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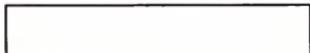
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AUTHOR: 414 JOANNE PONNITZ

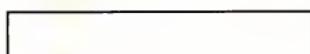
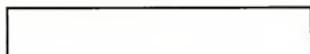
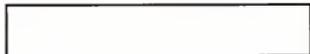
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**U.S. Information  
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Cross-Industry  
Markets  
1987-1992**

Education and  
Training Sector



**INPUT<sup>®</sup>**



DECEMBER 1987

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CROSS-INDUSTRY MARKETS,  
1987-1992

EDUCATION AND TRAINING  
SECTOR



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(MAPS)**

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Education and Training Sector***

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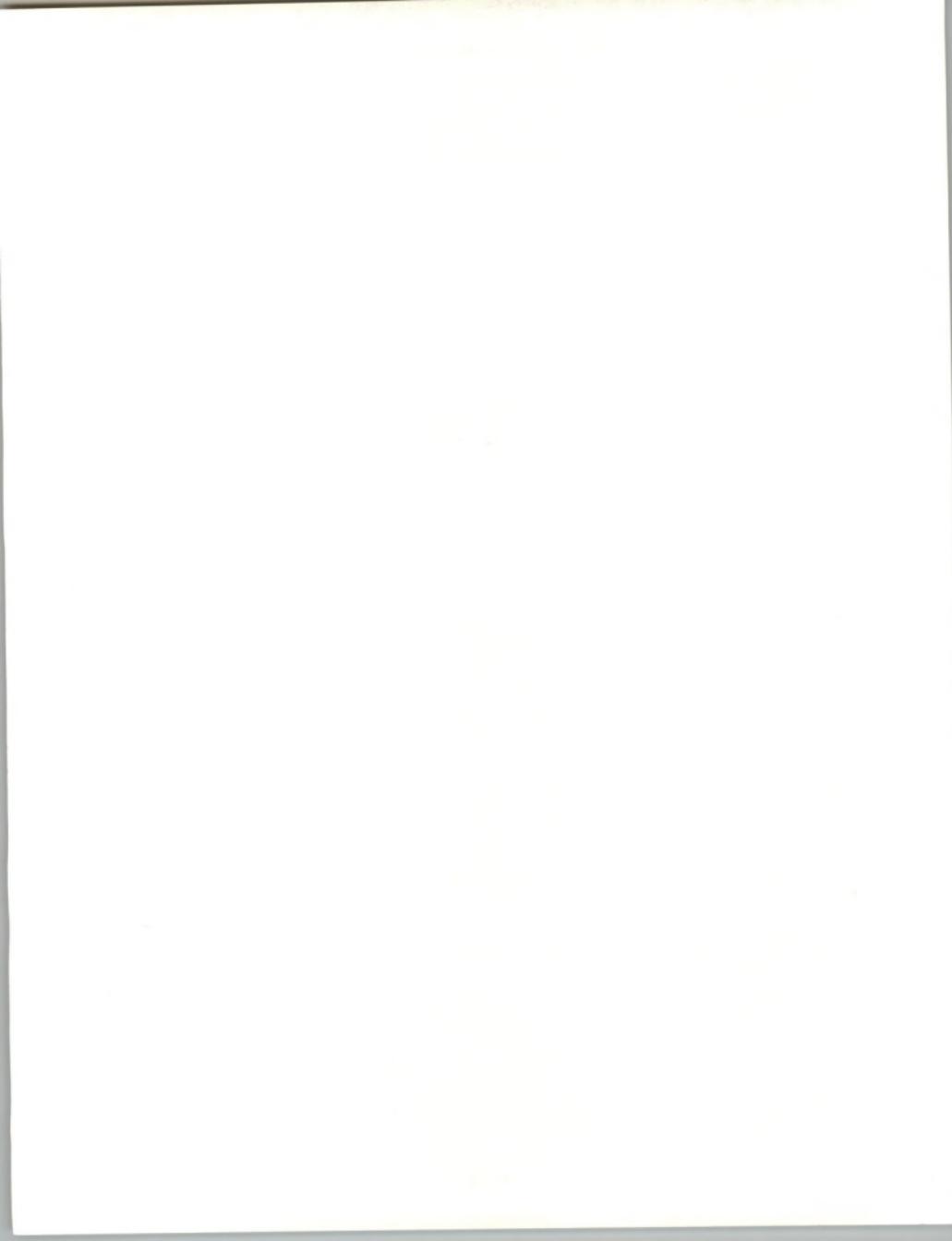
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## I

## Issues and Trends

## A

## Introduction

INPUT analyzes education and training both as a vertical industry and as a cross-industry professional service.

As shown in Exhibit I-1, the cross-industry education and training services that IS vendors sell can be added together for all markets but education.

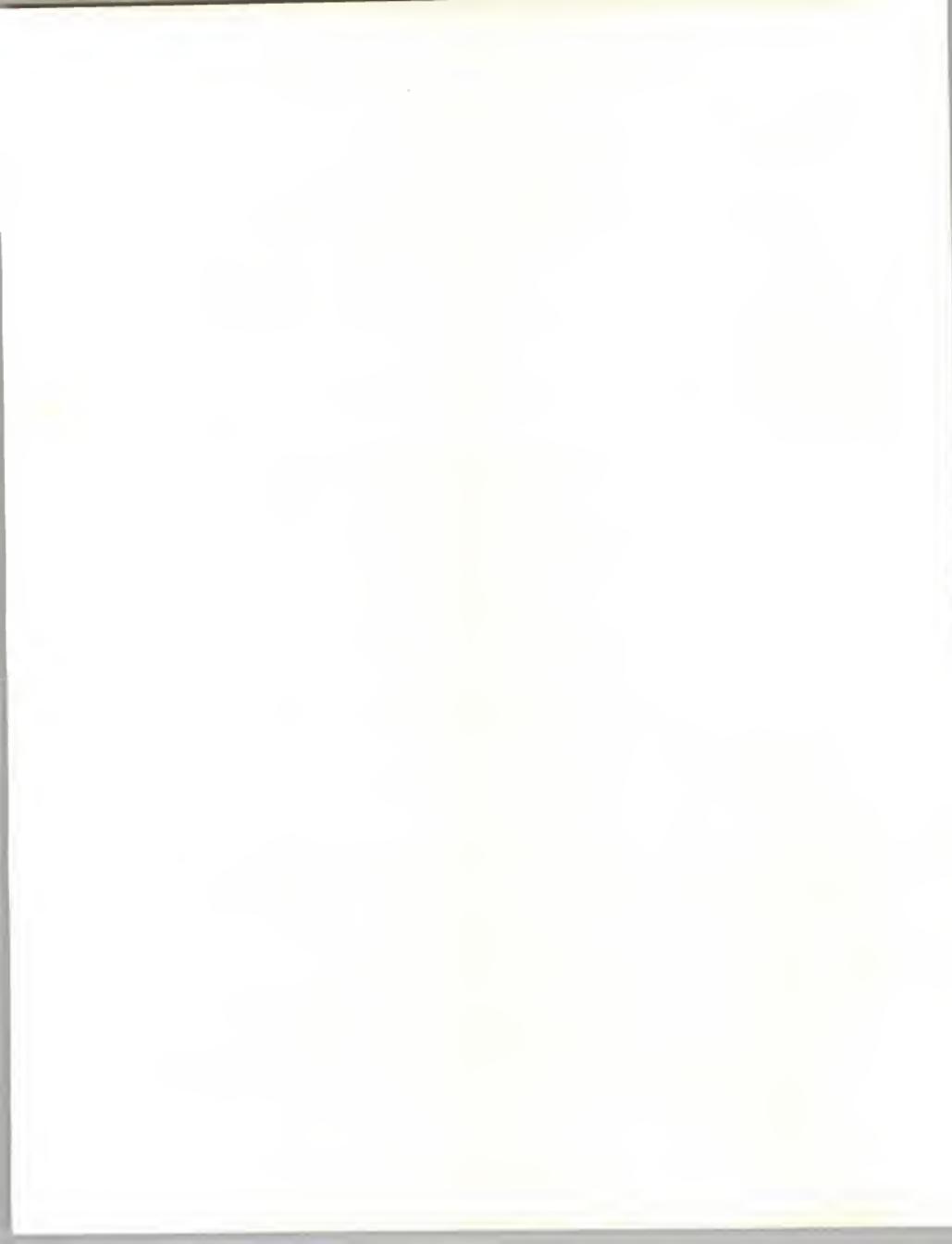
When education and training products such as a training course available on remote processing or on a diskette to load into a PC are sold by an IS vendor to the education market for use in schools, they are considered by INPUT to be part of the vertical market of education.

As later exhibits illustrate, the market for IS cross-industry education and training will include:

- Processing.
- Applications software for micro, mini, or mainframe computers.
- Turnkey systems.
- Professional services.

For the purposes of this report, "education and training professional services" refers only to training on computers and computing and management courses for IS professionals. Other modes – such as software and processing services – include training relating to other subjects in addition to computers and computing.

Education that occurs in educational institutions (i.e., schools) is forecast in the Education Industry-Specific segment, found in the report *U.S. Information Services Industry-Specific Markets, 1987-1992*. This report covers only the cross-industry segment of education and training market.



## EXHIBIT I-1

**I.S. CROSS-INDUSTRY EDUCATION AND TRAINING**

CROSS-INDUSTRY APPLICATION	SELECTED VERTICAL MARKETS			
	Banking/ Finance	Insurance	Manufacturing	Education
General Accounting	X	X	X	X
Human Resources	X	X	X	X
Education and Training	X	X	X	-

"X" shows the usage that is part of a cross-industry total.

IS education and training can be examined in terms of the following services:

- Classroom or live instruction,
- Multimedia and interactive video (IVT),
- Computer-based training (CBT), which includes computer-assisted instruction (CAI) and computer-managed instruction (CMI).
- Self study

Both white and blue collar workers will be exposed to several types of training from IS vendors. One type of training will concern using computers for specific job functions. The second type of training will involve the use of computers to train workers in procedures, techniques, and new systems.

- Training programs on the operation of complex financial and manufacturing systems are now being provided on computers.



## C

## Self Study

Self study comprises approximately 15% of the education and training market. Of this, about one-third is captive study on product-specific programs and two-thirds is generic instruction.

Self study constitutes one of the necessary adjuncts to training for busy executives and technical people.

A number of new techniques for self study have emerged including cassettes for the busy executive to play on a car audio system and material developed for presentation on VCRs and home computers.

## D

## Multimedia and Interactive Video (IVI)

This area has expanded during the last five years. Basically, it uses video instruction and adds an interactive phase to it. Respondents are questioned on information and a tailored response to their answers is given on video and possibly audio.

- Many of the basic ideas that are being used in IVI have been taken from experiments in childhood education: Sounds that keep a student attentive or a response that might embarrass students who have not been paying attention keep the session moving and the student attentive.
- Interactive education with pictures and sound has been found to be a highly successful means of imparting knowledge.

This form of training has been used successfully in the areas of sales and management as well as technical training.

## E

## Computer-Based Training (CBT)

The use of CBT in education and training is expanding. INPUT's definition of this segment includes:

- In the education and training segment, all methods for training users how to use computer systems, as well as using computers (CBT) to train workers in any subject, including non-computer topics.
- Computer-based training referring to any training activity in which computers are used to either a) present material that is to be learned, b) provide practice activities or tests on material presented through other media, or c) manage the administration of courses using computers.
- For the purposes of our forecasts, CBT includes CAI (computer-assisted instruction) and CMI (computer-managed instruction).

This is a large growth area for vendors who use computers to deliver or aid in the delivery of instruction for technical and semi-technical skills.



Retention of course material has been shown to be high when students actively take part in the instruction as is done in the interactive video area.

In the early 1980s, CBT courses had a very sparse existence on mainframes, minicomputers, or microcomputers. This has been changing over the last few years as major suppliers, software companies, and computer systems manufacturers are all getting on the CBT bandwagon and offering courses to end users.

CBT is being used to teach the following areas:

- Information systems skills.
- Technical skills.
- Software applications.
- Management capabilities, such as:
  - Project management.
  - Resource allocation.
  - Personnel dynamics.
  - Human resources.

The future uses of CBT cover a wide range of topics, and CBT will experience increases in the areas of :

- Training end users in systems and procedures, e.g., tellers, clerical workers, mechanics, and repair people.
- Users requiring technical training.

CBT systems can be used to present text, graphics, practice activities, simulations, and questions and to provide feedback.

The advantages of CBT include:

- Reduced costs of providing instruction.
- Increased flexibility in presenting instructional material.
- Convenience.
- Uniformity.

CBT courses are normally distributed to users by terminals connected to a mainframe (or minicomputer) at a vendor's location or from an in-house site or by standalone microcomputers.

Microcomputer applications software has been a fast growth area in this sector. Factors stimulating the market include the declining cost of both computer systems and software, the availability of microcomputers in large numbers, and the tremendous need for hands-on computer training.



Due to the increased availability of presentation systems, ASI, a leading education training vendor, anticipates delivering courses via telecommunications in the near future. They expect to download courses from their mainframe to customers' microcomputers. Micro-to-mainframe links should significantly improve courseware offerings due to the increased power provided by a mainframe.

Although growth will be strong in this delivery mode, there is real concern that dedicated systems may duplicate other multipurpose computer systems, especially microcomputers, that are coming into place. There will be some resistance to multiple-machine approaches.

Some companies are trying a combination of CBT and video tapes to train their non-technical staff or end users. Education and training may also be delivered on PCs that users have on premises. A growing number of firms are now offering CBT authoring packages to allow users to author their own custom CBT training courses for applications.

- The Phoenix system from Goal systems is one of the most popular of these authoring systems.
- Some firms develop their own materials based on previous training experiences or the knowledge of specialists who have been hired for that purpose.





## II

# Market Size and Growth

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## II

## Market Size and Growth

INPUT estimates that by 1992 practically all workers will be influenced by a computer as part of their jobs. Over 50% of workers currently use a computer or computer output to perform their jobs.

- White collar workers are now using personal computers or terminals when they travel or at home in conjunction with their jobs as well as in their offices.
- Blue collar workers also have increasing access to computers, largely in the form of terminals tied into networks, such as on automated factory floors.

The initial goal of end-user training was to develop computer literacy: a basic awareness of computers, skill in operation of computer systems and software, and an ability to adapt new technology to business needs on an ongoing basis. End users today are increasingly interested in more advanced training.

Information systems education and training will be showing significant growth during the next five years to support this increased use of automation.

- Until recently, the emphasis has been on training or educating technical IS professionals in new skills. The emphasis has started to shift toward the training and education of end users, secretaries, managers, and executives in IS skills.

Training of IS professionals in management skills and techniques will also expand to support the growth of automation throughout the user organization.

The training market's growth is largely due to the increased number of new users who need to be trained on computers. However, after users



master the machines, they can use the computers for all-purpose educational courses for everything from management training to stress management.

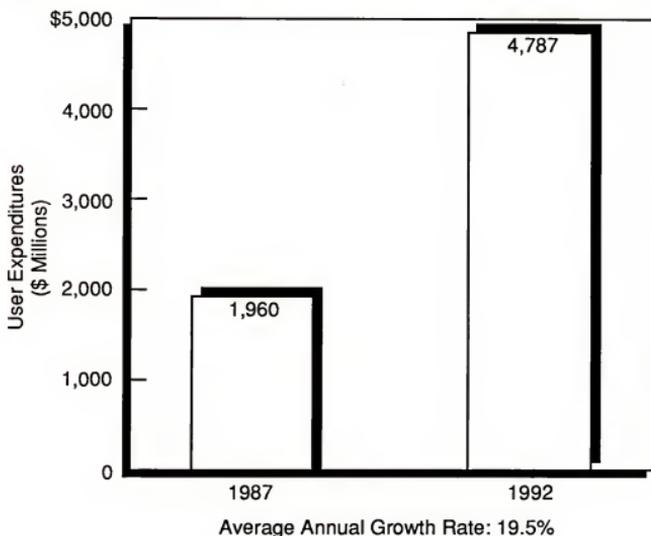
INPUT estimates that user expenditures in the U.S. in 1992 will be 4.7 billion dollars for education and training contracted with outside vendors.

A considerably larger expenditure for training done by the in-house staff is not included in this forecast. Only the services or applications purchased from outside vendors are counted. Some of these services will be purchased for use by internal training people to develop or present courses.

Market size and growth rates are shown in Exhibits II-1 and II-2.

EXHIBIT II-1

### EDUCATION AND TRAINING SECTOR MARKET FORECAST CROSS-INDUSTRY INFORMATION SERVICES, 1987-1992\*



\*Includes Professional Services

Rick,

Pls. copy today  
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Thanks.

Celia

- Microcomputer software will experience the fastest growth, rising at a 23% average annual growth rate (AAGR).
- Mainframe software, traditionally the largest computer-based training delivery mode, has now been surpassed by the microcomputer CBT market.
- Professional services for education and training, which include consulting, live instruction, and participative video instruction, is by far the largest delivery mode, totaling \$1.6 billion in 1987 and increasing to \$4.1 billion by 1992, reflecting a 21% annual growth rate.

The relation of educational and training products to the mainline role of IS vendors is illustrated in Exhibit II-3.

- Major computer systems firms including IBM, DEC, Unisys, Control Data, and Honeywell are very active in the education market.

Appendix ET contains data for market sizes by delivery mode for each year 1986-1992.

- Professional service, including "Big 8" firms, are more numerous and contribute the greatest amount of market revenue.



EXHIBIT II-3

### RELATION OF EDUCATION/TRAINING TO ROLE OF I.S. VENDORS

TYPES OF EDUCATION AND TRAINING PRODUCTS	ROLE OF I.S. VENDORS
Live classroom instruction	Firms with professional services business market this service
Self study, including computer books, manuals, audio cassettes, and visual (e.g., slides) and audiovisual (e.g., VCR)	Professional services, systems manufacturers, and software firms may sell these products for IS and end-user training
Interactive video and computer-based training (CBT), including computer-assisted instruction (CAI)	Professional services vendors market and present these courses; software, computer systems manufacturers, and turnkey vendors as well as professional services may sell this courseware for internal usage
Authoring systems	Developed and sold by professional services, software, and turnkey vendors









## Competitive Considerations







## Competitive Considerations

### A

#### Introduction

Due to rapid changes in technology, many companies have been emphasizing technical training. Many managers view management training as "an extra that's nice to have."

The thesis in the large companies who have been promoting technical training is that the correct use of technology will promote productivity.

- Efforts have been taken to improve the productivity of technical people by teaching them how to use technical facilities like a DBMS more effectively or to manage the performance on tasks in a project with more understanding.
- A view of internally and externally given lecture courses has addressed all aspects of IS performance.

It is now recognized that managers who have come up the ranks from the technical side need education to change their means of motivation. Technical people, for example, may have forgotten their motivation from writing a piece of code and getting it to work. These managers must now learn to become motivated by having their staff do a successful job on the technical "nuts and bolts" of projects.

Recently, it has also become evident that IS managers need more knowledge of functions within their companies such as manufacturing, accounting, and marketing as well as skills in managing and working with people.

- Courses are now being introduced on business subjects that can be tailored to the specific needs of a corporation.
- Courses are also being developed, to a large extent by new small firms, that address interpersonal skills and managing IS personnel.



Many of the new management oriented courses were introduced in university curricula for business management and then packaged by educational firms for delivery to the market.

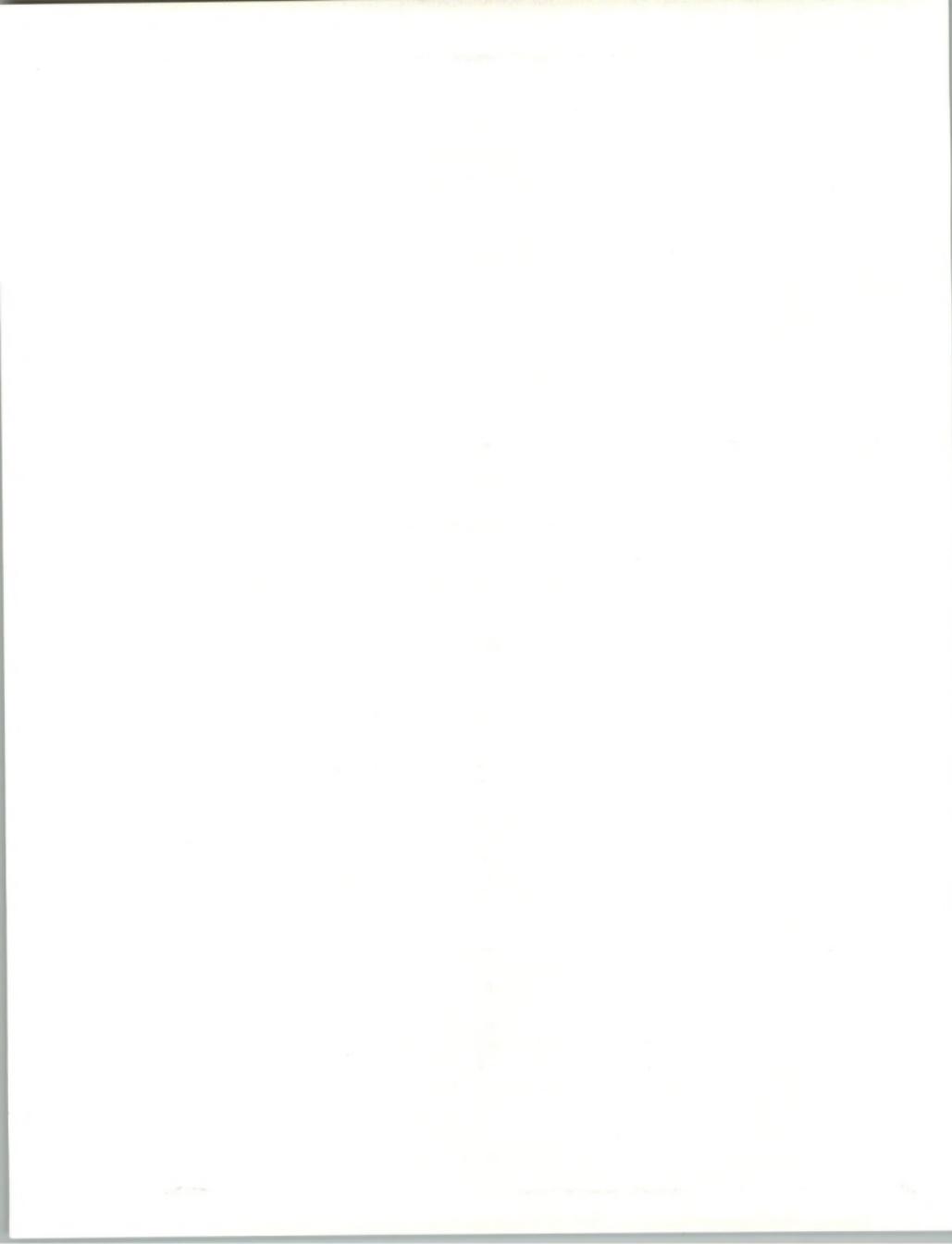
The director of education and training found it much easier in the past to address a limited range of technical courses. Today, there is a vast array of technical courses that can be delivered in many ways as well as a number of offerings that deal with management training.

The suppliers of training for IS personnel and end users vary in their use of IS, the products that they deliver, and quality. The major sources of training are computer systems and software manufacturers, training (professional) services firms, training package vendors, and in-house resources. Each of these sources has value.

- Computer systems and software vendors have a variety of courses that provide training in their products.
- The (professional services) training vendor has concentrated upon how to train.
- The in-house resources know the company and the IS department and end-user needs and applications.

The education and training marketplace has become quite complex, however, since many vendors are entering or expanding their product offerings.

- Computer systems vendors including IBM and DEC obtain substantial revenues from education and training, and other computer systems vendors have become aware of the opportunity and are attempting to increase earnings in this marketplace.
- Some computer systems and software vendors have increased their education/training offerings to address not only computer systems and software products but also general technical or management subjects such as communications, project management, human resources, and other management skills.
- Specialized IS training firms such as ASI and Deltak are also expanding their training offerings. ASI, for example, now provides training in the use of human resource systems. Many professional service vendors offer education and training services to support the installation of systems that they develop. Some are extending their training to address technical needs, particularly of end users. Both Advanced Systems and Deltak have expanded their product lines by contracting to market and distribute training courses designed by other manufacturers. Advanced



Systems has an agreement with American Training International; Deltak has linked with Cdex Corp.

A number of new vendors are entering this marketplace. MTEch, which offers processing services to the banking industry, markets CBT systems in banking application areas as well as in courseware design.

The growing complexity of the marketplace has been matched by corresponding development in the use of the in-house staff to select or develop products to meet internal training needs.

A listing of the leading vendors for authoring systems and courseware offerings is shown in Exhibits III-1 and III-2.

EXHIBIT III-1

<b>REPRESENTATIVE VENDORS OF AUTHORING SYSTEMS</b>	
AUTHORING SYSTEM	VENDOR
<u>Microcomputer-based</u>	
Authority	Interactive Training Systems
Maestro	Amtech
Teachers Aide	Selection Systems Inc.
Professional Authoring Software	Bell and Howell
Video Courseware Development	Bell and Howell
<u>Mainframe-Based</u>	
Interactive Instructional Systems	IBM
Phoenix	Goal Systems International
Plato	Control Data Corp.
Scholar/Teach 3	Boeing Computer Services

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EXHIBIT III-2

**REPRESENTATIVE VENDORS  
OF COURSEWARE**Microcomputer-Based

Cdex-Intelligence Corp.  
Applied Data Research  
Wicat Systems, Inc.  
On-Line Computer Systems Inc.  
Goal Systems International

Mainframe-Based

Crwth Computer Courseware  
Control Data Corp.  
Boeing Computer Services  
Advanced Systems, Inc.  
Goal Systems  
Unisys

Multi-Media Training

Advanced Systems, Inc.  
Deltak (subsidiary of National Education Corp.)  
Edutronics (subsidiary of McGraw-Hill)  
Interactive Training Systems

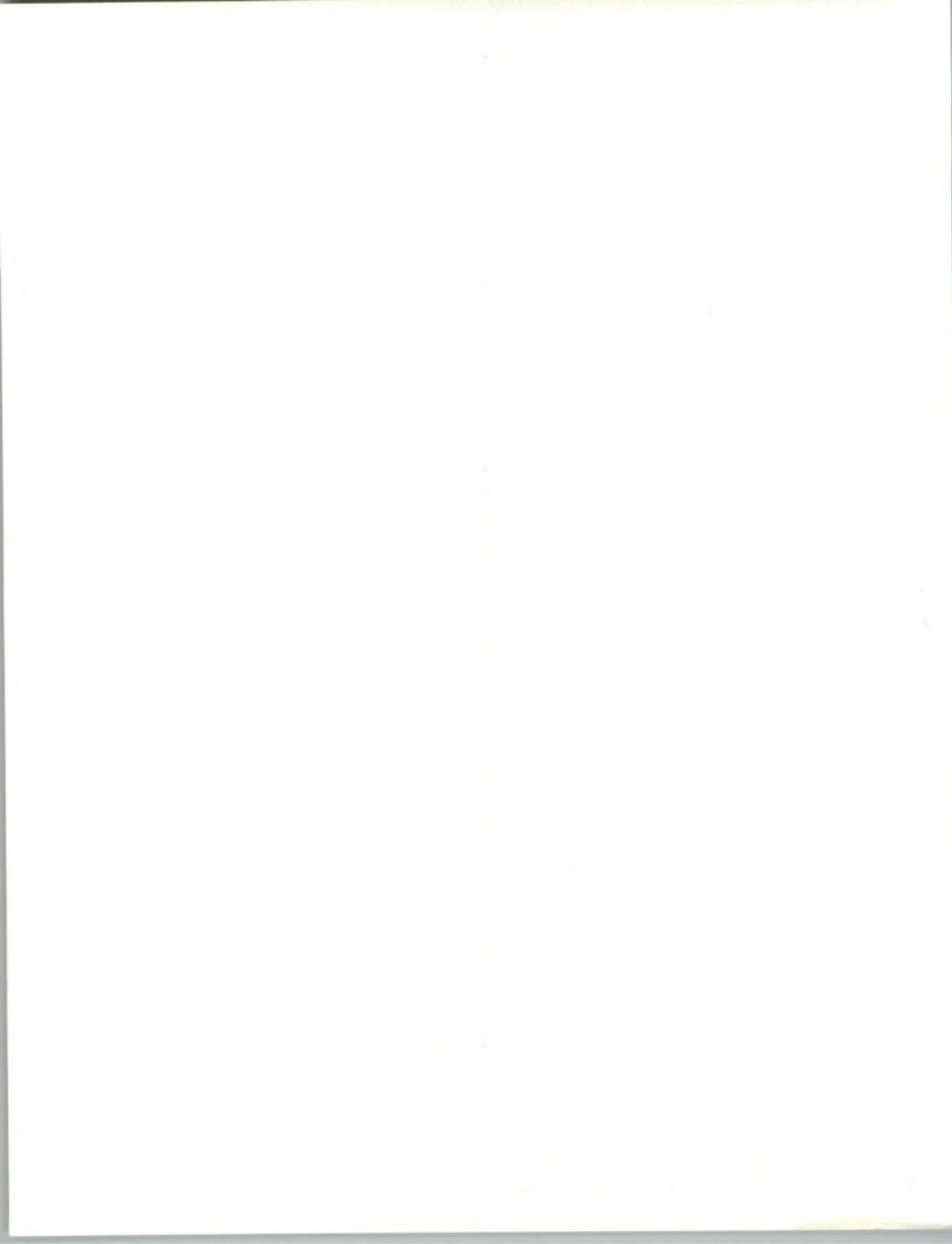
**B.**

## Vendor Profiles

**1. Advanced Systems, Inc.**  
(155 East Algonquin Road, Arlington Heights, IL 60005)

**a. Products/Services**

Advanced Systems Inc. (ASI) is the leading independent provider of educational and training courses.



- ASI provides live instruction, video-assisted education, computer-based training (micro and mainframe), and interactive video instruction alone or in combination to achieve education and training goals.
- ASI offers training services in a number of subjects including a variety of information system skills, end-user computing, manufacturing, and human resource development. These offerings include acquired courses as well as internally.
- ASI also offers consultation in the selection and development of a program of training services which provides a customized response to specific client needs.

**b. Markets Served**

Education, training, and related consulting services are marketed on an international basis to corporate and government clients.

**c. Company Strategy**

ASI attempts to maintain its visibility as a leading vendor of computer related courses by adding new course material on a regular basis and providing all modes of education and training from live classroom to CBT.

This vendor is also trying to leverage its reputation as an educator by offering consulting services on education and training to promote greater use of its products.

**d. Recent Activities/Events**

Fiscal 1986 revenue showed an increase of 18.5% from FY 1985.

ASI has been a leader in expanding training in information systems to other areas such as human resources.

**e. Future Directions**

ASI can be expected to further respond to the demands for training in functional subjects and for aid in developing in-house course material.



**2. Goal Systems International, Inc.**  
(Goal Systems Building, 5445 North High St., Columbus, OH 43214)

**a. Products/Services**

Goal Systems offers software for computer-based training (CBT) and professional services to develop custom courseware for CBT as well as other IS products not involved with education and training.

- The primary CBT product of Goal Systems is Phoenix, which was acquired from Ohio State University. It is an application development system that allows users to develop instructional courses utilizing CBT.
- The Phoenix product is also used to provide customization in education and training.
- Computer-based training is one of the four major product groups of Goal. The other three groups cover software products related to System Management Utilities, Application Development Systems, and Computer Security.

**b. Markets Served**

The company's CBT offerings are sold on an international basis. Over 80% of sales are in the U.S.

The CBT offerings are marketed for use on IBM and compatible mainframes.

**c. Company Strategy**

Goal Systems has marketed its computer-based training services as part of a group of VM, MVS, and VSE software products offered to IS departments to meet development and operational needs.

Recent strategy has also emphasized the use of Phoenix to meet a variety of current pressures such as educating employees on company methods and procedures, policies, and application systems.

**d. Recent Activities/Events**

Sales of the Phoenix product accounted for 25% of the revenue of Goal Systems during fiscal year 1987.



#### e. Future Directions

Goal Systems is expected to take further advantage of the demand for expanded and customized internal training courses through use of the Phoenix together with professional service assistance.

### 3. Control Data Corporation (8100 34th Avenue South, Minneapolis, MN 55440)

#### a. Products/Services

CDC has been in the education and training market for 25 years.

- CDC delivers its courses on microcomputers in local area networks (LAN).
- CDC has a growing number of products using micro-based technology.
- Its worldwide operations are a benefit to customers with facilities in many nations that need training.

#### b. Markets Served

Through its network of training facilities in over 50 cities internationally, CDC provides education and training to business and industry, schools and universities, consumers, the government, and the military.

#### c. Company Strategy

As part of the restructuring of 1986, the Training and Education group was formed to bring together several of the U.S. training units into one body that would serve multiple markets. This group will provide training and education based on a core set of CDC proprietary products.

The T&E group is targeting the following marketing whose needs can be met by the value-added products.

- Manufacturing and aviation.
- Computer-related areas of consumer vocational training.
- Job training sectors of the government-funded market.
- Kindergarten through Junior college sector of education (K-14).

The new Training and Education group was formed in November of 1986 as part of the restructuring of Control Data.

#### d. Recent Activities/Events

Fiscal 1986 revenue was approximately \$90 million, but the group was not profitable.



With the dissolution of the joint venture of PLATO/WICAT, T&E has had to redirect its efforts to proceed in the K-14 market.

#### **e. Future Directions**

T&E has intentions of building on Control Data's reputation for quality education and training courses.

#### **4. SAS Institute (Box 8000, SAS Circle, Cary, NC 27511-8000)**

##### **a. Products/Services**

The education and training products are an integrated part of the SAS set of statistical analysis, graphical, and data management products which have been widely marketed and used. These products are also sold to impart a working understanding of solving graphical and statistical problems with a computer.

- Instructor-based training as well as video- and computer-based training is provided at major hotels and five training centers.
- Ready-to-use CBT courses and authoring tools for writing CBT courses are available for use at customer sites.

##### **b. Markets Served**

SAS products and training are available on an international basis. Training centers are located in the U.S. and Canada.

Courses have been developed for mainframe, mini, and PC users of SAS Software.

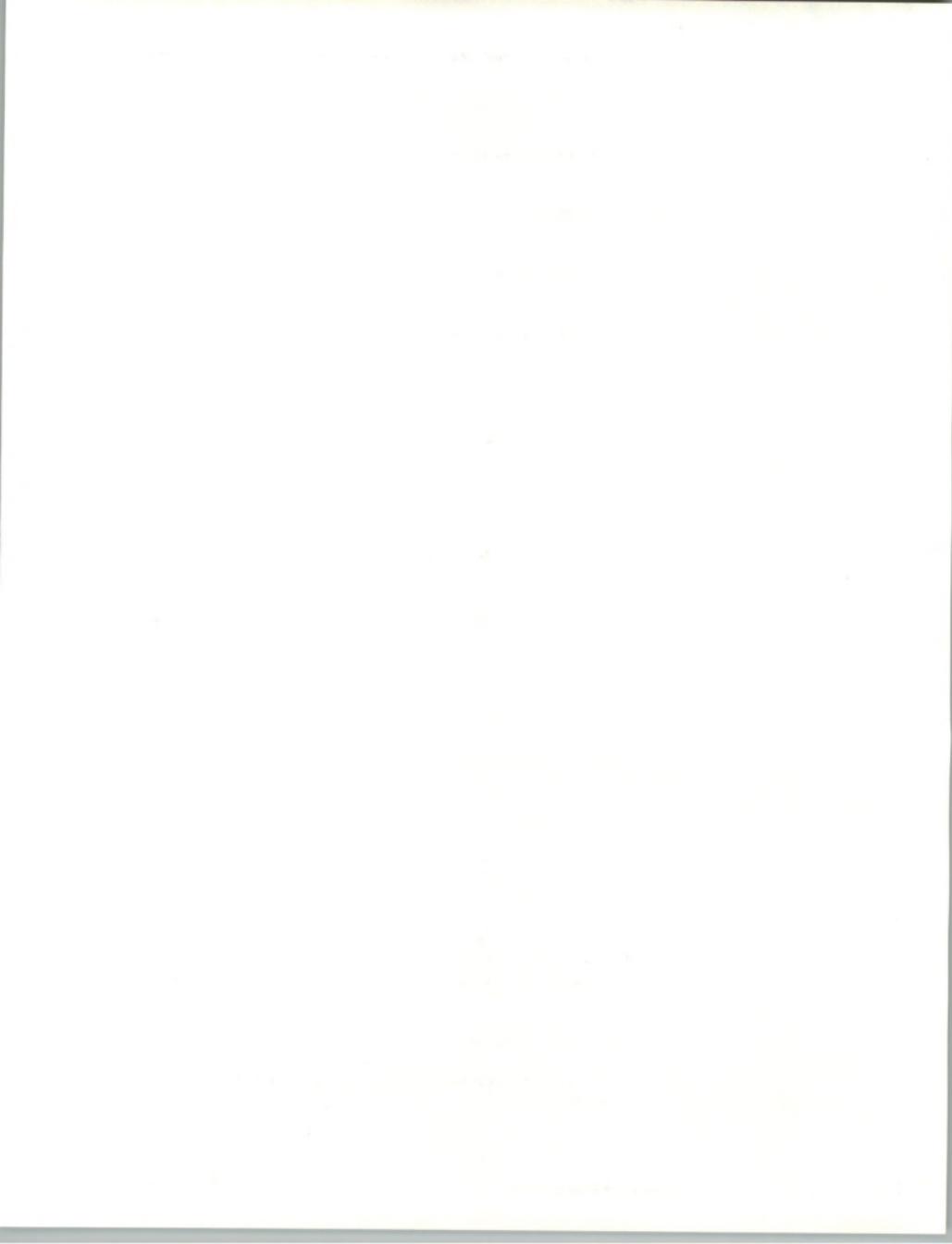
##### **c. Company Strategy**

Education and training is necessary to utilize the type of software products marketed by SAS, and the company's success is somewhat tied to its integration of training with use of these tools.

Education and training products have been expanded and supplemented with general statistical and mathematical courses including modeling and forecasting to increase revenue from the SAS product line and customer base.

##### **d. Recent Activities/Events**

Revenues of over \$8 million were obtained in fiscal year 1986 from education and training.



#### **e. Future Directions**

SAS can be expected to continue to expand education and training in the interpretation and manipulation of data since the need for this type of service is significantly large and growing.

### **5. Arthur Andersen (1405 North Fifth Ave., Saint Charles, IL 60174)**

#### **a. Products/Services**

Arthur Andersen provides educational consulting or professional seminar program and in-house training in computer related and business subjects through an educational services division.

- Instruction is offered through interactive video, computer-based training, embedded training, computer managed instruction, and live presentations.
- Subject matter focuses on the use of information, application systems, system planning, and microcomputer use as well as upon accounting, auditing, and management development.
- Consulting aid is also provided to assess training needs and design a curriculum.

#### **b. Markets Served**

These services are marketed on an international basis to clients and prospects of Arthur Andersen.

#### **c. Company Strategy**

Education and training is used as part of a total approach toward solving business problems of clients.

#### **d. Recent Activities/Events**

Fiscal 1986 revenue for education and training was about \$7 million.

Arthur Andersen presented an intensive seminar in both 1986 and 1987 in support of system integration that utilized education and training techniques to promote its product developments.

#### **e. Future Directions**

One of the firm's chief interests, automation in manufacturing, should result in increasing educational offerings in support of new techniques.



## **6. IBM** **(Armonk, NY)**

### **a. Products/Services**

In view of its size, IBM is the largest provider of computer-related education and training products and services. Other computer vendors such as DEC, Unisys, and Amdahl are also known for educational products and have also expanded their offerings to gain revenue.

- Products focus upon learning to utilize the software and hardware of IBM, although many general courses are offered in data communications, structured methodology, and projects management, for example.
- Live training is the leading mode for presentation, but IBM offers training that utilizes video and computer capabilities.

### **b. Markets Served**

IBM and its rivals offer products on an international basis utilizing worldwide facilities.

Courses are offered to all vertical markets and in some cases are tailored to particular industries.

### **c. Company Strategy**

IBM and other vendor courses not only support the use of its software and hardware, but also promote the advantage of certain facilities or capabilities that are provided.

IBM courses, particularly the offerings of its subsidiary, SRA, also promote a high level of professionalism which supports the company's image in general.

### **d. Recent Activities/Events**

An estimate of \$160 million in revenue resulted from education and training services in 1987.

### **e. Future Directions**

IBM can be expected to maintain a greater dedication to live training than many vendors devoted to education and training as a business. IBM will probably display innovation in training, however, as part of its offerings to demonstrate its interest in new capabilities.

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**7. Yourdon Corp.**  
(1501 Broadway, New York, NY 10036)

**a. Products/Services**

This firm and several others are known for training and education related to software engineering or system development methodology, but Yourdon has enlarged its course offerings to cover system software, software engineering, personal computers, and other media.

- Instruction is offered through live presentations in a seminar format.
- Subject matter includes structured analysis and design, information modeling, project planning, expert systems, MVS, CICS, and personal computers.
- Yourdon also markets consulting services related to education and training that focus on needs in regard to software engineering.

**b. Markets Served**

The products are marketed on an international basis.

**c. Company Strategy**

Yourdon presents an integrated approach in sales of seminars, consulting, and a software engineering product, the ANALYST/DESIGNER TOOLKIT™. By using this approach, Yourdon attempts to market more than just education and training to a prospect.

Yourdon emphasizes that its services involve more than just a seminar seat.

**d. Recent Activities/Events**

Yourdon had revenues of about \$10 million in fiscal year 1986.

Yourdon has profited from the recent growth in sales of software engineering products and services.

**e. Future Directions**

Yourdon can be expected to increase its course offerings and consulting services to meet the growth of interest in CASE.









IV

## New Opportunities

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## IV

## New Opportunities

Introducing and measuring the effectiveness of management oriented training has become an additional challenge for IS management. One of the new offerings that has been added to management courses is aid in measuring the effectiveness of the courses and selecting or tailoring the use of future ones.

New and expanding areas in self-study include audio cassettes that offer salesmanship, management, and time management courses to be played while commuting or relaxing at home.

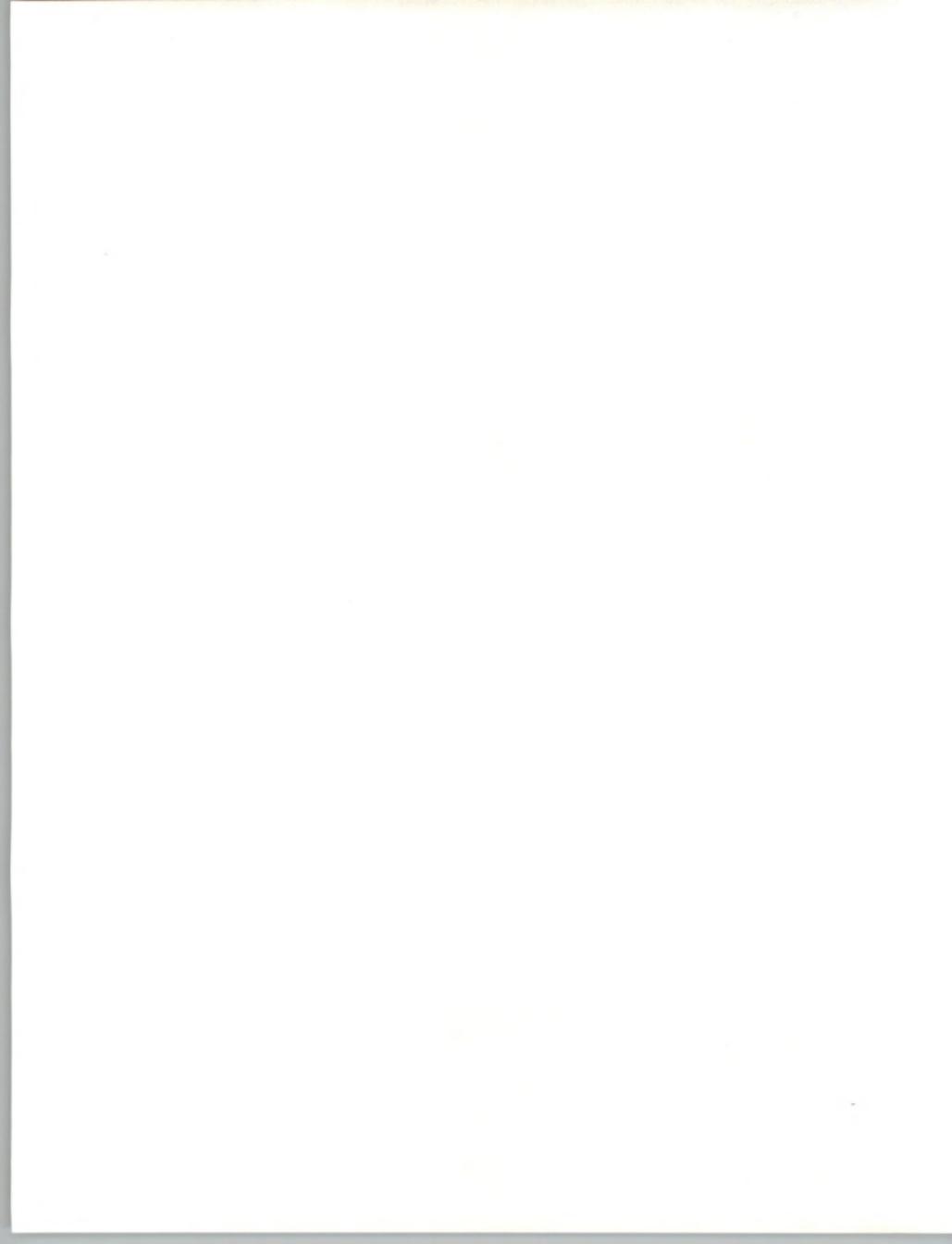
Similar to the self-study audio courses are the home VCR courses in areas such as management techniques, time management, and also some salesmanship.

CBT will be expanding with additional interactive, user-friendly aspects that will tailor responses to the individual.

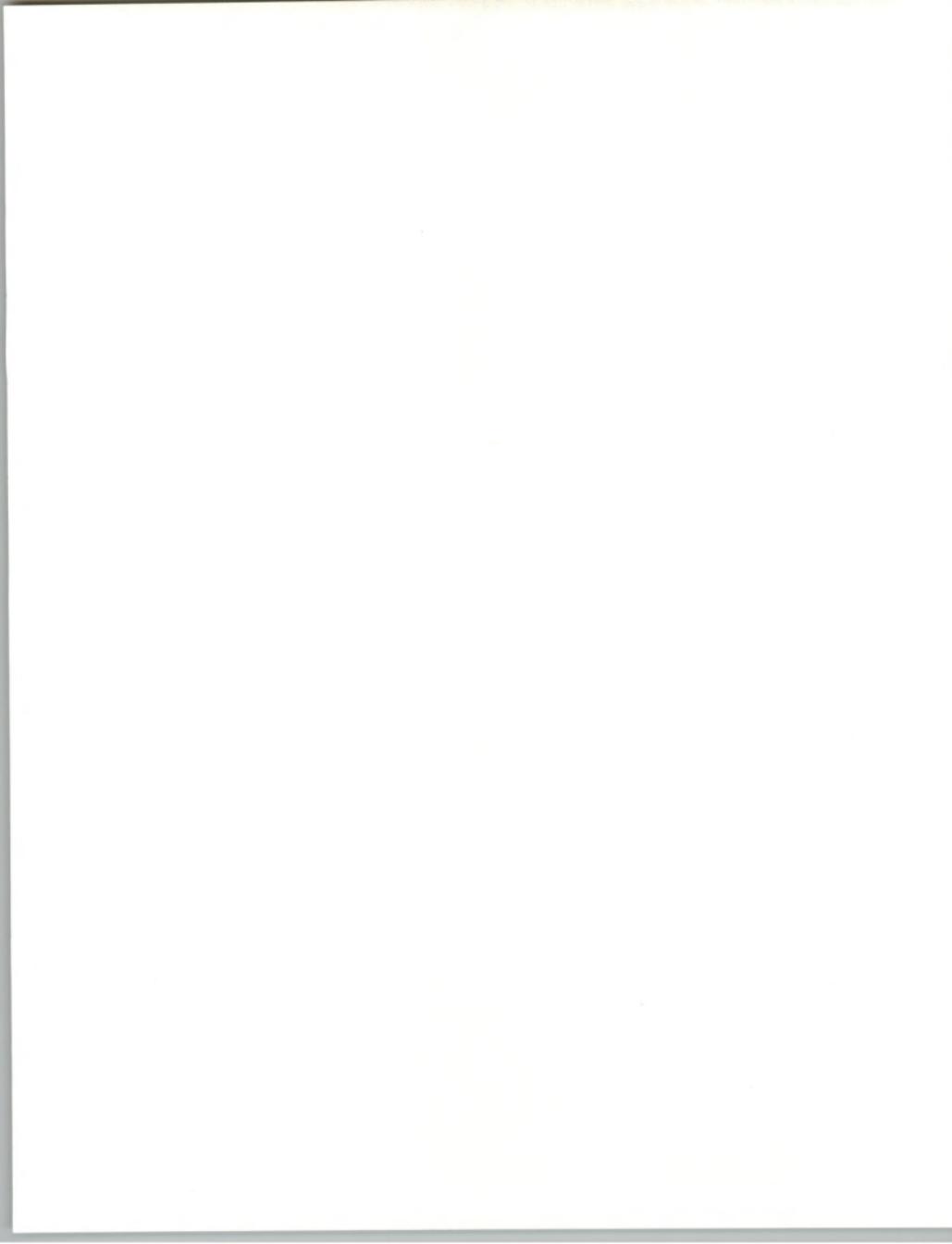
There is also a growth area for education and training customized for industry that will use a mixture methods to simulate situations where you can try out solutions. Much of this is being done in the defense arena, where training simulators are used to mimic real-life situations and train people in the best solutions.

In view of the proliferation of educational and training products, a few vendors have started to offer guidance services to courses and other materials for the data trainer.

There will also be an integration of technical and non-technical training, as in project management training, that will draw on technical knowledge to solve project management problems.









**Appendix ET:  
Forecast Data Base:  
Education and Training**

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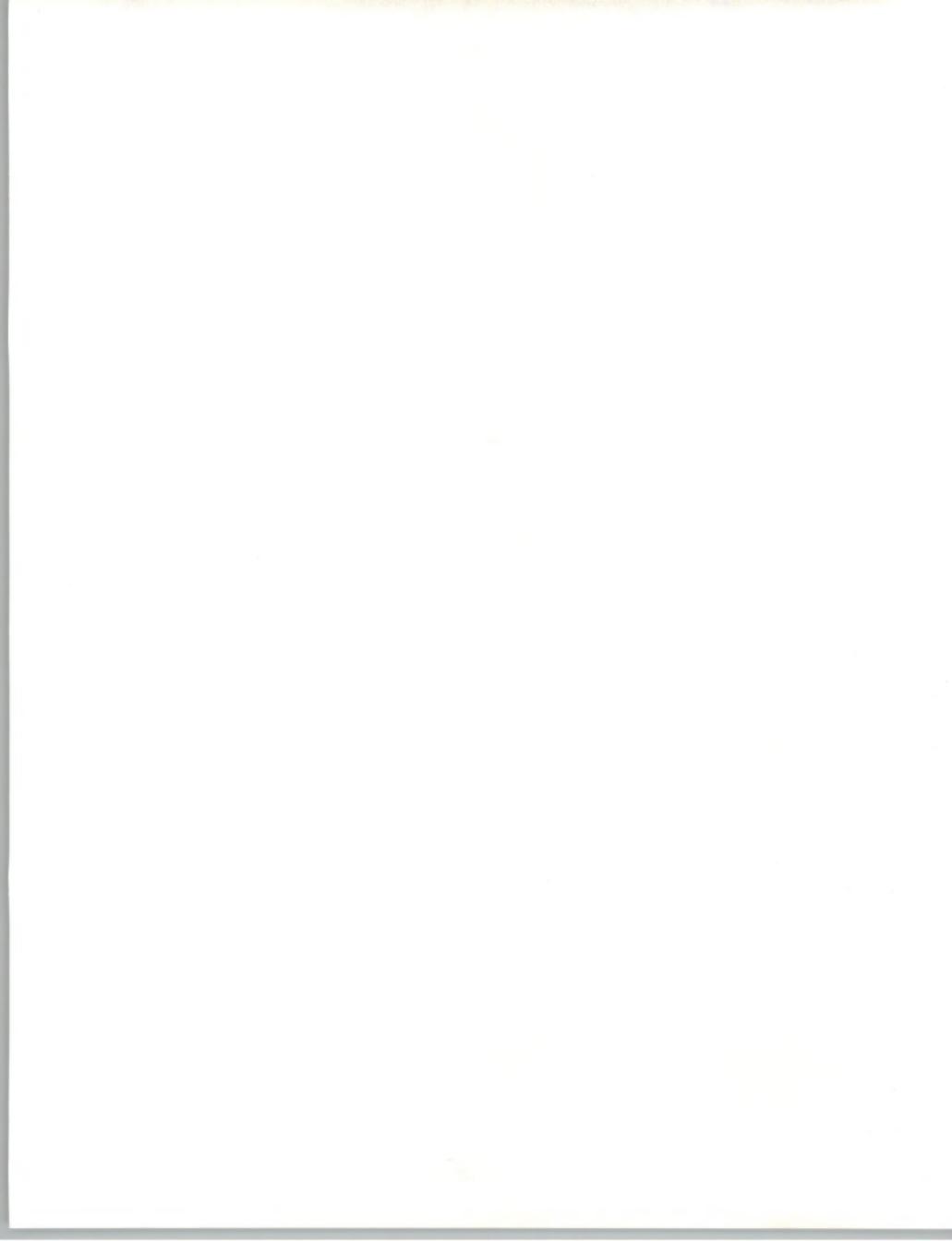


## A

## Appendix ET: Forecast Data Base: Education and Training

This appendix contains the following forecast information:

- Market size by delivery mode for each year 1986-1992.
- Market growth rate for 1986-1992.
- Average annual growth rate (AAGR) for each delivery mode for the five-year period 1987-1992.

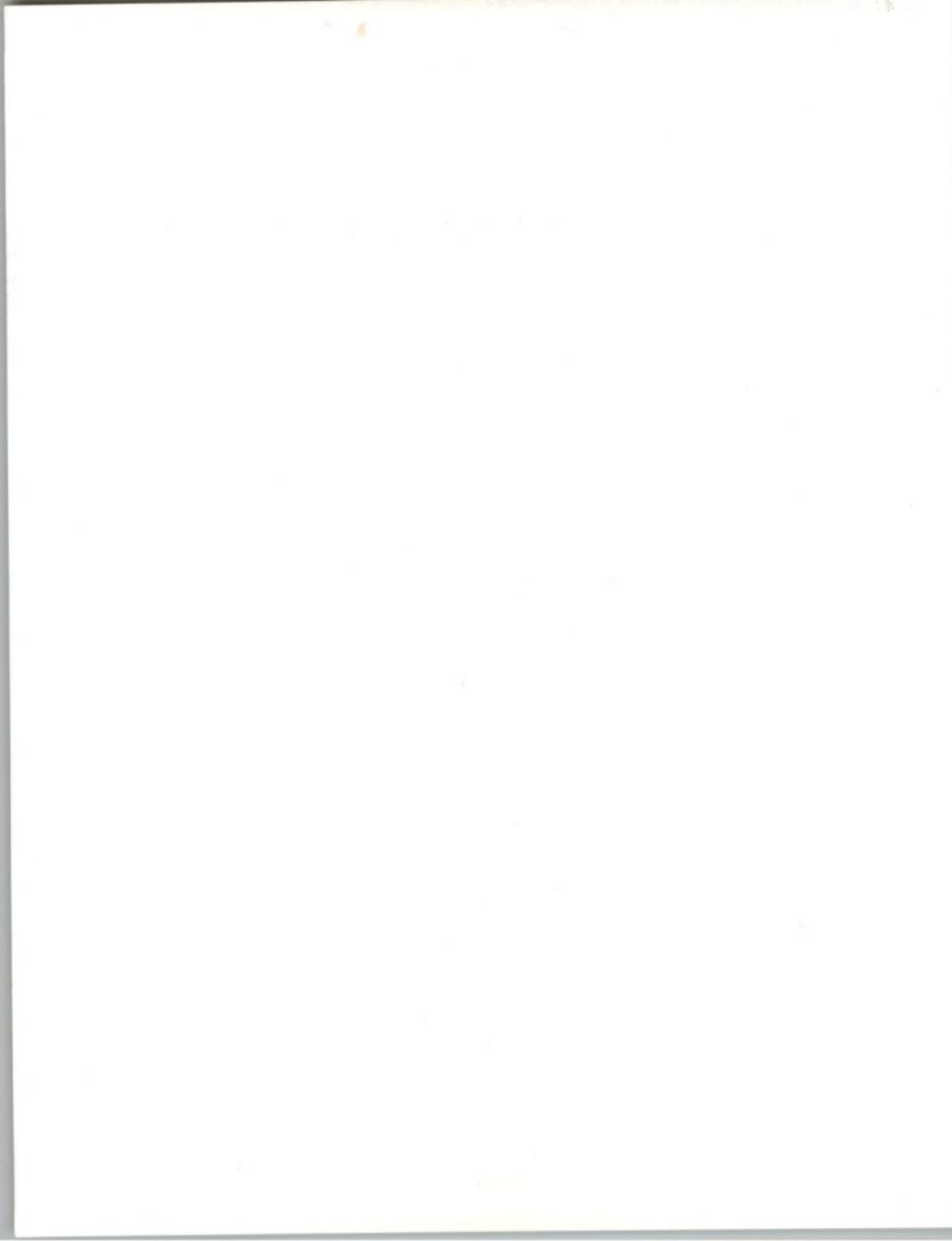


## EXHIBIT ET-1

**EDUCATION AND TRAINING SEGMENT  
USER EXPENDITURE FORECAST  
BY DELIVERY MODE, 1986-1992**

SEGMENTATION BY DELIVERY MODE	1986 (\$M)	1986- 1987 Growth	1987 (\$M)	1988 (\$M)	1989 (\$M)	1990 (\$M)	1991 (\$M)	1992 (\$M)	AAGR 1987- 1992 (Percent)
Remote Computing/ Batch	84	11	93	104	113	119	127	132	7
Applications Software									
Mainframe/Mini	37	30	48	58	71	84	95	109	18
Micro	50	28	64	79	94	119	148	177	23
Total Applications Software	87	29	112	137	165	203	243	286	21
Turnkey Systems	137	9	149	157	168	177	183	189	5
Cross-Industry Total	308	15	354	398	446	499	553	607	11
Professional Services*	1,313	22	1,606	1,910	2,304	2,785	3,384	4,180	21

\*Education and training professional services data are not included as part of the total for the education and training segment because they are included as part of the professional services segment.



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