughput, reliability, and capacity.

- The burden of maintenance is worsening as technology renders more applications feasible and consumes more personnel for the development function.

  - Lines of communication with management should be established now to anticipate system updates and facilitate their implementation at minimal cost.

  - The maintenance function must be upgraded to one of importance from one of drudgery.

  - The quality of staff assigned to maintenance must be improved. In the future this group will exert the greatest influence on equipment utilization and program productivity.

- The wide variety of terminal devices and the availability of more powerful and complex remote job entry units make the terminal selection process one which requires special care and deliberation. Furthermore, the pressures of research and development, financing, software marketing, and maintenance will result in a diminishing number of vendors in the next few years. Therefore, the stability of terminal and minicomputer suppliers should be evaluated carefully in the selection process.

- It is essential for EDP managers to control and supervise the installation of systems at remote locations which employ the DDP concept.

  - The smoothest and most error free DDP operations have resulted from added efforts to train remote site user personnel properly, and using equipment that is technically transparent to users.

- Although distributed processing may appear to offer greater local control and management of the data entry and processing functions, it does not necessarily suggest increased autonomy at the remote site. Centralized control of equipment procurement and systems development should continue at corporate or divisional headquarters.

- DDP in the future will be influenced by word processing and other office automation programs.

- As communications services are being "sold" at higher levels in the organization by AT&T, Satellite Business Systems, and now even Xerox, EDP and communications decisions in the future cannot be separated. EDP and communications managers must work more closely in evaluating, planning, and implementing systems involving both disciplines.

  - Both spheres of interest and areas of unique expertise can be brought to bear. Knowledge of remote testing, monitoring, reliability measurement, and tariffs from one area can be effectively applied to the other.

  - Traditional communications functions have now become a potential source of remote information, e.g., the intelligent PABX.

- Today's communication trends are contributing to an increase in the level of EDP involvement in office automation projects. Planners should begin now to prepare for future systems opportunities by integrating not only data but also voice and image (facsimile) into their long-range planning activities.

ABOUT INPUT

THE COMPANY

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. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 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 in 1974, INPUT has become a leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.

UNITED STATES, West Coast
2180 Sand Hill Road
Menlo Park, California 94025
(415) 854-3422
Telex 171407

UNITED STATES, East Coast
Park 80 Plaza West-1
Saddle Brook, New Jersey 07662
(201) 368-9471

UNITED KINGDOM
INPUT Europe
Empire House
414 Chiswick High Road
London, W4 5TF
England
995-5397/8/9
Telex 896739

ITALY
PGP Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850

JAPAN
Overseas Data Service Company, Ltd.
Shugetsu Building, No. 12-7 Kita Aoyama
3-Chome Minato-Ku
Tokyo, 107
Japan
(03) 400-7090

AUSTRALIA
Infocom Australia
Highland Centre, 7-9 Merriwa Street
P.O. Box 110, Gordon N.S.W. 2072
(02) 498-8199
Telex AA 24434

APPENDIX C: EXECUTIVE SUMMARY ANNUAL REPORT 1978 FROM THE SMALL ESTABLISHMENT SERVICE

ROUTE:

1._____

2._____

3._____

4._____

SMALL ESTABLISHMENT SERVICE

ANNUAL REPORT

EXECUTIVE SUMMARY

OCTOBER 1978

II EXECUTIVE SUMMARY

A. KEY CONCLUSIONS

- A total of $31.3 billion was spent in 1977 by small establishments on information processing equipment and services. This consists of:

-	Computer equipment	$5.7 billion
-	Computer services	$1.7 billion
-	Office equipment	$6.6 billion
-	Communications equipment	$4.3 billion
-	Communications services	$13.0 billion

These figures are for payment to outside vendors only, and do not include salaries or fringe benefits for EDP, communication, or office employees.

- Small establishments are rapidly increasing their use of information automation equipment. However, the number of employees required to automate is a function of the type of information to be processed and of the industry sector.

- For computer equipment and services in the sectors of utilities, finance and banking, insurance, and business services, firms of 20 employees use automation.

- The use of office automation equipment is lagging behind computer equipment and services. However, in the sectors of business services, and state and local government, establishments of 50 employees are using office automation equipment.

- The great majority of small establishments have immediate needs for additional equipment and services to be used for information processing and communications, although specific needs (and their importance) depend upon the industry sector.

- The users who are already making the most use of information automation equipment and services also have the greatest desire for additional equipment and services.

- Small establishments generally do not plan ahead to obtain information processing equipment and services. Instead, when a need is recognized, they examine a few alternatives and then make a decision based upon a financial analysis, a committee analysis, and possibly a test installation. The senior executive in the establishment is usually involved in the decision.

- Branches of large companies also use a financial analysis, a committee and possibly a test installation to decide upon information processing equipment and services. The senior executive in the branch is usually involved in the decision.

  - The branch has considerable say, even total say, in the selection of equipment and services.

- Major driving forces for the increased use of equipment and services in small establishments are:

- The decreased cost and improved performance of information processing equipment which makes it acceptable to increasingly smaller users.

- The increased interest by vendors in the small establishment market.

- Annual expenditures per employee for information processing equipment and services vary quite widely as a function of industry sector. The extremes are:

	Computer Equipment and Services	Office Equipment	Communications Equipment & Services
- Banking And Finance	$414	$363	$957
- Retail	$105	$92	$244

B. MARKET GROWTH

- The growth of the $31.3 billion small establishment market will be quite rapid due to the introduction of new equipment designed for small establishments and the increased vendor interest in the market. Exhibit II-1 shows that the market will be $76.1 billion by 1983, with growth rates as follows:

- Computer equipment and services	24 percent
- Office automation equipment	17 percent
- Communications equipment	14 percent
- Communications services	9 percent

- This growth varies by business sector and product type, as shown in Exhibit II-2. In general, an industry sector does not tend to be a high or low growth sector for all products and services. The sectors with the fastest overall growth are discrete and process manufacturing, insurance, finance and banking, and "other services."

- Another way to look at the growth of the small establishment market is to see which percentage of respondents, by industry sector, have immediate needs for which they would spend money for improved equipment and services:

  - Exhibit II-3 shows that in six industry sectors over one-half of all respondents had immediate needs for additional EDP equipment/services and that all sectors require additional EDP equipment/services.

  - The immediate needs for additional office automation equipment are shown in Exhibit II-4. In this case, discrete and process manufacturing, insurance, and "other services" have significant needs for additional office automation equipment. However, four sectors (utilities, wholesale, retail, and education) have little interest. This disparity in the case of retail is due to the relative newness of office automation. The other sectors are relatively well penetrated at the large end of the scale, but the smaller establishments have not considered office automation.

  - Needs for additional communications equipment and services, as shown in Exhibit II-5, are more uniform than office automation. All sectors said they had needs. Just as with office automation equipment, the sectors with the greatest needs are manufacturing, insurance, and "other services."

- Respondents' needs for additional equipment and services are a primary and traditional measure of industry sector "willingness to buy." This information combined with the number of employees in each industry sector can provide a measure of potential sales. In each industry sector, therefore, the percentage

of immediate needs for equipment and services was multiplied by the number of employees to arrive at a new measure called "factored needs for equipment and services."

- For computer equipment and computer services the key industry sectors are retail, "other services," manufacturing, and wholesale (see Exhibit II-6). The very large size of the retail and "other services" sectors makes them more important than when only their percentage of immediate needs are considered.

- Exhibit II-7 shows the factored needs for office automation equipment. Discrete manufacturing, process manufacturing, and "other services" are significantly stronger sectors than all of the others due to their size and interest in office automation.

- Factored needs for communications equipment and services (see Exhibit II-8) are similar to office automation equipment with the exception of the addition of the retail sector. Again larger sectors become more important.

C. DEMOGRAPHICS

- Over 99 percent of all United States establishments have less than 500 employees.

- There are 3,200,000 small establishments in the United States covered by this report, including the sectors of discrete and process manufacturing, transportation, utilities, wholesale, retail, banking and finance, insurance, health services, education, other services, and state and local government. This is almost 80 percent of all United States establishments. They consist of:

- 0-19 employees — 2,750,000 establishments
- 20-99 employees — 375,000 establishments
- 100-499 employees — 75,000 establishments

- Seventy percent of all employees in the United States work in small establishments. The employees are divided by establishment size in the following manner:

  - 0-19 employees — 21% of all U. S. employees
  - 20-99 employees — 25% of all U. S. employees
  - 100-499 employees — 24% of all U. S. employees

- Small establishments are mostly independent enterprises. However, the Fortune 500/50 companies (with an average of 220 branches each) contain 165,000 branches, which are a significant market by themselves.

D. THE AUTOMATION LINE AND MARKET TRENDS

- Exhibit II-9 shows the 70% "automation line" for computer equipment and services. This line corresponds to the point at which 70 percent of the establishments are automated. The very promising sectors of discrete manufacturing, process manufacturing, and retail, are not very automated and thus the opportunities in these sectors will increase with time.

- A penetration of 25 percent is used as the definition for the office "automation line," rather than the 70 percent used for EDP, because office automation is in a newer market phase. Exhibit II-10 shows that the greatest use of office automation occurred in "paperwork" industries of insurance, education, utilities, "other services," and state and local government.

- There is no correlation between the use of communications equipment and services not provided by local telephone operating companies and the size of establishments. Thus, an "automation line" for this area is not drawn. However, the industry sectors which make the most extensive use of interconnect equipment and communications services (other than direct dialing) are manufacturing, wholesale, and "other services."

E. RECOMMENDATIONS

- Vendors of all equipment and services should sell to small establishments because the markets they represent are large, fast growing, and open to competition.

- It is important to develop a market position as soon as possible since major vendors in each market are actively pursuing the small establishments.

- Branches of large corporations should be directly approached for sales of equipment and services because they are almost always involved in the selection process. Many times the branch will have the total say in what is obtained.

  - At the time the branch is approached, the vendor should determine if corporate headquarters is involved. If so, the sales effort should proceed in parallel at the branch as well as at corporate headquarters.

- For industry specialized products (such as turnkey computer systems and computer services), sell to the functional and industry specialty of the branch, not the parent corporation.

- Approach users who already are using information automation equipment and services. They are excellent candidates for additional equipment and services.

- Ensure that equipment and services can be expanded to multi-function applications as the need for these applications expands. Develop multi-function equipment for entry into the market.

- Computer equipment and computer services vendors should have the applications programs for the industry sectors which they target. If they are developing new programs, then the key sectors to approach (by size and immediate EDP needs) are:

  - Discrete manufacturing.
  - Process manufacturing.
  - Wholesale distribution.
  - Retail distribution.
  - "Other services."

- Computer equipment and services vendors should approach establishments down to 50 employees in size. Both independent enterprises and branches of large companies should be approached.

- Office automation equipment should be sold to larger establishments and in some cases different industry sectors than are targeted for computer equipment and services. Office automation vendors should concentrate upon the "paperwork industries" which are finance and banking, insurance, and "other services," as well as the key sectors of discrete and process manufacturing:

  - Both branches of large companies and independent enterprises should be approached for office automation equipment.

  - Establishments of 100 employees or more should be targeted.

- Unlike computer equipment and services and office automation equipment, the sale of communications interconnect equipment and communications services other than direct dial is not a function of establishment size:

  - The key industry sectors to target for communications equipment and services are discrete manufacturing, process manufacturing, retail, and "other services."

  - Sell computer equipment and services both to branches of major corporations and independent enterprises.

EXHIBIT II-1

MARKET SIZE AND GROWTH, 1977/1983

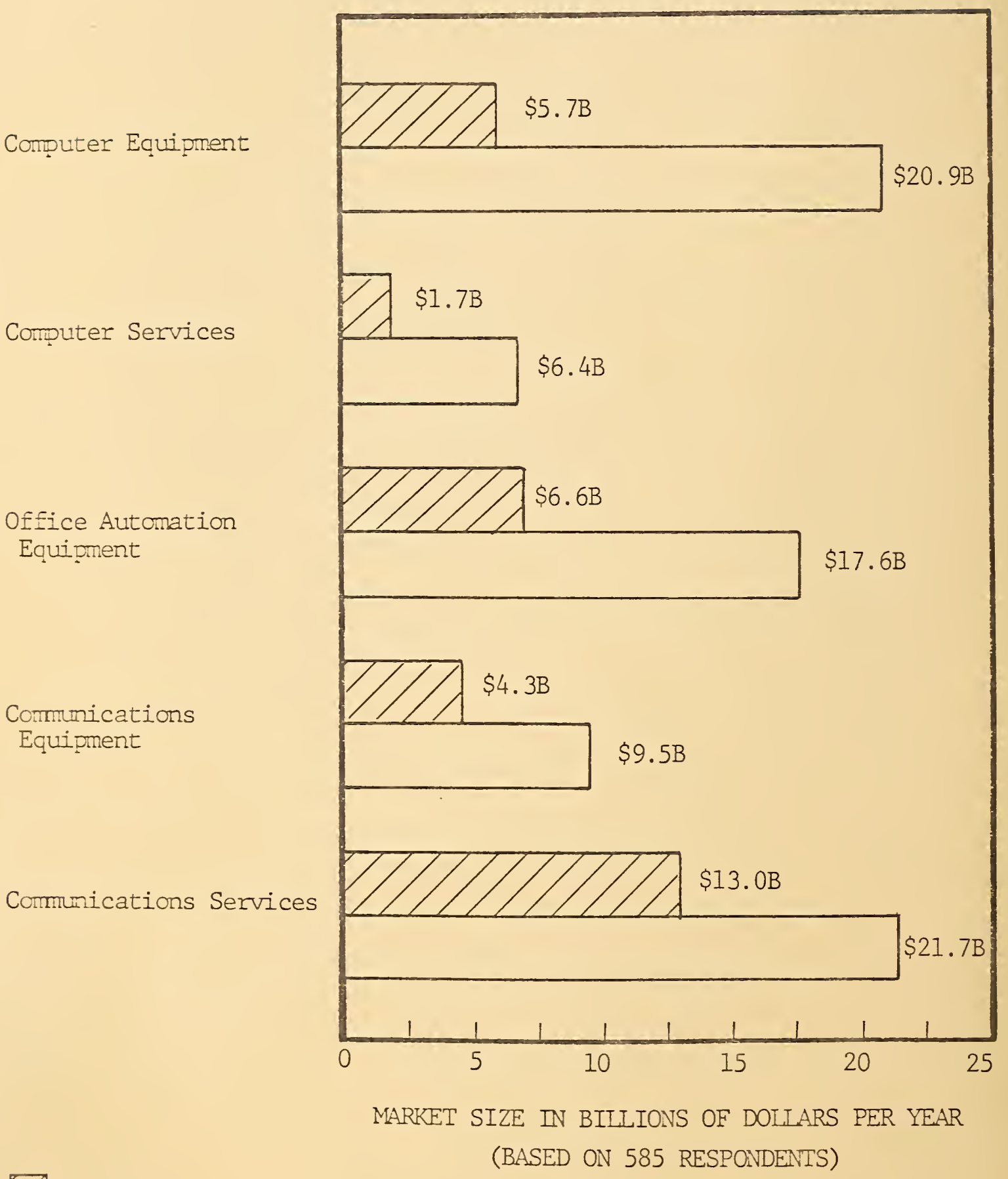


EXHIBIT II-2

RATE OF MARKET GROWTH BY INDUSTRY SECTOR

INDUSTRY SECTOR	COMPUTER EQUIPMENT AND SERVICES	OFFICE AUTOMATION EQUIPMENT	COMMUNICATION EQUIPMENT AND SERVICES
Discrete Manufacturing	H	H	M
Process Manufacturing	H	H	M
Transportation	M	M	M
Utilities	H	L	L
Wholesale	H	L	M
Retail	M	L	M
Finance and Banking	H	M	M
Insurance	H	H	M
Health Services	M	M	L
Education	M	L	L
Other Services	M	H	M
State & Local Government	M	M	L

GROWTH PERCENTAGE EQUIVALENTS			
	High	Medium	Low
EDP Equipment and Services	30%	20%	10%
Office Automation and Communications Equipment	25%	15%	10%
Communications Services	15%	10%	7%

EXHIBIT II-3

IMMEDIATE NEEDS FOR COMPUTER EQUIPMENT/SERVICES

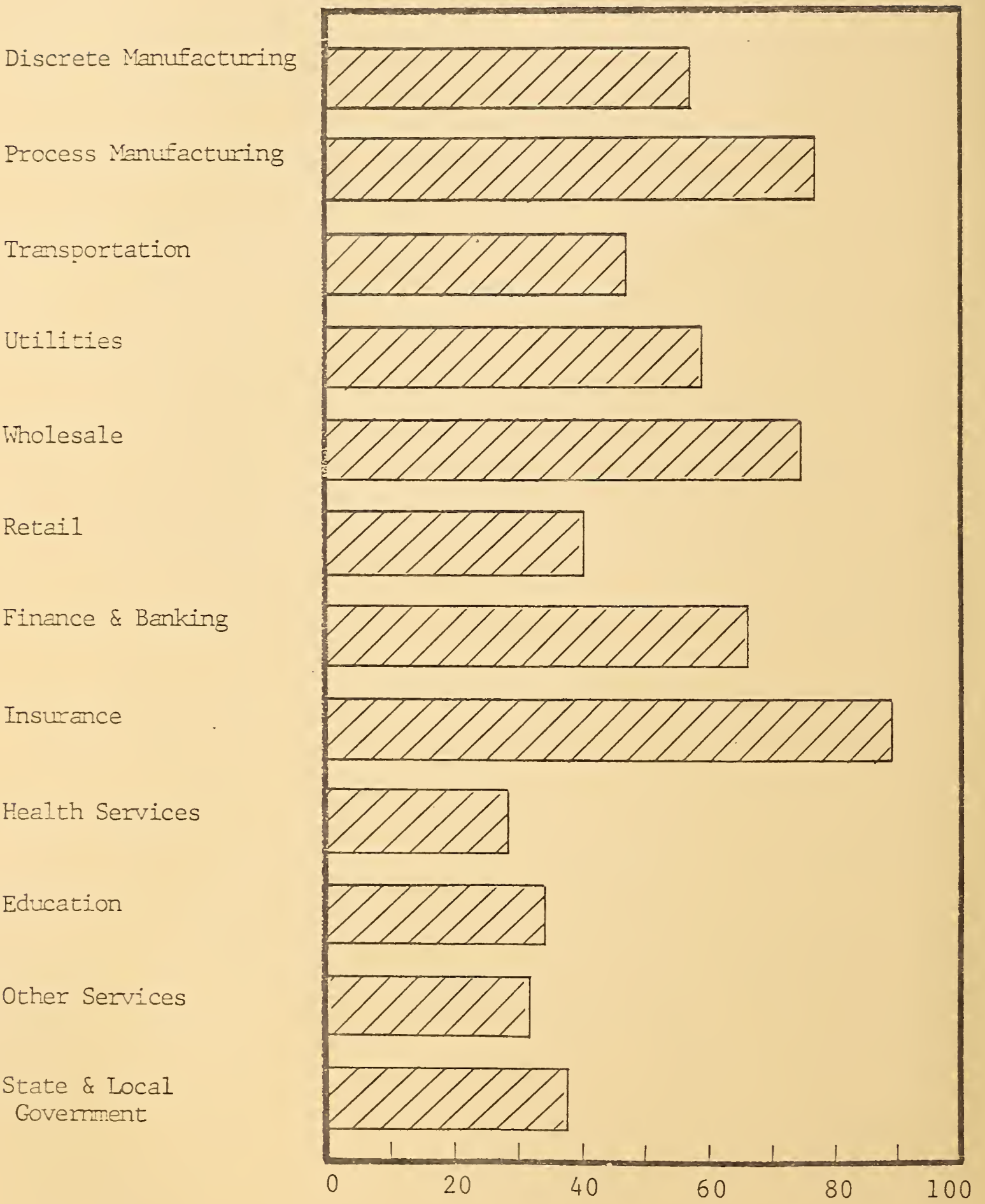


EXHIBIT II-4

IMMEDIATE NEEDS FOR OFFICE AUTOMATION EQUIPMENT

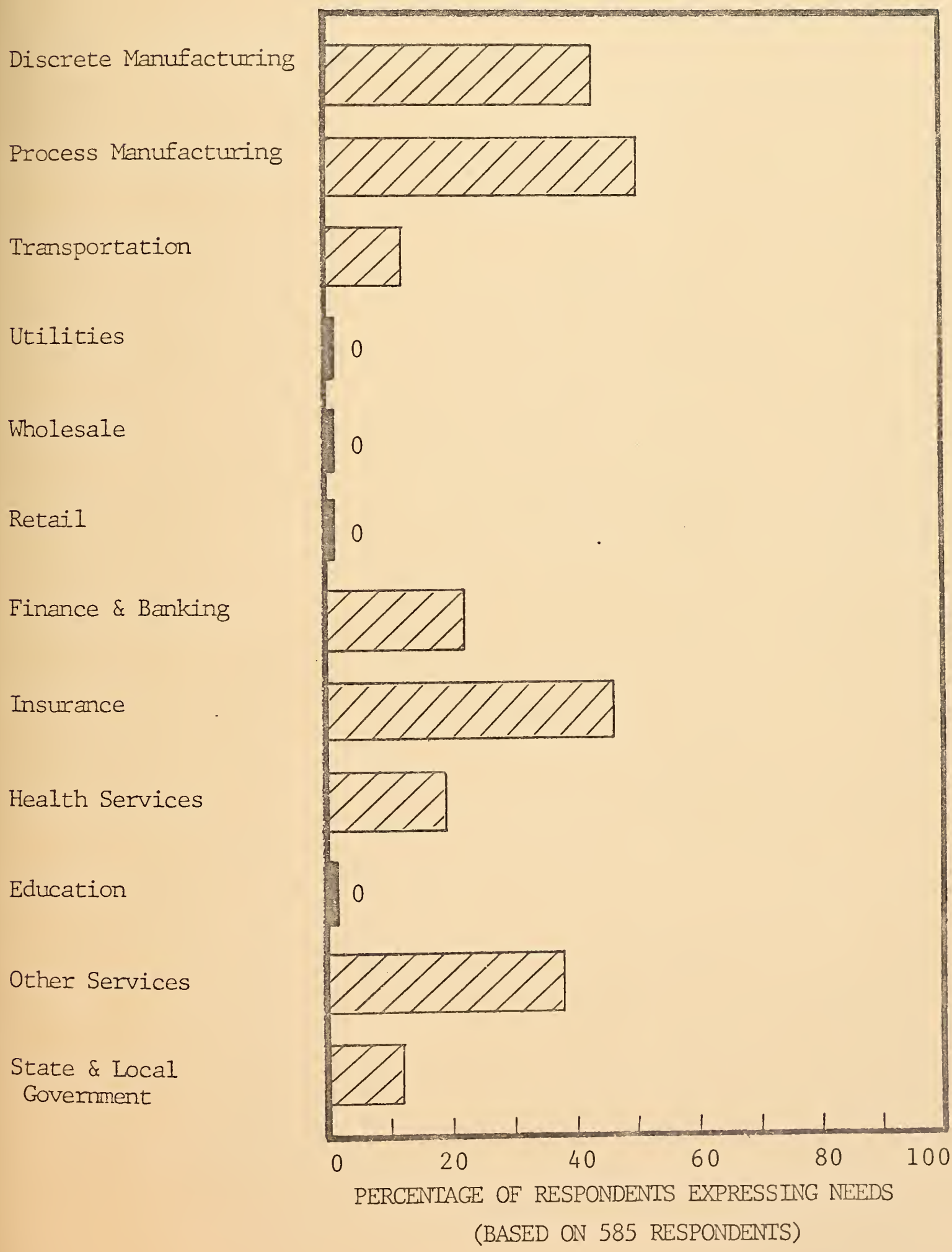


EXHIBIT II-5

IMMEDIATE NEEDS FOR NEW COMMUNICATIONS EQUIPMENT AND SERVICES

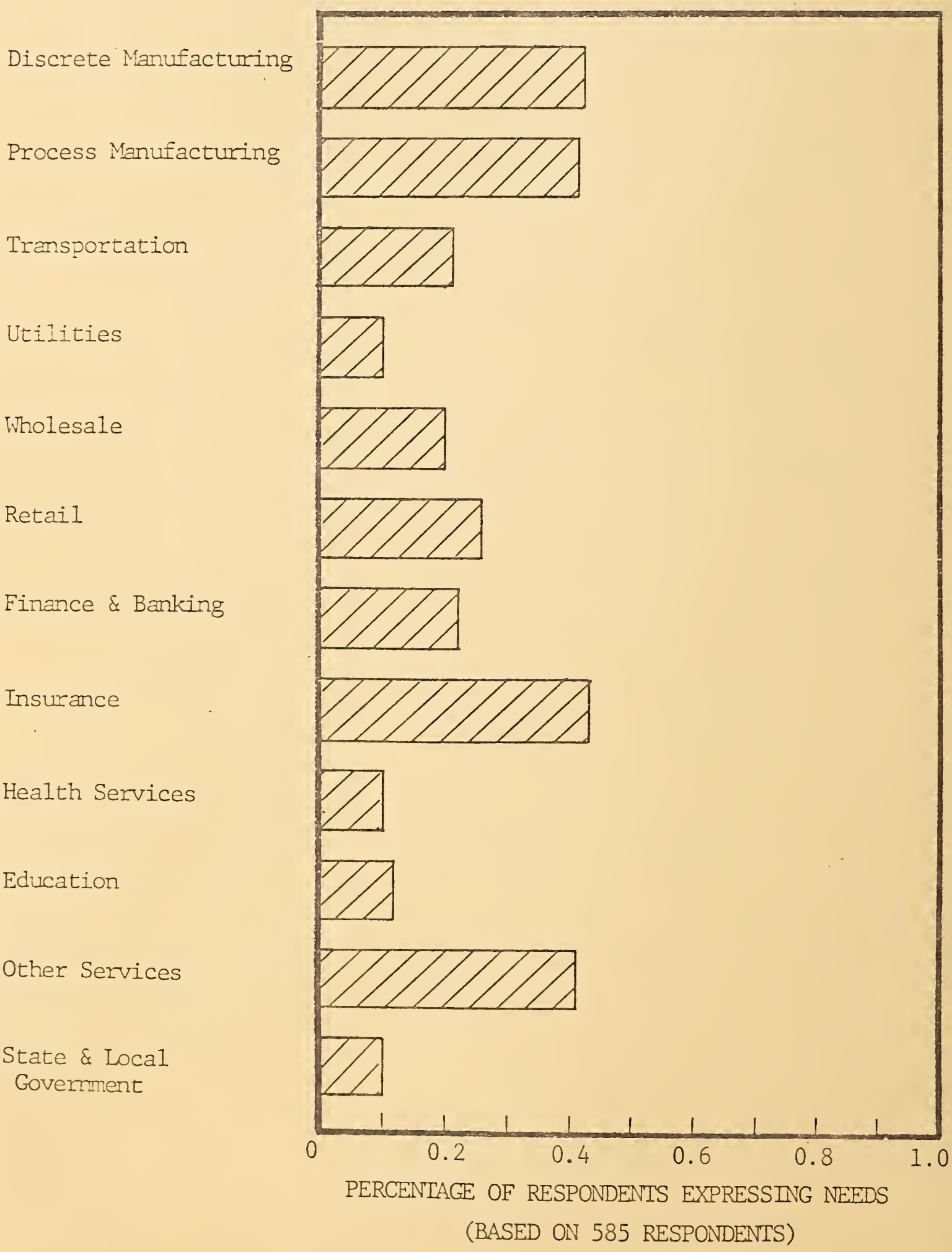


EXHIBIT II-6

FACTORED NEEDS FOR COMPUTER EQUIPMENT/SERVICES

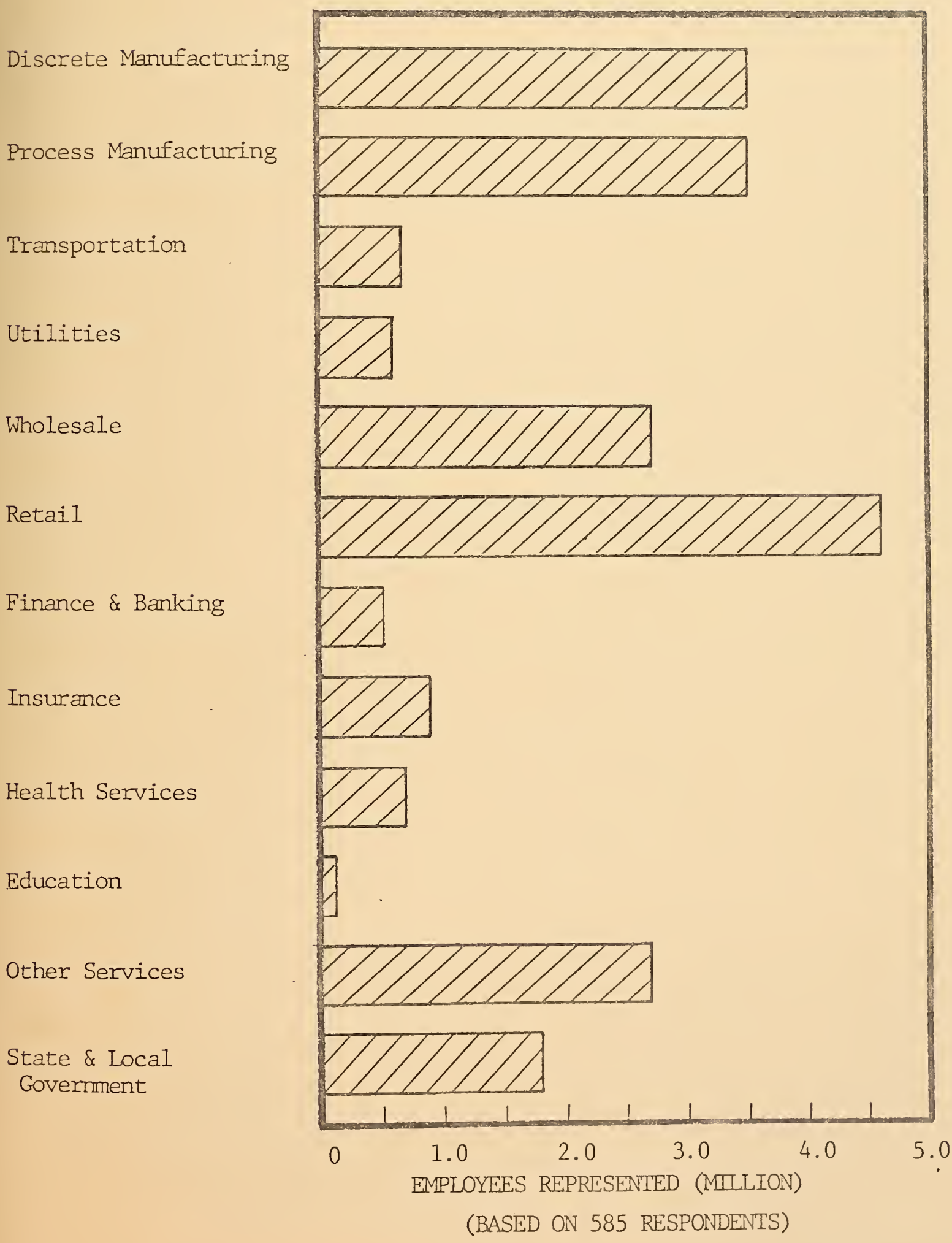


EXHIBIT II-7

FACTORED NEEDS FOR OFFICE AUTOMATION

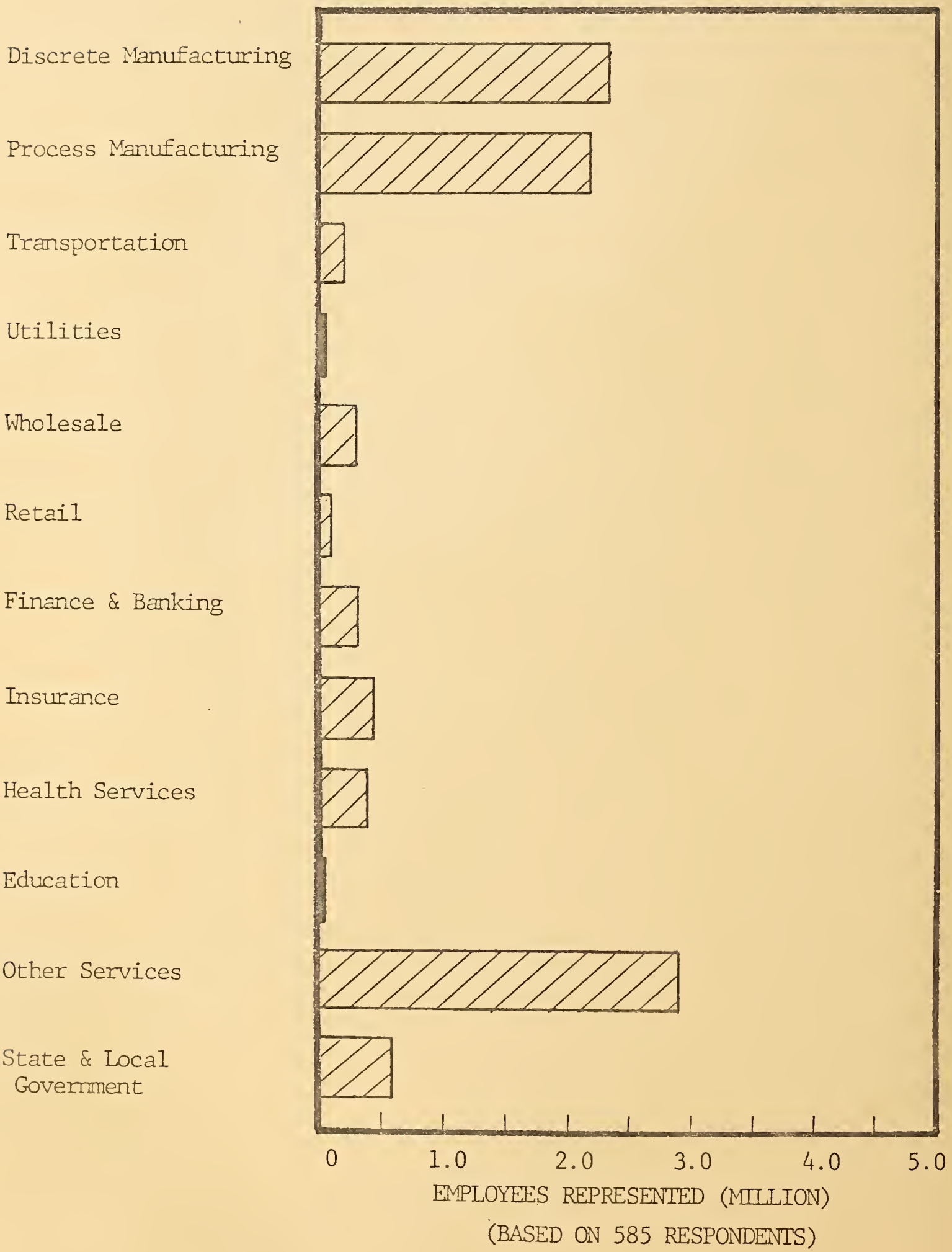


EXHIBIT II-8

FACTORED NEEDS FOR COMMUNICATIONS EQUIPMENT/SERVICES

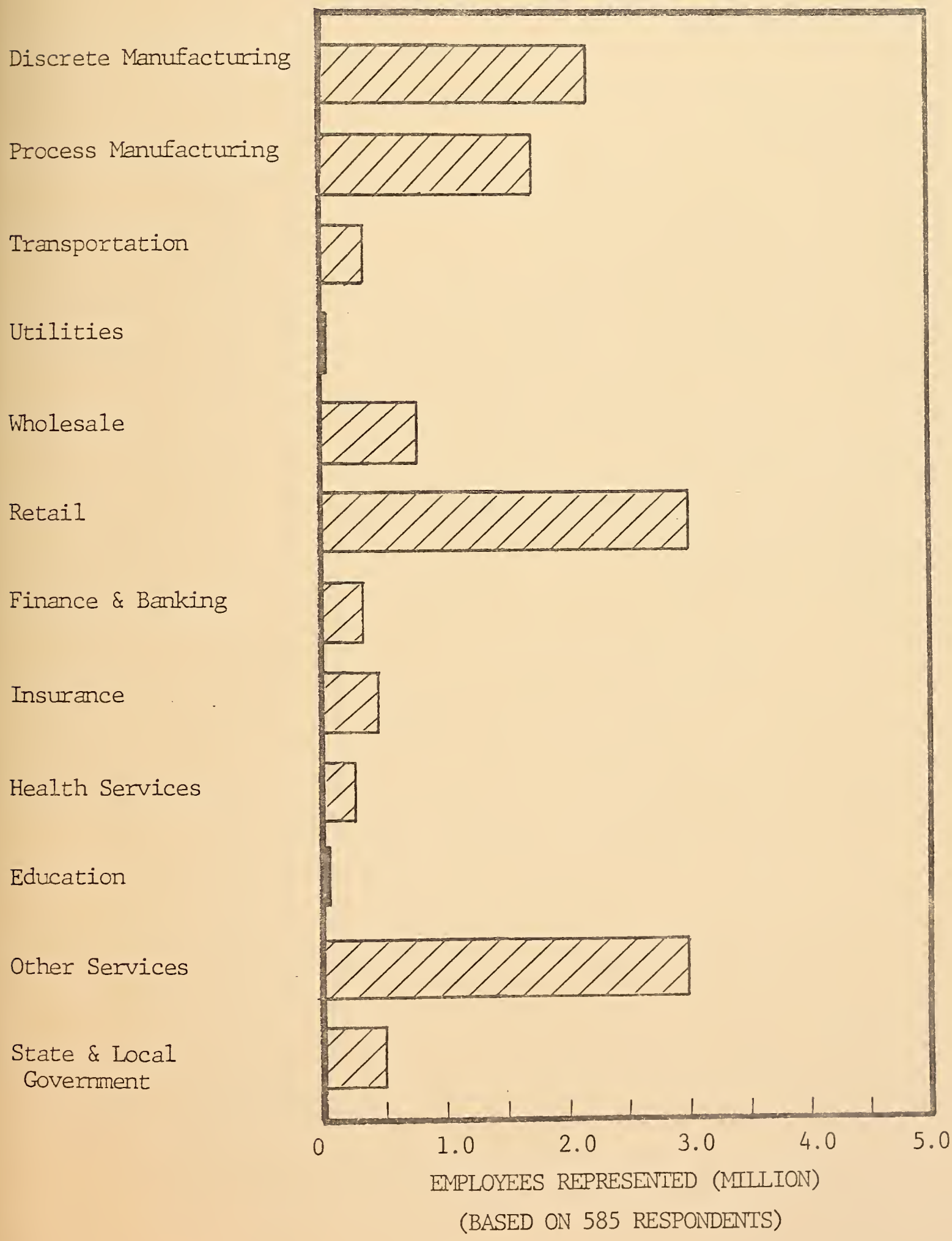


EXHIBIT II-9

THE AUTOMATION LINE FOR COMPUTER EQUIPMENT/SERVICES
(70% PENETRATION OF USERS)

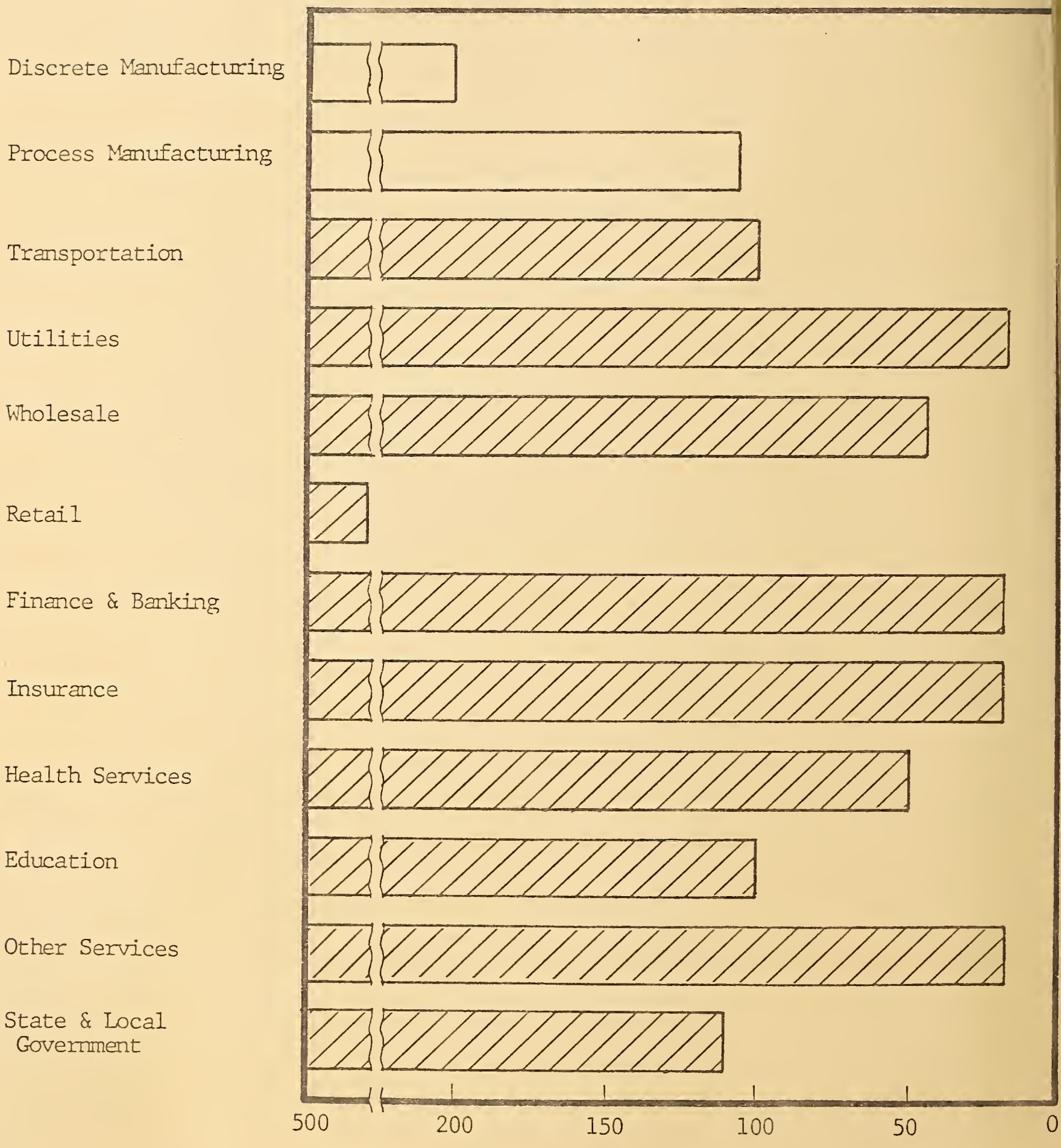
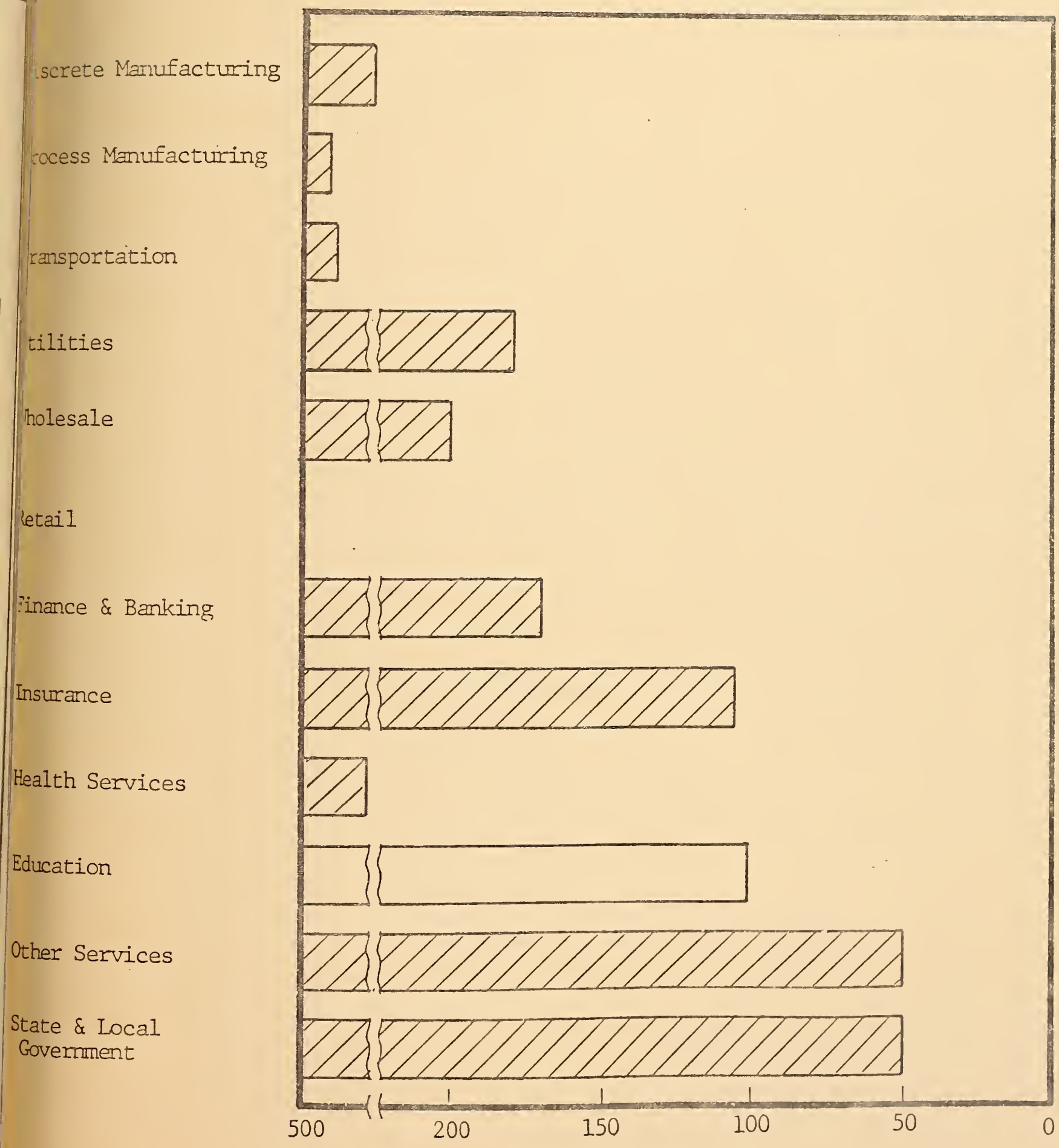


EXHIBIT II-10

THE AUTOMATION LINE FOR OFFICE AUTOMATION EQUIPMENT
(25% PENETRATION OF USERS)



= AT LEAST 25% OF ESTABLISHMENTS AUTOMATED

NUMBER OF EMPLOYEES REQUIRED TO AUTOMATE
(NOTE REVERSE ORDER)

ABOUT INPUT

THE COMPANY

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. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 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 in 1974, INPUT has become a leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.

UNITED STATES, West Coast
2180 Sand Hill Road
Menlo Park, California 94025
(415) 854-3422
Telex 171407

UNITED STATES, East Coast
Park 80 Plaza West-1
Saddle Brook, New Jersey 07662
(201) 368-9471

UNITED KINGDOM
INPUT Europe
Empire House
414 Chiswick High Road
London, W4 5TF
England
995-5397/8/9
Telex 896739

ITALY
PGP Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850

JAPAN
Overseas Data Service Company, Ltd.
Shugetsu Building, No. 12-7 Kita Aoyama
3-Chome Minato-Ku
Tokyo, 107
Japan
(03) 400-7090

AUSTRALIA
Infocom Australia
Highland Centre, 7-9 Merriwa Street
P.O. Box 110, Gordon N.S.W. 2072
(02) 498-8199
Telex AA 24434

APPENDIX D: EXECUTIVE SUMMARY
DISTRIBUTION CHANNELS

ROUTE:

1._____

2._____

3._____

4._____

DISTRIBUTION CHANNELS FOR INFORMATION PROCESSING EQUIPMENT AND SERVICES TO SMALL ESTABLISHMENTS

EXECUTIVE SUMMARY

IMPACT REPORT #1

JUNE 1978

INPUT

II EXECUTIVE SUMMARY

A. NEED FOR ALTERNATIVE CHANNELS OF DISTRIBUTION

- To reach the small establishment market, hardware and services vendors need distribution channels above and beyond conventional vendor-employed direct sales organizations. This need, extant today to some degree, will substantially increase over the next five years:

  - Even the largest vendors cannot adequately cover the entire market. This is illustrated in Exhibit II-1 which shows that even 100 sales offices can reach only a small percentage of the small establishments.

  - The ratio of sales-to-product costs is increasing as labor-related costs rise and hardware-related costs decline. Hence, more efficient methods of selling and distribution will be needed to maintain adequate margins.

  - Although the numbers of prospects are increasing as unit prices drop, the number of trained qualified sales personnel will remain relatively constant over the forecast period.

- As shown in Exhibits II-2 and II-3, 99.7% of the business establishments in the U.S., employing 75% of the work force, have fewer than 500 employees. Services and equipment whose usage is related to the number of employees (such

EXHIBIT II-1

EFFECTIVE COVERAGE OF SALES OFFICES

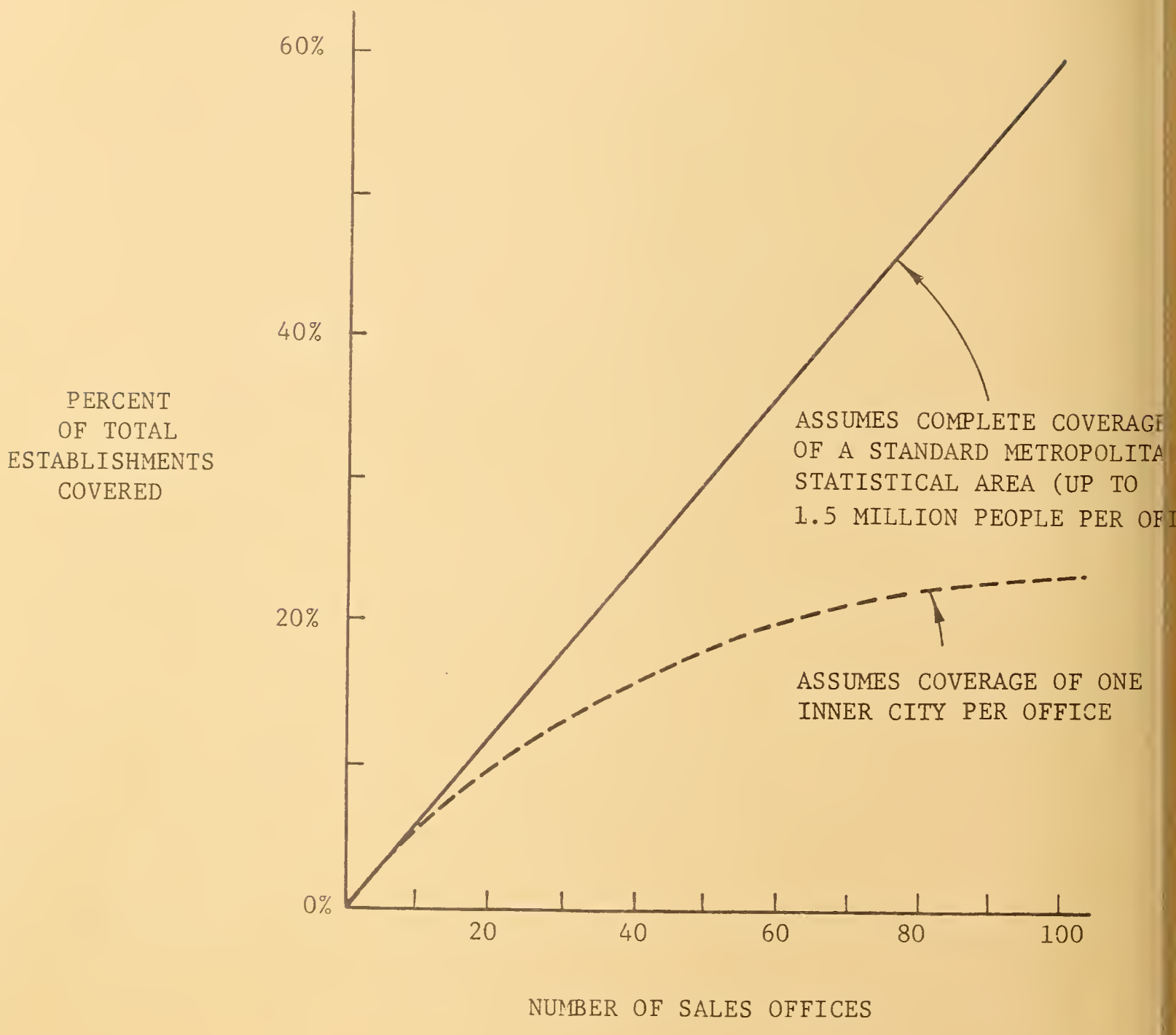
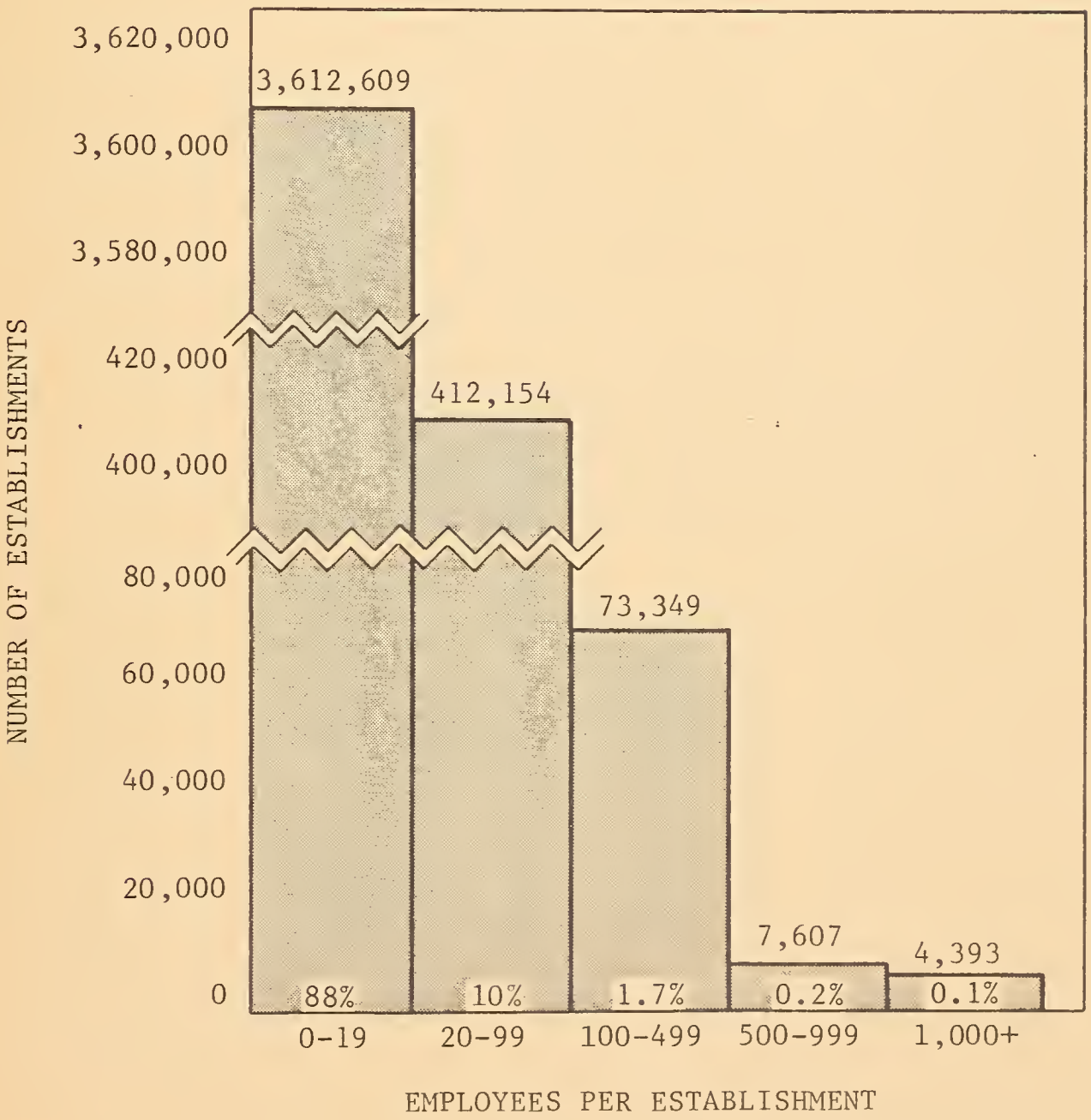


EXHIBIT II-2

NUMBER OF ESTABLISHMENTS BY SIZE IN THE UNITED STATES (1972)



TOTAL NUMBER OF ESTABLISHMENTS
IN U.S.: 4,110,112

EXHIBIT II-3

U.S. EMPLOYMENT BY SIZE OF ESTABLISHMENT

as calculators, telephones, text editing units, and supplies) depend upon requirements at the user location.

- The usage of other types of products and services (postage meters, PABXs, terminals) are tied to the number of establishments, in itself an imposing number, exceeding 4 million in the U.S.

- A summary of the products and services now being sold by various distribution channels is shown in Exhibit II-4. Exhibit II-5 contains INPUT's forecast of those channels which will be in use five years hence. These exhibits show that:

  - No channel does or will handle all products (except for vendor stores).

  - Most channels will be capable of servicing more than one type of product.

  - All products can be handled by some channel outside of direct vendor sales organizations.

B. TYPES OF DISTRIBUTION CHANNELS

- Many channels are available to the vendor. They include:

  - Manufacturer's representatives.

  - System houses.

  - Vendor operated stores.

  - Computer "hobby stores."

  - Office equipment dealers.

  - Large retailers.

EXHIBIT II-4
DISTRIBUTION CHANNELS - PRODUCTS AND SERVICES

	ELCTRONIC EQUIPMENT HOBBY STORES	COMPUTER "HOBBY" STORES	OFFICE EQUIPMENT DEALERS	LARGE RETAILERS	OFFICE AND COMPUTER SUPPLIES DEALERS	SYSTEMS HOUSE (OEM)	SYSTEMS HOUSE (TURNKEY)	COMPUTER SERVICE FIRMS	REPRESENTATIVES
MICRO COMPUTER "BARE BONES" SYSTEMS	O	●		O					●
COMPUTER SYSTEMS FOR BUSINESS	●	●	O			●	●	●	●
TELEPHONES & ANSWERING DEVICES	●		O	●					
KEYSETS & UP COMMUNI-CATIONS EQUIPMENT							O		●
COPIERS & TYPEWRITERS			●	●	O				
TEXT PROCESSING EQUIPMENT			●			●	●	O	●
SOFTWARE PACKAGES		O				●	●	●	●
SERVICES						O	O	●	●
TURNKEY SYSTEMS	●	●				●	●	●	●

KEY: ● - EXTENSIVE ACTIVITY
O - LIMITED ACTIVITY

EXHIBIT II-5

DISTRIBUTION CHANNELS FOR MARKETING PRODUCTS AND SERVICES
THROUGH 1983

	ELECTRONIC EQUIPMENT HOBBY STORES	VENDOR STORES	COMPUTER "HOBBY" STORES	OFFICE EQUIPMENT DEALERS	LARGE RETAILERS	OFFICE AND COMPUTER SUPPLIES DEALER	SYSTEMS HOUSE (OEM)	SYSTEMS HOUSE (TURNKEY)	COMPUTER SERVICE FIRMS	REPRESENTATIVES
MICRO COMPUTERS "BARE BONES" SYSTEMS	●	●	●	O	●	O			O	●
COMPUTER SYSTEMS FOR BUSINESS	●	●	●	●			●	●	●	●
TELEPHONE & ANSWERING SERVICE	●	●		●	●					
KEYSETS & UP COMMUNICATION EQUIPMENT		●		O			O	O		●
COPIERS & TYPEWRITERS		●		●	●	O				
TEXT PROCESSING EQUIPMENT		●		●			●	●	●	●
SOFTWARE PACKAGES	O	●	●		O		●	●	●	●
SERVICES		●	O	O			O	O	●	●
TURNKEY SYSTEMS	●	●	●	O	O		●	●	●	●

KEY: ● - EXTENSIVE ACTIVITY
O - LIMITED ACTIVITY

- Electronics hobby stores.
- Office and computer supplies dealers.
- Computer services companies.
- User associations.
- Mail order.

- Some outlets, such as the office equipment dealers, are well established with some of the older dealers going back 40 or more years. Others, such as the hobby stores, are quite recent. Still others, such as vendor stores, are untested as yet. There is no single ideal or universal channel for any one product or service. Vendors must consider using a mix of different channels tailored to fit both product and geographic requirements.

- Vendors must also keep in mind the limitations of the potential distribution channels and be prepared to provide training and support where necessary. For example, the office product distributor, unfamiliar with complex electronics, will require a substantial amount of help to effectively handle some products having a high electronic content.

- All types of distributors interviewed for this study were flexible in their attitudes toward selling new products and services. They lack the specialized people needed to handle sophisticated information products, but can acquire these people and skills by obtaining reasonable assistance from vendors.

C. USER ATTITUDES

- Users interviewed for this study shared a distinct preference for direct vendor contact and prefer to deal with representatives or direct sales personnel. (System houses were generally looked upon in the same light as original equipment manufacturers.)

- Despite the lack of actual experience, users rated vendor stores second only to direct sales as the place they would most like to purchase from. This would appear to support a contention that users are strongly biased toward vendor-controlled outlets in any form over and above third party outlets.

- Most users interviewed were not really familiar with the distribution channel structure and the many ways in which products and services can be obtained.

D. VENDOR ATTITUDES

- Vendors interviewed for this study included those who supply computer equipment and services, office equipment, communications equipment, and services. Vendors believe that:

  - New distribution channels will be established by major vendors.

  - Products will be partly developed to fit the requirments of the distribution channels.

  - Entirely new sales approaches will be developed aimed at reducing cost of sales.

- Both IBM and AT&T are experimenting with new distribution channels. The actions of these industry leaders will influence other vendors:

  - AT&T operating companies have opened walk-in street level stores.

  - IBM has opened "Business Computer Centers" for their Model 5100 desk top computer wherein customers call the center for appointments.

E. RECOMMENDATIONS FOR VENDORS OF COMPUTER, OFFICE, AND COMMUNICATIONS EQUIPMENT

- Vendors of all types of equipment should experiment with different distribution channels and closely monitor the successes and failures of competitive companies,

- A liaison departments for distribution channels should be established and publicized.

- Design equipment so that maintenance and repairs can be made by the (relatively) unskilled personnel employed by third party distributors.

- Develop sales and maintenance training programs for distributors.

- Applications software should be designed for easy tailoring or modification.

- All vendors should consider opening vendor name stores. These stores can be shared with other vendors selling other non-competing product lines. For example, a computer vendor, an office equipment vendor and a communications vendor can all utilize the same store.

F. RECOMMENDATIONS FOR SERVICES VENDORS

- Vendor stores are as suitable for the services vendors as they are for equipment vendors.

- Applications package vendors can utilize the same channels as do the computer equipment companies who produce the equipment upon which the software runs.

- Processing services vendors, both remote and batch, should establish relationships with hardware outlets to provide back-up support and to handle applications requiring more capability or capacity than the outlet's products can handle.

- Remote computing and batch services vendors should sell time and storage at wholesale or bulk rates to distributors who will resell it to small local accounts.

- As specialty communications services are developed, many will become suited for sale by specialized distribution channels. For example, a message store and forward network service could be sold by a distributor who also sells message terminals or office equipment.

- Communications services vendors should consider joint ventures with vendors offering specialty turnkey systems or services where the communications service is implicit in the end user product offering. A data base inquiry service (such as a stock quotation service) is an example.

ABOUT INPUT

INPUT provides planning information, analysis, and recommendations to companies in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Professional staff have, on average, nearly 20 years experience in the information processing industry. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.

OFFICES

UNITED STATES

2180 Sand Hill Road
Menlo Park, CA 94025
(415) 854-3422

Park 80 Plaza West-1
Saddle Brook, NJ 07662
(201) 368-9471

JAPAN

Overseas Data Service Company, Ltd.
Shugetsu Building, No. 12-7 Kita-Aoyama
3-Chome Minato-Ku
Tokyo, 107
Japan
(03) 400-7090

EUROPE

INPUT Europe
500 Chesham House
150 Regent Street
London, W1R 5FA
England
London 439-6288
Telex 261426

PGP Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850

AUSTRALIA

Infocom Australia
Highland Centre,7-9 Merriwa Street
P.O. Box 110, Gordon N.S.W. 2072
(02) 498-8199