

# ADCIS SIG CBT

## NEWSLETTER

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Association for the Development of Computer-Based Instructional Systems Special Interest Group in Computer-Based Training

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### GETTING STARTED IN CBT

Elizabeth M. Pflaumer

*Editor's Note: This article originally appeared in the November 1979 issue of the Journal of the National Society for Performance and Instruction (NSPI). That issue contains four excellent articles on CBT, including ones on CBT authoring and current video disc projects. The following article is reprinted with permission.*

As a training manager, you are confronted by basic logistical questions before investing in an extensive computer-based training effort. The instructional technology of CBT is relatively new and demanding to most potential users. Until recently computer-based education was too costly for the majority of training departments. This is beginning to change, however. The costs of computer technology are declining while costs for printing and paper reproduction of training materials are rapidly escalating. CBT is starting to look increasingly attractive.

Aside from cost estimates and time and computer facilities requirements, you also need answers to the following three basic questions.

1. **What kinds of training adapt to CBT?**
2. **What human resources will you need to adapt training to CBT?**
3. **What strategic approach best meets your training needs in converting to CBT?**

Perhaps consideration of these practical questions can assist you in deciding whether or not to go with CBT.

Across training programs you find certain commonalities:

1. Initially there is some sort of orientation for the learner.
2. Then comes a basic language familiarization with the terms necessary in the program. These may directly refer to the job performance at hand, i.e., names of equipment, procedures, or business transactions.

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Dr. Pflaumer is with the Personnel Department at Illinois Bell Telephone Company in Chicago.

3. After this basic terminology is taught, applications begin. Training may include situational transactions, problem solving, decision making involving usage of the basic terms, models to repair, and demonstrating correct handling of the basics in less than pure circumstances.

If the training is basic, it may isolate one skill (typing, speed-reading, safety procedures, equipment installation, operation or repair, filling out paper forms, filing, order processing). This is the foundation for later, more complex training. It is generally neither exciting nor very popular training material, but is required, and relies heavily on drill and practice. It is important as a basis for successful performance on the job or in other training modules.

Amid the basic specifics there is a mixture of generic kinds of training, corporate philosophy and policy, organizational procedures, interdepartmental interactions, sales skills, interpersonal communications, or management development. This provides the backbone of an industrial or business core of information needed at multiple levels within the organization, and in a wide variety of areas.

With this training program in mind let us turn to the first question:

#### 1. What Kinds of Training Adapt to CBT?

The following categories are instructional classifications within training that are directly applicable to CBT:

- a. *Definitions:* These consist of teaching a term or specific language to which specific meaning is attached. From this term, usage is applied for concrete comprehension, successful recognition, understanding, or application of tests or conditions to right and wrong use.
- b. *Drill and Practice:* Reinforces and establishes learning by repeated exercises of a particular procedure, formula applications, timed stimulus-response exercises, or other routines using this technique as a tool for learning.

The ADCIS CBT Newsletter is published quarterly by the ADCIS Special Interest Group in Computer-Based Training. Its purpose is to encourage the exchange of information on instructional computer applications in business, government, and industry.

#### **SIG CBT Officers**

Jesse M. Heines, Chairperson  
Digital Equipment Corporation  
12 Crosby Drive, BU/E32  
Bedford, MA 01730

Chuck Buchanan, Vice President  
United Airlines  
Flight Training Center  
32nd & Quebec  
Denver, CO 80207

Robert C. Fratini, Secretary/Treasurer  
Western Electric - 305161  
5151 Blazer Memorial Parkway  
Dublin, OH 43017

Kathleen Adkins, Newsletter Editor  
Savin Corporation  
87 Belden Drive  
Los Altos, CA 94022

Marion R. Hamblett, Newsletter Production  
Digital Equipment Corporation  
12 Crosby Drive, BU/E32  
Bedford, MA 01730

Articles on computer-based training are invited from all members of the training community. Manuscripts should be limited to one or two double-spaced pages and submitted to the editor.

Any opinions, conclusions, or recommendations expressed in this newsletter are those of the authors alone. They do not necessarily reflect the views of ADCIS, the SIG CBT, the editor, or the authors' employers.

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c. *Problems:* These vary from simple to extremely complex levels of difficulty and criticality that require sophisticated analysis techniques for decision making. These may be discrete basic applications of "hard" technical "facts," i.e., mathematics, pricing applications, feature combinations on equipment. The applications remain stable and constant and are either correct or incorrect. Although the discipline in the steps to the answer may be complex, it is simply a correct application of clear judgments. A missed step in the application of the problem is instantly visible. The combination of possibilities is fixed.

More complex levels of problems are in areas of critical analysis which require multiple branching systems used in generic problem solving, diagnostic work or sales training cases. More than one approach to solving the problems may be "right" and may vary with the individual situation.

d. *Testing:* A viable training program involves constant evaluation and testing before and after as well as in the classroom environment. Constant instructional monitoring occurs through discussions, question and answer sessions, dialogues, exercises, and synergistic behavioral interactions to which the sensitive instructor is constantly alert and aware, poised for action and accommodation to assure learning competency, or mastery.

e. *Curriculum or Course Training Agenda:* Expedites a course map or lesson plans. Decisions are traditionally predetermined by the course designer and controlled by the discretionary judgment of the instructor in the classroom. Depending upon the extent of computerization or individualized automation, managing the course curriculum is viable via the computer for the optimal training per trainee. The course is constantly adapted to the needs of the trainee, based on that trainee's accomplishments.

f. *Resources:* These include those support documents necessary to the training, i.e., reference documents, charts, job or performance aids, formulas, tables, procedural directions, rules and regulations. This content is too complex or too vital to be learned totally in the instruction. The instruction rather centers on how to retrieve and use this vital information.

g. *Records Management:* This includes course scheduling, curriculum sequencing, registration, grading and scoring of tests, and evaluation of course administration. Computer-managed instruction may operate independ-

ently or serve as an adjunct to the computer-aided instruction. It frees the training specialists for their primary tasks by performing the more mundane administrative functions automatically.

The above listing is not intended as a comprehensive one by any means. It is, however, a broad overview of the total process of the instructional improvement or quality assurance, by incorporating CBT.

## 2. What Human Resources Will You Need to Adapt Training to CBT?

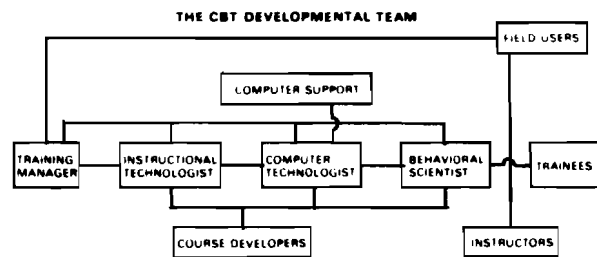
As with any other project the right combination of human resources can make CBT a success or failure. Chances are that there is no ready-made CBT development team available to dispatch to any given project. An examination of the components of a CBT project will focus on the kinds of skills needed.

Generally the following kinds of expertise are important for implementing CBT:

- a. *The Instructional Technologist:* This is someone who analyzes the training stream and its functions, problems, and areas for impacting profitable benefit from the conversion effort. This person plans and steers the project from orientation to the best instructional approach to implementation and serves as an operational interface with managers, learners, and users to assure success and efficiency; maintains quality of instruction through the cutover to computer process; and serves as an internal resource on learning problems, material presentation problems, distribution, and sequencing of content problems as well as evaluation.
- b. *The Computer Technologist:* This is not to be confused with a programmer. S/he must be able to interface successfully with the computer software technical support groups on system and program design; make suggestions and recommendations that adapt the material in the smartest, most efficient way possible within the program and instructional constraints; troubleshoot problems to prevent them from happening; interface with the instructional technologist, the behavioralist and various course developers on course design for computer application; and assure efficient usage and alternative methods to achieve end results cost-efficiently with the instructional technologist and course content developers.
- c. *The Behavioral Scientist:* This person insures that the psychological, intellectual, and emotional needs of user groups are met in cutting

over to computer-based instruction. S/he makes recommendations to implement a smooth orientation to each situational application; monitors job performance success and instructional effectiveness; understands the needs of the adult learner and the training environmental requirements or conditions to meet those needs; designs and supports motivational reinforcements within the training stream to assure success; and monitors pre- and post-training conditions and behavioral sequences.

- d. *The Course Developers:* There may be several of these simultaneously working on a course. Course developers confer with the above named resources, design and supply the core content with appropriate tests, references, responses, and branching recommendations; develop appropriate off-line support materials for the training program using various instructional media; and assure accuracy of content, course maintenance, and updating of information.



- e. *The Instructor:* This person serves as course mediator, or instructional manager. S/he interfaces with the learner as a resource and counselor, responding to individual needs of users in training. The instructor makes recommendations to course developers or managers regarding adaptations to the instructional objectives and also supplies developmental recommendations for the trainee and subsequent on-the-job performance in follow-up to training.

With this basic team of human resources, successful utilization of skill contributions should assure successful conversion to CBT. Now that we've discussed the "who" and the "what," consideration must focus on the "how" factors.

## 3. What Strategic Approach Meets Your Training Needs in Converting to CBT?

The primary decision to be made involves the logistics of where to begin. The following decision table (Table 1) indicates that there are choices between offering computer assistance to one aspect

of all instruction, such as one or more of the categories above, or addressing the conversion of several aspects in one course. The vertical course-by-course approach accomplishes a more comprehensive course conversion to the computer's assistance.

**Table 1 CBT Implementation Decision Table**

Course:		1	2	3	4	5
CMI	Records					
	Resources					
	Curriculum					
	Tests					
CAI	Problems					
	Drill & Practice					
	Terms					

Since this conversion is initially both time consuming and laborious, and since normal instruction must continue during the conversion process, there may be an advantage in addressing the conversion course by course. This is somewhat less disruptive to normal operation of traditional training. The contrary argument is that it may be advisable to develop expertise in one of the instructional aspects and do a conversion of all testing, for instance, before proceeding to another aspect.

CBT necessitates fluidity of scheduling student movement and also demands available terminals. It does significantly affect the class time needed for remaining instruction to be mastered. It can also assure a standard core content in the instructional development or criterion-referenced instruction.

If quality of training is a major concern, then the effort to convert all testing to the computer will make apparent the learning problems which may be impeding achievement of mastery. The generating of stable, uniform objectives assists in the unbiased reporting of pre- and post-training levels. Decisions of this nature depend upon what computer facilities are accessible, what time and financial constraints are imposed, and what human resources are available (Table 2).

An advantage of converting only one course at a time is that the entire training stream remains intact while the conversion effort is under way. The course under modification may still be conducted traditionally even though technically under con-

struction for conversion to CBT. Benefits may be realized immediately as modified portions or re-structured sections are phased in prior to complete cutover.

When only one class/course is involved, clean and simple studies can be used to report direct impact from the effort. These reports may be helpful in justifying further computer-based training. Table 2 compares the advantages and potential disadvantages to be considered in this choice.

The CBT approach places a high value on both trainee and instructor time. It can decrease the amount of prime time away from the mainstream job productivity due to training requirements. The trainee accesses the terminal for a portion of the training and, upon demonstrating competency on basic terms and their usage, is "ready to learn" or is competent to enter the classroom learning situation where this basic knowledge/skill is required.

The CBT approach realizes many benefits across the entire training track. All training is affected immediately as well as all trainees. It is estimated that the savings of trainee time is as high as 30% using this pre-entry course training via computer. That 30% training time savings represents an immediate increase in job productivity since the learning is reinforced directly on the job. This also offers quality assurance that all trainees are at entry level instruction prior to class.

Current industrial indicators show that in today's intensive business environment, with the vast array of new products and developments occurring within our accelerated, mobile society, there is an information boom in progress. This is having a profound effect on the training field. The luxury of traditional, instructor-led classroom sessions is becoming obstructive at the very least. Simultaneously, and as part of the technical information boom, practical progress is being made within the computer industry which makes new uses for computers feasible, advantageous, and financially sound.

Computers are available at economical rates to do more for less than standard mechanical means. The software support exists. The primary deterrent appears to be a reluctance to develop in-house expertise on the front lines of training delivery. The luxury of standing before an admiring audience, imparting knowledge, wisdom and experience to a thirsty and hungering audience is showing itself to be ineffective and uneconomic. This traditional approach to training is fraught with a myriad of problems from personnel turnover to cost benefit justification and quality assurance. Maintaining a centralized training center can be astronomically expensive if simulators or extensive equipment is purchased for instructional purposes and then is less than optimally utilized.

**Table 2 Comparative Analysis Table**

**The Vertical Approach to CBT**

<b>Advantages</b>	<b>Disadvantages</b>
1. Does not disrupt normal operation of other courses.	1. Investment is "loaded" toward CBT developmental expertise expenses.
2. Provides an integrated CBT approach to maximize impact per course.	2. Each stage vertically requires new problem mastery.
3. Assures uniform standard of equality and continuity of core content. Criterion-referenced-instructions within the course.	3. Necessitates fluid scheduling to incorporate CBT terminals, adaptable course pacing.
4. Provides early clean pure data for CBT justification reports.	4. Confused media interaction during cutover to CBT causes disruption of instruction for trainees and trainers.
5. Builds a valuable database making other conversions increasingly easier.	5. Maximum benefit is dependent on course selected for CBT development.
6. Isolates learning and media problems and allows for integrated improvement.	

**The Horizontal Approach to CBT**

1. Provides maximum efficiency in design construction per stage.	1. Disrupts/affects every course across the line.
2. Systematically converts each course to a criterion-referenced base.	2. Low cost savings initially as computer costs are high at start up with low level calculation contributions.
3. Assures entry level competency.	3. Adaptability of courses is variable.
4. Initially provides greatest class time savings per trainee in courses.	4. Must train all users at once to use CBT.
5. Isolates learning problems stage-by-stage to allow for correction and improvement of instruction.	5. Provides mixed data in production output reports.
6. Every course benefits from positive impact immediately.	
7. Builds a valuable database, making subsequent conversions increasingly efficient.	
8. Increases trainer efficiency by caring for fundamental skills.	

The reader will note that entering terminology and definitions as the basics of any course is a relatively simple process. To eliminate just that portion from the lecture-driven classroom is to realize a justifiable cost savings in the training program. It is a sound and sensible choice for beginning to computerize training.

Negatively, however, computerization can consume a fairly sizable quantity of computer project effort with minimal payoff. Basic mastery of definitions might be memorizable just as easily through the use of canned video, audio cassette tapes, printed word lists, dictionaries, or other job aids.

By contrast, much more complex in the learning hierarchy is abstract problem analysis composed of highly variable constructs. Here the computer rises to perhaps its ultimate in training contributions by achieving discipline for the learner. When response feedback is done by the instructor, it is potentially subjective, circuitous, and time consuming - a taxing proposition.

The computer is immediate, exact and tolerant of any number of variables. CBT is excellent for payoff in quality assurance of high level competency or mastery applications. To do the entry work to get this kind of material on line is also quite complex and demands an initial high time investment.

Begin simply by converting mundane repetitive tasks to the computer. This frees the trainer for higher levels of instruction. It also allows those on the conversion team the time to build experience, discipline, and creativity for computerizing training.

**Conclusions**

Many have tasted the bitter disappointments accompanying early decisions to "go with the computer." The results all too often were that quality varied, commitments within the vendor development team varied or deteriorated, and content was not satisfactory for job competency. These were expensive experiences. The training field is littered with the tombstones of computerized training attempts which failed.

This is not to be construed negatively. It was to be expected as part of the introductory growth stage in the state of the art of CBT. It does reflect the misunderstandings, misapprehensions, and mismanagement of the process of converting to CBT. As with any other media used in training, CBT offers benefits and advantages that have to be carefully selected and used, not abused.

CBT is not a new miracle cure-all. It is a medium that requires developmental work. Much has been written on the advantages of CBT in retrieving, updating, distributing, and managing the individualization of training. Much is yet to be realized from trial applications. As with other sophisticated equipment used in virtually

any occupation, proper handling procedures assure a successful operation.

This article is but one attempt to clarify some of the issues that must be considered in planning a conversion to CBT.

## SIG BYLAWS PROPOSED

Jesse M. Heines

It was agreed at the last Business Meeting that it would be advantageous to have a set of formal bylaws for the SIG CBT to focus our activities and strengthen the organization of our Special Interest Group. I then drafted bylaws and circulated them to our committee members for review.

Following are the revised bylaws that I now submit for passage at our 1980 Business Meeting. These bylaws incorporate comments and suggestions from Harold Rahmlow, Donna Hutcheson, Chuck Buchanan, and Bob Tannebaum (the ADCIS Parliamentarian), and I thank them for their time. Additional comments are welcomed prior to or during the Business Meeting.

### Article I - Name and Parent Organization

The name of this organization shall be the Association for the Development of Computer-Based Instructional Systems Special Interest Group in Computer-Based Training (ADCIS SIG CBT).

This Special Interest Group is constituted under Article IX of the Bylaws of the Association for the Development of Computer-Based Instructional Systems. The Bylaws of the ADCIS SIG CBT are intended to augment those of the parent organization. If conflicts arise, the Bylaws of ADCIS shall take precedence over those of the SIG CBT.

### Article II - Purposes

The purposes of this organization are:

- (a) to attract to ADCIS organizations that use computer-based techniques in their training programs,
- (b) to establish a forum where such organizations can exchange information and methods,
- (c) to promote the use of CBT in non-academic organizations, and
- (d) to encourage cooperative CBT research and development employing the resources of both training and educational organizations.

### Article III - Membership

Membership shall be available to all institutions and individuals interested in the purposes of this organization as stated in Article II, who are members of ADCIS, and who will pay dues according to Article VII of these Bylaws.

### Article IV - Officers

*Section 1.* The officers of this organization shall be: the Chairperson, the Vice-Chairperson, the Secre-

tary/Treasurer, and the Editor of the Newsletter.

#### 1.1 The duties of the *Chairperson* shall be:

- to call and conduct meetings of the organization;
- to prepare, with the assistance of the other officers, the agendas for the meetings of the organization;
- to create and appoint such committees as are needed to further the purposes or conduct the business of the organization;
- to prepare and propose a formal budget for the organization and to present it to the ADCIS Secretary/Treasurer.

#### 1.2 The duties of the *Vice-Chairperson* shall be:

- to assist the Chairperson in performing his/her duties;
- to act in the place of the Chairperson when so requested by the Chairperson or when necessitated by the Chairperson's resignation or absence.

#### 1.3 The duties of the *Secretary/Treasurer* shall be:

- to conduct the membership and business-related secretarial duties for the organization;
- to be responsible for receipt and recording of all funds, to interface with the ADCIS Secretary/Treasurer in the banking or disbursement of these funds, and to present a financial report at organization meetings;
- to conduct mail ballots.

#### 1.4 The duties of the *Newsletter Editor* shall be:

- to solicit articles for the ADCIS SIG CBT Newsletter from members of the professional CBT community;
- to edit such articles for readability and select those that will be included in the Newsletter;
- to prepare camera-ready copy of the Newsletter for printing;
- to arrange for the Newsletter to be printed and mailed to all members of the organization.

*Section 2.* The Chairperson, Vice-Chairperson, and Secretary/Treasurer shall be elected for two-year terms at the annual business meeting of the organization in odd-numbered years. They shall assume office at the conclusion of the meeting in which they are elected.

The Newsletter Editor shall be elected for a one-year term at the annual business meeting of the organization. He or she shall assume office immediately following the meeting.

No individual may hold more than one Bylaw office simultaneously.

Any Officer may be re-elected.

*Section 3.* In the event of a vacancy in the office of Vice-Chairperson, Secretary/Treasurer, or Newsletter Editor, the position may be filled through appointment by the Chairperson. The person so appointed shall remain in office until the next scheduled business meeting

(continued on page 8)

## THE CHAIR'S VIEWPOINT

Jesse M. Heines

As the second year of our SIG's existence draws to a close, I find this column much easier to write than I did in the past. The application of computers to the training process seems to be growing like mad. During the past year we have seen the video disk realized as an instructional device and microcomputers continue their emergence as effective training tools. Within our own organization, we have seen the membership of the SIG CBT grow almost as quickly as the price of gold.

It is appropriate at this juncture to pass out the standard kudos to the officers of our SIG and its committees. I have personally thanked each one of the people privately, but I wish to publicly recognize the contributions of Dr. Harold Rahmlow of The American College. Harold has been a staunch reporter of the SIG since its inception in 1978. For the 1980 Conference, Harold has organized both the SIG CBT Novice Pre-Session and the General ADCIS Novice Pre-Session. In addition, he reviewed the papers submitted for presentation at technical sessions of the SIG CBT and managed to find time to submit a paper himself. Harold has been a great support to me in carrying out the duties of Chairperson, and I feel that we owe him a debt of gratitude for helping to make the SIG CBT what it is today.

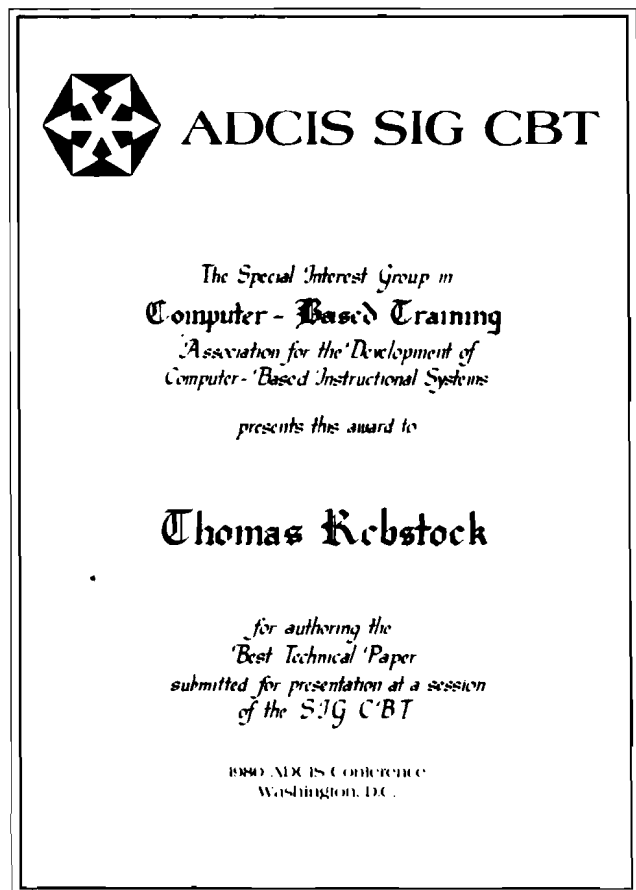
The end of our second year, of course, marks the beginning of our third. We established six committees at our 1979 Business Meeting, and some of these have had trouble getting started. With our membership now at well over the 100 mark, I hope that we can get larger participation in our business meetings and the subsequent activities that we deem worthwhile to pursue. We have many new members in our group, and I encourage as many of you as possible to attend our 1980 Business Meeting and join with us to move strongly into the 1980s.

## SIG CBT AWARDS

The SIG CBT is making two awards at the 1980 ADCIS Conference. The first is for the Best Technical Paper submitted for presentation at a session sponsored by the SIG and printed in the Conference Proceedings. The second is for the Best Presentation at a SIG session.

As announced in the January 1980 issue of this Newsletter, the Best Technical Paper award has been won by Thomas Rebstock of Control Data Corporation for his paper "CBT Breaks Ground in the Oilfield." He will be presented with a bronze plaque at our annual business meeting, printed as shown in the illustration.

A similar plaque will be presented to the recipient of the second award, to be determined at the Conference. The purpose of these awards is to attract, encourage, and recognize quality reports and presentations in the field of computer-based training. If you missed submitting a paper to this year's Conference, it is not too early to start thinking about next year!



of the organization. At that time, the members in attendance shall elect a person to fill the unexpired term.

In the event of a vacancy in the office of the Chairperson, the Vice-Chairperson shall assume the responsibilities of the Chairperson until the next scheduled business meeting of the organization. At that time, the members in attendance shall elect a person to fill the unexpired term.

*Section 4.* The quorum for all business meetings of the organization shall be 10 percent of the members.

#### **Article V - Committees**

The Chairperson shall create such committees as are needed to further the purposes or conduct the business of the organization.

#### **Article VI - Amendments and Revisions**

*Section 1. Initiation:* Any member(s) of the organization may submit a proposed amendment(s) to these Bylaws to the Chairperson in writing and signed by the proposer(s). The Chairperson shall then submit the proposed amendment(s) with any arguments advanced by its proposer(s) to the members for discussion and decision at the annual business meeting of the organization.

*Section 2. Adoption:* Amendments or revisions to these Bylaws shall be voted upon at the annual business meeting of the organization. A two-thirds majority affirmative vote of members voting shall be required for passage.

#### **Article VII - Dues and Finances**

*Section 1.* The organization shall not be operated for profit. All monies collected by the organization shall be used to further the purposes and conduct the business of the organization.

*Section 2.* Membership dues shall be established by the ADCIS Steering Committee.

*Section 3.* Each member of the SIG CBT shall receive a subscription to its Newsletter.

*Section 4.* Non-members may subscribe to the Newsletter at a rate established by the ADCIS Steering Committee.

*Section 5.* The Newsletter will not accept commercial advertising of any kind. It will accept announcements of events and position openings related to computer-based training. Any copy deemed by the Editor to be unsuitable, misleading, or false may be refused. There will be no charge for such announcements.

*Section 6.* Membership becomes effective upon the date of receipt of the application by the ADCIS Secretary/Treasurer and continues for one year. If dues are not received within three months, the membership shall be cancelled.

*Section 7.* The fiscal year for the organization shall be from September 1 to August 31.

*Section 8.* The property of this organization is irrevocably dedicated to the advancement of computer-based training and shall be governed by Section 11, Article VII of the ADCIS Bylaws.

#### **Article VIII - Information Exchange**

The organization shall publish a Newsletter with the single purpose of providing information to the professional CBT community on developments and significant events that affect the field of computer-based training.

#### **Article XI - Procedures**

All business meetings of the organization shall be conducted with the guidance of Roberts Rules of Order Revised (latest edition) except where the Bylaws and procedures of the organization shall be in conflict therewith, in which case they shall prevail.

ADCIS SIG CBT  
c/o Jesse M. Heines, Ed. D.  
Digital Equipment Corp.  
12 Crosby Drive, BU/E32  
Bedford, MA. 01730

(Address Correction Requested)