OPPORTUNITIES IN EDUCATION SERVICES

INPUT

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OPPORTUNITIES IN EDUCATION SERVICES

INDUSTRY REPORT #15

OCTOBER 1979

OPPORTUNITIES IN EDUCATION SERVICES

ERRATA

P.4 Last sentence should read:

The market size for EDP-related subjects is approximately 20% of all external training, or $642 million in 1979.

P.5 Fourth bullet, last sentence should read:

The market at that time will be from $3.4 billion to $4.5 billion.

P.47 Exhibit IV-3

Subcolumn heading for EDP Users should read External, not Internal.

OPPORTUNITIES IN EDUCATION SERVICES

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OPPORTUNITIES IN EDUCATION SERVICES

LIST OF EXHIBITS

1 INTRODUCTION

I INTRODUCTION

- This INPUT report on education services is part of the Market Analysis Service (MAS).

- The topic was selected because of high client interest and the growing importance of the education services market to the computer industry.

- Research for this report included a series of in-person and telephone interviews, conducted in August 1979, with representatives from education services vendors and end users.

- The report evolved from an analysis of the specific interviews conducted for the study combined with the experience and judgement of INPUT's staff.

- The study addresses only the United States market for education services.

- Inquiries and comments from clients on the information presented are requested.

- The interview profile and questionnaires are included in Appendix A.

- Related INPUT studies are listed in Appendix B.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. EDUCATION AND TRAINING AS AN OPPORTUNITY

- Education services is defined as the business of providing training to people. This study examines education services provided in the commercial marketplace, excluding elementary schools, secondary schools, colleges and universities. This study forecasts the size of the market for:

  - All training in the commercial marketplace.

  - The Computer Assisted Instruction (CAI) market.

  - EDP user and end user training for data processing-oriented subjects.

- Major vendors of education services are hardware manufacturers, remote computing services companies, software vendors, training institutes, and education services vendors such as Advanced Systems, Inc., Boeing Computer Services Education Group, Control Data Education Company, Deltak, Edutronics Division - McGraw-Hill Book Company, and Tratec Division - McGraw-Hill Book Company.

- Hardware manufacturers, remote computing services companies, and education services vendors are all well positioned to add more courses to their offerings and to add more customers to their classes.

- IBM is well positioned to expand its CAI offerings because of its present instructional system and courses.

- Remote computing services companies have the client base that needs training in data processing.

- Educational services vendors are in an excellent position to serve the needs of the EDP community.

  . These vendors have experience in developing courses.

  . These vendors have large and rapidly growing customer bases.

  . The vendors already sell packaged training that the user can administer within his own timeframe.

- Constantly changing technology is the driving force behind the need for training. The need for training continues in concert with new developments.

- Personnel turnover and business growth are the driving forces behind the need for continuous training on existing products, methods, and services. In other words, the industry itself provides the fuel for training opportunities.

B. MARKET SIZE AND GROWTH

- The total market for all training in the U.S. is approximately $12 billion in 1979, of which nearly $3 billion will be obtained from training services vendors. The market size for EDP-related subjects is approximately 20% of the total, or $642 million in 1979.

- Approximately 1,270,000 people work in the EDP industry in the U.S. Of these, 450,000 are programmer/analysts; 300,000 programmer/analysts work on on-line systems.

- In the U.S., there are approximately 7,400 large computer installations. Each installation has five to ten application systems, and there are five to fifty end users per application system.

- The U.S. has approximately 43,000 small computer installations with two to five application systems per installation. In turn, there are two to fifteen end users for each application system.

- INPUT estimates that the 1979 market for CAI is between $120-600 million. (Most of its use is outside the EDP training area which was the focus of this study.) Based on the comments received from respondents, however, INPUT believes that CAI usage will grow at a 60% rate through 1984. The market at that time will be from $3.4 million to $4.5 million.

- The total market forecast for internal and external EDP training is shown in Exhibit II-1.

C. USER BUYING CHARACTERISTICS

- An average of 332 people per respondent were trained in 1978, and 371 are expected to receive training in 1979, a 12% increase.

- Projections for training in 1980 averaged 446 persons per respondent, a 20% increase over the 1979 figure.

- The 1979-1984 average annual growth rate projected by respondents is 9%. This is probably due to the relatively short-term view of DP management people. As a result, this figure should probably be adjusted upward.

EXHIBIT II-1

TOTAL EDP TRAINING FORECAST 1979-1984

INDUSTRY SECTOR	1979 ($ MILLION)	1984 ($ MILLION)	AAGR 1979/1984
DISCRETE MANUFACTURING	$ 348.1	$ 851.0	20%
PROCESS MANUFACTURING	237.9	643.5	22
TRANSPORTATION	159.2	439.8	23
UTILITIES	99.6	222.7	17
BANKING AND FINANCE	70.7	158.9	18
INSURANCE	67.2	152.7	18
RETAIL	142.8	420.6	24
WHOLESALE	58.7	149.6	21
SECURITIES AND OTHER	263.8	528.1	15
TOTAL	$1,448.0	$3,566.9	20%

- Over 92% of respondents utilize audio/visual training aids, and all respondents utilize classroom training. Only one respondent indicated that they did not have some type of internal training program. All other respondents combined internal and external training programs.

- Most of the respondents (77%) have their own training budget, and the authority to make expenditures.

- The buyer perception of training quality from vendors is very high overall. This speaks well for the vendor efforts to date.

- Selected key training statistics are shown in Exhibit II-2:

  - The number of people to be trained in DP is expected by respondents to grow at 9% a year through 1984.

  - The average number of training days per EDP employee per year is ten.

  - The average total amount spend training EDP personnel is currently $593 per person per year, excluding salaries.

- Almost 60% of respondents place the decision to buy educational services at a high level in the organization.

  - Nearly 20% of respondents required a top management decision.

  - Nearly 40% of respondents required a DP management decision.

- However, only one-fourth of respondents delegated the buying decision to the manager of DP education or other education managers.

- Usually, two recommendations are required for a decision.

EXHIBIT II-2

KEY TRAINING STATISTICS
AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	KEY TRAINING STATISTICS AS REPORTED BY RESPONDENTS			
	1979-1984 AAGR IN # OF PEOPLE TO BE TRAINED	1980 AVERAGE # OF TRAINING DAYS PER PERSON	1979-1984 AAGR IN # OF PEOPLE TO BE INVOLVED IN TRAINING MANAGEMENT	AVERAGE $ SPENT ON TRAINING PER EDP EMPLOYEE IN 1979
DISCRETE MANUFACTURING	11%	6	10%	$ 556
PROCESS MANUFACTURING	7	13	2	608
TRANSPORTATION	2	11	6	571
UTILITIES	16	10	5	628
BANKING AND FINANCE	14	6	4	635
INSURANCE	9	5	13	1,048
RETAIL	2	11	0	704
WHOLESALE	13	8	8	531
SERVICES	N/A	10	0	347
OTHER	N/A	19	0	
TOTAL	9%	10	4%	$ 593

N/A = NOT APPLICABLE

- Vendors should remember, however, that even though the decision maker is high in the organization, middle level personnel extend considerable influence, and it is often on their recommendations that the decision maker acts. Therefore, the education vendor should not overlook department managers or other mid-management people in his sales approach.

- External course training is used to increase in-house productivity, and using an outside vendor may be the only means of obtaining the necessary skills for this task. In addition, outside vendors may be the only source for new technical knowledge.

- The prime courses currently needed by respondents are programming instruction followed by DDP/networking, systems design, and data base.

- The high demand for programming instruction was unexpected since vendors currently offer a large number of courses in programming.

- In the future, functional specialties appear to be an area of growing importance. DDP networking, programming, and on-line systems will continue to be important for the foreseeable future.

D. TECHNOLOGICAL IMPACTS

- Computer assisted instruction (CAI) is a training technique whose time has arrived. Microcomputer manufacturers are beginning to be an impressive force in this area.

- CAI is useful because:

  - The student receives logical direction.

  - Grading is consistent.

  - Remedial training needs can be readily identified and administered.

  - Additional course or sequence needs can be readily determined.

  - Training can be tailored to the individual.

  - CAI can be used for all types of training.

- CAI is expected to have increased use in end user training in systems and procedures and in technical training.

- INPUT believes that CAI will account for 15-20% of all training by 1984 and as much as 80% ten years hence.

- Computer-driven video electronics will be widely available within two to five years.

- By 1985, satellite, video, microprocessor, and terminal technologies will be merged.

- By 1985-1990, there will also be much greater use of video disk and multi-media learning centers.

- Microprocessor-based teaching machines will play some role in basic instruction and drilling. They will be in general use within the next five years.

- Satellite communications may have a strong impact on educational technology within the next five years. Satellite communications will widen the scope, as well as lower the cost, of educational services and will introduce new training methodologies.

- DDP will have a very high impact on educational services within two to five years. DDP is expected to make training more user-oriented and will enable the addition of more educational sites within a company.

E. RECOMMENDATIONS

- Following IBM's lead, companies should consider adding more end user and management training. Their investment is paying off and will continue to do so.

- Companies should evaluate the CAI systems which are available from mini and microcomputer manufacturers. These systems are growing rapidly in acceptance and will soon be a major industry force.

  - The potential market for CAI will be enormous by 1984. Vendors should plan to be a part of this $4 billion market. Hardware manufacturers are currently best positioned in this market because they have the hardware and, in some cases, the CAI software already in place.

- There is an opportunity for education service firms to offer new courses in such areas as networking, data bases, distributed processing, and on-line applications. Hardware manufacturers and remote computing services companies have an advantage in developing these courses because of the technical skills that both types of companies possess.

- There is a need for training of non-EDP experienced personnel as these people continue to be hired due to the personnel shortage in the industry. Education services vendors such as Advanced Systems, Deltak, Edutronics, Tratec, etc., are positioned to serve this market because of the package courses that these products have created.

- Courses offered must be of high quality because of the high standards set by current course offerings.

  - Course quality is the primary criterion by which users judge outside educational services.

- User requirements for courses include immediate availability, courses that fit into the user's timeframe, and courses that are offered close to the user's location.

- Vendors need to establish contact points at multiple levels in the user's organization to insure that all decision making and decision influencing personnel are covered.

- Educational vendors should try to meet the demand for courses addressing functional specialties, an area that is growing in importance.

- Traditional course subjects including programming, DDP networking, and on-line systems, should continue to be emphasized.

III EDUCATION SERVICE MARKET CHARACTERISTICS

III EDUCATION SERVICE MARKET CHARACTERISTICS

A. HARDWARE MANUFACTURERS

1. IBM

- IBM offers more technical, management, and user courses than any other manufacturer.

- IBM does not charge for most of its 73 industry sector courses, and user courses are low cost or free.

  - This is very significant. IBM is making an investment in the end user for the future. An "obligation" will be created for the end user to "go IBM."

- This strategy is very similar to the discounts given to academic institutions in the 1960s. Students became familiar with IBM and then either went to work for IBM when they graduated or recommended IBM equipment when they were in a position to do so.

- IBM also offers some free management courses for similar reasons.

- The courses offered by IBM are shown in Exhibit III-1. Information on IBM's courses was obtained from available published information. Further details on

EXHIBIT III-1

COURSES OFFERED BY IBM

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING	12	C	8-40	27	$ 0-585	$ 99
	PROCESS MANUFACTURING	5	C	8-40	21	0	0
	TRANSPORTATION	11	C,T	8-40	27	0-515	161
	UTILITIES	3	C	24	24	0	0
	BANKING AND FINANCE	1	C	8	8	0	0
	INSURANCE	8	C	24	24	0	0
	MEDICAL	6	C	24-40	27	0	0
	EDUCATION	3	C	24-40	35	0	0
	RETAIL	9	C	16-40	27	0	0
	WHOLESALE	1	C	40	40	0	0
	STATE AND LOCAL GOVERNMENT	7	C	40	40	0	0
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER	7	C	8-24	19	0-260	84
FUNCTIONAL AREA	ACCOUNTING						
	PERSONNEL	1	C	8	8	0	0
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING	1	C	8	8	0	0
	ENGINEERING	4	C	16-40	32	0-425	106
	ADMINISTRATION						
	OTHER						

* T=TEXT, V=VIDEO, A=AUDIO, ME=MACHINE EDUCATION, C=CLASSROOM

EXHIBIT III-1 (CONTD)

COURSES OFFERED BY IBM

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	9 (8)	ME,C,T	1-20	10	$ 0-2400**	$ 537
FLOWCHARTING	1	ME,T	4	4	1200**	1200
PROGRAMMING FUNDAMENTALS	2	T,A	25	25	3-125	64
ADVANCED PROGRAMMING	27 (24)	ME,T,A,C	5-80	25	0-3840**	527
COBOL	9 (8)	ME,T,V,A,C	4-75	23	0-7835**	1480
FORTRAN	1	T	22	22	18	18
APL	4	T,ME,C	6-40	16	0-600**	181
PL/1	5 (3)	T,ME,C	24-80	61	766-7923**	264
ASSEMBLY LANGUAGE	4	T,ME,A,V,C	5-95	39	13-2876**	928
OPERATING SYSTEM USER INTERFACE	38	T,A,ME,C	4-40	17	0-3150**	326
SYSTEMS PROGRAMMING	58	C,T,V,A,ME	8-80	33	0-2330**	624
SYSTEMS ANALYSIS	19	C,T	1-64	26	0-790	321
MANAGEMENT	22	C,T	3-40	27	0-660	313
PLANNING	5	C,T, ME	10-80	36	365-2580**	1077
INTERPERSONAL RELATIONS						
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS						
MARKETING						
OPERATOR	44 (42)	C,T,ME,A	3-63	19	0-3000	528
DATA BASE	47	C,T,V,A,ME	5-80	25	0-3420	791
COMMUNICATIONS	20	C,T,A	3-40	23	0-1095	354
MAINTENANCE						
TOTAL	394 (385)					

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

individual courses can be obtained directly from the vendor. IBM course offerings cover 12 industry sectors, three functional areas, and 17 computer-oriented technical subjects.

- IBM offers 12 technical courses using computer-assisted instruction.

- The wide variety of course offerings and the status of IBM in the industry places the company in an advantageous position to offer and sell more training courses if the company wishes to do so.

- In terms of the cost of instruction, IBM courses average $19.54 per hour. This compares to $18.11 per hour for DEC, $14.18 per hour for Hewlett-Packard, and $7.50 per hour for Sperry Univac.

2. OTHER HARDWARE VENDORS

- All hardware manufacturers have some training courses, if only for the purpose of training new customers and new personnel on their equipment.

- However, most hardware manufacturers are not making the same investment in the ultimate user as is IBM. Most non-IBM manufacturers have few courses and a fee is usually charged.

- For example, Hewlett-Packard offers only one course in a functional area while IBM offers six. IBM offers 315 courses in computer languages and operations. DEC offers 140 in this area, Hewlett-Packard offers 42, and Sperry Univac offers only 23.

- In addition, very few of the non-IBM manufacturers offer computer-oriented instruction as Exhibit III-2 shows.

EXHIBIT III-2

HARDWARE MANUFACTURERS' COMPUTER ASSISTED INSTRUCTION OFFERINGS AS REPORTED BY RESPONDING COMPANIES

VENDORS OFFERING CAI COURSES	VENDORS NOT OFFERING CAI COURSES
IBM DIGITAL EQUIPMENT CORP** BURROUGHS TEKTRONIX*** HAZELTINE UNIVAC**	HONEYWELL AMDAHL DATA GENERAL TEXAS INSTRUMENTS DATAPOINT APPLE COMPUTER HEWLETT-PACKARD WANG NCR

** VERY LIMITED OFFERING
*** SOFTWARE AVAILABLE FROM INDEPENDENT SOFTWARE COMPANY

- Course offerings of three hardware vendors are shown in Exhibits III-3 through III-5. Information on vendors' courses was obtained from available published literature. Further details on individual courses can be obtained directly from the vendor.

- All hardware manufacturers are well-positioned to sell more training if they choose.

B. REMOTE COMPUTER SERVICES COMPANIES

- Few RCS companies offer training of a generic nature on a for-charge basis.

- Most RCS companies offer bundled (or "free") training for their own products.

- Few RCS vendors offer CAI: CDC offers PLATO; BCS offers SCHOLAR/TEACH 3, a CAI system. Exhibit III-6 illustrates how few of the major RCS vendors offer CAI.

- RCS companies are well-positioned to offer educational services and should consider doing so in view of the sizable market opportunity.

C. NOT-FOR-PROFIT ORGANIZATIONS

1. SCHOOLS, COLLEGES, AND UNIVERSITIES

- Most schools are offering technical and/or management courses in EDP.

- Course prices can be lower than those charged by profit-making institutions because expenses for school facilities and overhead are either minimal or non-existent.

EXHIBIT III-3

COURSES OFFERED BY HEWLETT-PACKARD

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING						
	PROCESS MANUFACTURING						
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE						
	INSURANCE						
	MEDICAL						
	EDUCATION						
	RETAIL						
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING						
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING	1	C	40	40	$500	$ 500
	ENGINEERING						
	ADMINISTRATION						
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-3 (CONTD)

COURSES OFFERED BY HEWLETT-PACKARD

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	3	C	32-40	37	$400-500	$ 467
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS						
ADVANCED PROGRAMMING	8	C	16-80	33	200-500	413
COBOL						
FORTRAN						
APL						
PL/1						
ASSEMBLY LANGUAGE	1	C	40	40	100-500	500
OPERATING SYSTEM USER INTERFACE	14 (12)	C	8-80	43	300-1000	540
SYSTEMS PROGRAMMING	5	C	24-80	45	360-1000	720
SYSTEMS ANALYSIS						
MANAGEMENT	1	C	40	40	500	500
PLANNING						
INTERPERSONAL RELATIONS						
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS						
MARKETING						
COMPUTER OPERATIONS						
DATA BASE						
COMMUNICATIONS						
MAINTENANCE	10	C	24-80	44	1200	744
TOTAL	43 (41)					

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-4

COURSES OFFERED BY DIGITAL EQUIPMENT CORPORATION

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	3 (2)	C,A,V	16-UP	20	$255-2600*	$ 1067
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS	4	C	16-80	40	255-1300	601
ADVANCED PROGRAMMING	22 (15)	C,A,V,T	24-UP	39	30-2275*	513
COBOL	3	C	40	40	550-600	583
FORTRAN	5 (2)	C,T	40-UP	40	125-650	504
APL	1	C	40	40	600	600
PL/1						
ASSEMBLY LANGUAGE	4	C	40-80	60	500-1200	863
OPERATING SYSTEM USER INTERFACE	37 (23)	C,A,V,T	24-UP	41	125-3600*	625
SYSTEMS PROGRAMMING	19	C	16-80	44	300-1300	684
SYSTEMS ANALYSIS	1	C	40	40	550	550
MANAGEMENT						
PLANNING						
INTERPERSONAL RELATIONS						
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS						
MARKETING						
COMPUTER OPERATIONS						
DATA BASE						
COMMUNICATIONS						
MAINTENANCE	41	C,A,V	24-120	60	345-1800	944
TOTAL	140(115)					

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-5

COURSES OFFERED BY SPERRY UNIVAC

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	1	C	80	80	$ 600	$ 600
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS						
ADVANCED PROGRAMMING	5	C	40-80	48	300-600	360
COBOL	1	C	40	40	300	300
FORTRAN						
APL						
PL/1						
ASSEMBLY LANGUAGE						
OPERATING SYSTEM USER INTERFACE						
SYSTEMS PROGRAMMING	4	C	40	40	300	300
SYSTEMS ANALYSIS						
MANAGEMENT						
PLANNING						
INTERPERSONAL RELATIONS						
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS						
MARKETING						
COMPUTER OPERATIONS						
DATA BASE	1	C	40	40	300	300
COMMUNICATIONS						
MAINTENANCE	11	C	40-160	95	300-2000	709
TOTAL	23					

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-6

REMOTE COMPUTER SERVICES COMPANIES' COMPUTER ASSISTED INSTRUCTION OFFERINGS AS REPORTED BY RESPONDING COMPANIES

VENDORS OFFERING CAI COURSES	VENDORS NOT OFFERING CAI COURSES
BOEING COMPUTER SERVICES	SERVICE BUREAU CORP
CONTROL DATA EDUCATION COMPANY	GENERAL ELECTRIC INFORMATION SERVICES
UNITED COMPUTING SYSTEMS*	AUTOMATIC DATA PROCESSING
GRUMMAN DATA SYSTEMS (CALLDATA SYSTEMS)*	COMPUTER SCIENCES CORP
	MCDONNELL DOUGLAS AUTOMATION
	TYMSHARE
	NATIONAL CSS
	COMSHARE
	UCC
	XEROX COMPUTER SERVICES
	COMPUSERVE
	INFORMATICS
	ITEL
	INTERACTIVE DATA CORP
	KEYDATA
	ON-LINE SYSTEMS
	OPTIMUM SYSTEMS
	RAPIDATA
	MELLONICS INFORMATION CENTER
	PRC COMPUTER CENTER
	SUN INFORMATION SERVICES
	ANACOMP
	BRADFORD NATIONAL GROUP
	COMPUTER TASK GROUP
	ELECTRONIC DATA SYSTEMS
	MARTIN MARIETTA DATA SERVICES
	CGA COMPUTER ASSOCIATES
	DATA RESOURCES
	ACTS COMPUTING DIVISION
	THE COMPUTER COMPANY
	BOWNE TIME SHARING
	FIRST DATA CORP
	INSCO SYSTEMS
	INTERACTION SCIENCES
	I.P. SHARP
	LITTON COMPUTER SERVICES
	LOCKHEED INFORMATION SYSTEMS
	MANUFACTURING COMPUTER SYSTEMS
	PROPRIETARY COMPUTER SYSTEMS
	SCIENTIFIC TIME SHARING
	SYSTEM DEVELOPMENT CORP
	WINGATE ASSOCIATES
	AMERICAN MANAGEMENT SYSTEMS

* VERY LIMITED OFFERING

- Courses offered by schools, however, are not always relevant to solving "real world" problems.

- A key means of attracting students to these courses are direct mail solicitations.

- The Northwest Regional Educational Laboratory in Portland, Oregon has developed an author language for CAI that is hardware independent.

  - The author language allows creation and administration of lessons.

  - The system, called PLANIT, is transportable across hardware. It currently runs on IBM, Honeywell, Prime, Harris, and Texas Instruments hardware, as well as several others.

  - The learning curve to use the author language is under two hours.

  - PLANIT was developed under an NSF grant and is available to the public at the nominal fee of $20 to $100.

  - PLANIT has been installed in 200 to 250 installations, mostly universities, but there are not many active users today.

  - The system is currently being tested on several microcomputers (Cromemco, nearing completion; Intel, planned).

2. ASSOCIATIONS

- Several not-for-profit associations offer training in EDP, including:

  - American Management Association.

  - IEEE.

- Institute for Professional Education.

- DPMA.

- American Management Research.

- These associations use industry people as instructors so that their courses are often relevant to solving everyday problems in industry.

- Most of this training is done in the classroom, almost none is done by CAI.

- Direct mail solicitation to attract students is used extensively.

D. EDUCATION SERVICES FIRMS

- The major education services vendors are:

  - Control Data Education Company.

  - Advanced Systems, Inc.

  - Deltak.

  - Boeing Computer Services.

  - Tratec Division - McGraw Hill Book Company.

  - Edutronics Division - McGraw Hill Book Company.

- These vendors offer training courses by the following means:

  - Classroom.

- Programmed instruction.

- Audio-visual with text.

- CAI (CDC and BCS are the only vendors).

- Current vendor course offerings are shown in Exhibits III-7 through III-12. Information on vendors' courses was obtained from available published information. Further details on individual courses can be obtained directly from the vendor.

- Other representative education services firms include:

  - Brandon Systems.

  - Datapro Research.

  - Wane Associates.

  - Yourdon.

  - Institute for Advanced Technology (CDC).

- The vendors listed above primarily offer classroom and/or text only training. These vendors are presently not well positioned to move into CAI or audio/visiual type training. This could change appreciably if these vendors make a substantial investment in computer assisted instruction technology (mainly software).

- When comparing the cost per hour for instruction from those respondents supplying data, it can be seen that both Boeing at $18.65 per hour and Deltak at $9.73 per hour are competitive with the hardware manufacturers.

EXHIBIT III-7

COURSES OFFERED BY ADVANCED SYSTEMS

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING						
	PROCESS MANUFACTURING						
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE						
	INSURANCE						
	MEDICAL						
	EDUCATION	71	T,V	2-120	29		
	RETAIL						
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING						
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING	8	T,V,A	4-60	26		
	ENGINEERING	24	T,V	6-115	42		
	ADMINISTRATION	1	T,V	15	15		
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-7 (CONTD)

COURSES OFFERED BY ADVANCED SYSTEMS

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	2	T,V	4-15	10		
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS	1	T,V,A	13	13		
ADVANCED PROGRAMMING	17	T,V,A	2-87	14		
COBOL	8	T,V,A	3-100	27		
FORTRAN	1	T,V	11	11		
APL	1	T,V	2	2		
PL/1	1	T,V	75	75		
ASSEMBLY LANGUAGE	1	T,V	78	78		
OPERATING SYSTEM USER INTERFACE	11	T,V,A	1-40	13		
SYSTEMS PROGRAMMING	23	T,V,A	1-56	16		
SYSTEMS ANALYSIS	24	T,V,A	1-35	7		
MANAGEMENT	115	T,V,A	1-42	6		
PLANNING						
INTERPERSONAL RELATIONS	6	T,V,A	5-24	13		
TIME MANAGEMENT	1	T,V	8	8		
INTERVIEWING	4	T,V	2-34	10		
SALES SKILLS	3	T,V	10-40	21		
MARKETING						
OPERATIONS	10	T,V,A	9-56	22		
DATA BASE	12	T,V,A	3-40	14		
COMMUNICATIONS	3	T,V	1-17	6		
MAINTENANCE						
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-8

COURSES OFFERED BY BOEING COMPUTER SERVICES

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING						
	PROCESS MANUFACTURING						
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE						
	INSURANCE						
	MEDICAL						
	EDUCATION						
	RETAIL						
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING	6	C	8-40	24	$170-785	$ 448
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING						
	ENGINEERING	1	C	32	32	615	615
	ADMINISTRATION	2	C	8-24	16	110-325	218
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

(*) Available for rent $995/mth

EXHIBIT III-8 (CONTD)

COURSES OFFERED BY BOEING COMPUTER SERVICES

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	2	T,V,C	16	28	$220-6495*	$ 3358
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS	1	C	40	40	540	540
ADVANCED PROGRAMMING	12	C	8-40	21	40-725	388
COBOL	9	C	24-120	46	217-1800	675
FORTRAN	2	C	40-64	52	540-980	760
APL	1	C	40	40	780	780
PL/1	1	C	80	80	1205	1205
ASSEMBLY LANGUAGE	2	C	40	40	645	645
OPERATING SYSTEM USER INTERFACE	16(12)	ME,C	1-80	21	155-1335	451
SYSTEMS PROGRAMMING	4	C	24-80	44	325-1570	761
SYSTEMS ANALYSIS	5	C	16-40	34	220-940	539
MANAGEMENT	5	C	24-40	32	480-760	565
PLANNING						
INTERPERSONAL RELATIONS	1	C	8	8	130	130
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS	1	C	24	24	360	360
MARKETING						
COMPUTER OPERATIONS						
DATA BASE	8	C	8-40	24	110-615	327
COMMUNICATIONS						
MAINTENANCE						
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-9

COURSES OFFERED BY CONTROL DATA EDUCATION COMPANY

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING						
	PROCESS MANUFACTURING						
	TRANSPORTATION						
	UTILITIES	6	ME	.5-20	11		
	BANKING AND FINANCE						
	INSURANCE						
	MEDICAL	58 (52)	ME	.3-UP	1		
	EDUCATION	482 (405)	ME,T,A,V	.1-UP	7		
	RETAIL						
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING	16	ME,T,A,V	.3-20	3		
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING						
	ENGINEERING	34 (30)	ME,T,A,V	.1-UP	37		
	ADMINISTRATION						
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-9 (CONTD)

COURSES OFFERED BY CONTROL DATA EDUCATION COMPANY

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	12 (7)	ME,T,A,V	.3-UP	114		
FLOWCHARTING	1	ME	.2	.2		
PROGRAMMING FUNDAMENTALS						
ADVANCED PROGRAMMING	3 (2)	ME,T,A,V	7-120	64		
COBOL	1	ME,T,A,V	180	180		
FORTRAN	5	ME,T,A,V	.2-60	12		
APL	3	ME	.5-.8	1		
PL/1	15	ME	.2-1.5	1		
ASSEMBLY LANGUAGE	2	ME,T,A,V	20-150	85		
OPERATING SYSTEM USER INTERFACE	37 (24)	ME	.1-UP	1		
SYSTEMS PROGRAMMING	4	ME,T	.5-35	14		
SYSTEMS ANALYSIS	1	ME,T,A,V	48	48		
MANAGEMENT	33	ME,T,A,V	3-150	16		
PLANNING						
INTERPERSONAL RELATIONS	4	ME,T,A,V	.5-11	7		
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS	2	ME,T,V	2-12	7		
MARKETING	4 (3)	ME	.3-UP	1		
COMPUTER OPERATIONS	5 (3)	ME,T,A,V	15-UP	129		
DATA BASE						
COMMUNICATIONS						
MAINTENANCE						
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-10

COURSES OFFERED BY DELTAK

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING	8					
	PROCESS MANUFACTURING	8					
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE	2	T,A,V				
	INSURANCE						
	MEDICAL						
	EDUCATION	469(225)	T,A,V	1-4	1	10-40	15
	RETAIL						
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING	5	T,A,V	7-11	9	70-110	94
	PERSONNEL	1	T,A				
	DISTRIBUTION	1	T,A,V				
	INVENTORY CONTROL						
	MANUFACTURING	1	T,A,V				
	ENGINEERING	386					
	ADMINISTRATION	5	T,A,V	1-2	2	10-20	16
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-10 (CONTD)
COURSES OFFERED BY DELTAK

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	4	T,A,V	2-3	4	20-30	25
FLOWCHARTING	2	T,A,V	2-4	3	20	20
PROGRAMMING FUNDAMENTALS	(13(10)	T,A,V	4-6	5	40-60	50
ADVANCED PROGRAMMING	12	A,V	4-15	8	40-150	78
COBOL	69	A,V	4-9	5	40-90	52
FORTRAN						
STRUCTURED DISCIPLINE	33	T,A,V	3-5	4	30-60	40
PL/1	15	A,V	4-6	5	40-60	47
ASSEMBLY LANGUAGE						
OPERATING SYSTEM USER INTERFACE	81	T,A,V	2-6	4	20-60	37
SYSTEMS PROGRAMMING	26	T,A,V	1-6	4	10-60	41
SYSTEMS ANALYSIS	68	T,A,V	2-4	3	20-40	33
MANAGEMENT	(183) 176	T,A,V	1-5	2	10-50	21
PLANNING	14	V	1	1	10-20	15
INTERPERSONAL RELATIONS	30	T,A,V	1-3	1	10-30	14
TIME MANAGEMENT	12	T,A,V	1-2	2	10-20	15
INTERVIEWING	3	T,A,V	1-3	2	10-20	15
SALES SKILLS	42	T,A,V	1-2	1	10-20	13
MARKETING	7	T,A,V	1-2	2	10-20	20
COMPUTER OPERATIONS						
DATA BASE	100	T,A,V	2-7	3	20-20	30
COMMUNICATIONS	4	T,V	1	1	10	10
OPERATIONS	106	T,A,V	2-4	3	20-40	28
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-11

COURSES OFFERED BY EDUTRONICS DIVISION MCGRAW-HILL BOOK COMPANY

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING						
	PROCESS MANUFACTURING						
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE						
	INSURANCE						
	MEDICAL						
	EDUCATION	586	T, V				
	RETAIL	1	T, V				
	WHOLESALE						
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING	17	T, V				
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING						
	ENGINEERING						
	ADMINISTRATION						
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-11 (CONTD)

COURSES OFFERED BY EDUTRONICS DIVISION MCGRAW-HILL BOOK COMPANY

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING	47	T,F,V				
FLOWCHARTING	3	T,F,V				
PROGRAMMING FUNDAMENTALS	41	T,F,V				
ADVANCED PROGRAMMING	13	T,F,V				
COBOL	9	T,F,V				
FORTRAN	6	T,F,V				
APL	7	T,V				
PL/1						
ASSEMBLY LANGUAGE	9	T,F,V				
OPERATING SYSTEM USER INTERFACE	30	T,F,V				
SYSTEMS PROGRAMMING	87	T,F,V				
SYSTEMS ANALYSIS	41	T,F,V				
MANAGEMENT	116	T,F,V,A				
PLANNING						
INTERPERSONAL RELATIONS	41	T,V				
TIME MANAGEMENT	3	T,F,V				
INTERVIEWING						
SALES SKILLS						
MARKETING						
COMPUTER OPERATIONS	49	T,F,V				
DATA BASE	32	T,F,V				
COMMUNICATIONS	11	T,F,V				
MAINTENANCE						
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-12

COURSES OFFERED BY TRATEC DIVISION MCGRAW-HILL BOOK COMPANY

	TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INDUSTRY	DISCRETE MANUFACTURING	1	T,A,V	8	8		
	PROCESS MANUFACTURING	1	T,A,V	8	8		
	TRANSPORTATION						
	UTILITIES						
	BANKING AND FINANCE	1	T,A,V	8	8		
	INSURANCE	1	T,A,V	8	8		
	MEDICAL						
	EDUCATION						
	RETAIL						
	WHOLESALE	1	T,A,V	8	8		
	STATE AND LOCAL GOVERNMENT						
	FEDERAL GOVERNMENT						
	SERVICES						
	OTHER						
FUNCTIONAL AREA	ACCOUNTING						
	PERSONNEL						
	DISTRIBUTION						
	INVENTORY CONTROL						
	MANUFACTURING						
	ENGINEERING						
	ADMINISTRATION						
	OTHER						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

EXHIBIT III-12 (CONTD)

COURSES OFFERED BY TRATEC DIVISION MCGRAW-HILL BOOK COMPANY

TRAINING SUBJECT	NUMBER OF COURSES	MEDIA*	HOURS/ COURSE RANGE	HOURS/ COURSE AVERAGE	COST/ STUDENT RANGE	COST/ STUDENT AVERAGE
INTRODUCTION TO DATA PROCESSING						
FLOWCHARTING						
PROGRAMMING FUNDAMENTALS						
ADVANCED PROGRAMMING						
COBOL						
FORTRAN						
APL						
PL/1						
ASSEMBLY LANGUAGE						
OPERATING SYSTEM USER INTERFACE						
SYSTEMS PROGRAMMING						
SYSTEMS ANALYSIS						
MANAGEMENT	1	T,A,V	8	8		
PLANNING						
INTERPERSONAL RELATIONS						
TIME MANAGEMENT						
INTERVIEWING						
SALES SKILLS	6	T,A,V				
MARKETING	2	T,A,V				
COMPUTER OPERATIONS						
DATA BASE						
COMMUNICATIONS						
MAINTENANCE						
TOTAL						

* T = TEXT, V = VIDEO, A = AUDIO, ME = MACHINE EDUCATION, C = CLASSROOM

IV MARKET SEGMENTATION SIZE AND GROWTH

IV MARKET SEGMENTATION, SIZE, AND GROWTH

A. MARKET SEGMENTATION AND SIZE

- Education and training are obviously essential services to U.S. industry.

- Technology is the driving force behind the need for training in new developments.

- Personnel turnover and business growth are the driving forces behind the need for continued courses on existing products, methods, and services.

- However, several factors limit all types of training:

  - Cost.

  - Availability and skill of instructors.

  - Adequacy of course material.

  - Travel time and expense involved.

  - Lost work time.

- Training could be improved in quality if the following factors could be adequately controlled:
  - Reproducibility of results.
  - Consistency in quality of course material.
  - Proper coverage of subject matter.
  - Student testing without bias.
- Training quality could be improved by employing computer assisted instruction (CAI) so that:
  - The student can be logically directed through the course.
  - The student can be consistently graded.
  - Remedial training can be recommended and administered if needed.
  - Additional courses or sequences, based on student performance, can be suggested.
- CAI allows training to be tailored to each student based on the student's performance throughout the course.
- All types of training can be accomplished by CAI, not just computer-oriented instruction.
  - CDC's PLATO, for example, has more courses in non-EDP subjects than in EDP.

- CAI's current potential is estimated by vendor respondents and industr experts to be 1% to 5% of all training (regardless of industry). This potential is mainly limited by:

  - User acceptance of this type of training.

  - Course availability on CAI.

- It is now economical for most users to employ CAI. The system can be implemented by:

  - Using an in-house computer, such as a mainframe type (e.g., IBM) or a mini or microcomputer (e.g., Apple Computer), and terminals.

  - Using a computer service (e.g., Boeing Computing Services' SCHOLAR/TEACH 3).

- Economics appear to favor microcomputers for future CAI implementation. Vendors such as Tandy, Apple, and Computer Curriculum have equipment available that can meet the needs of most users.

  - Several hardware manufacturers have dropped mainframe CAI packages because of lack of user interest. Users found the packages to be too expensive to implement and use on a mainframe.

  - Several remote computing services firms have also dropped CAI offerings because of lack of user interest. In this case, the users not only found the CAI packages too expensive but also not sophisticated enough for their needs.

  - Minicomputer and microcomputer offerings, on the other hand, have received much more attention in the last 12 months. Examples of firms offering their systems are:

- Apple Computer.
- Atari.
- Bell & Howell (with Apple).
- Commodore.
- Computer Curriculum Corporation.
- Creative Computing.
- Heath.
- Monroe Calculator.
- Systems & Computer Technology Corporation.
- Tandy Radio Shack.
- Tektronix.
- Texas Instruments.

- CAI is expected to see increasing use in:
  - End users training in systems and procedures; e.g., bank tellers, accounting clerks, mechanics, repairmen.
  - Technical training; e.g., engineers, computer operators, programmers, systems analysts, word processors.
- CAI should easily achieve 15% to 20% acceptance by 1984 and, ultimately, 75% to 80% of all training.

- To show the amount of dollars spent on training in the U.S., INPUT has forecasted the size of the commercial market and the growth rate. A breakdown by industry of the over $12 billion market is shown in Exhibit IV-1.

  - Training in elementary, secondary, and trade schools, as well as in colleges and universities, are not included. However, these figures would obviously add substantially to the total market for training and education services.

  - Training potential has been forecasted by taking the average expenditures on training made by users as a base.

  - As the model for this, we have used the computer industry, and averages in this industry have been used to calculate average expenditures in other industries.

  - Training forecasts have two elements: internal training and external training. Both elements are needed to properly size the market. The external training market is easy to identify and size, yet more is spent on internal training. However, CAI estimates can address both internal and external markets equally.

- CAI currently accounts for 1% to 5% of the total market, or, as shown in Exhibit IV-2, $121 million to $607 million in 1979.

- The market for EDP training is a subset of the entire training market. EDP training is directed at two groups: EDP personnel and end users.

- There are approximately 1,270,000 people in the EDP industry in the U.S.; 450,000 are programmer/analysts of which 300,000 work on on-line systems.

- The market size for external training for data processing personnel is $237 million. Total market size for internal and external training combined is $535 million.

EXHIBIT IV-1

EXPECTED TRAINING EXPENDITURES BY INDUSTRY IN 1979

INDUSTRY SECTOR	NUMBER OF EMPLOYEES	TECHNICAL & MGMT. EDP TRAINING EXPENDITURES PER EDP PERSON		EXPECTED TRAINING EXPENDITURES PER EMPLOYEE		TOTAL EXPECTED TRAINING EXPENDITURES		
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	TOTAL
DISCRETE MANUFACTURING	15.1M	$ 338	$ 219	$ 175	$ 75	$ 2,643M	$ 1,133M	$ 3,776M
PROCESS MANUFACTURING	8.5M	329	279	175	75	1,488	638	2,126
TRANSPORTATION	2.1M	355	216	125	60	263	126	389
UTILITIES	1.8M	226	401	150	50	270	90	360
BANKING AND FINANCE	3.7M	223	309	150	50	555	185	740
INSURANCE	1.1M	431	273	100	30	110	33	143
RETAIL	14.5M	355	280	80	20	1,160	290	1,450
WHOLESALE	2.4M	625	424	70	20	168	48	216
SERVICES AND OTHER	53.3M	196	152	50	5	2,665	267	2,932
TOTAL	102.5M	$ 330	$ 263	N/A	N/A	$ 9.322M	$ 2,810M	$12,132M

N/A = NOT APPLICABLE

EXHIBIT IV-2

CAI MARKET FORECAST

INDUSTRY	1979 TOTAL TRAINING EXPENDITURES ($ MILLION)	1979 CAI MARKET ($ MILLION)
DISCRETE MANUFACTURING	$ 3,776	$ 38-189
PROCESS MANUFACTURING	2,126	21-106
TRANSPORTATION	389	4-19
UTILITIES	360	4-18
BANKING AND FINANCE	740	7 37
INSURANCE	143	1-7
RETAIL	1,450	15-73
WHOLESALE	216	2-11
SERVICES AND OTHER	2,932	29-147
TOTAL	$ 12,132	$ 121-607

- There are approximately 7,400 large computer installations in the U.S. There are five to ten application systems per installation, and there are five to fifty end users per application system.

- There are approximately 43,000 small computer installations in the U.S. Each installation has two to five application systems, and there are two to fifteen end users for each application system.

- As shown in Exhibit IV-3, the market size for external training of EDP users is $405 million. The total market for both internal and external training is $913 million. The total market for all DP training in 1979 is nearly $1.5 billion.

B. MARKET SHARE AND COMPETITION

- As shown in Exhibit IV-4, the education services market is largely divided between hardware manufacturers and major education services vendors such as:

  - Advanced Systems, Inc.
  - Boeing Computer Services Education Group.
  - Control Data Education Company.
  - Deltak.
  - Edutronics Division - McGraw-Hill Book Company.
  - Tratec Division - McGraw-Hill Book Company.

- IBM is the largest vendor of education services.

EXHIBIT IV-3

1979 EDP TRANING MARKET FORECAST

INDUSTRY SECTOR	EDP USER		END USER		TOTAL	
	INTERNAL ($ MILLION)	TOTAL ($ MILLION)	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)
DISCRETE MANUFACTURING	$ 28.4	$ 64.2	$ 126.0	$ 283.9	$ 154.4	$ 348.1
PROCESS MANUFACTURING	34.6	78.1	70.9	159.8	105.5	237.9
TRANSPORTATION	57.6	130.0	13.0	29.2	70.6	159.2
UTILITIES	32.0	72.2	12.2	27.4	44.2	99.6
BANKING AND FINANCE	6.6	15.0	24.7	55.7	31.3	70.7
INSURANCE	24.9	56.2	4.9	11.0	29.8	67.2
RETAIL	14.7	33.2	48.6	109.6	63.3	142.8
WHOLESALE	18.7	42.3	7.3	16.4	26.0	58.7
SERVICES AND OTHER	19.5	43.8	97.4	220.0	116.9	263.8
TOTAL	$ 237.0	$ 535.0	$ 405.0	$ 913.0	$ 642.0	$1,448.0

EXHIBIT IV-4

EDUCATION SERVICES MARKET SHARE BY VENDOR TYPE

HARDWARE MANUFACTURERS	1979 REVENUE ($ MILLION)	MARKET SHARE
IBM	$ 210	33%
ALL OTHERS	140	22
TOTAL HARDWARE MANUFACTURERS	350	55
EDUCATION SERVICES VENDORS*	110	17
REMOTE COMPUTING SERVICES COMPANIES	50	8
SOFTWARE COMPANIES	30	5
FOR-PROFIT TRAINING INSTITUTES	32	5
NOT-FOR-PROFIT TRAINING INSTITUTES	58	9
CONSULTANTS	12	2
TOTAL	$ 642	100%

* ADVANCED SYSTEMS, INC.; BOEING COMPUTER SERVICES EDUCATION GROUP; CONTROL DATA EDUCATION COMPANY; DELTAK; ELECTRONICS DIVISION–McGRAW HILL BOOK COMPANY; TRATEC DIVISION–McGRAW HILL BOOK COMPANY

- Hardware manufacturers have over 50% of the market for education services. They also charge for more courses than do RCS/software companies.

C. MARKET GROWTH

- Exhibits IV-5 and IV-6 show vendor views of factors fueling and limiting the growth of educational services, respectively.

- Technology is the most important factor enhancing the growth of educational services (Exhibit IV-5).

  - From the user perspective, technology impacts software and systems more than hardware.

  - New concepts, such as networking, data bases, distributed processing, and on-line applications have had tremendous impact on software and systems. Therefore, people need training in the mechanics of these concepts and how to apply them to real world environments.

- The second major factor affecting the enhancement of growth is personnel shortages in the industry, which forces companies who use computers to hire people with no experience. Therefore, these people must be trained.

- Concomitant with this factor is the rising cost of personnel, which makes it important to increase employee productivity through training.

- The impact of new hardware is also significant for training services, especially in the systems software area. However, the impact of new hardware is not as great as the impact of other technological changes.

- Vendors rated the availability of user budgets as the major factor in limiting the growth of educational services (Exhibit IV-6). However, this factor is not

EXHIBIT IV-5

FACTORS ENHANCING THE GROWTH OF EDUCATIONAL SERVICES
AS REPORTED BY RESPONDENTS

FACTOR	VENDOR RATING*							
	VENDOR						TOTAL	AVERAGE
	1	2	3	4	5	6		
EMPLOYEE PRODUCTIVITY IMPROVEMENT	3	4	5	5	3	5	25.0	4.2
IMPACT OF TECHNOLOGY	4	5	5	5	5	5	29.0	4.8
DISTRIBUTED DATA PROCESSING	5	2	3	4	5	3	22.0	3.7
INDUSTRY ORIENTATION	4	1	1	3	3	4	16.0	2.7
SHORTAGE OF SKILLED PERSONNEL	4	5	4	4	5	5	27.0	4.5
NEW EDUCATIONAL SERVICES OFFERINGS	2	2	4	5	3.5	5	21.5	3.6
NEW PRODUCTS FROM HARDWARE VENDORS	3	3	5	4	5	4	24.0	4.0
INCORPORATION OF MINICOMPUTERS IN OFFERINGS OF SERVICE VENDORS	2	1	1	1	1	3	9.0	1.5
EXCELLENT PRODUCTS FROM VENDORS	2	4	5	4	4	3	22.0	3.7
EXCELLENT MARKETING BY VENDORS	2	3	4	4	3	3	19.0	3.2

* 1 = NOT IMPORTANT
5 = MOST IMPORTANT

EXHIBIT IV-6

FACTORS LIMITING THE GROWTH OF EDUCATION SERVICES
AS REPORTED BY RESPONDENTS

FACTOR	VENDOR RATING*							
	VENDOR						TOTAL	AVERAGE
	1	2	3	4	5	6		
AVAILABILITY OF USERS BUDGETS (FUNDS)	3	2	1	5	5	5	21	3.5
AVAILABILITY OF GOOD AUTHORS	1	3	3	3	1	2	13	2.2
CREATIVITY OF EDUCATIONAL SERVICES VENDORS	2	4	1	5	1	2	15	2.5
ADEQUATE MARKETING PERSONNEL	2	1	1	5	1	3	13	2.2
LOW COST EDUCATION FROM GOVERNMENT	1	1	3	1	1	2	9	1.5
COMPETITION FROM EQUIPMENT VENDORS	2	1	3	3	1	3	13	2.2
REPLACEMENT BY IN-HOUSE COURSES	4	1	1	3	1	4	14	2.3
REPLACEMENT BY MINI-COMPUTER BASED SYSTEMS	2	1	3	1	1	2	10	1.7
OTHER	–	–	–	–	–	5	5	0.8

* 1 = NO IMPACT
2 = SERIOUS IMPACT

rated significantly high. While the availability of funds for training can be a problem, it is more likely to be an irritant to the vendor when the user gives this as an excuse for not buying.

- The low rating vendors give to the use of minicomputers in training is surprising. Current trends seem to point to the increasing use of minis by end users. This is particularly significant for the deployment of CAI.

- CAI is growing at 61% per year as shown in Exhibit IV-7.

  - In three to five years, the vast majority of this type of training will be for end users, rather than for EDP users.

  - CAI, as a teaching tool, lends itself more to teaching the same material over and over, rather than to the situation where the course material is constantly changing. Thus, CAI currently tends to be used for teaching such courses as programming fundamentals and other slowly changing subjects.

- Market forecasts for training are shown in Exhibits IV-8 through IV-10.

  - These exhibits show amounts spent for external training and for total training (the difference is the amount spent on internal training).

  - Figures are also shown for both the EDP professional and end user.

- Overall, the market for educational services is growing by 20% per year.

  - Educational services firms and hardware manufacturers are in the best position to take advantage of this growth.

  - Hardware manufacturers, in particular, could experience substantial growth if training courses were offered to end user groups or through CAI (which would sell more hardware).

EXHIBIT IV-7

CAI MARKET FORECAST

INDUSTRY SECTOR	1979 MARKET SIZE RANGE ($ MILLION)	1984 MARKET SIZE RANGE ($ MILLION)	1979/1984 AAGR (PERCENT)
DISCRETE MANUFACTURING	$ 38-189	$ 1,058-1,411	61%
PROCESS MANUFACTURING	21-106	599-798	61
TRANSPORTATION	4-19	107-143	60
UTILITIES	4-18	102-136	61
BANKING AND FINANCE	7-37	208-278	62
INSURANCE	1-7	41-54	64
RETAIL	15-73	406-541	61
WHOLESALE	2-11	61-81	59
SERVICES AND OTHER	29-147	825-1,100	61
TOTAL	$ 121-607	$ 3,407-4,542	61%

EXHIBIT IV-8

EDP USER TRAINING MARKET FORECAST

INDUSTRY SECTOR	1979		1984		AAGR 1979-1984 (PERCENT)
	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	
DISCRETE MANUFACTURING	$ 28.4	$ 64.2	$ 76.8	$ 173.5	22%
PROCESS MANUFACTURING	34.6	78.1	101.4	229.0	24
TRANSPORTATION	57.6	130.0	168.9	381.1	24
UTILITIES	32.0	72.2	73.2	165.2	18
BANKING AND FINANCE	6.6	15.0	13.9	31.5	16
INSURANCE	24.9	56.2	57.0	128.6	18
RETAIL	14.7	33.2	38.1	86.1	21
WHOLESALE	18.7	42.3	46.5	105.3	20
SERVICES AND OTHER	19.5	43.8	46.5	104.5	19
TOTAL	$ 237.0	$ 535.0	$ 622.3	$1,404.8	21%

EXHIBIT IV-9

EDP END USER TRAINING MARKET FORECAST

INDUSTRY SECTOR	1979		1984		AAGR 1979-1984 (PERCENT)
	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	
DISCRETE MANUFACTURING	$ 126.0	$ 283.9	$ 300.7	$ 677.5	19%
PROCESS MANUFACTURING	70.9	159.8	183.9	414.5	21
TRANSPORTATION	13.0	29.2	26.1	58.7	15
UTILITIES	12.2	27.4	25.6	57.5	16
BANKING AND FINANCE	24.7	55.7	56.5	127.4	18
INSURANCE	4.9	11.0	10.7	24.1	17
RETAIL	48.6	109.6	148.3	334.5	25
WHOLESALE	7.3	16.4	19.7	44.3	22
SERVICES AND OTHER	97.4	220.0	187.5	423.6	14
TOTAL	$ 405.0	$ 913.0	$ 959.0	$2,162.1	19%

EXHIBIT IV-10

TOTAL EDP TRAINING MARKET FORECAST

INDUSTRY SECTOR	1979		1984		AAGR 1979/1984 (PERCENT)
	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	EXTERNAL ($ MILLION)	TOTAL ($ MILLION)	
DISCRETE MANUFACTURING	$ 154.4	$ 348.1	$ 377.5	$ 851.0	20%
PROCESS MANUFACTURING	105.5	237.9	285.3	643.5	22
TRANSPORTATION	70.6	159.2	195.0	439.8	23
UTILITIES	44.2	99.6	98.8	222.7	17
BANKING AND FINANCE	31.3	70.7	70.4	158.9	18
INSURANCE	29.8	67.2	67.7	152.7	18
RETAIL	63.3	142.8	186.4	420.6	24
WHOLESALE	26.0	58.7	66.2	149.6	21
SERVICES AND OTHER	116.9	263.8	234.0	528.1	15
TOTAL	$ 642.0	$1,448.0	$1,581.3	$3,566.9	20%

- Over 40% of the educational services market is in manufacturing companies.

- Transportation and retail account for about 12% of the market each, while the balance is split among the rest of the industry sectors.

- EDP user training (Exhibit IV-8) is growing slightly faster than end user training (Exhibit IV-9), but end user training represents over 60% of the total market size (Exhibit IV-10).

V BUYING CYCLE

V BUYING CYCLE

A. BUYER CHARACTERISTICS

1. NUMBER OF PEOPLE TRAINED

- Exhibit V-1 shows the number of people who have received training as reported by respondents.

  - An average of 332 people were trained in 1978, and 371 are expected to receive training in 1979, a 12% increase.

  - Projections for training in 1980 averaged 446 persons, a 20% increase over those expected to be trained in 1979.

  - However, the 1979-84 average annual growth rate is 9%, so these figures may have to be adjusted. Either the users did not estimate correctly or they are being very optimistic about turnover and personnel needs.

- Exhibit V-2 shows that the average number of training days per person, as reported by respondents, changed little, or is estimated to change little, from 1978 to 1984.

EXHIBIT V-1

NUMBER OF PEOPLE TRAINED AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPON-DENTS	1978	1979	PERCENT CHANGE 1978-79	1979	PERCENT CHANGE 1978-79	1980	AAGR 1979-1984
DISCRETE MANUFACTURING	6	484	446	(8%)	583	31%	747	11%
PROCESS MANUFACTURING	7	3,277	4,241	29	4,396	4	6,053	7
TRANSPORTATION	4	925	945	2	990	5	1,025	2
UTILITIES	4	1,395	1,490	9	1,865	25	3,105	16
BANKING AND FINANCE	4	343	371	8	383	3	700	14
INSURANCE	4	2,940	3,572	21	4,420	24	5,500	9
RETAIL	5	836	820	2	838	2	872	2
WHOLESALE	2	55	82	49	82	0	154	13
SERVICES	1	2,000	1,800	10	3,000	67	-	N/A
OTHER	2	698	698	0	855	22	-	N/A
TOTAL	39	12,953	14,465	12%	17,412	20%	18,156	9%
OVERALL	N/A	332	371	N/A	446	N/A	504	N/A

N/A = NOT APPLICABLE

EXHIBIT V-2

AVERAGE NUMBER OF TRAINING DAYS PER PERSON
AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPON-DENTS	1978	1979	PERCENT CHANGE 1978-79	1980	PERCENT CHANGE 1978-79	1984	AAGR 1979-1984
DISCRETE MANUFACTURING	6	42	46	10%	35	(24%)	47	<1%
PROCESS MANUFACTURING	6	66	74	12	76	3	86	2
TRANSPORTATION	4	40	40	0	44	10	44	2
UTILITIES	3	20	20	0	31	55	35	12
BANKING AND FINANCE	3	18	18	0	19	6	19	1
INSURANCE	2	8	8	0	9	13	25	26
RETAIL	5	49	59	20	56	5	58	0
WHOLESALE	2	15	15	0	15	0	15	0
SERVICES	1	10	10	0	10	0	10	0
OTHER	1	19	19	0	19	0	19	0
TOTAL	33	287	309	8%	314	2%	358	3%
OVERALL	N/A	9	9	N/A	10	N/A	11	N/A

N/A = NOT APPLICABLE

- This average of nine to eleven days per person per year is comparable to the number of days of ongoing training for sales and sales support people, as shown in INPUT's earlier MAS study dealing with sales training in the services industry.

- Here, days of training ranged from less than five to over twenty with an average of around ten, very close to the number of days reported for all types of training.

- The number of people involved in the management of training is shown in Exhibit V-3.

  - Respondents indicated that the overall number of training managers will increase by over 25% a year between 1978 and 1980.

  - Little additional growth is forecasted in this group between 1980 and 1984. The growth rate is projected to be 2% per year in training management between 1980 and 1984.

2. INTERNAL TRAINING PROGRAMS

- Only two respondents stated they did not have an internal training program.

  - One of these two firms had an informal program of on-the-job training and also used IBM audio cassettes. As this firm spent $6,000 on this type of "informal" training in 1979, it could be inferred that this company did indeed have some kind of internal training.

  - The other company spent $2,000 on external training in 1979 and nothing on internal training. This firm is a paper manufacturer with $80 million in annual sales.

- Exhibit V-4 shows the type of instruction employed in internal education. The widespread use of multi-media and audio-visual formats is noteworthy,

EXHIBIT V-3

NUMBER OF PEOPLE INVOLVED IN MANAGEMENT OF TRAINING AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPON-DENTS	1978	1979	PERCENT CHANGE 1978-79	1980	PERCENT CHANGE 1978-79	1984	AAGR 1979-1984
DISCRETE MANUFACTURING	6	9	11	22%	13	18%	18	10%
PROCESS MANUFACTURING	7	39	40	3	42	5	45	2
TRANSPORTATION	4	12	12	0	15	25	16	6
UTILITIES	3	17	23	35	24	26	30	5
BANKING AND FINANCE	4	13	14	8	15	7	17	4
INSURANCE	4	10	11	10	14	27	20	13
RETAIL	5	16	16	0	16	0	16	0
WHOLESALE	2	2	2	0	2	0	3	8
SERVICES	1	8	55	588	55	0	55	0
OTHER	2	4	4	0	4	0	4	0
TOTAL	38	130	188	45%	205	9%	224	4%
OVERALL	N/A	3	5	N/A	5	N/A	6	N/A

N/A = NOT APPLICABLE

EXHIBIT V-4

TYPES OF INSTRUCTION EMPLOYED
AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	CLASSROOM	AUDIO-VISUAL	TEXT	COMPUTER BASED	OTHER
DISCRETE MANUFACTURING	7	6	4	1	1
PROCESS MANUFACTURING	7	7	5	2	1
TRANSPORTATION	4	4	4	1	1
UTILITIES	4	4	4	1	–
BANKING AND FINANCE	4	4	3	–	2
INSURANCE	4	4	3	2	–
RETAIL	5	4	4	1	2
WHOLESALE	2	1	1	–	–
SERVICES	1	1	1	–	–
OTHER	2	2	2	–	–
TOTAL	40	37	31	8	7

although these techniques are exceeded by formal classroom instruction and closely followed by other types of teaching techniques.

3. EXTERNAL TRAINING PROGRAMS

- All respondents in this study reported they had external training programs. The vendors providing this service are shown in Exhibit V-5. IBM was used the greatest number of times, followed by Deltak and ASI.

  - The overall rating for outside educational services vendors is very favorable: 3.8 (5=excellent; 1=Poor).

  - While the ratings for individual vendors may not be a statistically valid indicator, all vendors were rated at good to excellent.

    . IBM technical training was rated as particularly strong (4.0).

    . Deltak's educational services were also highly rated (4.3).

    . For-profit training institutes such as Brandon Systems and Yourdon, were rated highest overall (4.8).

4. TRAINING PROGRAM EXPENDITURES

- Training program expenditures are expected to increase over the next several years as shown in Exhibit V-6.

  - Average budgeted training program expenditures for 1979 are $270,000, a 16% increase over the $233,000 spent on training in 1978.

  - Average expenditures for 1980 are estimated to be $314,000, a 16% increase over 1979, and in 1984 expenditures for training are expected to be $451,000.

EXHIBIT V-5

RATING OF EXTERNAL EDUCATION SERVICES
AS REPORTED BY RESPONDENTS

VENDOR	NUMBER OF RESPONSES	RATING
IBM TECHNICAL	33	4.0
IBM SEMINARS	20	3.6
OTHER IBM	10	3.4
DELTAK	28	4.3
ASI	18	3.6
EDUTRONICS	8	2.8
HARDWARE MANUFACTURERS	15	3.6
SOFTWARE MANUFACTURERS	11	3.4
TRAINING INSTITUTES (FOR PROFIT)	8	4.8
TRAINING INSTITUTES (NON-PROFIT)	10	3.8
CONSULTANTS	3	4.3
OVERALL RATING	164	3.8

EXHIBIT V-6

TOTAL INTERNAL AND EXTERNAL TRAINING EXPENDITUES
AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPON-DENTS	1978 ($000)	1979 ($000)	PERCENT CHANGE 1978-79	1980 ($000)	PERCENT CHANGE 1978-79	1984 ($000)	AAGR 1979/1984
DISCRETE MANUFACTURING	6	$ 382.5	$ 451.5	18%	$ 582.0	29%	$ 1,125.0	20%
PROCESS MANUFACTURING	6	1,112.8	1,162.0	4	1,208.0	4	1,570.0	6
TRANSPORTATION	4	695.0	716.0	3	749.0	5	1,022.0	7
UTILITIES	3	2,700.0	2,800.0	4	3,400.0	21	5,550.0	15
BANKING AND FINANCE	3	152.0	252.0	66	272.0	8	362.0	8
INSURANCE	2	600.0	692.0	15	690.0	0	680.0	0
RETAIL	1	10.0	12.0	20	15.0	25	20.0	11
WHOLESALE	1	20.0	25.0	25	30.0	20	50.0	15
SERVICES	1	600.0	1,200.0	1	1,600.0	33	2,000.0	11
OTHER	1	250.0	250.0	0	250.0	0	250.0	0
TOTAL	28	$6,522.3	$ 7,560.5	16%	$ 8,796.0	16%	$ 12,629.0	11%
OVERALL	N/A	$ 232.9	$ 270.0	N/A	$ 314.1	N/A	$ 451.0	N/A

N/A = NOT APPLICABLE

- This average annual growth rate of 11% for the years 1979-1984 is probably conservative based on year-to-year changes between 1978 and 1980.

- Exhibit V-7 shows the origin of training budget funds.

  - The majority (87%) of respondents have their own training budget and the authority to make expenditures.

  - Of the 33 respondents who have their own EDP training budget, 30 control the entire budget amount.

5. COMPANY SIZE AND INDUSTRY SECTOR TYPE

- Exhibits V-8 through V-17 show training expenditures for various industry sectors.

  - Exhibit V-8, the summation of all industry sectors, shows that industries spent more money on technical training than on management training ($23,000 vs. $5,000). The average dollar spent per EDP employee was more for technical training ($268) than for management training ($74).

  - Again, looking at all industries, more was spent on outside training ($15,000) than on inside training ($13,000), although not by much.

  - The transportation sector had the highest average total, with a little over $69,000 spent on training.

  - The highest average dollar spent per attendee was in the insurance sector, with $637 spent for management training and $1,570 spent for technical training.

  - The insurance sector also spent the highest average number of dollars per EDP employee in 1978: $1,148.10.

EXHIBIT V-7

ORIGIN OF TRAINING BUDGET FUNDS AS
REPORTED BY RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPONDENTS	NUMBER OF RESPONSES				OTHER TRAINING BUDGET
		CORPORATE WIDE	EDP			
			100%	60-99%	<60%	
DISCRETE MANUFACTURING	6	-	6	-	-	-
PROCESS MANUFACTURING	6	1	5	-	-	-
TRANSPORTATION	4	-	4	-	-	-
UTILITIES	4	-	4	-	-	-
BANKING/FINANCE	4	-	4	-	-	-
INSURANCE	4	-	3	1	-	-
RETAIL	5	-	3	-	-	2
WHOLESALE	2	-	2	-	-	-
SERVICES	1	-	-	-	-	1
OTHER	2	-	2	-	-	-
TOTAL	38	1	33	1	-	3

EXHIBIT V-8

TRAINING EXPENDITURES IN ALL
INDUSTRY SECTORS*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 5.6	41%	$ 76	$ 385
EXTERNAL MANAGEMENT TRAINING	$ 5.0		$ 70	
INTERNAL TECHNICAL TRAINING	$ 19.2	44%	$ 254	$ 1,070
EXTERNAL TECHNICAL TRAINING	$ 13.8		$ 193	
TOTAL	$ 43.6	N/A	$ 593	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-9

TRAINING EXPENDITURES IN THE DISCRETE MANUFACTURING SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 4.9	44%	$ 57.65	$ 268
EXTERNAL MANAGEMENT TRAINING	$ 5.0		$ 58.80	
INTERNAL TECHNICAL TRAINING	$ 23.8	43%	$ 280.00	$ 1,011
EXTERNAL TECHNICAL TRAINING	$ 13.6		$ 160.00	
TOTAL	$ 47.3	N/A	$ 556.45	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-10

TRAINING EXPENDITURES IN THE
PROCESS MANUFACTURING SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 6.0	48%	$ 92.30	$ 342
EXTERNAL MANAGEMENT TRAINING	$ 4.6		$ 70.75	
INTERNAL TECHNICAL TRAINING	$ 15.4	41%	$ 236.90	$ 1,070
EXTERNAL TECHNICAL TRAINING	$ 13.5		$ 207.70	
TOTAL	$ 39.5	N/A	$ 607.65	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-11

TRAINING EXPENDITURES IN THE
TRANSPORTATION SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 10.2	48%	$ 84.30	$ 285
EXTERNAL MANAGEMENT TRAINING	$ 6.3		$ 52.05	
INTERNAL TECHNICAL TRAINING	$ 32.8	50%	$ 271.05	$ 862
EXTERNAL TECHNICAL TRAINING	$ 19.8		$ 163.65	
TOTAL	$ 69.1	N/A	$ 571.05	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-12

TRAINING EXPENDITURES IN THE
UTILITY SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 1.4	53%	$ 18.40	$ 218
EXTERNAL MANAGEMENT TRAINING	$ 7.3		$ 96.05	
INTERNAL TECHNICAL TRAINING	$ 15.8	51%	$ 207.90	$ 1,000
EXTERNAL TECHNICAL TRAINING	$ 23.2		$ 305.25	
TOTAL	$ 47.7	N/A	$ 627.60	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-13

TRAINING EXPENDITURES IN THE
WHOLESALE SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 1.3	40%	$ 37.15	$ 343
EXTERNAL MANAGEMENT TRAINING	$ 3.5		$ 100.00	
INTERNAL TECHNICAL TRAINING	$ 6.5	51%	$ 185.70	$ 767
EXTERNAL TECHNICAL TRAINING	$ 7.3		$ 208.55	
TOTAL	$ 18.6	N/A	$ 531.40	N/A

FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-14

TRAINING EXPENDITURES IN THE
RETAIL SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 8.4	34%	$ 115.05	$ 488
EXTERNAL MANAGEMENT TRAINING	$ 3.8		$ 52.05	
INTERNAL TECHNICAL TRAINING	$ 23.1	45%	$ 316.45	$ 1,188
EXTERNAL TECHNICAL TRAINING	$ 16.1		$ 220.55	
TOTAL	$ 51.4	N/A	$ 704.10	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-15

TRAINING EXPENDITURES IN THE
BANKING AND FINANCE SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 4.3	38%	$ 87.75	$ 437
EXTERNAL MANAGEMENT TRAINING	$ 4.0		$ 81.65	
INTERNAL TECHNICAL TRAINING	$ 13.1	42%	$ 267.35	$ 1,085
EXTERNAL TECHNICAL TRAINING	$ 9.7		$ 197.95	
TOTAL	$ 31.1	N/A	$ 634.70	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-16

TRAINING EXPENDITURES IN THE INSURANCE SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 6.2	36%	$ 119.25	$ 637
EXTERNAL MANAGEMENT TRAINING	$ 5.9		$ 113.50	
INTERNAL TECHNICAL TRAINING	$ 26.3	52%	$ 505.75	$ 1,570
EXTERNAL TECHNICAL TRAINING	$ 16.1		$ 309.60	
TOTAL	$ 54.5	N/A	$ 1,048.10	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

EXHIBIT V-17

TRAINING EXPENDITURES IN THE
SERVICE AND OTHER INDUSTRIES SECTOR*

TYPE OF TRAINING	AVERAGE TOTAL ($ 000)	PERCENT OF STAFF ATTENDING	AVERAGE DOLLAR PER EDP EMPLOYEE	AVERAGE DOLLAR PER ATTENDEE
INTERNAL MANAGEMENT TRAINING	$ 8.1	28%	$ 73.00	$ 439
EXTERNAL MANAGEMENT TRAINING	$ 5.5		$ 49.55	
INTERNAL TECHNICAL TRAINING	$ 13.6	33%	$ 122.50	$ 673
EXTERNAL TECHNICAL TRAINING	$ 11.3		$ 101.80	
TOTAL	$ 38.5	N/A	$ 346.85	N/A

* FROM 1979 EDP USER PANEL
N/A = NOT APPLICABLE

- In looking at the percentage of the EDP staff that attends training courses, the utilities sector had the highest percentage (53%) attending management training courses. The insurance sector had the highest percentage (52%) attending technical training courses.

- Exhibits V-18 through V-27 show the respondent profiles according to individual industry sectors as well as for all sectors combined.

- Exhibit V-18, the combined industry profile, shows the average EDP budgets for respondent firms by company size.

  - Transportation, discrete manufacturing, and process manufacturing all have high EDP budgets: $33.3 million, $15.3 million, and $18.6 million, respectively, in firms with more than $1,000 million in annual sales.

  - The transportation sector had the highest average EDP budget for all three categories of annual sales/revenues: $1.75 million for companies with less than $100 million in revenues; $4.15 million for those in the $101-999 million bracket; and, as already stated, $33.3 million in the highest category. The transportation sector, as noted previously, also spent the highest average amount for EDP training.

  - The EDP budget per total employee, for all industry sectors combined, was $2,244 for firms with less than $100 million in revenues, $1,074 for firms with $101-999 million, and $1,836 for those with over $1,000 million.

  - Industries with high EDP budgets per total employee are insurance ($1,822 for firms in the over $1,000 million category), banking and finance ($1,740 for firms in the over $1,000 million category), and transportation ($938 for firms in the highest category).

EXHIBIT V-18

RESPONDENT PROFILE IN ALL INDUSTRY SECTORS*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	36.6%	52.9%	10.5%	100.0%
AVERAGE ANNUAL SALES	$ 49.1M	$ 328.5	$ 3.8B	$ 595.4M
AVERAGE TOTAL EMPLOYEES	990.0	4,070.0	20,625.0	4,736.0
AVERAGE EDP EMPLOYEES	34.0	67.0	294.0	80.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	3.4	1.6	1.4	1.7
AVERAGE EDP BUDGET (MILLIONS)	$ 1.0M	$ 2.2M	$ 10.5M	$ 2.6M
EDP BUDGET PERCENT OF ANNUAL SALES	2.0%	0.7%	0.3%	0.4%
EDP BUDGET PER EDP EMPLOYEE	$28,892.0	$32,257.0	$35,572.0	$33,052.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 1,002.0	$ 529.0	$ 508.0	$ 555.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-19

RESPONDENT PROFILE IN THE
DISCRETE MANUFACTURING SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	39.0%	55.0%	6.0%	100.0%
AVERAGE ANNUAL SALES	$ 54.0M	$ 324.0M	$ 2.0B	$ 312.0M
AVERAGE TOTAL EMPLOYEES	1,100.0	5,780.0	38,600.0	5,783.0
AVERAGE EDP EMPLOYEES	38.0	95.0	355.0	87.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	3.4	1.6	0.9	1.5
AVERAGE EDP BUDGET (MILLIONS)	$ 1.0M	$ 2.9M	$ 15.3M	$ 2.8M
EDP BUDGET PERCENT OF ANNUAL SALES	1.8%	0.9%	0.8%	0.9%
EDP BUDGET PER EDP EMPLOYEE	$26,315.0	$30,526.0	$43,098.0	$32,184.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 909.0	$ 502.0	$ 396.0	$ 484.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-20

RESPONDENT PROFILE IN THE
PROCESS MANUFACTURING SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	24.0%	65.0%	11.0%	100.0%
AVERAGE ANNUAL SALES	$ 62.0M	$ 356.0M	$ 3.5B	$ 647.0M
AVERAGE TOTAL EMPLOYEES	1,290.0	4,262.0	38,833.0	7,511.0
AVERAGE EDP EMPLOYEES	22.0	57.0	477.0	97.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	1.7	1.3	1.2	1.3
AVERAGE EDP BUDGET (MILLIONS)	$ 0.7M	$ 1.8M	$ 18.6M	$ 3.5M
EDP BUDGET PERCENT OF ANNUAL SALES	1.1%	0.5%	0.5%	0.5%
EDP BUDGET PER EDP EMPLOYEE	$31,818.0	$31,579.0	$38,993.0	$36,082.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 542.0	$ 422.0	$ 479.0	$ 466.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-21

RESPONDENT PROFILE IN THE
TRANSPORTATION SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	29.0%	57.0%	14.0%	100.0%
AVERAGE ANNUAL SALES	$ 91.0M	$ 299.0M	$ 2.8B	$ 438.0M
AVERAGE TOTAL EMPLOYEES	1,630.0	3,990.0	35,500.0	5,829.0
AVERAGE EDP EMPLOYEES	27.0	72.0	840.0	121.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	1.7	1.8	2.4	2.1
AVERAGE EDP BUDGET (MILLIONS)	$ 1.8M	$ 4.2M	$ 33.3M	$ 5.8M
EDP BUDGET PERCENT OF ANNUAL SALES	1.9%	1.4%	1.2%	1.3%
EDP BUDGET PER EDP EMPLOYEE	$64,815.0	$57,638.0	$39,642.0	$47,934.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 1,074.0	$ 1,040.0	$ 938.0	$ 995.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-22

RESPONDENT PROFILE IN THE UTILITY SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	12.0%	71.0%	17.0%	100.0%
AVERAGE ANNUAL SALES	$ 74.0M	$ 328.0M	$ 6.2B	$ 1.3B
AVERAGE TOTAL EMPLOYEES	1,235.0	3,077.0	11,267.0	4,212.0
AVERAGE EDP EMPLOYEES	29.0	67.0	176.0	80.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	2.3	2.2	1.6	1.9
AVERAGE EDP BUDGET (MILLIONS)	$ 1.4M	$ 2.6M	$ 7.1M	$ 3.2M
EDP BUDGET PERCENT OF ANNUAL SALES	1.9%	0.8%	0.1%	0.3%
EDP BUDGET PER EDP EMPLOYEE	$48,176.0	$38,806.0	$40,341.0	$40,000.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 1,133.0	$ 845.0	$ 630.0	$ 760.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-23

RESPONDENT PROFILE IN THE WHOLESALE SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	40.0%	55.0%	5.0%	100.0%
AVERAGE ANNUAL SALES	$ 52.0M	$ 315.0M	$ 1.7B	$ 277.0M
AVERAGE TOTAL EMPLOYEES	435.0	2,502.0	8,750.0	1,988.0
AVERAGE EDP EMPLOYEES	13.0	37.0	200.0	36.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	3.0	1.5	2.3	1.8
AVERAGE EDP BUDGET (MILLIONS)	$ 0.4M	$ 0.9M	$ 6.4M	$ 1.0M
EDP BUDGET PERCENT OF ANNUAL SALES	0.8%	0.3%	0.4%	0.4%
EDP BUDGET PER EDP EMPLOYEE	$30,769.0	$24,324.0	$32,000.0	$27,778.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 919.0	$ 360.0	$ 731.0	$ 503.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-24

RESPONDENT PROFILE IN THE RETAIL SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	15.0%	70.0%	15.0%	100.0%
AVERAGE ANNUAL SALES	$ 100.0M	$ 303.0M	$ 2.6B	$ 613.0M
AVERAGE TOTAL EMPLOYEES	2,400.0	6,178.0	25,750.0	8,547.0
AVERAGE EDP EMPLOYEES	54.0	44.0	224.0	73.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	2.2	0.7	0.9	0.9
AVERAGE EDP BUDGET (MILLIONS)	$ 1.2M	$ 1.5M	$ 8.4M	$ 2.5M
EDP BUDGET PERCENT OF ANNUAL SALES	1.2%	0.5%	0.3%	0.4%
EDP BUDGET PER EDP EMPLOYEE	$22,530.0	$34,090.0	$37,500.0	$34,247.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 500.0	$ 242.0	$ 326.0	$ 293.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-25

RESPONDENT PROFILE IN THE
BANKING AND FINANCE SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	17.0%	55.0%	28.0%	100.0%
AVERAGE ANNUAL SALES	$ 38.0M	$ 359.0M	$ 5.1B	$ 1.6B
AVERAGE TOTAL EMPLOYEES	394.0	707.0	1,666.0	919.0
AVERAGE EDP EMPLOYEES	14.0	33.0	102.0	49.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	3.5	4.6	6.1	5.3
AVERAGE EDP BUDGET (MILLIONS)	$ 0.4M	$ 1.1M	$ 2.9M	$ 1.5M
EDP BUDGET PERCENT OF ANNUAL SALES	1.0%	0.3%	0.1%	0.1%
EDP BUDGET PER EDP EMPLOYEE	$28,571.0	$33,333.0	$28,431.0	$30,612.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 1,015.0	$ 1,556.0	$ 1,740.0	$ 1,632.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-26

RESPONDENT PROFILE IN THE INSURANCE SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	64.0%	32.0%	4.0%	100.0%
AVERAGE ANNUAL SALES	$ 35.0M	$ 195.0M	$ 2.0B	$ 171.0M
AVERAGE TOTAL EMPLOYEES	302.0	1,798.0	4,500.0	958.0
AVERAGE EDP EMPLOYEES	28.0	73.0	259.0	52.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	9.2	4.1	5.7	5.4
AVERAGE EDP BUDGET (MILLIONS)	$ 0.9M	$ 3.0M	$ 8.2M	$ 1.9M
EDP BUDGET PERCENT OF ANNUAL SALES	2.5%	1.5%	0.4%	1.1%
EDP BUDGET PER EDP EMPLOYEE	$32,143.0	$41,096.0	$31,660.0	$36,538.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 2,980.0	$ 1,668.0	$ 1,822.0	$ 1,983.0

* FROM 1979 EDP USER PANEL

EXHIBIT V-27

RESPONDENT PROFILE IN THE
SERVICE AND OTHER INDUSTRIES SECTOR*

PROFILE CHARACTERISTIC	COMPANY SIZE IN TERMS OF ANNUAL SALES/REVENUES			
	$100 MILLION OR LESS	$101 - 999 MILLION	$1 BILLION OR MORE	OVERALL
PERCENT OF RESPONDENTS	75.0%	17.0%	7.0%	100.0%
AVERAGE ANNUAL SALES	$ 34.0M	$ 411.0M	$ 2.2B	$ 283.0M
AVERAGE TOTAL EMPLOYEES	1,389.0	6,395.0	17,167.0	3,538.0
AVERAGE EDP EMPLOYEES	58.0	122.0	440.0	101.0
EDP EMPLOYEES PER 100 TOTAL EMPLOYEES	4.2	1.9	2.5	2.9
AVERAGE EDP BUDGET (MILLIONS)	$ 1.5M	$ 2.2M	$ 5.7M	$ 2.0M
EDP BUDGET PERCENT OF ANNUAL SALES	4.4%	0.5%	0.2%	0.7%
EDP BUDGET PER EDP EMPLOYEE	$25,862.0	$18,032.0	$12,954.0	$19,802.0
EDP BUDGET PER TOTAL EMPLOYEE	$ 1,079.0	$ 344.0	$ 332.0	$ 565.0

* FROM 1979 EDP USER PANEL

- Industries with low EDP budgets per total employee are process manufacturing ($479 for firms in the highest category), retail ($326 for highest category firms), and services ($332 for highest category firms).

B. BUYING PROCESS

1. DECISION MAKING

- Exhibit V-28 shows the level at which the decision to buy educational services is made.

  - The decision to buy education services is a high-level one for almost 60% of the respondents.

    . Nearly 20% of respondents required a top management decision.

    . Nearly 40% of respondents required a DP management decision.

  - Only one-fourth of the respondents delegate the buying decision to a manager of DP education or other education manager.

- Exhibit V-29 shows that the buying process is fairly diffuse.

  - Two recommendations are usually required for a decision.

  - The DP manager makes the prime recommendation in 30% of the cases, although others - programming manager, operations manager, training coordinator, etc., also participate in varying degrees, depending on the company organization.

EXHIBIT V-28

DECISION LEVEL FOR BUYING EDUCATIONAL SERVICES

AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	TOP MANAGEMENT	DP MANAGEMENT	DP MANAGER OF EDUCATION	DEPARTMENT MANAGERS	EDUCATION MANAGERS	TOTAL
DISCRETE MANUFACTURING	1	4	1	1	2	9
PROCESS MANUFACTURING	2	5	1	2	2	12
TRANSPORTATION	2	4	–	3	–	9
UTILITIES	1	2	–	2	–	5
BANKING AND FINANCE	2	2	–	–	1	5
INSURANCE	2	–	2	–	–	4
RETAIL	1	1	1	1	2	6
WHOLESALE	–	2	1	–	–	3
SERVICES	–	–	1	1	–	2
OTHER	–	1	1	–	–	2
TOTAL	11	21	8	10	7	57
PERCENT	19%	37%	14%	18%	12%	100%

EXHIBIT V-29

BUYING PROCESS INVOLVEMENT BY JOB TITLE AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	TOP MANAGE-MENT	DP MANAGE-MENT	MANAGER, PROGRAM-MING	MANAGER, OPERATIONS	DP EDUCATION MANAGER	TRAINING CO-ORDINATOR	DEPARTMENT MANAGER	TOTAL
DISCRETE MANUFACTURING	1	3	–	–	1	2	–	7
PROCESS MANUFACTURING	1	5	3	2	1	2	–	14
TRANSPORTATION	2	2	2	2	1	–	–	9
UTILITIES	2	2	–	–	–	1	–	5
BANKING/FINANCE	1	2	–	1	–	1	–	5
INSURANCE	2	–	1	1	2	–	–	6
RETAIL	1	1	2	2	1	2	–	9
WHOLESALE	–	3	–	1	–	1	–	5
SERVICES	–	–	–	–	1	1	1	3
OTHER	–	1	–	–	1	–	–	2
TOTAL	10	19	8	9	8	10	1	65
PERCENT	15%	30%	12%	14%	12%	15%	2%	100%

2. EXPENDITURE JUSTIFICATION

- As shown in Exhibit V-30, five reasons are advanced for expenditure justification. While all five have some importance, it can be seen that two, improved productivity and adding a new capability, have slightly more significance.

- Exhibit V-31 shows the reasons for buying outside education services.

  - Most training by outside sources is obtained because the technical expertise is not available in-house, and because outside vendors can teach new technical skills.

  - External source training is also used to increase in-house productivity. Using an outside vendor may be the only means of acquiring the skills necessary to obtain increased productivity.

  - The other factors shown in Exhibit V-31 are also important but not to the degree of those already described.

3. DECISION PROCESS IMPROVEMENT

- Many factors are important in stimulating the purchase of additional education services.

  - As shown in Exhibit V-32, higher quality and proven improvement in employee productivity are the most significant factors, closely followed by more extensive course content.

  - Lower cost is an important criterion for purchase but not an overriding one. An additional 10% in sales might be obtained by lowering the cost of the course.

EXHIBIT V-30

JUSTIFICATION OF TRAINING COSTS AS REPORTED BY RESPONDENTS*

INDUSTRY SECTOR	IMPROVED PRODUCTIVITY	IMPROVED MORALE	REDUCED TURNOVER	ADDED CAPABILITY	PROVIDED CAREER PATH
DISCRETE MANUFACTURING	3.7	3.8	3.2	4.4	3.6
PROCESS MANUFACTURING	4.6	3.4	2.1	4.2	3.3
TRANSPORTATION	4.0	3.1	3.6	4.3	4.3
UTILITIES	4.8	2.6	3.3	4.5	3.3
BANKING AND FINANCE	4.0	3.0	4.0	3.8	3.8
INSURANCE	4.5	3.5	3.8	4.3	3.8
RETAIL	4.4	3.6	3.8	4.4	3.2
WHOLESALE	5.0	4.0	4.0	3.5	4.0
SERVICES	3.0	4.5	4.5	4.0	3.0
OTHER	4.5	3.5	4.5	4.0	5.0
AVERAGE	4.3	3.4	3.4	4.2	3.6

* 1 = LEAST IMPORTANT
5 = MOST IMPORTANT

EXHIBIT V-31

REASONS FOR BUYING EXTERNAL EDUCATIONAL SERVICES

FACTOR	NUMBER OF RESPONDENTS	RATING*
DON'T HAVE TECHNICAL EXPERTISE INTERNALLY.	40	4.0
WANT TO IMPROVE EMPLOYEE PRODUCTIVITY.	39	3.4
SUBJECT MATERIAL CHANGES RAPIDLY.	40	3.8
EDUCATION SERVICES ARE INEXPENSIVE	40	2.8
WANT EMPLOYEES TO BE EXPOSED TO INDUSTRY PEERS.	39	2.8
EDUCATION SERVICE VENDOR IS THE ONLY ONE CAPABLE OF PROVIDING THE TRAINING.	39	3.2
THE EDUCATION SERVICE VENDOR PROVIDES MULTI-MEDIA DELIVERY VEHICLES	39	2.8

* 1 = LEAST IMPORTANT
5 = MOST IMPORTANT

EXHIBIT V-32

FACTORS PROMPTING BUYING MORE EXTERNAL EDUCATIONAL SERVICES

FACTOR	NUMBER OF RESPONDENTS	RATING*
LOWER COST.	40	3.6
HIGHER QUALITY.	40	3.9
PROVEN IMPROVEMENT IN EMPLOYEE PRODUCTIVITY.	40	3.9
BETTER SCHEDULING.	39	2.9
CLASSES CLOSER TO YOUR INSTALLATION(S).	39	3.2
WIDER VARIETY OF COURSES.	39	3.5
MORE EXTENSIVE COURSE CONTENT.	39	3.7
OTHER	39	3.7

* 1 = LEAST IMPORTANT
5 = MOST IMPORTANT

- Additional course offerings are desired by respondents and could stimulate purchases by 25% or more.

- Respondents want courses that fit into their timeframes, that are immediately available, and which are offered close to their location. Vendors meeting these requirements would find the demand for their courses increased by 10% to 15%.

- Most significantly, all three of these factors relate to course quality, the main criterion for judging external educational services.

C. COMPARISON OF BUYER AND VENDOR PERSPECTIVES

1. BUYING PROCESS

- The fundamental processes in buying educational services as reported by vendors are shown in Exhibit V-33.

  - As expected, vendors aim their services at large firms, particularly those in the Fortune 500. They also sell to firms that have an established, in-house, large computer capability.

  - The main lesson to be learned from this exhibit, however, is that more contact points need to be established at multiple organization levels in the selling process.

    . Responses show that the decision maker is usually in the top echelon of the organization. However, vendors' contact points are also often at this level in spite of the fact that users have middle management personnel who extend considerable influence and are often the most important persuader in the selection of teaching systems.

EXHIBIT V-33

THE BUYING PROCESS ACCORDING TO EDUCATION SERVICE VENDOR RESPONDENTS

COMPANY	INDUSTRY SECTORS	APPLICATION AREA	SIZE OF COMPANY	HARDWARE TYPE TARGETED	CONTACT POINTS	CLOSE TIME	DECISION MAKER
#1	INFORMATION PROCESSING	CUSTOMER EDUCATION	$100MM +	INFORMATION PROCESSING CAPITAL GOODS	MARKETING PRODUCT MANAGEMENT	90 DAYS	VICE PRESIDENT MARKETING
#2	MANUFACT-URING	EDP, MFG, ENGINEERING, MANAGEMENT DEVELOPMENT	FORTUNE 850	IBM 370 155-3032 135-4341	VICE PRESIDENT MIS	90 DAYS	VICE PRESIDENT
#3	GOV'T TRANSPORT MFG AEROSPACE	-	FORTUNE 500	-	VICE PRESIDENT MFG PERSON	6 MONTHS	VICE PRESIDENT
#4	ALL EXCEPT EDUCATION AND HOME	-	-	IBM 360/40 370/35	DP DIRECTOR MIS DIRECTOR	90-120 DAYS	SYSTEM MANAGER
#5	MANUFACT-URING	-	$100M AND UP	IBM 370 AND UP	VP MIS, VP FINANCE, PLANT MANAGER	90-180 DAYS	VICE PRESIDENT FINANCE
#6	LARGE CORPORATIONS AND GOVERNMENT	DP, FINANCE AND ENGINEERING	FORTUNE 500	LARGE IBM AND CDC	DP MANAGER, TRAINING DIRECTOR	TWO MONTHS	TRAINING DIRECTOR

- Therefore, the educational vendor should not overlook the department manager or similar middle management personnel in his sales approach. INPUT found very few examples of this kind of top-to-bottom selling in the course of this study.

2. COURSE OFFERINGS NEEDED

a. Current Needs

- Exhibit V-34 shows the courses that are currently needed by respondents. Programming instruction is the highest requirement, followed by DDP/networking, systems design, and data base.

- Much lower needs are currently registered for functional specialties, management training, and mini/microcomputers, although the requirements for courses on these subjects are certainly not minimal.

b. Future Needs

- Exhibit V-35 shows the needs of respondents for educational courses two to five years from today.

- Functional specialties, with 16% of total responses, appears to be an area that is growing in importance, and the greater demand reflects this.

- Other areas will remain strong, particularly DDP networking, with 17% of total responses; programming with 13% of total responses; and on-line systems, also with 13% of total responses.

- The areas identified as those with relatively low demand (e.g. management training, operating systems, etc.) underscore the fact that there is no need for new courses in these areas. In other words, a new COBOL course is not needed because there are so many available now. Market participants would be well advised to focus attention on those fields for which little is available to date.

EXHIBIT V-34
CURRENT NEEDS IN COURSES ACCORDING TO RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPONDENTS	DDP/NETWORKING	PROGRAMMING	SYSTEM DESIGN	OPERATING SYSTEMS	ON-LINE SYSTEMS	DATA BASE	FUNCTIONAL SPECIALTIES	MINI/MICRO-COMPUTERS	MANAGEMENT TRAINING	OTHER
DISCRETE MANUFACTURING	7	4	7	6	3	3	2	–	2	–	–
PROCESS MANUFACTURING	7	6	2	4	3	2	4	–	4	–	–
TRANSPORTATION	4	1	1	–	2	1	–	1	–	1	3
UTILITIES	5	–	4	2	2	–	–	–	–	–	–
BANKING AND FINANCE	4	3	1	2	1	1	2	–	1	1	1
INSURANCE	4	1	–	–	–	–	3	–	–	–	–
RETAIL	5	2	4	2	1	2	3	–	1	2	1
WHOLESALE	2	–	1	1	–	1	2	–	–	–	–
SERVICES	1	1	1	1	1	1	1	–	1	–	–
OTHER	2	–	1	–	–	–	1	–	–	1	1
TOTAL	41	18	22	18	13	11	18	1	9	5	6
PERCENT OF TOTAL RESPONSES	15%	18%	15%	11%	9%	15%	1%	7%	4%	5%	–

EXHIBIT V-35
FUTURE NEEDS IN COURSES ACCORDING TO RESPONDENTS

INDUSTRY SECTOR	NUMBER OF RESPONDENTS	DDP/NETWORKING	PROGRAMMING	SYSTEM DESIGN	OPERATING SYSTEMS	ON-LINE SYSTEMS	DATA BASE	FUNCTIONAL SPECIALTIES	MINI/MICRO-COMPUTERS	MANAGEMENT TRAINING	OTHER
DISCRETE MANUFACTURING	7	2	1	1	–	1	–	3	1	–	1
PROCESS MANUFACTURING	7	1	1	–	2	2	1	4	–	–	3
TRANSPORTATION	4	3	–	–	–	–	–	1	–	1	2
UTILITIES	5	1	2	–	–	–	–	1	–	–	1
BANKING AND FINANCE	4	–	–	–	–	1	2	1	–	–	2
INSURANCE	3	1	1	–	–	1	1	1	–	–	–
RETAIL	4	2	2	2	1	3	2	–	1	–	–
WHOLESALE	2	–	1	1	–	–	1	–	–	–	1
SERVICES	1	–	–	–	–	1	–	–	–	–	–
OTHER	2	2	1	–	–	–	–	–	1	–	1
TOTAL	39	12	9	4	3	9	7	11	3	1	11
PERCENT OF TOTAL RESPONSES	17%	13%	6%	4%	13%	10%	16%	4%	1%	16%	–

VI TECHNOLOGICAL IMPACTS

VI TECHNOLOGICAL IMPACTS

A. VIDEO

- Exhibit VI-1 shows respondents' views on the impact of technology on educational services within two years and within two to five years.

- Users see a high probability (18%) of computer driven video electronics within two years, and a very high probability (40%) within two to five years.

- Vendors generally agree that by 1985 there will be a merging of satellite, video, microprocessor, and terminal technologies.

- Vendors also see a much greater use of video disk and multi-media learning centers by 1985-90.

B. MICROPROCESSOR

- Only 8% of users' responses indicate a high change of microprocessor impact within two years, although this increases to 25% of responses when assessing its impact in two to five years.

EXHIBIT VI-1

TECHNOLOGICAL IMPACT ON EDUCATION SERVICES AS REPORTED BY RESPONDENTS

(H=HIGH, M=MEDIUM, L=LOW)

INDUSTRY SECTOR	WITHIN 2 YEARS (NUMBER OF RESPONSES)															WITHIN 2-5 YEARS (NUMBER OF RESPONSES)														
	COMPUTER-DRIVEN VIDEO ELECTRONICS			SATELLITE COMMUNICATIONS			MICROPROCESSOR BASED TEACHING MACHINES			DDP			TERMINAL-BASED TEACHING			COMPUTER-DRIVEN VIDEO ELECTRONICS			SATELLITE COMMUNICATIONS			MICROPROCESSOR BASED TEACHING MACHINES			DDP			TERMINAL-BASED TEACHING		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
DISCRETE MANUFACTURING	1	0	6	0	1	6	0	2	5	2	4	1	1	2	4	2	3	2	1	1	5	2	3	2	4	2	1	2	5	0
PROCESS MANUFACTURING	1	2	4	1	0	6	0	2	5	2	2	3	1	3	3	2	4	1	1	1	5	1	3	3	4	1	2	3	4	0
TRANSPORTATION	1	1	2	0	1	2	1	1	2	1	3	0	0	2	1	1	2	1	0	2	1	2	1	1	3	1	0	1	1	1
UTILITIES	0	3	1	1	0	3	0	1	2	1	2	1	1	2	1	2	2	0	1	1	2	2	1	0	3	1	0	2	2	0
BANKING AND FINANCE	2	0	2	1	0	3	2	0	2	1	1	2	1	1	2	2	1	1	1	0	3	2	1	1	2	0	2	2	1	1
INSURANCE	1	1	2	1	0	3	0	0	4	1	2	1	0	1	3	2	0	2	2	1	1	0	3	1	3	0	1	1	0	3
RETAIL	0	1	4	0	2	3	0	2	3	1	2	2	0	3	2	3	1	1	1	2	2	1	3	1	2	2	1	2	2	1
WHOLESALE	0	1	1	1	0	1	0	1	1	1	1	0	0	0	2	1	0	1	1	1	0	0	2	1	1	1	0	0	0	2
SERVICES	0	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	1	0	1	0	0
OTHER	1	0	1	1	0	1	0	1	1	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	1	1	0	1	0	1
TOTAL	7	9	24	6	5	28	3	10	26	11	19	10	6	14	19	16	14	10	10	9	20	10	19	11	23	10	7	15	15	9
WEIGHTED AVERAGE	1.6			1.4			1.4			2.0			1.6			2.2			1.7			2.0			2.4			2.2		

- Vendors have mixed opinions concerning microprocessors. They see microprocessor-based teaching machines as good for drilling and basic instruction. One vendor sees these machines enhancing training in applications. Others, however, perceive these machines as relatively unsophisticated and see their utility primarily in the home and secondary schools.

- Vendors predict microprocessor-based teaching machines will be in general use within the next five years.

- The respondent vendors had a negative reaction to the use of microcomputer-based education in the short term.

  - This response could be caused because none of the respondent vendors have such a system!

  - This response could also be a conditioned competitive response to offerings from companies that use microprocessors for training today (such as Apple Computer, Tandy, Radio Shack, and Computer Curriculum).

  - All vendor respondents except one indicated that microprocessor-based training would ultimately become widely used in the marketplace.

C. SATELLITE COMMUNICATIONS

- Users see a strong impact from satellite communications on educational services, but not as high as some other forms of technology. Fifteen percent of respondents see a high impact of satellite communications within two years, and 26% see a high impact in two to five years (Exhibit VI-1).

- Vendors see a strong satellite communications impact, although they generally place it beyond 1984.

- Vendors see satellite communications widening the scope of educational services to take in international training, teleconferencing, and larger audiences.

- They also envision new training methodologies, lower costs for training, and enhanced use of video disk and video tape, resulting from this technology.

D. DDP

- Users see a very high impact of DDP on educational services. Within two years, 28% of respondents see a high technological impact of DDP (Exhibit VI-1), and in two to five years, 58% see a high impact.

- Vendors see a high impact for DDP, but differ in their conception of the timeframe. Some vendors state that DDP is or can be implemented now, and others envision its use in up to five years from now.

- Vendors' responses indicate that DDP will make instructional courses more user-oriented and will gain more customers for vendors.

- Other vendors envision DDP adding more educational sites within the company and allowing a greater distribution of educational services. DDP, they feel, will also enhance the need for additional training.

E. TERMINAL-BASED SYSTEMS

- User respondents envision a very high impact of terminal-based teaching on educational services, although generally not within the next two years.

- As shown in Exhibit VI-1, 15% of respondents see a high impact for terminal-based teaching within the next two years, but 38% see a high impact within two to five years.

- Vendor respondents have a wide range of reactions to terminal-based instructional systems, from those who see no future and no impact within 15 years to those who see an immediate implementation and a strong future.

- The majority of vendors, however, see a strong future for terminal-based teaching and an almost immediate use for this technology. Several vendors, for example, envision more end user and operator training provided with PLATO, SCHOLAR/TEACH 3, and IIS.

- In general, vendor respondents see terminal-based teaching as a sophisticated technology that will be utilized by the small businessman and the sophisticated user.

APPENDIX A: INTERVIEW PROFILE AND QUESTIONNAIRES

APPENDIX A: INTERVIEW PROFILE AND QUESTIONNAIRES

- Hardware Manufacturers Interviewed 17
- Remote Computing Services Firms Interviewed 49
- Education Services Vendors Interviewed 9
- Buyers of Education Services Interviewed 41

CATALOG NO. MEDU

TRAINING OPPORTUNITIES

User Interview

Education services is the term used to describe the training provided to employees to enable them to be productive at their jobs. These services are generally provided by each company internally (internal training) and frequently are supplemented by outside company training programs (external training).

1. Please provide the following basic data which will allow us to understand your training activity.

INTERNAL TRAINING	ACTUAL		ESTIMATED	
	1978	1979	1980	1984
Number of people trained				
Average number of training days per person				
Number of people involved in management of training				

2. Will the type of person to be trained change in the 1978-1984 timeframe as distributed data processing is implemented? (explain)

_____

_____

_____

3. How are training costs justified? (Rate 5=Most important, 1=Least important)

	Rating
Improve productivity	_____
Improve morale	_____
Reduce turnover	_____
Add new capability	_____
Provide a career path	_____
Other (specify) _____	_____
_____	_____
_____	_____

4. Do you have an internal training program? Describe (length, faculty, facilities, content, etc.).

5. Do you purchase external education services?

( ) Yes ( ) No

If No, go to question 9.

6a. Describe the outside education services that you use.

6b. Please rate the outside education services that you use. Use a scale of 1 to 5 (5-Excellent, 1=Poor).

EDUCATION SERVICE	RATING
IBM	

7a. Who makes the decision to buy outside education services (specify titles, levels of management)?

7b. Describe how the decision process may vary by type of service bought or by expenditure level. (EDP, sales, management, etc.)

7c. Who is involved in the buying process of outside education services (specify titles, levels of management)?

7d. Describe how the buying process may vary by type of service bought or by expenditure level. (EDP, sales, management, etc.)

7e. Does each individual education expenditure involve this type of decision process or are department managers assigned a budget amount that can be drawn on throughout the year as each manager desires?

8. Please rate the following factors for why you buy outside education services. Use a scale of 1 to 5 (1 = Unimportant, 5 = Most important).

	Rating
Don't have technical expertise internally.	
Want to improve employee productivity.	
Subject material changes rapidly.	
Education services are inexpensive.	
Want employees to be exposed to industry peers.	
Education service vendor is the only one capable of providing the training.	
The education service vendor provides multi-media delivery vehicles.	
Other (describe) _____	
Other (describe) _____	

9. Please rate the following factors of what would prompt you to buy more outside education services. Use a scale of 1 to 5 (1 = Unimportant, 5 = Most important).

	Rating
Lower cost.	
Higher quality.	
Proven improvement in employee productivity.	
Better scheduling.	
Classes closer to your installation(s).	
Wider variety of courses.	
More extensive course content.	
Other (describe) _____	
Other (describe) _____	

10a. How much is spent on education services?

TRAINING	1978	1979	1980 (budget)	1984 (estimate)
Internal				
External				

10b. What budgets do these funds come from?

	% of Total
Corporate wide	
EDP	
Other (define)	

10c. How many man-days of training are obtained annually:

DELIVERY VEHICLE	NUMBER OF MAN-DAYS OF TRAINING OBTAINED	
	INTERNALLY	EXTERNALLY
Classroom training		
Audio and/or audio/visual training		
Text only (programmed instruction)		
Computer based instruction		
Other		

10d. Why do you use the delivery vehicles identified?

10e. Is there a trend to change the use of delivery vehicles? ( ) Yes ( ) No
If yes, explain.

10f. What are the problems and benefits of each delivery vehicle?

Classroom

Audio/Visual

Text only

Computer based instruction

Other

11. Please assess the impact of the following on education services in the next 2 years and in the 2-5 year timeframe (H=high, M-medium, L=low).

IMPACT	WITHIN 2 YEARS			2-5 YEARS			EXPECTED VENDOR(S)	COMMENTS
	H	M	L	H	M	L		
Computer Driven Video Electronics								
Sattelite Communications								
Microprocessor Based Teaching Machines								
Distributed Data Processing								
Terminal Based Teaching Systems								

12a. What are the courses you need most? EDP (programming, intro. to DDP, etc.); Functional specialties (accounting, marketing, etc.); Industry specialties (discrete manufacturing, insurance, etc.). Please be as specific as possible.

12b. What courses will you need in 2-5 years in the above areas (explain).

CATALOG NO. MEDU

TRAINING OPPORTUNITIES

Vendor Interview

Education services is the term used to describe the training provided to employees to enable them to be productive at their jobs. This questionnaire addresses the issue of education services provided by vendors such as yourselves to your clients.

1. Please describe your education services offerings by placing a check in the appropriate box.

COURSE OFFERING	AUDIO TAPES		WORKBOOKS		VIDEO TAPE		COMPUTER ASSISTED	
	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING
INTRODUCTION TO DATA PROCESSING								
FLOWCHARTING								
PROGRAMMING FUNDAMENTALS								
ADVANCED PROGRAMMING								
COBOL								
FORTRAN								
APL								
PL/1								
ASSEMBLY LANGUAGE								
OPERATING SYSTEM USER INTERFACE								
SYSTEMS PROGRAMMING								
SYSTEMS ANALYSIS								
MANAGEMENT								
PLANNING								
INTERPERSONAL RELATIONS								
TIME MANAGEMENT								
INTERVIEWING								
SALES SKILLS								
MARKETING								
OTHER (DESCRIBE)								

1. a. Functional Specialties:

COURSE OFFERING	AUDIO TAPES		WORKBOOKS		VIDEO TAPE		COMPUTER ASSISTED	
	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING
ACCOUNTING								
PERSONNEL								
SALES AND MARKETING								
DISTRIBUTION								
INVENTORY CONTROL								
MANUFACTURING								
ENGINEERING								
ADMINISTRATION								
OTHER (DESCRIBE)								

CATALOG NO. MEDU[ ][ ][ ]

1. b. Industry Specialties:

COURSE OFFERING	AUDIO TAPES		WORKBOOKS		VIDEO TAPE		COMPUTER ASSISTED	
	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING	CURRENTLY OFFERED	PLANNED OFFERING
DISCRETE MANUFACTURING								
PROCESS MANUFACTURING								
TRANSPORTATION								
UTILITIES								
BANKING AND FINANCE								
INSURANCE								
MEDICAL								
EDUCATION								
RETAIL								
WHOLESALE								
STATE AND LOCAL GOVERNMENT								
FEDERAL GOVERNMENT								
SERVICES								
OTHER (DESCRIBE)								

INP

CATALOG NO. MEDU

2. Please rate the need for the following courses (H=high, M=medium, L=low).

COURSE OFFERING	IMMEDIATE NEED			UNDER 2 YEARS			2-5 YEARS		
	H	M	L	H	M	L	H	M	L
INTRODUCTION TO DATA PROCESSING									
FLOWCHARTING									
PROGRAMMING FUNDAMENTALS									
ADVANCED PROGRAMMING									
COBOL									
FORTRAN									
APL									
PL/1									
ASSEMBLY LANGUAGE									
OPERATING SYSTEM USER INTERFACE									
SYSTEMS PROGRAMMING									
SYSTEMS ANALYSIS									
MANAGEMENT									
PLANNING									
INTERPERSONAL RELATIONS									
TIME MANAGEMENT									
INTERVIEWING									
SALES SKILLS									
MARKETING									

2. a. Functional Specialties:

COURSE OFFERING	IMMEDIATE NEED			UNDER 2 YEARS			2-5 YEARS		
	H	M	L	H	M	L	H	M	L
ACCOUNTING									
PERSONNEL									
SALES AND MARKETING									
DISTRIBUTION									
INVENTORY CONTROL									
MANUFACTURING									
ENGINEERING									
ADMINISTRATION									
OTHER (DESCRIBE)									

2. b. Industry Specialties:

COURSE OFFERING	IMMEDIATE NEED			UNDER 2 YEARS			2-5 YEARS		
	H	M	L	H	M	L	H	M	L
DISCRETE MANUFACTURING									
PROCESS MANUFACTURING									
TRANSPORTATION									
UTILITIES									
BANKING AND FINANCE									
INSURANCE									
MEDICAL									
EDUCATION									
RETAIL									
WHOLESALE									
STATE AND LOCAL GOVERNMENT									
FEDERAL GOVERNMENT									
SERVICES									
OTHER (DESCRIBE)									

3. What impact will satellite communications have on training?

Within what time frame? _____

4. What impact will microprocessor based reading machines have on training?

Within what time frame? _____

5. What impact will computer assisted instruction (CAI) have on training?

Within what time frame? _____

6. What impact will DDP have on training? _____

_____

_____

_____

_____

_____

Within what time frame? _____

_____

7. If you are an education services vendor, do you work with computer services vendors to develop course offerings?

( ) Yes* ( ) No

Would you consider it?

( ) Yes ( ) No

Why? _____

_____

*Describe _____

_____

_____

8. If you are a computer services vendor, do you work with education vendors to develop course offerings?

( ) Yes* ( ) No

Would you consider it?

( ) Yes ( ) No

Why? _____

_____

*Describe _____

_____

_____

CATALOG NO. MEDU[ ][ ][ ]

TRAINING OPPORTUNITIES

Vendor Interview

Education Services is a term used to describe the training provided to employees to enable them to be productive at their jobs. This questionnaire addresses the issues of education services provided by vendors such as yourselves to your clients.

1. Please rate the relative importance of the following factors which are feeding the growth of education services. Please use a 1 to 5 scale where 1 = not important and 5 = most important.

FACTOR	RATING	COMMENTS
Employee Productivity Improvement		
Impact of Technology		
Distributed Data Processing		
Industry Orientation		
Shortage of Skilled Personnel		
New Educational Services Offerings		
New Products From Hardware Vendors		
Incorporation of Minicomputers in Offerings from Services Vendors		
Excellent products from Vendors		
Excellent Marketing by Vendors		
Other		

2. Please break down your revenues by category (will be held confidential - Only survey totals will be presented in the report).

TYPE OF COURSE	REVENUES		% REVENUE GROWTH	
	1978	1979 (est)	1979-80	1980-84
EDP Management				
EDP Technical				
Marketing				
Management				
Industry Oriented				
Technology				
Functionally Oriented				

3. Please rate the following factors as to their impact in limiting the growth of education services. Please use a 1 to 5 scale where 1 = no impact and 5 = serious impact.

	Rating
Availability of user budgets (funds)	_____
Availability of good authors	_____
Creativity of education services vendors	_____
Adequate marketing personnel	_____
Low cost education from government	_____
Competition from equipment vendors	_____
Replacement by in-house courses	_____
Replacement by minicomputer based systems	_____
Other (specify) _____	_____

4. How do your expenditures break out among the following categories:

CATEGORY	% OF TOTAL EXPENDITURES		
	1978	1979 (est)	1980 (est)
Marketing/Sales			
Product Development			
Operations			
Other			
	100%	100%	100%

5. What are your main target areas for product development with regard to:

a. New courses _____

_____

b. Incorporation with hardware _____

_____

c. Communications based education systems _____

_____

6. a. What user industry sectors are your main targets?

_____

b. What application areas?

_____

7. a. What size company do you target? _____

b. What type of hardware do you target? _____

_____

8. a. Who is (are) the buying points you contact?

b. What is the average time from initial contact to sales close?

c. Who is most often the key decision maker?

9. a. Do you compete with IBM directly or do you avoid direct competition. Explain.

b. What do you perceive IBM's education strategy to be?

c. Will future IBM announcements help or hinder your growth?

10. What impact will satellite communications have on training?

Within what time frame? _____

11. What impact will microprocessor based teaching machines have on training?

Within what time frame? _____

12. What impact will terminal based systems such as Boeing's Scholar/Teach 3 or CDC's Plato have on training?

Within what time frame? _____

13. By 1985 will satellite, video, microprocessor and terminal technologies merge?

What do you envision as the offerings in 1985-1990?

14. What impact will DDP have on training? _____

_____

_____

_____

_____

_____

Within what time frame? _____

_____

NOTE to interviewer: Use 15 or 16, as appropriate.

15. As an education services vendor, do you work with computer services vendors to develop course offerings?

( ) Yes* ( ) No

Would you consider it?

( ) Yes ( ) No

Why? _____

_____

*Describe _____

_____

_____

16. As a computer services vendor, do you work with education vendors to develop course offerings?

( ) Yes* ( ) No

Would you consider it?

( ) Yes ( ) No

Why? _____

_____

*Describe _____

_____

_____

17a. Describe your training delivery vehicles.

DELIVERY VEHICLE	INFORMATION PRESENTATION	WORKSHOP ORIENTATION
Classroom training		
Audio and audio/visual		
Text only (programmed instruction)		
Computer Based Instruction		
Other		

17b. Why are these vehicles used? _____

_____

_____

_____

18a. How many customers do you have? _____

18b. How many locations or installations does this represent? _____

18c. What type of customer accounts for the bulk of sales (e.g., manufacturing companies, utilities, government agencies, schools, individuals)?

_____

_____

_____

_____

19a. What is the gross market potential for education services?

_____

19b. What percent of this total is computer based instruction? _____

APPENDIX B: RELATED INPUT REPORTS

APPENDIX B: RELATED INPUT REPORTS

Title	Publication Date	Price
Impact of Marketing Compensation Plans in the Computer Services Industry. Impact Report #7.	December 1977	$2,500
Sales and Sales Support Training. Impact Report #13.	June 1979	$2,000
Computer Services Industry 1978 Annual Report.	November 1978	$4,000

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