U.S. Marine Corps

COMPUTER BASE TRAINING DEVELOPMENT STANDARDS

IN REPLY REFER TO:

5231/22
CCIS-28

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From: Commandant of the Marine Corps

Subj: INFORMATION RESOURCES MANAGEMENT (IRM) COMPUTER-BASED
        TRAINING (CBT) DEVELOPMENT STANDARDS

Ref: (a)   MCO 1553.1A
        (b)   MCO P5231.1B
        (c)   MCO 5271.1
        (d)   MCO 5600.31F,Ch2

Encl: (1)   IRM-5231-22

1.   PURPOSE. To provide guidance and instructions on the
development of Computer-based Training (CBT) as required by
references (a), (b), and (c).

2.   AUTHORITY. These standards are published under the auspices
of reference (c).

3.   APPLICABILITY. The guidance contained in this publication
is applicable to all contractors and Marine Corps personnel
responsible for the creation of CBT. These standards apply to
the Marine Corps Reserve.

4.   DISTRIBUTION. This technical publication will be
distributed as indicated. Appropriate activities will receive
updated individual activity Table of Allowances for Publications.
Requests for changes in allowance should be submitted in
accordance with reference (d).

5.   SCOPE

     a.   Compliance. Compliance with the provisions of this
publication is required unless a specific waiver is authorized.

     b.   Waivers. Waivers to the provisions of this publication
will be authorized only by CMC (CC), as defined by references
(a), (b), and (c) on a case-by-case basis.

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Subj: INFORMATION RESOURCES MANAGEMENT (IRM) COMPUTER-BASED
      TRAINING (CBT) DEVELOPMENT STANDARDS

6. RECOMMENDATIONS. Recommendations concerning the contents of
this technical publication should be forwarded to CMC (CCI) via
the appropriate chain of command. All recommended changes will
be reviewed upon receipt and implemented if appropriate.

7. SPONSOR. The sponsor of this technical publication is CMC
(CCI).

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Intelligence and Interoperabilit

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UNITED STATES MARINE CORPS

**Information Resources Management (IRM)
Standards and Guidelines Program**

CBT DEVELOPMENT STANDARDS
IRM-5231-22

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RECORD OF CHANGES

Log completed change action as indicated.

Change Number	Date of Change	Date Received	Date Entered	Signature of Person Entering Change

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CBT DEVELOPMENT STANDARDS
IRM 5231-22

PUBLICATION TABLE OF CONTENTS

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CBT DEVELOPMENT STANDARDS
IRM 5231-22

LIST OF FIGURES

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Chapter Table of Contents

Chapter 1

GENERAL

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Chapter 1

General

1.1. INTRODUCTION

1.1.1. Background. Computer-based Training (CBT) as a training alternative is a technology coming into more use throughout the government and industry. This technology uses a computer as a medium for training delivery. Appendix A provides a glossary of terms in current use that pertain to this technology, and Appendix B provides a bibliography of material used in the creation of the standards set forth within this document. The creation of training courses that run on computers requires a development methodology that is sequential and iterative. The CBT development process contained in this publication provides phases parallel to the phases found in the structured Systems Development Methodology (SDM) that the Marine Corps uses to build data processing systems (see FIGURE 1-01). The CBT development process, however, incorporates instructional development procedures necessary for effective training. Blending these procedures with SDM provides an acceptable computer systems development process that accommodates an electronic Systems Approach to Training (SAT).

a. During a time of reductions in training staff and increasing budget constraints, the use of CBT technology has proven to be cost-effective over the long term. Using CBT instruction allows individuals to progress at their own pace, helps to minimize the impact of personnel turnover by providing instruction in local procedures or the use of specific pieces of equipment, provides consistency in presenting information and minimizes the long-term cost of providing the training. Additionally, CBT can be developed for delivery on existing equipment, such as mainframe systems and personal computers, including standalone personal computers and personal computers connected to a local area network.

b. Using the computer as a medium for delivering training requires specificity in articulating design, scripts, displays, and logic beyond that required in other instructional environments. Consequently, following CBT development standards is a necessity for CBT systems development. There are phases, stages, activities, and deliverables that must be carefully managed to accomplish the maximum result with the minimum effort. The Project Manager/Officer either pays up front by following precise and demanding development steps or pays later with less than adequate programs, several passes through the revision process, or poor learner performance on the job.

SYSTEM DEVELOPMENT METHODOLOGY

Need Justification Phase	Concepts Development Phase	Design Phase	Development Phase	Deployment Phase	Operations Phase

Decision Documents
Milestone-

| | MNS 0 | SDP I | SDP II | SDP III | SDP IV | SDP V |

MNS - Mission Need Statement

SDP - System Decision Paper

FIGURE 1-01
SDM Process

c.   Following SDM during the CBT development process ensures that the following goals will be met:

(1)   The specific tasks or topics that need to be taught are identified during the analysis phase.   This will ensure that the course objectives address the training need and that effective courseware is delivered on schedule and within budget.

(2)   The Project Manager/Officer retains control over the design and production process to include product content, logical flow, screen displays, and interactivity levels.   This will provide continuous involvement that allows the Project Manager/Officer to review, approve, and sign off on tangible paper-based or electronic deliverables. Additionally, project planning, directing, and controlling will be enhanced because work will begin on subsequent phases only after concurrence is received on the current phase's deliverables.

(3)   Clear specifications, priorities, and responsibilities are established at the start of the project. This provides CBT designers and developers a series of organized steps through which they can proceed.

d.   As previously stated, the CBT development process is a sequential and iterative process.   Design cannot begin before content and learning objectives are defined.   Programming cannot occur before complete and detailed storyboards, including interactions, are created.   All deliverables lead to an increasingly detailed description of the CBT courseware, which is developed entirely on paper or on electronic media before the material is ready to be "programmed" or input into the CBT authoring system.

e.   Each step in the CBT development process is critical.   To the degree that a more superficial rather than a thorough job has been completed and adequately documented, the final product will suffer, or the developer will have to repeat the cycle.   Rarely does a development team walk through the entire process in a straight line.   Typically, there are repetitions of each phase when ideas, changes, or corrections are identified in the walkthroughs.   The objectives are to keep the total number of iterations through the cycle to a minimum and to keep the loops closed in each phase.   For example, it is easier and less expensive to repeat a high-level design phase than to proceed all the way through a later phase and have to come back to the fundamental design structure and start all over.   Major revisions at the later stages cost more in money and elapsed time than changes in the earlier stages.

f.   Adhering to a standard CBT methodology during course development will ensure the following:

(1) A consistent tone, format, and style

(2) An appropriate level of interactivity

(3) A reduction in ambiguities and errors

(4) An integration of activities among team members

(5) A reduction in recoding activities

(6) A reduction in risk at subsequent development stages

g.   A clearly defined development process, predefined expectations for output at the end of each phase, and a critical and structured walkthrough process are necessary conditions for quality and timely CBT development.

1.1.2.   Objectives.   The objectives of this standard are to provide a framework for the design, development, and control of CBT, to define the process to be used in the creation of CBT, and to define the format and content of the required documents. Adherence to this standard ensures that all CBT development will be accomplished following existing Marine Corps policies and directives and ensures a systems approach to training.

1.1.3.   Purpose.   The purpose of this technical publication is to provide functional and technical users the information, guidance, and procedures required to create CBT courseware effectively once CBT has been identified in the SAT process as the appropriate training method.   In providing individual training through the use of CBT, a well-designed course of instruction can be used to ensure that all personnel have received adequate instructions for a given subject.   This instruction can be used in both formal schools or informal on-the-job training.

1.2.   SCOPE.   This technical publication describes the approach to the design, development, implementation, and evaluation of CBT systems, the associated documentation, and its required contents. Examples of all required documents are contained in the appendices of this publication.

1.3.   APPROACH.   This section provides the SAT process to be used in developing CBT material.   FIGURE 1-02 provides an overview of the SDM process comparative to the Marine Corps SAT process.

SYSTEM DEVELOPMENT METHODOLOGY

Need Justification Phase	Concepts Development Phase	Design Phase	Development Phase	Deployment Phase	Operations Phase

Decision Documents - Milestone-

| MNS 0 | SDP I | SDP II | SDP III | SDP IV | SDP V |

MNS - Mission Need Statement

SDP - System Decision Paper

SYSTEMS APPROACH TO TRAINING

Concept Analysis	Design	Development	Implementation	Evaluation

Phase I   Phase II   Phase III   Phase IV   Phase V

FIGURE 1-02
SDM and SAT Comparison

1.3.1. Definition. CBT is instructional material that is delivered to the student via computer, either mainframe or personal. The personal computer can be standalone or connected to a local area network. During a CBT training session, the student interacts with the system by responding to scenarios and receiving feedback to his responses. Responses can then be recorded and monitored to ensure that the student achieves mastery.

1.3.2. Development Process. Whether during initial development or as part of the reevaluation and enhancement of an existing course of instruction, either formal or informal, the development of any CBT material should follow the system life cycle process described within this publication. This process ensures that the SAT process requirements for individual training are met.

   a. Concept Analysis. The training need or deficiency is examined; the purpose, goal, and scope of the project are defined; and the subject matter references and specialists are identified. A job analysis or reference review is conducted and documented, and, from this, a topic or task inventory along with selection criteria is developed. Additionally, during analysis, the intended learners and prerequisite skills are identified and the course content is defined. As a result of analysis, the resources, materials, and equipment required for the project are identified along with the method for presenting the training materials, the media to be used, and the authoring system selected.

   b. Design. Terminal and Enabling Learning Objectives (TLOs and ELOs) and testing criteria are determined. A presentation sequence in terms of lessons containing teaching points that logically demonstrate the objectives is determined and outlined. Additionally, the courseware level of interactivity is identified, flowcharts and storyboards are created, descriptions of questions are written, and the predevelopment checklist is created.

   c. Development. Prototypes, user and instructor/ administrator guides, validation procedures, rating forms for users, and the postdevelopment walkthrough checklists are all produced. Additionally, the courseware is delivered and the results of validation are documented.

   d. Implementation. The material distribution schedule, the instructor/administrator training schedule, and the courseware implementation schedule are developed.

   e. Evaluation. Internal and external evaluation plans are prepared. Courseware Change Requests (CWCRs) and the evaluation process of those requests are developed. Additionally, the results of evaluation are analyzed, course enhancements or revisions are identified, and their scope and impact are defined.

1.3.3. <u>Development Standards</u>. The design and development of CBT is dependent on the course material. The purpose of training, however, is to ensure that the student achieves mastery in the skill or concept being presented. For this reason, it is important to follow basic development standards:

a. The option to review lesson material must be available in the courseware. The list below provides suggestions for incorporating reviews. Since the methods for presenting review options is dependent on the course design, this list is not intended to prohibit other methods.

(1) Provide the option to page back through the lesson. This option, which could appear on the screen legend, provides easy access to earlier screens.

(2) Provide a review option on the menu. This method is convenient for students who simply want a quick review of the highlights of the lesson.

(3) Provide a review hot key on question screens. This option lets a student go directly from a question to a review of the material and then return to the question.

b. Student recordkeeping or course management must be available in the courseware. At a minimum, the following statistics should be monitored:

(1) Name

(2) Social Security Number

(3) Test scores

(4) Time spent in course and/or test

(5) The number of test attempts

(6) The numbers of the questions answered incorrectly

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CBT DEVELOPMENT STANDARDS
IRM 5231-22

Chapter Table of Contents

Chapter 2

PROCEDURES

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Chapter 2

PROCEDURES

2.1. RESPONSIBILITY. The Project Manager/Officer is responsible for reviewing, evaluating, and providing guidance in the development of the CBT material and documentation. The reviews and evaluations should ensure that the CBT is complete, well organized, understandable by the user audience, and in compliance with this standard.

The following paragraphs outline the components of the CBT process phases. This process develops the CBT step by step with each phase systematically building and developing upon the previous. The phases of the CBT process closely coincide with those of the SAT process as shown in FIGURE 2-01.

2.2. CONCEPT ANALYSIS. The concept analysis examines the need for the development, the estimated resources needed, equipment and material requirements and the methods for development. The Marine Corps Combat Development Center (Code TE31) publishes Individual Training Standards (ITSs) within reference (a) that will serve as a basis for developing instruction. When ITSs are available, formal schools will not apply the processes contained in this phase for CBT development but will begin with the design phase. Where standards have not been published, formal schools are to ensure compliance with each phase of the CBT standard. When development of CBT by other than formal school activities is contemplated, the Project Manager/Officer will ensure that all requirements set forth in references (a), (b), (c), and this standard are met.

2.2.1. Tasks. The tasks to be accomplished within this analysis phase include a job analysis, task listing, selection of tasks for training and the development of task performance measurements.

2.2.2. Concept Analysis Document. The results of the analysis phase are culminated in the Concept Analysis Document. This document will include, but will not be limited to, the following sections.

     a. **Need/Deficiency Statement.** This section identifies the problem that needs to be resolved. It specifies the task that needs to be accomplished in general terms and the deficiency preventing success.
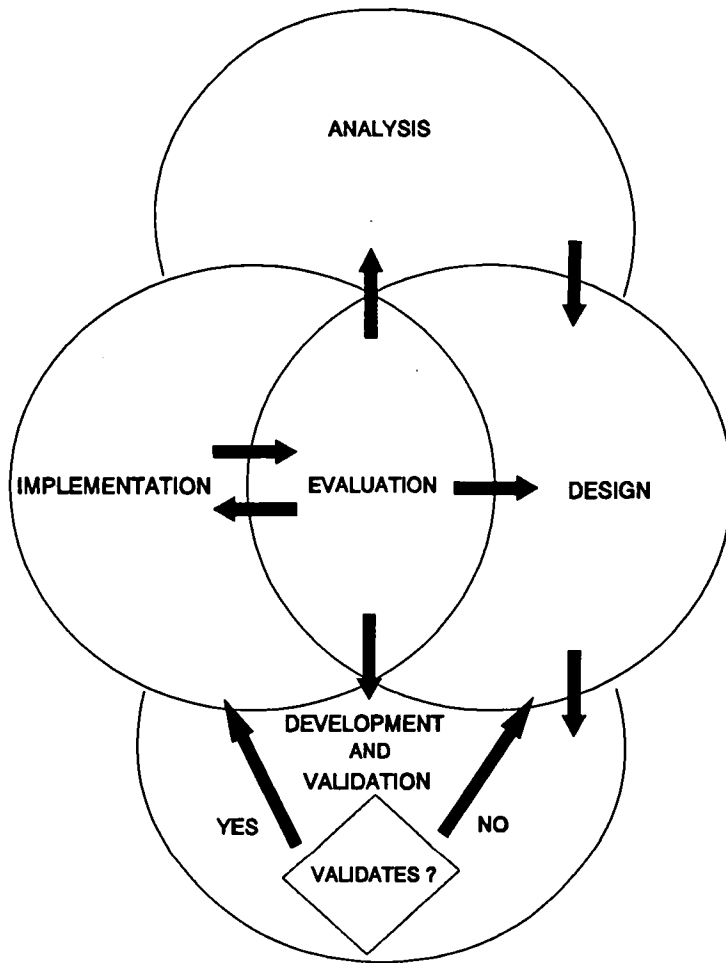
FIGURE 2-01
Diagram of SAT/CBT Phases

b. <u>Course Purpose, Goal, and Scope Statement</u>. This section is composed of three paragraphs. The purpose paragraph describes what the proposed course will accomplish or provide to the students in terms of satisfying the need/deficiency and ensuring job/task success. The goal paragraph summarizes what must be done to achieve the purpose of the course and the expected outcome in terms of gained knowledge and/or proficiencies. The scope paragraph limits the subject matter to be addressed in the courseware.

c. <u>Identification of Subject Matter Specialist</u>. This paragraph identifies individuals who have a current, recognizable expertise in the subject matter described in the preceding paragraphs and lists their qualifications and credentials.

d. <u>List of Subject Matter References</u>. This paragraph provides a list of subject reference material that will be used by the project team.

e. <u>Results From Job Analysis and/or Review of Subject Matter References</u>. This section is required only if ITSs do not already exist for the courseware. If ITSs exist, this section will be noted as not applicable. If ITSs do not exist, this section will discuss the results of the job analysis and/or the review of subject matter references. Specifically, the section should address, but should not be limited to, the following:

(1) What job tasks and/or subtasks were identified or what topics and/or subtopics were identified.

(2) What subject matter references and materials were found to be adequate or inadequate in addressing the defined problem.

(3) What areas had poorly defined job procedures, inadequate reference material, or poorly documented material.

f. <u>Topic and/or Task Inventory and Selection Criteria</u>. If a job analysis was not conducted because of existing ITSs, this section will be noted as not applicable. If a job analysis was conducted, this section will contain a discussion on which topics or tasks were chosen for training and the criteria used for selection. For material that is conceptual, this discussion should include, but should not be limited to, the following for each identified topic:

(1) Discussion of each issue that supports the topic

(2) Importance of the issue

(3) Criticality to the job

(4) Complexity of the issue

For material that is task-oriented, this discussion should include, but should not be limited to, the following for each identified task:

      (1)   Description of the task that needs to be performed

      (2)   Frequency of performance

      (3)   Criticality to the job

      (4)   Complexity of performance

   g.   <u>Description of Learners, Course Content, and Prerequisites</u>. This section will contain three paragraphs. Paragraph one will provide a description of the intended learner. The description should address the issues relative to the design of the course and should include, but should not be limited to, the following:

      (1)   Average age or age span

      (2)   Educational levels

      (3)   Years of employment

      (4)   Job responsibilities that the course will address

This paragraph should also identify the reading level selected for the course and the justification for that level.

Paragraph two should provide a brief description of the course content, and paragraph three should identify any prerequisite skills that the learner must have before taking the course.

   h.   <u>Resources, Materials, and Equipment</u>. This section will contain three paragraphs. Paragraph one will state the number and describe the type of personnel needed for the project. The second paragraph will provide a specific list of paper-based materials and software required to design and develop the training. The paper-based materials include directives, orders, publications, manuals, and other documentation. The software includes authoring packages, supporting graphics packages, and other packages necessary for development. Paragraph three identifies the equipment required to develop and deliver the training and identifies the equipment available at the site where the training will occur. If the training is to occur over multiple sites, this paragraph will identify the equipment common to each site.

i. **Rationale for Methods, Media, and CBT Authoring System Selection**. This section includes three paragraphs. The first will describe the proposed method of training being recommended/ considered and its advantages. The second paragraph will describe the proposed media and will provide a comparison between that media and the equipment already available at the targeted sites. The third paragraph will discuss the CBT authoring system to be used in the developmental effort. This discussion should include the reason for selecting the authoring system and the compatibility of the authoring system with existing hardware.

2.3. **DESIGN**. During this phase published ITSs will be used by formal schools to design CBT courseware. Where ITSs have not been published, formal schools activity heads are to ensure compliance with each process of this phase. When development of CBT by other than formal school activities is contemplated, the Project Manager/Officer will ensure that all requirements set forth in references (a), (b), (c), and this standard are met.

2.3.1. **Tasks**. The tasks necessary for this phase are the training standards if available, completed Job Structure Diagram/List, consideration of the formal school or informal training environment, and related indicative behaviors.

2.3.2. **Courseware Objectives Document**. This document specifies the overall learning objectives, the teaching points to be included in the lessons to attain the enabling learning objectives (ELOs), the desired behaviors to be accomplished, the conditions under which the behaviors will be obtained, and the standards by which the behaviors will be measured. Appendix E contains a sample of the Courseware Objectives Document.

a. **List of Course Terminal Learning Objectives**. This section specifies the terminal learning objective(s) (TLO) that are to be obtained. Within each of the specified TLOs, the desired behavior, the condition under which the behavior will be attained, and the standard by which the behavior will be measured will be discussed.

b. **Lesson Outlines**. This section of the document will present the lesson outlines that have been determined necessary to attaining the TLO(s). Each lesson outline will address, but will not be limited to, the following:

(1) **Grouped/Sequential List of ELOs with Behavior, Conditions, and Standards**. Each ELO will be described. For each ELO, the desired student behavior, the condition under which the desired behavior will be attained, and the standard by which the behavior will be measured will be discussed.

(2) List of Teaching Points for Each ELO. The teaching points necessary to attain each of the ELOs of the lesson will be listed.

(3) Tes Scenarios to Measure Mastery of Objectives. The method of measuring the student's ability to display the desired behavior will be described.

2.3.3. Courseware Design Document. This document provides a representation of the flow and content of each lesson. Additionally, the document includes a detailed description of every screen and a synopsis of required and optional student interactions. Appendix F contains a sample of the Courseware Design Document.

a. Courseware Level of Interactivity Statement. This section of the document states the average number of times the student is required to or has the option to make choices throughout the entire course. Student choices, called student interactions, do not include those options required to move linearly from screen to screen or those options required to move from menu to menu. The average number of interactions will be stated as percentages and will be divided into two parts. Part one will define the percent of interactivity available for the overall course. Included in this percentage would be possible interactions with options such as online glossaries, online references, and online help or review features as well as interactions prompted by system questioning. Part two will analyze the overall level of interactivity defined in part one and will determine what percent of that figure is interaction caused by stimulus and response. For the purpose of this document, stimulus and response is defined as a dialog between the training system and the learner in that the system presents a query relative to the lesson objective, the learner responds, and the system provides feedback.

b. Courseware General Design of Flow Charts. This section provides a graphic representation of how a student moves through the course and of the available branches.

c. Courseware Detailed Design of Storyboards. This section provides a description of each screen that appears in the course (see FIGURE 2-02). One storyboard will be prepared for each screen. Where course conventions or standards have been established, these conventions or standards can be detailed on a storyboard cover sheet rather than on individual storyboards. Conventions or standards may include screen colors, font types, global hot keys, and universal branches such as glossaries. Storyboards will include the following information:

(1) Storyboard Number. A unique number assigned to each storyboard.

INTERACTIVE STORYBOARD

Storyboard Number:_____   Came From:_____

Module:_____Course Name_____   No branch marked came from
                                     last

Topic:_____   **Graphic**

Lesson:_____

Screen   This space contains a detailed
Name: _____   description or sketch of the graphic
                                     that will appear on the screen.
Text
Name: _____   The items on the left are flexible,
                                     depending on the information that a
Graphic   particular authoring language might
Name: _____   use. In this case, the authoring
                                     language uses screen names, text file
1 goto _____   names, and graphic file names.

2 goto _____   **Text**

3 goto _____   This space contains the text that will
                                     appear on the screen.
4 goto _____
                                         Special Instructions
5 goto _____
                                     This space contains any special
6 goto _____   directions necessary for graphic
                                     creation or programming.
7 goto _____
                                     The goto statements on the left show
No branch marked   branching. If, for example, this
   goes to Next   screen had an option that branched to
                                     storyboard 100, it would be annotated
                                     as follows: 1 goto _100_

FIGURE 2-02
Sample Storyboard

(2) <u>Graphic Description</u>. A sketch or detailed description of the graphic that appears on the screen.

(3) <u>Text or Script</u>. The exact text that appears on the screen or a script of the audio that is heard with a screen.

(4) <u>Special Directions</u>. Any special directions required for graphic creation or programming.

(5) <u>File Names</u>. The text, audio, graphic, or screen file names if they are files external to an authoring system or authoring/programming language.

(6) <u>Branching</u>. All forward (goto) and backward (comes from) screen branching not defined as a course convention or standard.

d. <u>Summary of Activities and Practice Questions by Topic, Lesson, and ELO</u>. This section contains a description of the activities and questions associated with a particular ELO.

e. <u>Predevelopment Walkthrough (Use Checklist)</u>. This section contains the completed checklist generated by the predevelopment walkthrough. An example of a pre/postdevelopment checklist can be seen in FIGURE 2-03. The predevelopment walkthrough consists of a review of the course flow, the storyboards, and the course conventions and standards.

2.4. <u>DEVELOPMENT</u>. This phase includes the development of a lesson prototype, the developed courseware, the development of text materials required to support or supplement the courseware, a plan for validating the completed course, a report of the results of the actual validation, and a review of the courseware and any courseware materials. When development of CBT by other than formal school activities is contemplated, the Project Manager/Officer will ensure that the requirements set forth in references (a), (b), (c), and this standard are met.

2.4.1. <u>Tasks</u>. The tasks in this phase include authoring or programming the information on the storyboards, writing any supporting courseware materials, devising a plan for validation, conducting the validation, writing an analysis of the validation results, and revising the courseware as required.

PRE/POSTDEVELOPMENT WALKTHROUGH (CHECKLIST)

Topic:

Lesson:

	YES	NO	N/A
The subject matter was technically correct.			
The instruction centered around the objectives.			
The subject matter was appropriate to actual job tasks.			
The reading grade level was appropriate to the average student.			
The wording was clear and concise.			
The interactions were appropriate to lesson content.			
The end-of-lesson activity was pertinent to the lesson.			
The end-of-lesson activity was technically correct.			
The feedback for the activity reinforced student response.			
The feedback for the activity was technically correct.			

Summary:

FIGURE 2-03 page 1 of 2
Sample of Pre/postdevelopment Walkthrough (Checklists)

PRE/POSTDEVELOPMENT WALKTHROUGH (CHECKLIST) (CONTINUED)

Practice Exercise Review Form

Topic:

	YES	NO	N/A
The practice exercises were pertinent to the topic.			
The practice exercises were technically correct.			
The feedback for the practice exercises reinforced student response.			
The feedback for the practice exercises was technically correct.			
The review screens for the practice exercises present material appropriate to the question.			

Summary:

Pre/Posttest Review Form

Course:

	YES	NO	N/A
The questions were pertinent to the course objectives.			
The questions were technically correct.			

Summary:

FIGURE 2-03 page 2 of 2
Sample of Pre/postdevelopment Walkthrough (Checklists)

2.4.2. <u>Courseware Prototype</u>. This requirement includes machine-readable copies of a developed lesson or section of the course. The prototype must be representative of the entire course and must have all branches active. Instructions for installing and executing the prototype software and the storyboards from which the prototype was developed will also be included.

2.4.3. <u>Courseware and Associated Guides</u>. This requirement will be submitted separately from other deliverables and will include a machine-readable copy of the courseware, a machine-readable copy of the authoring screens or uncompiled program code, a User's Guide, and an Instructor's/Administrator's Guide. The User's Guide will contain the following information:

    a. Software installation instructions and hardware requirements

    b. Explanations of course conventions including color coding conventions and hot keys

    c. Summary of the lessons and the lesson objectives

    d. Any other information necessary to use the course

    e. Courseware glossary

The User's Guide will be included as a file on the machine-readable copy of the courseware unless the necessary information is included as an option in the course.

The Instructor's/Administrator's Guide will contain the following information:

    a. Software installation instructions and hardware requirements

    b. Student recordkeeping procedures

    c. Any other information necessary for monitoring the student progress

2.4.4. <u>Courseware Validation Document</u>. This section of the document describes the plan by which the course will be validated (see FIGURE 2-04). The validation plan will include the following information:

    a. Number of students required

    b. Type of students required

    c. Type of equipment required

    d. Time required for validation
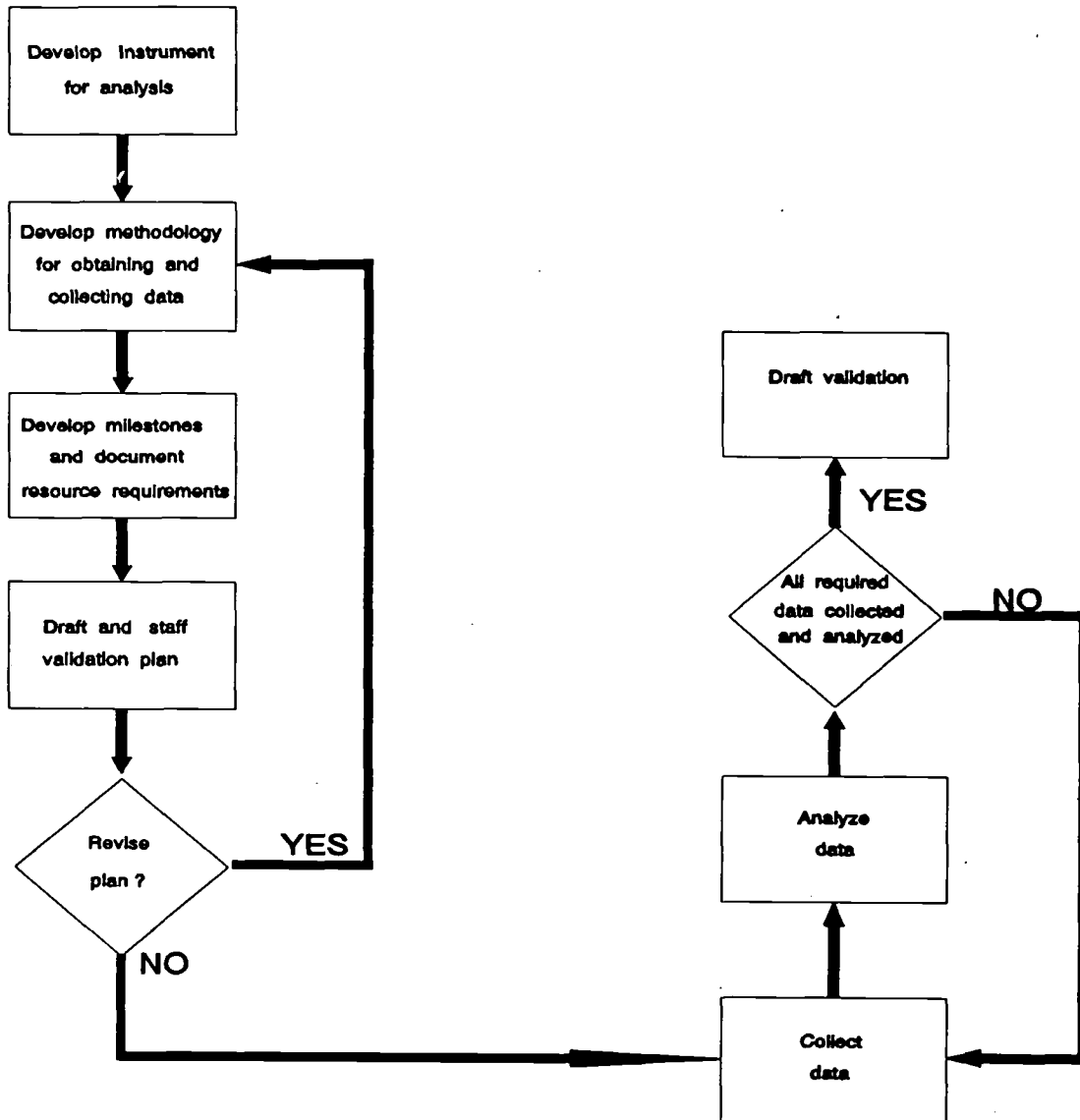
FIGURE 2-04
Diagram of Validation Steps

e.   Description of items to be validated

f.   Copies of forms to be used during validation

g.   Criteria and methodology by which the course is considered validated

This section also contains the completed checklist generated by the postdevelopment walkthrough. An example of a pre/postdevelopment walkthrough checklist can be seen in FIGURE 2-03. The postdevelopment walkthrough consists of a review of the developed courseware and supporting documentation.

2.4.5. Courseware Validation Report. This section provides an analysis of the results of validation and the user rating form(s) that were completed during course validation. An example of a student rating form can be seen in FIGURE 2-05.

2.5. IMPLEMENTATION. The implementation phase of the development process involves the rehearsals and presentation of the courseware and testing process. Formal school activity heads are responsible for this phase. When development of CBT by other than formal school activities is contemplated, the Project Manager/Officer will ensure that the requirements set forth in references (a), (b), (c), and this standard are met.

2.5.1. Tasks. During this phase, an inventory of all instructional materials should be made. A schedule for training instructors or courseware administrators and a schedule for implementing the courseware should be developed.

2.5.2. Courseware Implementation Plan. This document defines the schedule for implementation of the CBT course. Included within this document are the Materials Distribution Schedule, the Instructor's/Administrator's Training Schedule, and the Courseware Implementation Schedule. See Appendix J for a sample of the document.

a.   Materials Distribution Schedule. This section of the document itemizes all of the materials necessary for the CBT course to be given. This includes all instructor or administrator materials, instructional media, and a user's guide. The document also includes a schedule for the distribution of the instructional materials to the commands and/or the schools and a schedule for the implementation of the course.

Rate the following items.

	YES	NO	N/A
The software installation directions provided in the User's Guide were clear and concise.			
The course instructions provided in the User's Guide or online were helpful.			
The wording in the lessons was clear and concise.			
The lessons held my interest.			
The graphics supported the point of the text.			
When I was asked to do something, the directions were clear.			
The computer screens did NOT create eye strain.			
The computer screens were attractive in terms of color and lettering used.			
The end-of-lesson activities were appropriate for the lesson.			
The feedback for the end-of-lesson activities was helpful.			
The practice exercises were appropriate for the topic.			
The feedback for the practice exercises was helpful.			
Overall, the course was user friendly.			

Comments:

FIGURE 2-05
Sample of Courseware Student Rating Form

b. **Instructor's/Administrator's Training Schedule.** This section of the document defines the schedule for school instructors or courseware administrators to learn about the courseware, instruction materials, and student recordkeeping functions. For implementation in formal schools, this schedule will include the time, date, location of the classes, and a description of the instructors to be present. For implementation in other than formal schools, a training schedule will not be required. Instead of a training schedule, this section of the document will identify the number of administrators to be trained and the time required for training. In both cases, this section will include an outline of the items that will be taught.

c. **Courseware Implementation Schedule.** For implementation in formal schools, the schedule will include the number of classes to be offered, time, date, and location of the classes, length of class (in hours and/or calendar days), class size (maximum, minimum, optimum number of students), instructor/ support manning for each class, and a description of students who should attend the class. For implementation in other than formal schools, the schedule will provide the date that the course will be available for implementation and a description of the type of person who would benefit from the course.

2.6. **EVALUATION.** The evaluation phase involves both internal and external evaluation of the courseware and an analysis of the results. Revisions to the courseware and methods of presentation, as necessary, will be based upon recommendations from internal and external evaluations.

a. Internal evaluations will consist of, but will not be limited to, the following:

(1) An analysis of the student tests and rating forms to determine student mastery of the subject matter

(2) An analysis of the instructional materials, equipment, and, where applicable, instructor methodologies

b. External evaluations will consist of, but will not be limited to, the following:

(1) Feedback on job performance of graduates as reported by the graduates' supervisors to determine the effectiveness of the training

(2) Additional feedback from the graduates after they have returned to their jobs and had some time to put into practice the objectives of the training

c. The products of both the internal and external review processes are recommendations for any possible changes and/or revisions to the courseware, instructional materials, equipment, or instructional procedures.

d. The scope and impact of the changes and/or revisions on the courseware are presented in the evaluation plan.

e. Formal school activity heads are tasked with the responsibility of this phase. When development of a CBT by other than formal school activities is contemplated, the Project Manager/Officer will ensure that all requirements set forth in references (a), (b), (c), and this standard are met.

2.6.1. Tasks. During the internal evaluation task, tests and rating forms are examined to determine student mastery and the effectiveness of the instructional materials, equipment, and courseware. The external evaluation involves feedback on job performance of graduates from both the former student and supervisors. This feedback assists in the evaluation of the effectiveness of the training. The results from both the internal and external evaluation processes help identify whether or not the concept analysis correctly identified the necessary learning objectives and/or the correct teaching methodology in attaining the objectives. From this evaluation process comes recommendations for any necessary courseware revisions or enhancements.

2.6.2. Courseware Evaluation Plan. This document presents the method to be used in the required ongoing evaluation of the courseware. See Appendix K for a sample of this document.

a. Internal Evaluation Plan. This section describes when the reviews should be started, the processes to be undertaken for the collection of information, and the type of analysis that should be accomplished. During the internal evaluation, student test results, instructional materials used, and student comments should all be reviewed. In the case of formal schools, instructor proficiency, classroom organization and environment, and instructor comments should also be reviewed. Data collection forms should be developed and included within this section.

b. External Evaluation Plan. This section describes how information external to the learning environment should be collected, who should provide that information, and the type of analysis that should be accomplished along with the frequency of that analysis. Data collection forms should be developed and included within this section.

c. <u>Courseware Problem Report (CWPR)</u>. The CWPR will be used to report all problems that arise in the validation portion of the courseware acceptance testing process. Courseware will not be fielded if there are outstanding CWPRs unless the Project Manager/Officer approves the decision to conditionally accept and release the courseware to the field sites. The CWPR is further explained in Chapter 4 of this IRM.

d. <u>Courseware Change Request (CWCR)</u>. The CWCR will be used to document all revisions and enhancements determined to be necessary as a result of either the internal or external evaluation process. This form will then be used to determine levels of effort and priorities. The CWCR is further explained in Chapter 4 of this IRM.

2.6.3. <u>Courseware Evaluation Report</u>. This document analyzes the recommendations resulting from internal and external evaluations, determines the scope of the recommendations, and defines the impact on the overall course.

a. <u>Analysis of Courseware Revisions and/or Enhancements</u>. The analysis will divide the recommendations into two categories:

(1) <u>Courseware Revisions</u>. Recommendations will be categorized as revisions when they identify technical, courseware, or programming errors or deficiencies.

(2) <u>Courseware Enhancements</u>. Recommendations not categorized as revisions will be considered enhancements. Enhancements include additional student options such as online references, graphic changes made for appearance rather than for technical deficiencies, script changes that do not affect technical content, and other changes that affect the flow or appearance of the courseware but do not correct inaccuracies or deficiencies.

b. <u>Scope of the Revisions and/or Enhancements</u>. This section will describe the magnitude of the revisions and/or enhancements. The description will include items such as the number of existing screens that will be affected by the revision and/or enhancement, the number of screens that will need to be added or deleted to comply with the revision and/or enhancement, the number of graphics that will need to be created or revised, the amount of rescripting or reprogramming, and any other design or development issues that will be affected. These numbers can be presented as percentages.

   c.   <u>Impact of the Revisions and/or Enhancements</u>. This
section will describe the effect of the revisions and/or
enhancements on ʻhe total courseware package. This description
will include iss ɘs such as additional cost and time required to
comply with the ʻevisions or enhancements, the effect that the
revisions or enhancements have on the quality of the courseware,
and the effects the revisions or enhancements could have on
following courses.

Chapter Table of Contents

Chapter 3

DOCUMENTATION

Chapter 3

DOCUMENTATION

3.1. PURPOSE. The purpose of establishing criteria for CBT documentation is to ensure consistency in the presentation of all documentation for CBT courseware. Responsible Project Managers/Officers are to ensure these documents are completed as described in the following sections of this chapter. The documentation can be submitted as paper-based or electronic media.

3.2. SIZING OF DOCUMENTS. The size of the documents depends on the magnitude and complexity of the courseware, the decision of the Project Manager/Officer, the environment where it will be used, and other factors. Each of the sections within a given document type, however, generally bears a relationship to the other sections of that same document in its percentage of volume. For detailed information on documentation and project complexity, refer to Section 6 of DoD-STD-7935A.

3.3. CONCEPT ANALYSIS DOCUMENT. The purpose of the Concept Analysis Document is to document the conclusions from the SAT analysis phase. An example of a Concept Analysis Document can be seen in Appendix D. This document will be formatted following the standards established in the Project Deliverable Style Manual, IRM 5230-02. The document will contain seven sections, with subsections divided as follows:

    a.   Section 1: Need/Deficiency Statement

    b.   Section 2: Course Purpose, Goal, and Scope Statement

        (1)   Purpose

        (2)   Goal

        (3)   Scope

    c.   Section 3: Subject Matter Identification and Review

        (1)   Identification of Subject Matter Specialist

        (2)   List of Subject Matter References

        (3)   Results From Job Analysis and/or Review of Subject Matter References

    d.   Section 4: Topic/Task Inventory and Selection Criteria

        (1)   Each selected topic/task will be a separate subsection.

(2)   A visual summary of topic/task selection criteria will be included. Refer to FIGURE 4-01 of Appendix D for an example.

    e. Section 5:   Descriptions of Learners, Course Content, and Prerequisites

        (1)   Description of Learners

        (2)   Description of Course Content

        (3)   Description of Prerequisites

    f.   Section 6:   Requirements

        (1)   Estimated Resources Requirements

        (2)   Estimated Materials Requirements

        (3)   Estimated Equipment Requirements

    g.   Section 7:   Rationale for Method, Media, and CBT Authoring System Selection

        (1)   Method

        (2)   Media

        (3)   CBT Authoring System Selection

3.4.   COURSEWARE OBJECTIVES DOCUMENT. The purpose of this document is to determine course objectives to the lesson level and to establish the teaching points and testing scenarios to support those objectives. This document will contain a grouped/sequential list of the enabling learning objectives (ELOs) with behavior, conditions, and standards. An example of a Courseware Objectives Document can be seen in Appendix E. The format of the document will be consistent with the example provided in Appendix E and will contain the following information:

    a.   The first page will list the course name followed by the TLO(s) with behavior, condition, and standard.

    b.   Each lesson will appear on a separate page following the first page.

    c.   A lesson page will contain the following items in the order presented below.

        (1)   The topic name at the top

        (2)   The ELO that applies to the lesson

(3) The lesson name

(4) The behavior, condition, and standard for the ELO

(5) The major teaching points

(6) Test scenarios (to measure mastery of objectives)

3.5. COURSEWARE DESIGN DOCUMENT. The purpose of the courseware design document is to provide a description of the actual course. An example of a Courseware Design Document can be seen in Appendix F. This document will contain the sections listed below.

3.5.1. Courseware Level of Interactivity Statement. This statement will be in paragraph form and will appear on the first page of the document.

3.5.2. Courseware General Design of Flow Charts. The flow charts will provide a detailed map of the intended logic of the courseware. The charts will include all defined lesson tasks, decision points, branching options, remediations, and other screen activities to show the design of the course. Flow charts will identify all CBT blocks of instruction clearly, using flow diagram language and explaining all symbols used.

3.5.3. Courseware Detailed Design of Storyboards. The storyboards will provide a blueprint for the development of the CBT. They will include all required information and directions for the graphic artist, programmer and instructional designer. A separate storyboard will be created for each screen in the lesson. Course conventions or standards can be summarized on a cover storyboard. Buffer pages will be inserted between lessons and topics. The format of the storyboards will be as follows:

    a. Page layout. The storyboard may be displayed on either a single page or facing page layout, in a paper or a government approved automated storyboard format.

        (1) Single page layout. The single page layout will provide three distinct areas on the page for the following information: one area reserved for sketches or descriptions of graphics; another area for text or audio; a third area for special graphic creation, audio, or programming directions. Additional areas on the page will be provided for branching directions and filenames if the files are external to the authoring system.

        (2) Facing page layout. The facing page layout will provide two distinct sections on one page: sketches or descriptions of graphics and the text/audio. The facing or opposing page will provide special directions, branching directions, and file names if external to the authoring system.

b. <u>Paper size</u>. The paper size can be either 8 1/2 x 11 inches or 8 1/2 x 14 inches, depending on the content requirements.

c. <u>Page numbering</u>. Pages will be numbered consecutively. Inserted pages will have the same number as the preceding page but the number will be followed by a letter, starting with letter a. Deleted pages will be noted by number on the preceding page. For example, if a storyboard is added between storyboards 8 and 9, the added storyboard will be numbered 8a. If storyboard 11 is deleted, storyboard 10 will contain the note "no 11" next to the number.

3.5.4. <u>Summary of Activities, Practice Questions, and Pre/posttest Questions by Topic, Lesson, and ELO</u>. This section provides a description of the activities and questions associated with a particular ELO. The section will be divided as follows:

a. <u>Topic</u>: The topic name or descriptor

b. <u>Lesson</u>: The lesson name or descriptor

c. <u>ELO</u>: The ELO that applies to this lesson

d. <u>Activity</u>: A description of the lesson activity, if applicable

e. <u>Practice</u>: A description of the topic practice that applies to the lesson, if applicable

f. <u>Pre/posttest</u>: A description of the pre/posttest questions that apply to the lesson

3.5.5. <u>Predevelopment Walkthrough</u>. The predevelopment walkthrough checklist will provide separate forms for each lesson, a form for ungraded activities and practice exercises, and a form for graded tests. The forms will prompt for responses on technical, structural, and grammatical correctness and user friendliness. An example of a checklist can be seen in FIGURE 2-03.

3.6. <u>COURSEWARE PROTOTYPE</u>. The purpose of the Courseware Prototype is to provide a completed lesson that represents the style and flow of the course. The following documentation will be submitted with the prototype:

a. The storyboards from which the prototype was developed

b. Software installation instructions and any other documentation required for review

3.7. COURSEWARE USER'S GUIDE, INSTRUCTOR'S/ADMINISTRATOR'S GUIDE, AND COPY OF COURSEWARE. The purpose of both guides is to provide detailed directions for using the Courseware and the Course Management features.

3.7.1. User's Guide. The User's Guide will be formatted according to the standards established in the style guide for User Manuals, IRM 5231-07A. The electronic version of this document will be included with the copy of the courseware as a "read.me" file unless the course offers an option that explains course flow and conventions. See Appendix G for a sample of this document. The guide will contain the following sections:

   a. Section 1: Software installation instructions and hardware requirements

   b. Section 2: Explanation of course conventions and hot keys (how to use the course)

   c. Section 3: Lesson objectives without behavior, conditions, and standards and a brief summary of each lesson

   d. Section 4: Other information as required by the design of the course or the subject matter

   e. Appendix A: Course glossary

3.7.2. Instructor's/Administrator's Guide. The Instructor's/Administrator's Guide will also be formatted according to the standards established in the style guide for User Manuals, IRM 5231-07A. See Appendix H for a sample of this document. The guide will contain the following sections:

   a. Section 1: Software installation instructions and hardware requirements

   b. Section 2: Explanation and instructions for using the student recordkeeping or Course Management features

   c. Section 3: Lesson objectives without behavior, conditions, and standards and a brief summary of each lesson

   d. Section 4: Other information as required by the design of the course or the subject matter

3.7.3. Electronic Copy of Authoring Screen or Program Code. This section of the document will be submitted in electronic media and will contain the uncompiled code generated by the authoring system or programming language.

3.8. COURSEWARE VALIDATION DOCUMENT. The purpose of the Courseware Validation Document is to establish the criteria for validation, provide rating forms for users, and provide the postdevelopment checklist. The document will define the following:

    a. The target audience

    b. Additional personnel required

    c. Location of validation

    d. Type of equipment required

    e. Criteria by which a test is considered validated

    f. Criteria by which the course is considered validated

3.8.1. Courseware Rating Form for Users. The completed courseware rating forms for students will be submitted with the Courseware Validation Report. An example of a course rating form can be seen in FIGURE 2-05.

3.8.2. Postdevelopment Walkthrough (Use Checklist). The postdevelopment walkthrough checklist will provide separate forms for each lesson, a form for ungraded activities and practice exercises, and a form for graded tests. The forms will prompt for responses on technical, structural, and grammatical correctness, screen design, and user friendliness. An example of a checklist can be seen in FIGURE 2-03.

3.9. COURSEWARE VALIDATION REPORT. The purpose of this report is to provide an analysis of the results of validation. In cases where results are presented as statistics, the statistics will be documented as figures or tables.

3.10. COURSEWARE IMPLEMENTATION PLAN. The purpose of this document is to determine how and when the courseware will be implemented. This document will contain three sections that will detail exactly what will be done during the implementation phase and how and when it will be accomplished. A copy of the Implementation Plan can be seen in Appendix J. The format of the document will be consistent with the example provided in Appendix J and will contain the sections listed below.

3.10.1. Material Distribution Schedule. This section provides the software delivery date and the time required for installation. Hardware specifications, including required disk space and memory, are also provided in this section.

3.10.2. Instructor's/Administrator's Training Schedule. This section details the number of instructors or administrators who will be trained on the different aspects of the course and the student management program and the time required for training.

3.10.3. <u>Courseware Implementation Plan</u>. The last section provides the date of actual courseware implementation. In most cases, the date of implementation will be dependent on the completion of validation.

3.11. <u>COURSEWARE EVALUATION PLAN</u>. The purpose of this document is to describe and explain the methods that will be used for internal and external evaluation. The document will contain three sections. Section 1 will provide an overview of the evaluation method, section 2 will describe the internal evaluation, and section 3 will describe the external evaluation. A copy of the Courseware Evaluation Plan can be seen in Appendix K. The format of the document will be consistent with the example provided in Appendix K and will contain the sections listed below.

3.11.1. <u>Method of Evaluation</u>. This section provides an overview of the internal and external evaluation methods, the date of the evaluation, and the tools that will be used.

3.11.2. <u>Internal Evaluation</u>. This section provides a detailed description of the type of analysis that will be performed on student records and will define the expected results. Examples of student rating forms and explanations of how these forms will be used are also included in this section.

3.11.3. <u>External Evaluation</u>. This section provides a detailed description of the steps that will be taken for external evaluation. Examples of student and supervisor rating forms and explanations of how these forms will be used are also included in this section.

3.12. <u>COURSEWARE EVALUATION REPORT</u>. The purpose of this document is to provide the statistics that resulted from the evaluation. The document will contain the following four sections:

   a. Section 1: An analysis of the statistics gathered and completed

   b. Section 2: An analysis of the revisions and/or enhancements that resulted from evaluation

   c. Section 3: The scope of the revisions and/or enhancements

   d. Section 4: An analysis of the impact of the revisions and/or enhancements

3.12.1. <u>Results of Evaluation</u>. This section provides the raw statistics gathered during evaluation. The statistics will be presented in an easily readable format, such as a table. This section also provides an explanation of the statistics.

3.12.2. <u>Analysis of Courseware Revisions and/or Enhancements</u>.
This section provides a description of the revisions and/or
enhancements that are required or recommended as a result of
evaluation.

3.12.3. <u>Scope of Courseware Revisions and/or Enhancements</u>. This
section identifies the sections of the course that are affected
and describes how they are affected.

3.12.4. <u>Impact of Courseware Revisions and/or Enhancements</u>.
This section defines the effect of the revisions/enhancements
over the course, including cost and the time involved.

Chapter Table of Contents

Chapter 4

COURSEWARE MANAGEMENT

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Chapter 4

COURSEWARE MANAGEMENT

4.1. PURPOSE. The subsequent paragraphs describe the
identification process of Courseware Items (CWIs) to be placed
under Courseware Management (CWM).

4.2. COURSEWARE AND DOCUMENTATION. The development of CWIs and
their corresponding documentation is usually determined by the
need to control an item's inherent characteristics and/or to
control that item's interface and dependencies with other items.
Because these prerequisites do exist, all courseware authorized
and developed for use on Marine Corps equipment and any relative
documentation will be subject to CWM control.

4.2.1. Identification of Software/Courseware. Identifying
software as a CWI is the responsibility of the Marine Corps
activity authorizing the courseware development. Courseware
identification for an existing courseware package will be
established in the form of current specifications, manuals,
hardware characteristics, and the documentation of any courseware
interface that is relevant to operating the CWIs. The
identification of new courseware under the first phase of
development will be as described in the form of functional and
technical documentation. This identification process becomes
more detailed as design and validation progress. The
documentation gathered during the CWIs' identification process
will be used as the basis for courseware and status accounting
throughout the CWIs' life cycle. These procedures require the
development of formal departure points called baselines. The
information gathered in the identification process will become
the foundation for these baselines.

4.2.2. Identification of Courseware Documentation. Once the
determination has been made to place a software/courseware
package under CWM, the corresponding documents will have to be
identified. A conformity must exist between the documentation
and the performance of the courseware. For this reason the
identified documents will be incorporated into the baselines and
will be subject to CWM.

4.2.3. Numbering and Marking Conventions. Media containing
courseware and related documents will display proper
identification including the courseware name, CWI number, release
level, and release date. If the documentation for a particular
courseware release has not changed, a new cover sheet for the
document will reflect the new related courseware release. The
CWI number will remain constant throughout the life cycle of the
courseware and its corresponding documents. FIGURES 4-01 and 4-
02 provide examples of the assignment of supporting CWIs.

The CWI number is a four-part number in the format of "mnnxxc" where:

    a.   "m" will equate to one of the following:

    "1" will indicate a Commercial-Off-The-Shelf (COTS) software/courseware item

    "2" will indicate a Marine Corps developed software/courseware item

    "3" will indicate an outside developed software/courseware item

    b.   "nn" will equate to 01 to 99 for sequencing purposes.

    Example: If Banyan CBT is the 1st Marine Corps developed CBT System under CWM, the "nn" will equal 01.

    c.   "xx" will equal "00" for the identification of software/courseware and will be greater than 00 for the identification of the related documentation. Specification type documentation will be numbered 01 - 29 as follows:

```
01 = Concept Analysis Document
02 = Courseware Objectives Document
03 = Courseware Design Document
04 = Courseware User's Guide
05 = Courseware Validation Plan
06 = Implementation Plan
07 = Courseware Evaluation Plan
08 = Courseware Evaluation Report
09 = Instructor's/Administrator's Guide
10 - 29:  To Be Determined
```

Procedures and plans will be numbered 30 - 49 as follows:

```
30 = Test Procedures
31 = Test Plans
32 = Training Support Plan
33 = Installation Instructions
34 = Implementation Plan
35 = Telecommunication Support Plan
36 - 49:  To Be Determined
```

Manuals will be numbered 50 - 79 as follows:

```
50 = User's Manual
51 = Operations Manual
52 = Program Maintenance Manual
53 = System Diagnostic Manual
54 = Courseware Support Manual
55 - 79:  To Be Determined
```

d.   "c" will equal 0 through 3 where:

   "0" will equate to unclassified courseware

   "1" will equate to confidential courseware

   "2" will equate to secret level courseware

   "3" will equate to top secret level courseware

```
Banyan Tutorial
Users Manual CWI#:   201500    2     01    50    0
                               ─     ──    ──    ─
                               m     nn    xx    c
                               .     .     .     .
   "2" Marine Corps Developed ___.   .     .     .
                                     .     .     .
   "01" for 1st Marine Corps         .     .     .
   developed system placed           .     .     .
   under configuration control       .     .     .
   at development site  _____. .     .
                                           .     .
   "50" for Users Manual  _____.    .
                                                .
   "0" for unclassified  _____.
```

FIGURE 4-01
Documentation Identification Numbering

```
Banyan CWI#:  201000
CBT                                 2    01    00    0
                                    ─    ──    ──    ─
                                    m    nn    xx    c
                                    .    .     .     .
"2" Marine Corps Developed ____ .   .     .     .
                                          .     .     .
"01" for 1st Marine Corps                 .     .     .
developed system placed                   .     .     .
under configuration control               .     .     .
at development site _____.    .     .
                                                .     .
"00" for Software _____.      .
                                                      .
"0" for unclassified _____.
```

FIGURE 4-02
Software Identification Numbering

4.2.3.1. Software/Courseware Release Numbering and Marking.
Software releases will be labeled with the CWI number, release
level, release date, and any description identification that may
be appropriate. In each case the release level reflects the
issue status. The release level for the software is a three-
part number in the format "VER.mm.nn.xx", where "mm" has a value
of 01 to 99, "nn" has a value of 00 to 99, and "xx" has a value
of 00 to 99. A change in the "mm" number identifies the release
of a major software change to the courseware. Changes in the
"nn" identify modifications of lesser magnitude. A change in the
"xx" indicates a complete upgrade in the software/courseware.


```
Banyan CWI#:  201000           . . May 18, 1991
CBT                    .       .   VER.01.00.01
                       .       .               .
Software/Courseware .          .               .
Item Number _____.          .               .
                               .               .
Courseware Release Date _____.              .
                                               .
Version Number (VER.mm.nn.xx),                 .
initial release                                .
of Banyan CBT _____.
```

FIGURE 4-03
Software/Courseware Identification Number
with Version Control

4-6

4.2.3.2. Courseware Numbering. Once courseware (documents/ software) is placed under CWM, the courseware remains unaltered until either:

    a. It is amended by an authorized and released CWCR.

    b. It is totally replaced by a new release and an authorized issue.

      (1) In each case the release level of the courseware reflects the issue status of the courseware. The release level is a two-part number in the format "VER.mm.nn". The "mm" is the version with a value of 01 to 99. When major modifications are made to the courseware, a total reprint of the courseware will occur with a change to the "mm" value. The "nn" is the amendment level within that version with a value of 00 to 99. A modification to the courseware by the insertion of change pages will change the "nn" value. A total reprint of the courseware will take place when a third of the courseware is changed.

      (2) The release level of courseware does not necessarily have to correspond to the release level of the related documents. There can be major modifications applied to one that will not affect the other.

4.2.4. Documentation Administration. Documentation preparation is a continuing effort in the life cycle process of courseware development. Documentation should reflect standards, indicate alternative courses of action, and record decisions. Documentation also serves to:

    a. Provide managers with informational documents to review at significant developmental milestones to determine if requirements have been met and resources, such as people or equipment, should continue to be used or expanded.

    b. Simplify future development/modification of systems and programs by providing full detail in support of each module of the courseware.

    c. Provide data necessary for answering inquiries regarding operation of the courseware items.

    d. Aid in instructing new personnel by providing background on previous courseware revisions and serve as a guideline for new development.

(1) Documentation Administrator. To ensure all documentation requirements are fulfilled, the Marine Corps Formal School, Central Design and Programming Activity (CDPA), or the Headquarters Marine Corps (HQMC) Functional Manager, such as Command, Control, Communications and Computer Division, Manpower Management Information Systems Division, or Training Management, that sponsored courseware development will serve as documentation administrator, performing the following functions:

(a) Coordinate and control development of new documentation and the revisions of existing documents.

(b) Review new documentation releases.

(c) Establish and maintain a library for Marine Corps courseware-specific documents.

Documentation users will submit recommendations for changes and/or inquiries concerning their content to the respective documentation administrator.

(2) Physical Control. The respective documentation administrator will be responsible for maintaining a library of courseware and document masters. This will be accomplished in a physically secured storage container.

(a) The courseware will be contained on some form of magnetic medium while the documents will be stored on both hard copy and magnetic media. A minimum of three release levels for both courseware and documentation will be held at one time in the library. Any issues previous to these will be kept in a repository for the life of the courseware. Once the courseware item is no longer utilized, the most current version of the CWI package will be held for 5 years in the repository with previous versions destroyed.

(b) If the documentation is an amended release and not a re-issue of the complete document, the amended pages will be incorporated into the main document. A front sheet featuring the new release level and release date along with the amendment instructions will be attached to the front of the document.

4.3. COURSEWARE CHANGE CONTROL PROCESS. Decisions made concerning any courseware changes must be directed to all parties concerned. These changes include everything from lesson modifications to utilization of a new courseware version release. The respective documentation administrator will be notified by all Marine Corps personnel or developers considering any type of modification. This will be accomplished through the use of a Courseware Problem Report (CWPR). See Appendix L for instructions concerning the CWPR and for a sample form. Once the request has been received by the documentation administrator, an extensive analysis will be performed and if found valid or feasible, a Courseware Change Request (CWCR) will be generated.

See Appendix M for an example of the CWCR and amplifying instructions on its use. If the CWCR is approved, the documentation administrator will update the CWI baseline and notify in writing all interested personnel of the approved change. To ensure that compatibility and traceability exist between the baselines of a CWI, status accounting procedures will be established, and a series of reviews and audits will be conducted during the transition phase of a CWI. The respective documentation administrator is responsible for maintaining these accounting procedures.

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Chapter Table of Contents

Chapter 5

AUTHORING STANDARDS

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Chapter 5

AUTHORING STANDARDS

5.1. <u>GENERAL GUIDELINES</u>. MIL-STD-1379D is the Department of Defense's standard for Military Training Programs. The proposed Appendix D to this MIL-STD, dated 30 July 1990, provides guidance with respect to software interface and command requirements for interactive courseware and authoring systems. This guidance should be consulted for changes before initiating CBT development. Since CBT is visual, it is important to follow screen design standards to ensure that the screens are uncluttered, are independently clear, and are formatted to allow quick comprehension. Additionally, the screens must be aesthetically pleasing and readable. Screen formats should always make the most effective use of white space, colors, text/audio, and graphics to ensure that the program is interesting and easy to use.

5.2. <u>TEXT</u>. The number of words and lines per screen, the number of characters per line, and the font types and sizes depend on design. There is, however, a general rule of text limits for readability. FIGURE 5-01 provides the guidelines for text limits.

a. When selecting fonts and font sizes, choose a style that is easy to read and use that style consistently throughout the course. In general, thinner fonts are easier to read than thicker ones, and lowercase lettering is easier to read than all uppercase lettering. Avoid large type. If a single word requires more than a single eye fixation, it is likely the student will misread the word.

b. Do not use boldface and color type for the main body of the text. Both tend to fill in the space between letters. On poor-quality monitors, some of the text could be illegible.

c. Line length should be planned to make it as easy as possible for a learner's eyes to move from the end of one line to the start of the next. Shorter lines of text require less eye movement.

d. Do not use hyphens to break words at the end of a line. Hyphens are common in printed text, but they are awkward on the computer screen. Since they require learners to recognize a single word over two lines, they are hard to read.

Text limits per screen	45 words 10 lines
Text limits per line	40 characters including spaces
Fonts	Use simple letter style such as Helvetica or Courier Avoid condensed letters Use no more than three fonts per screen Use thin rather than thick lettering Avoid large type Avoid boldface and color type for the main text
Safe areas	Avoid screen clutter - text and graphic should not use more than 80% of the total screen
Quick comprehension	Be concise; omit unnecessary words, especially articles

FIGURE 5-01
Text Limits for Readability

5.3. AUDIO. When digitized audio is used in CBT, the courseware must appeal to both the eye and the ear to derive the maximum benefit. The principles listed below will ensure effective communication to both senses.

a. Narration (audio) should be used to explain details, suggest relationships, or supply any kind of information that cannot be adequately explained in the graphic.

b. Narration should always be related to the graphic being seen. The narration should not compete with the graphic by describing or calling attention to details not in the visual. If in doubt, ask if the narration complements the graphic. If the answer is no, rewrite the narration until it does, replace or revise the visual.

c. Narration should identify or describe the content of a graphic as soon as the graphic appears. Do not make the users guess what the graphic is about.

d. Narration should always be simply stated. Do not use long, complicated sentences. Use a simple vocabulary. Try to strike a balance between brevity and simplicity without talking down to the users.

e. The pace of the narration should be varied. Allow for breaks of silence to bridge different graphics.

f. One graphic should not be left on the screen for more than 20 seconds of audio. If more time is necessary to explain a graphic, follow the first one with a second, similar graphic.

g. Audio should not be compressed to the point of hissing or distortion. Make certain that the audio is clearly understandable and free of background noise.

h. The audio level must be consistent throughout the course.

i. Audio should "read" displayed text for learners only when the following or similar conditions apply:

(1) Pronunciation of the displayed text is being taught.

(2) Learners have known reading problems.

(3) It is essential that learners do not miss an instruction important to the lesson or to the conduct of the lesson.

j. If the audio reads text on the screen, the text and audio must be identical.

5.4. GRAPHICS. Since graphics are an important part of CBT, they should be designed and incorporated with consideration for their overall effectiveness. Use graphics that will provide a clearer understanding of the material, reduce the required amount of text or audio, emphasize or clarify important points, or aid retention or recall of the information. Additionally, graphics should be simple, well balanced, evenly spaced, and large enough in size and format to be read and comprehended quickly. Colors must be consistent throughout the entire course and should provide contrast so the images are clear and distinct. Text and graphics should not use more than 80 percent of the total screen area.

a. When planning graphics, consider the following issues:

(1) Do not use graphics that are more complex or contain more information than is needed to demonstrate the point. Too many details can overload memory and confuse the learner. Learners will not know which parts of the graphic are important.

(2)   If a complicated graphic must be used, break it into simpler parts and present it in steps.

(3)   Avoid unnecessary ornamentation in graphics. Overly decorative borders or fancy boxes around text can distract from what is being presented.

(4)   Avoid optical illusions and alignment flaws such as arrows pointing to the wrong place or graphics not positioned properly.

(5)   Place the text associated with a graphic in a consistent and predictable manner so learners do not have to search for information.

(6)   When descriptive text is used with a graphic, present the graphic and the text at the same time so learners can inspect the graphic and the explanation together.

5.5.   SCREEN FORMAT. Screen format should always make the most effective use of white space, colors, text, and graphics to ensure that the course is interesting and easy to use. Following the guidelines listed below will help to ensure learning effectiveness and user friendliness.

a.   Course prompts. Prompts for inputs to the system concerning program branching should be consistently placed on the screen and should use the same ASCII character throughout the course. These prompts typically appear at the bottom of the screen. If several courses make up one series, the keys used for specifics prompts should be consistent across the courses. For example, if in a course, the function key F1 is placed in the bottom left-hand corner of the screen and is used to provide a help feature, it should be placed in the same corner and should provide help every time it appears on the screen. If the course is part of a series of courses, the placement and function of F1 should remain consistent throughout the series.

b.   Sign posts. Users should always have a sense of where they are in the program. This can be achieved through the use of headers or footers on each frame. When the program is menu-intensive, headers on the same path can be coded with the same color.

c.   Menus. With the exception of information retrieval programs, virtually all CBT should be menu-driven and hierarchical. In an effective menu, advancement through a course or lesson should be easy; and the consequences of decisions should be clear. Follow these guidelines when creating menus:

(1)   Menu options should indicate the contents of the course or lesson.

(2) Use the order of the menu options to illustrate the intended flow of the lesson.

(3) Use a vertical layout for ease in readability.

(4) Use numbers for menu options rather than letters or bullets.

(5) Use parallel structure in options.

(6) Do not abbreviate options.

(7) Do not have more than eight options on one menu. When there are more than eight, create menu levels.

(8) When there is more than one menu level, provide the option to return to the previous level.

An example of a typical menu can be seen in FIGURE 5-02.

```
  Finding Your Way Through Basic DOS

  1.  Creating and Removing Directories
  2.  Changing Directories
  3.  Copying Files
  4.  Renaming Files
  5.  Deleting Files


                          F4 - Return to Main Menu
```
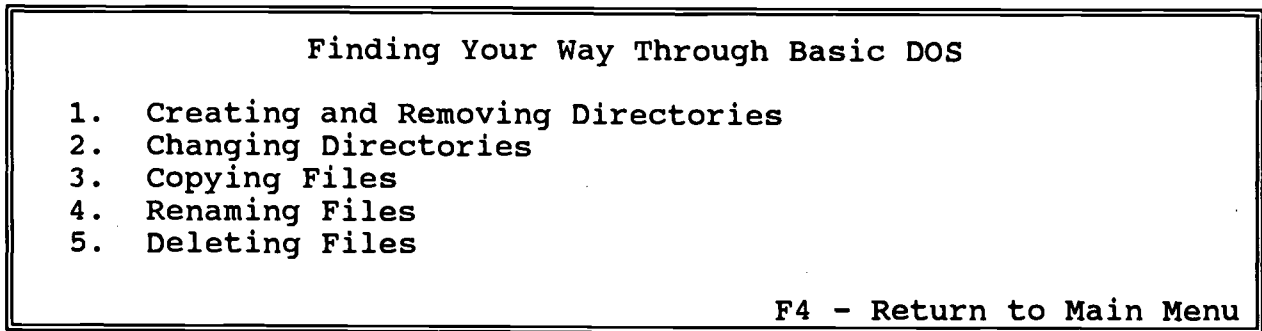
FIGURE 5-02
Typical Menu

d. Colors. Designers should select colors that are complementary and provide reasonable contrast. One excellent technique for ensuring contrast is to develop the screen according to the standard color scheme adopted for the course. Once the screen is complete, view it on a black and white monitor to check for obvious black, white, and shades of gray contrast. The use of colors should be tracked and documented throughout a course to ensure that consistent practices are followed. When using colors for specific purposes, make certain that the color is consistent with any common usage. For example, do not use green for stop or danger and do not use red for go or continue. Additionally, no more than five different colors should be used on one screen. During color selection, avoid color-blind combinations. The two colors most commonly associated with color blindness are green and red, and, in some cases, mixed hues containing green or red, such as orange or violet. Bright greens appear tan and reds appear reddish brown. When using these

colors, be certain to provide contrast between foreground and background colors. Never use color alone to point out important issues. Since color combinations can look different on different computers, they should always be tested on several computers.

e. White space. Using white space (empty screen space) effectively can reduce eye movement and, in turn, reduce eye stain and fatigue. Never use more than 80 percent of the total screen area. Leave white space on both sides of the screen and between text and graphics and screen content and course prompts.

f. Shifting. Items such as text, page numbers, headers, footers, and course prompts that appear on every screen should be placed in exactly the same location on the screen to avoid shifting.

g. Blinking and highlighting. Blinking and highlighting should be used sparingly and strategically. When overused, blinking and highlighting lose their original intent of drawing emphasis to a few critical aspects of the material and can actually detract from the effectiveness of the course. A specific meaning should be assigned to a specific type of highlighting and that meaning should be kept consistent throughout a course or series. Use no more than three forms of highlighting in a course and no more than two forms of highlighting on a screen at the same time.

h. Animation. Animation can help to make a screen more interesting, thereby maintaining the interest of the user. Used incorrectly, however, it can be distracting. Use animation only if the animation reinforces a teaching point or provides significant value to the lesson. Do not use animation simply because animation is available. Do not require learners to read and view animation simultaneously. When text appears with animated graphics, allow the learner to read the text along with a static view of the graphic, and then provide a key to initiate the animation.

5.6. INPUT DEVICES. The input device used for a particular course will depend on several issues:

a. The subject matter of the course

b. The available hardware

c. The user's requirements

(1)   Since a keyboard does not require special equipment and is available with every computer, it should be the primary means of input. A mouse can provide a secondary means. It is important, however, to remember that the keyboard is not user friendly and that certain guidelines should be followed during course design:

(a)   When selecting keys for course prompts, select keys that logically represent their function.

(b)   Be consistent in the use of keys for course prompts.

(c)   Avoid keys that are located closely on the keyboard for course prompts.

(d)   When a mouse is used for input, it should work in conjunction with the keyboard, not as a replacement.

(2)   Two other input devices commonly used in CBT include the touch screen and the light pen. Since both require specific hardware, they should be considered only when course content dictates the necessity for touch input. If a touch screen is used as an input device, touch zones and size must be considered carefully. When plotting touch zones, leave a minimum of 3/4 inch between each touch-active area. Make the touch-active areas large enough to accommodate different angles of touch. If touch input is being used in a program, avoid using dark colors for screen backgrounds. Touch does not work accurately on dark backgrounds. Since monitors have areas called safe areas where touch will not work, identify those areas on the delivery monitor. Safe areas can not be made touch active.

(3) If a light pen is used as an input device, avoid using dark colors for screen backgrounds. The light pen does not work accurately on a dark background. Since monitors have areas called safe areas where light pens will not work, identify those areas on the delivery monitor. Safe areas can not be made light-pen active.

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Appendix A

GLOSSARY

Analysis Survey Report (ASR): Provides information that can be used to improve training and evaluate the structure of an occupation field. The report contains an executive summary, an occupational analysis, and a training analysis. ASRs will be published for specialized skill training and other categories of training for which training standards are developed.

Authoring: A structured approach to developing all components of an interactive courseware program.

Authoring Language: A specialized, high-level, plain-English, language-like computer program (often based on another computer language like BASIC or PASCAL) with codes specifically designed for developing interactive courseware instructional units and handling major courseware needs such as response judging. The instructional logic and instructional content are contained in one program. A set of words, notation, syntax, and semantics used by an author to specify the logic and content of instruction to be delivered by a computer. A high-level language designed to be easily learned and read by people who are concerned with instructional application.

Authoring System: Prepackaged prompted authoring aides, courseware templates, or menu driven editors designed to help authors (without formal programming skills) create interactive courseware without elaborate programming. A high level interface and structured approach to developing and editing interactive courseware. The instructional logic and instructional content are separate.

Automated Information System (AIS): A combination of information, computer, and telecommunications resources, and other information technology and personnel resources that collects, records, processes, stores, communicates, retrieves, and displays information.

CDPA: Central Design and Programmimg Activity.

Computer Assisted Instruction (CAI): The use of computers to aid in the delivery of instruction.

Computer-based Training (CBT): Instruction delivered by a computer which includes CAI, CMI, as well as computer simulation and part-task training. Use of computer systems in a primary or direct support role in the development, delivery, and management of instruction. An instructional methodology where students interact individually to instruction presented through a variety of media controlled and monitored by a computer.

Computer-Managed Instruction (CMI): A CBT application in which the computer manages a learner's progress through a training program. A CMI system supports instruction by selecting, presenting, and scoring tests; recording student progress data; providing feedback on drills and tests; and prescribing use of various learning resources.

Concept Needs Analysis (CNA): A systematic in-depth analysis and verification of training discrepancies identified by a needs assessment, the results of which are the definition of performance deficiencies and the isolation of potential solutions.

COTR: Contracting Officer's Technical Representative.

CWCR: Courseware Change Request.

CWDR: Courseware Design Review.

CWI: Courseware Item.

CWM: Courseware Management.

CWPR: Courseware Problem Report.

Documentation Administrator (DA): The Documentation Administrator is responsible for maintaining a library for the storage of all master copies of related project documents. The Functional Manager could also be the Documentation Administrator.

DoD: Department of Defense.

DON: Department of the Navy.

Enabling Learning Objective (ELO): A learning objective describing what is expected of the trainee in demonstrating mastery of the skills and knowledge necessary for achievement of a terminal objective or another enabling objective.

Evaluation: A process of interpreting the results of measurement data (e.g., test, surveys) for the purpose of making a judgment or decision on the instruction or on the success of a trainee.

Flowchart: A diagram that depicts events or actions and their sequence in the program.

FMFM: Fleet Marine Force Manual.

Functional Manager: The functional manager is a Headquarters Marine Corps staff agent whose mission includes the management of responsibility for a specific functional area such as: manpower, training, aviation, intelligence, logistics, or fiscal division.

Government Furnished Material (GFM): The documents, equipment, facilities, and services supplied to a contractor before and during the execution of a contract.

HQMC: Headquarters Marine Corps.

Individual Training Standard (ITS): A measure of job performance used to determine who can and cannot perform satisfactorily. It constitutes the basis for design, development, implementation, and evaluation of all individual training conducted in units and institutions. In addition, training standards are designed to be used by the commander to determine proficiency, evaluate individual training, and maintain quality control. ITSs contain the following five components:

1. TASK. A unit of work usually performed over a short period of time which has a specific beginning and ending, can be measured, and is a logical and necessary unit of performance.

Note: Formal schools who are performing Phase I functions and haven't been furnished ITSs will use the above task definition and the following additional task characteristics:

   a. Have an identifiable result or product.

   b. Are independent of other actions and done for their own sake.

2. ADMINISTRATIVE INSTRUCTIONS. Describes the relative amount of simulation involved with the behavior, conditions, and standard in the training environment. If there is no simulation, only pertinent administrative instructions will appear in this component.

3. TRAINING OBJECTIVES. A measure of the job or mission performance used to determine individual proficiency, evaluate training, and maintain quality control. The training objectives contain behaviors, conditions, and standards. Training objectives equate to terminal learning objectives utilized in training programs conducted in units and Marine Corps training institutions.

   a. Behavior. The action to be performed by the student. In some cases, the action to be performed by the student will differ from the task described in 1. above. This will be the case when time constraints, equipment limitations, and other factors make it impossible for the student to perform the task. Often, the task and behavior will be the same.

b. <u>Conditions</u>. Equipment, manuals, assistance and/or supervision, special physical demands, environmental conditions, and locations that pertain to performing the behavior.

c. <u>Standard</u>. Accuracy, time limits, sequencing, quality, product, process, and restrictions that indicate how well a behavior should be performed.

4. <u>TRAINING STEPS</u>. Steps that must be performed in order to accomplish the training objective. The preceding "Standard" subparagraph lists sequencing considerations.

5. <u>REFERENCE</u>. Manuals, job aids, FMFMs, and other materials not listed in the "Conditions" subparagraph, that will guide trainers, instructors, or performers.

<u>Individual Training Standards System (ITSS)</u>: Provides guidelines relating to behaviors that Marines should be able to perform within a given grade for a particular military occupational specialty and/or billet requirement. ITSSs contain training standards. An ITSS will be published for each occupational field (OccFld) and billet requirement for which training standards are developed.

<u>Information Resources Management (IRM)</u>: The planning, budgeting, organizing, directing, training, promoting, controlling and management activities associated with the burden, collection, creation, use and dissemination, including the management of information and related resources, such as personnel, funds and information technology.

<u>Instructional Materials</u>: All items used by the instructor and the student during implementation of the instruction (e.g., instructor guidelines, student handouts, testing materials, etc.).

<u>Instructional Rating Form</u>: A form designed to obtain feedback on a period of instruction.

<u>Instructional Systems Development (ISD)</u>: See Systems Approach to Training.

<u>Interaction</u>: A reciprocal dialog between the user and the computer system.

<u>Interactive Courseware (ICW)</u>: A computer program controlled instruction that relies on trainee input to determine the order and pace of instruction delivery. The trainee advances through the sequence of instructional events by making decisions and selections. The instruction branches according to the trainee's responses.

<u>Knowledge</u>: The facts, concepts, procedures, and principles that make up a body of information that contributes to the effective performance of a task or terminal learning objective.

<u>Learning Analysis</u>: The process of deriving knowledge and skills required to perform a task and terminal learning objectives or indicative behavior.

<u>Learning Objective</u>: A concise statement that describes precisely what the student will be able to do as a result of instruction. A learning objective has three elements:

1. <u>Behavior</u>. The element of a learning objective that is composed of a single, observable and measurable, action verb and a clearly identified object that describes specifically what a student will do.

2. <u>Conditions</u>. The element of a learning objective that describes all the important aspects of the performance environment that aids or limits the behavior to be performed.

3. <u>Standard</u>. The element of a learning objective that specifies how well the student must perform the behavior.

<u>Level of Interactivity (LI)</u>: The potential for interaction determined by hardware capability and courseware design.

<u>Life Cycle Management (LCM)</u>: A management discipline for acquiring and using AIS resources in a cost-effective manner throughout the entire life of an AIS.

<u>M&RA</u>: Manpower and Reserve Affairs.

<u>Media</u>: Means for presenting instruction to the student (e.g., books, audiotapes, computer software, and films).

<u>Methods</u>: The techniques and procedures used in the delivery and practice of instruction (e.g., lecture, group discussion, programmed instruction, or field exercises).

<u>Mission Need Statement (MNS)</u>: A clear, concise statement that identifies a mission deficiency that requires further investigation.

<u>Needs Assessment</u>: A systematic process for identifying the causes of discrepancies between what exists and what is currently required and for identifying the causes of potential discrepancies between current and future requirements.

<u>Objective</u>: A precise statement of results that should occur when a user has completed a given program; it includes the behavior, conditions, and standards of performance.

Program of Instruction (POI): A formal course record that identifies and describes the course content, course material, type of instruction, the major learning objectives, trainee information, and resources required to conduct training in an institutional setting.

Storyboard: A full description of each still frame or motion sequence, specifying all details such as visuals, text, audio, special effects. The storyboards are deliverables as part of the Courseware Design Document.

Subject Matter Specialist (SMS): A person qualified to assist in the training development process by virtue of thorough knowledge of a job's duties and tasks.

Systems Approach to Training (SAT): A generic term referring to the orderly process analysis, design, development, implementation, evaluation, revision, and operation of a collection of interrelated training elements. A logical process for effectively and efficiently determining what, where, when, and how tasks should be taught. A process for effectively and efficiently achieving a required outcome based on documented needs. It consists of the five interrelated phases of analysis, design, development, implementation, and evaluation. It is a process that synthesizes and interrelates the components of a process within a conceptual framework, ensuring continuous, orderly, and effective progress toward a stated goal. a process in which performance requirements are explicitly defined from an analysis which occurs in a training development effort; includes a subsequent specification of performance requirements in terms of behavior objectives; is followed by the development criterion tests which match job performance; and, with the appropriate curriculum development efforts supporting training on specified objectives. The entire process undergoes extensive evaluation to ensure the validity of the process. Also, called "instructional system development".

Skill: The ability to perform a learning related activity which contributes to the effective performance of a task or TLO.

Systems Development Methodology (SDM): The SDM is the formal specification for building a system. It defines the activities to build a system, the interfaces between them, and the products created as a result of those activities. It uses modeling, partitioning, parallel activities execution, and iterative processing. The intent of the SDM is to provide a methodology consistent with the Department of Defense (DoD) and Department of the Navy (DON) directives, but enhanced to accommodate the technologies, constraints, and concerns specific to Marine Corps automated information system developments.

Systems Decisions Paper (SDP): This paper recaps the essential information on an AIS for decisionmakers. An updated SDP is submitted at each major LCM milestone and provides the necessary information for decisionmaking.

Target Population Description (TPD): A summary of the characteristics of students who will be entering a course of instruction.

Terminal Learning Objective (TLO): A learning objective describing what is expected of the trainee upon completion of a lesson, topic, major portion of a course, or course completion.

Training Deficiencies: A lack of knowledge and/or skills that prevents the jobholder from performing a task performance requirement.

Validation: The process of testing instructional materials on a sample of the target population to ensure that the materials are effective.

Walkthrough: A structured in-process review.

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Appendix B

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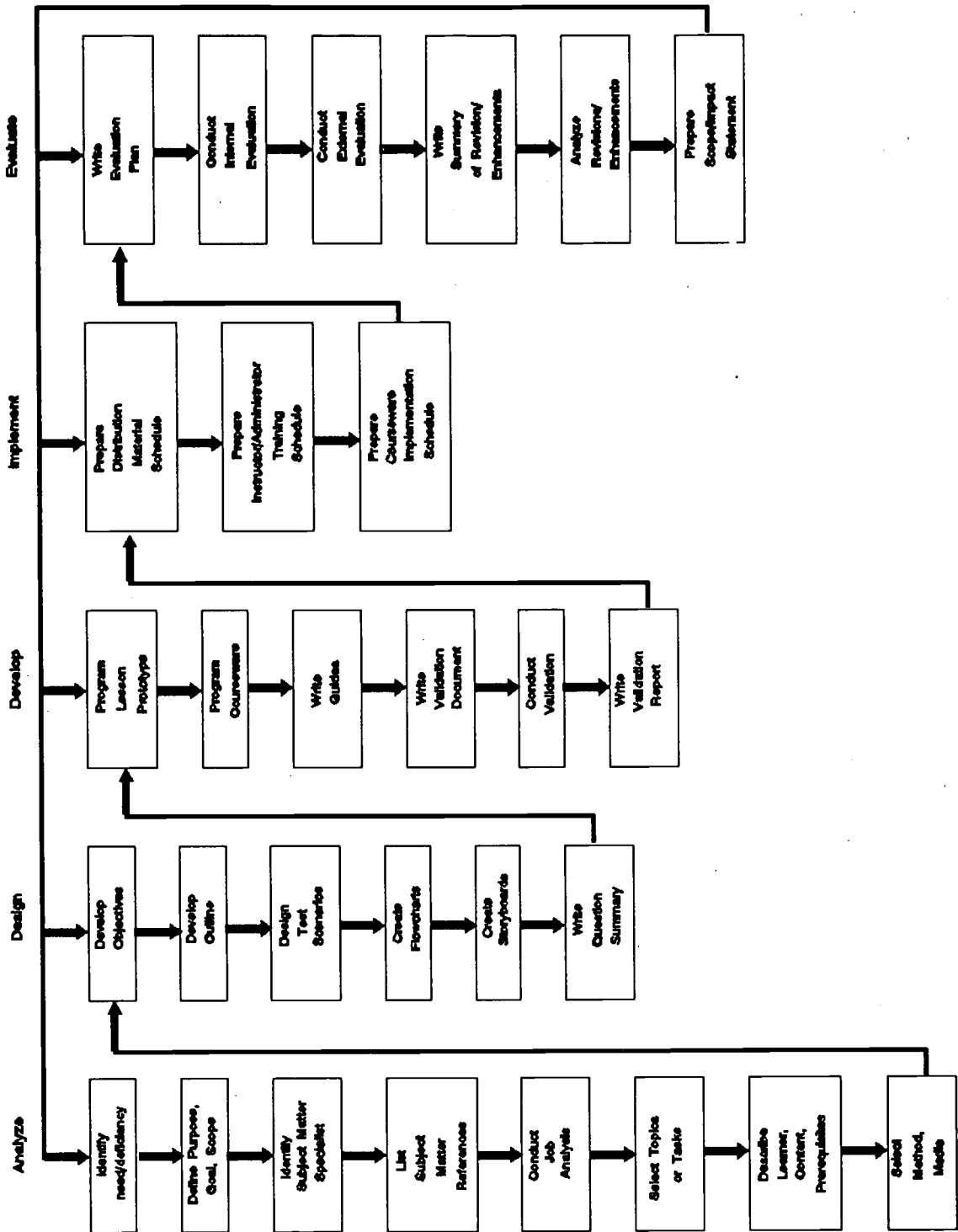
FLOWCHART OF EACH CBT PHASE
SHOWING STEPS TO BE ACCOMPLISHED

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Appendix D

SAMPLE OF A CONCEPT ANALYSIS DOCUMENT

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5230-02, the Project Deliverable
Style Manual.   This sample document does not include the front
cover, the cover letter, the title page, nor the record of
changes page, all of which are mandatory. Page numbering has
been altered for the purposes of this appendix. Actual
informational content within a concept analysis document may vary
from the information presented in this appendix. The information
contained within this appendix is for **illustration purposes only**
and should not be mistaken as a standard in terms of authoring
systems, methodologies, or presentation style to be used. This
appendix does illustrate the types of information that this
document must contain and the format for its presentation.

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PUBLICATION TABLE OF CONTENTS

CONCEPT ANALYSIS DOCUMENT
Computer-based Training Course
Banyan Local Area Network

CONCEPT ANALYSIS DOCUMENT
Computer-based Training Course
Banyan Local Area Network

LIST OF FIGURES

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SECTION 1. NEED/DEFICIENCY STATEMENT

Since Banyan is the Marine Corps local area network (LAN), employees using computers must have, at a minimum, a basic understanding of how Banyan and the menus program interfaces with available programs and applications. Currently, there is no formal training plan for the users. Training in general is a self-teaching trial-and-error process. Additionally, a large turnover in personnel prohibits structured on-the-job training and learning through experience.

In addition to the users, certain employees have been assigned as points of contact for the management and administration of the network in their work sections. These employees provide the liaison between network end-users and the centralized LAN office representative who is authorized to perform network management and administrative functions. To represent their sections efficiently and effectively regarding LAN issues, they must understand network capabilities and rudimentary Banyan LAN management and administration principles. Currently, employees assigned to act as points of contact do not have the technical expertise to perform basic LAN management duties effectively.

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SECTION 2. COURSE PURPOSE, GOAL, AND SCOPE STATEMENT

2.1 PURPOSE

The purpose of the Banyan course is to teach the employees who will be working in the Banyan network environment how to use the network efficiently and effectively and to provide those users assigned as points of contact the technical knowledge necessary to work with the LAN management office. The course will provide practical knowledge on how to use the Banyan network.

2.2 GOAL

The goal is to develop a computer-based training (CBT) course to instruct Banyan users. In order to use the network efficiently, employees must be familiar with basic Banyan capabilities and operations and be competent in the use of the different Banyan options. These skills can be attained conveniently by employing CBT technology.

2.3 SCOPE

The scope of the course includes using the Banyan network and becoming familiar with operational functions, troubleshooting, and backup procedures. The scope is based primarily on results from conducting a task analysis and observations on the job.

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SECTION 3. SUBJECT MATTER IDENTIFICATION AND REVIEW

3.1 IDENTIFICATION OF SUBJECT MATTER SPECIALIST (SMS)

The SMS identified for this project is Michael Carriger. Mr. Carriger, who is currently employed by Computer Sciences Corporation, has a broad knowledge of LANs and is conversant with using, administering, and managing Banyan. Mr. Carriger has several years' experience as a systems analyst and network administrator. His educational credentials include a B.S. and M.S. in Computer Information Systems.

3.2 SUBJECT MATTER REFERENCES

The following references apply to this subject matter:

Banyan Local Area Network End-users/Administrators Training Support Plan. June 1990. Prepared by Computer Sciences Corporation under Contract Number N66032-89-D-0001, Delivery Order MY19.

Banyan Local Area Network User's Guide. October 1990. Prepared by Computer Sciences Corporation under Contract Number N66032-89-D-0001, Delivery Order MY19.

Banyan Local Area Network Administrator's Guide. October 1990. Prepared by Computer Sciences Corporation under Contract Number N66032-89-D-0001, Delivery Order MY19.

3.3 REVIEW OF SUBJECT MATTER REFERENCES

Since a Banyan User's Guide and Banyan Administrator's Guide were previously written, they will serve as the primary source of information for development. Consequently, a Job Analysis is not necessary.

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SECTION 4. TASK INVENTORY AND SELECTION CRITERIA

An analysis was performed to develop an inventory of major tasks and associated subtasks. For each task, a brief discussion of the following is presented:

a. Description of discrete subtasks,

b. Criteria regarding frequency of performance,

c. Criteria regarding criticality to using the network options, and

d. Criteria regarding complexity of performance.

The task inventory along with a description of subtasks and qualifying criteria for the end user is discussed below. A summary of task selection criteria is presented in Table 1. Specific tasks and associated subtasks are summarized in Appendix A of the Banyan LAN Users/Administrator Training Support Plan. A task qualified for selection if the sum of the values assigned to its frequency, criticality, and complexity criteria was greater than four.

4.1 USE MICROCOMPUTERS AND PERFORM BASIC DISK OPERATING SYSTEM (DOS) FUNCTIONS

As a prerequisite, a network user must be computer literate. This entails being proficient in using microcomputers and performing basic DOS functions. These functions are performed daily, are important, and are simple to perform.

4.2. KNOW THE FUNCTIONS OF THE NETWORK HARDWARE COMPONENTS

To understand how network hardware components communicate with each other, the user must know what hardware is required and what the function of each component is. The components that he must be familiar with include the server, the workstation, and the adapter card. Additionally, he must have a precursory understanding of network cabling and hardware troubleshooting. Since this is not a task, frequency, criticality, and complexity are not applicable.

4.3 USE THE BANYAN MENUS

To perform network functions, the user must be able to access programs and applications from menus and from menu options. The menus and their options are used daily, understanding their use is critical, and making selections is simple. The subtasks that the user must be able to perform include the following: activating and deactivating windows, selecting menu and command items, and customizing activity menus.

4.4 UNDERSTAND BACKUP AND RESTORE PROCEDURES

To ensure that the files the user creates are safe and are accessible, the user must have a basic understanding of the process involved in backing up the system and of the importance of backing up his local drives. Additionally, he must be aware of the steps involved in restoring files lost from his workstation. Although he does not perform the backup or restore procedure on the system, he needs to establish a schedule for his local drive. Backups are performed daily, they are critical, and they are simple to perform.

4.5 USE NETWORK DIRECTORIES AND FILES

To use directories and to perform DOS functions on the files in a directory, the user must be able to access network directories and files and must be able to use the Banyan menu options that are available once they are accessed. Directories and files are accessed daily, using the Banyan options is important, and performing the functions is moderately difficult. The subtasks that the user must be able to perform include the following: opening directory windows; expanding and contracting directory windows; marking files to perform directory and file functions; and arranging files by name, date, or time.

4.6 USE THE PRINT SERVICE

To print copies of files from a network, the user must understand what print jobs are, how a print queue works, and how print jobs are created. The printer connections option on the main menu is used weekly, is important, and is simple to use. The subtasks that the user must be able to perform include interpreting information in the print queue and deleting print jobs.

4.7 USE THE MAIL SERVICE

To use the mail service, a user must, at a minimum, be able to read the mail folder display, retrieve and read mail, respond to mail messages, create messages, and store and forward messages. A user must also be familiar with additional options that are available. The mail service is used as required, is important, and is moderately difficult to use. The subtasks that the user must be able to perform include the following: interpreting the information on the main display and reading, creating, sending (registered and nonregistered), printing, saving, deleting, and renumbering mail messages.

4.8 USE THE ADDITIONAL MENU ITEMS

To use the network capabilities and to use the available
applications, a user must be able to access options from menu
items. Depending on the user's requirements, the different menu
options are used daily, are important, and are simple to
moderately difficult to use.

Task (Criteria Sum)	Frequency 3=Daily 2=Weekly 1=As Reqd	Criticality 3=Critical 2=Important 1=Unimportant	Complexity 3=Very 2=Moderate 1=Simple
Use Micros and DOS (6)	3	2	1
Know Network Hardware Components	NA	NA	NA
Use Banyan Menus and Menu Options (7)	3	3	1
Understand Backup and Restore Procedures (7)	3	3	1
Use Directories and Files (7)	3	2	2
Use Print Service (5)	2	2	1
Use Mail Service (5)	1	2	2
Use Additional Menu Items (6)	3	2	1

Figure 4-1. Summary of Task Selection Criteria

4-3

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SECTION 5. DESCRIPTION OF LEARNERS, COURSE CONTENT, AND PREREQUISITES

5.1 LEARNERS

The learners who will undertake this course are primarily
military and civilian employees working with the Banyan system.
The educational levels range from high school through college.
Most of the learners are career oriented with between 3 and 25
years of employment within the federal government. When
performing their jobs, the learners are regularly required to
function in a network environment and, in some cases, to serve as
liaison between network users and the LAN management office.
Since the educational levels and the backgrounds of the learners
are diversified, the course will be presented at a high school
reading level. This reading level avoids extensive use of
complex sentence structure and uses direct wording in the active
voice. At the same time, the high school reading level presents
enough sentence structure variety to retain the attention of the
more advanced learners.

5.2 COURSE CONTENT

In addition to providing prerequisite knowledge regarding
networks, the course content will help learners become familiar
with network hardware and backup procedures and become proficient
with using the network menu options.

5.3 PREREQUISITES

As a prerequisite, the learner must be proficient in using
microcomputers and must have a basic understanding of DOS.

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SECTION 6. REQUIREMENTS

6.1 ESTIMATED RESOURCES REQUIREMENTS

The estimated resources required to develop the CBT include two senior systems analysts and one junior analyst.

6.2 ESTIMATED MATERIALS REQUIREMENTS

Three personal computers plus at least one additional computer connected to Banyan, three copies of the SUMMIT authoring package, and three copies of MicroSoft PaintBrush with the MicroSoft Mouse will be required for courseware development.

6.3 EQUIPMENT REQUIREMENTS

The Marine Corps is currently using IBM-PC or compatible hardware connected to the Banyan LAN. To be compatible with existing hardware, the CBT package will require the following:

   a. IBM PC or compatible with a hard disk and at least one 5 1/4 inch diskette drive

   b. EGA or VGA color adapter card

   c. EGA or VGA color monitor

   d. 512K of available RAM

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SECTION 7. RATIONALE FOR METHOD, MEDIA, AND CBT AUTHORING SYSTEM SELECTION

7.1 METHOD

Because the Banyan network system has a large number of users at different proficiency levels, CBT has been selected as the method to present the training materials. As a training method for Banyan users, CBT offers several advantages:

a. Through menu selections, a student can tailor the course to suit his unique needs.

b. The instruction is self-paced.

c. Since the course can reside on individual workstations, the training schedule is flexible.

d. The stress often associated with traditional environments is reduced because the computer-based environment is noncompetitive.

e. The student can perform actual tasks through simulation.

f. The student can check his understanding of material through self-examination and can review areas of weakness.

g. The student can work toward mastery through reviewing and retesting options.

7.2 MEDIA

Since each employee is provided with a personal microcomputer, CBT has been chosen as the medium for this course. CBT can reside on each employee's microcomputer or on the LAN, making access to the course convenient.

7.3 CBT AUTHORING SYSTEM SELECTION

The authoring language SUMMIT will be used to develop this course. SUMMIT is presented in the "Needs Analysis for Computer-based Training" document prepared by Computer Sciences Corporation for Headquarters, U.S. Marine Corps. In contrast to programming languages or authoring languages that use code for development, SUMMIT is a menu-driven authoring language. Menu-driven authoring languages offer the advantage of a shorter learning curve for courseware developers. In addition to being menu-driven, SUMMIT can be used on IBM-PCs and compatibles that are standalone or connected to a Banyan LAN.

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Appendix E

SAMPLE OF A COURSEWARE OBJECTIVES DOCUMENT

A. GENERAL. All documents must comply with the formatting and style standards laid out in IRM 5230-02, the Project Deliverable Style Manual. This sample document does not include the front cover, the cover letter, the title page, nor the record of changes page, all of which are mandatory. Page numbering has been altered for the purposes of this appendix. Actual informational content within a courseware objectives document may vary from the information presented in this appendix. The information contained within this appendix is for **illustration purposes only** and should not be mistaken as a standard in terms of authoring systems, methodologies, or presentation style to be used. This appendix does illustrate the types of information that this document must contain and the format for its presentation.

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PUBLICATION TABLE OF CONTENTS

COURSEWARE OBJECTIVES DOCUMENT
Computer-based Training Course
Banyan Local Area Network

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SECTION 1. TERMINAL LEARNING OBJECTIVE

Upon completion of this course, the student shall be able to use the menu options and other appropriate commands to perform network functions.

Behavior: The student will become proficient in the use of the options available on the Banyan network system.

Condition: Given graphics of actual menus and menu item windows

Standard: Proficiency will be demonstrated by the student successfully performing specific network functions.

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SECTION 2. INTRODUCTION TO BANYAN

2.1   ENABLING LEARNING OBJECTIVE #1

Upon completion of Topic 1, Lesson 1, the student shall be able
to identify the hardware elements that make up a network system,
describe the functions of the hardware, and describe basic
troubleshooting procedures.

Lesson 1: HARDWARE

Behavior:	The student will become familiar with the hardware that makes up a network system and with the function of the hardware.
Condition:	Given a graphic of the different network hardware components.
Standard:	Proficiency will be demonstrated by the student successfully identifying the purpose of individual network hardware components.

2.1.1 Major Teaching Points

To reach this objective, the following major teaching points will
be included in the lesson:

  a. the function of a network server

  b. the function of a workstation

  c. the different types of workstations

  d. why adapter cards are needed for Banyan

  e. the basic steps of troubleshooting hardware

  f. common error messages

2.1.2 Test Scenarios

  a. The student will be shown graphics of the hardware
      components and will be required to select the component
      that performs a specific function.

  b. The student will be given a list of hardware functions
      and will be required to match components to their
      functions.

2-1

2.2   ENABLING LEARNING OBJECTIVE #2

Upon completion of Topic 1, Lesson 2, the student shall demonstrate a familiarity with the Banyan Network software by using the menus to select a menu option and by activating and deactivating windows made available through their selections.

Lesson 2:   SOFTWARE

Behavior: The student will activate or deactivate the appropriate windows to make specified selections.

Condition: Given a graphic of the Banyan main menu and directions to select a particular menu item.

Standard: Proficiency will be demonstrated by the student successfully activating and deactivating windows to find and open the appropriate menu item.

2.2.1   Major Teaching Points

To reach this objective, the following major teaching points will be included in the lesson:

a.   activating and deactivating windows to select menu items

b.   selecting menu items to open windows

c.   selecting commands from the command bar

2.2.2   Test Scenarios

a.   The student will be shown a graphic of the main menu and will be given a scenario. From that scenario, the student will be required to make specific selections from different menus.

b.   Student will be required to activate and deactivate windows to reach those selections.

2-2

2.3 ENABLING LEARNING OBJECTIVE #3

Upon completion of Topic 1, Lesson 3, the student shall demonstrate a familiarity of backup and restore procedures by selecting the type of backup or restore most appropriate to a given situation.

Lesson 3: BACKING UP AND RESTORING FILES

Behavior: The student will select the most appropriate method of backup and restore for a given scenario.

Condition: Given a scenario and directions to select a method of backup or restore.

Standard: Proficiency will be demonstrated by the student successfully selecting the most appropriate procedure.

2.3.1 Major Teaching Points

To reach this objective, the following major teaching points will be included in the lesson:

    a. on-line backup

    b. off-line backup

    c. full and incremental backup

    d. on-line restore

    e. off-line restore

2.3.1 Test Scenarios

    a. The student will be given the appropriate information and will be required to select a backup procedure.

    b. The student will be given the appropriate information and will be required to select a restore procedure.

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2-4

SECTION 3.   BANYAN MENU ITEMS

3.1   ENABLING LEARNING OBJECTIVE #4

Upon completion of Topic 2, Lesson 1, the student shall demonstrate the ability to use the Directories and Files option on the main menu by working with directory and file options.

Lesson 1:   DIRECTORIES AND FILES

Behavior: The student will use the Directories and Files menu item to perform shared directory and file functions.

Condition: Given a graphic of the Banyan main menu and directions to perform a specific shared directory or file function.

Standard: Proficiency will be demonstrated by the student successfully accessing specific directories and files and by performing file functions.

3.1.1   Major Teaching Points

To reach this objective, the following major teaching points will be included in the lesson:

a.   opening the correct directory window for a specific directory

b.   expanding a directory window to gain access to additional file information

c.   marking files to perform specified directory and file functions

d.   arranging files by name, date, or time

3.1.2   Test Scenarios

a.   The student will be shown a graphic of the main menu and will be required to select the items necessary to open specified directory windows.

b.   The student will be shown a graphic of the main menu and will be required to select the items necessary to use the mark command for a directory or file function.

3.2 ENABLING LEARNING OBJECTIVE #5

Upon completion of Topic 2, Lesson 2, the student shall demonstrate the ability to use the Printer Connections option on the main menu by interpreting the information in a print queue and by deleting a print job.

Lesson 2: PRINTER CONNECTIONS

Behavior: The student will use the Printer Connections menu item to delete a print job from the print queue.

Condition: Given a graphic of the Banyan main menu and directions to delete a print job.

Standard: Proficiency will be demonstrated by the student successfully deleting a print job from the print queue.

3.2.1 Major Teaching Points

To reach this objective, the following major teaching points will be included in the lesson:

a. interpreting the information in a print queue

b. deleting print jobs from the print queue

3.2.1 Test Scenarios

a. The student will be shown a graphic of the appropriate menu and, by selecting the correct menu items, will be required to delete a job in the queue.

b. The student will be shown a graphic of a print queue window and will be required to interpret the information provided.

3.3 ENABLING LEARNING OBJECTIVE #6

Upon completion of Topic 2, Lesson 3, the student shall demonstrate the ability to use the Mail option on the main menu by reading, creating, and sending electronic mail messages.

Lesson 3: MAIL

Behavior: The student will use the Mail menu item to access and use the Mail software.

Condition: Given a graphic of the Banyan main menu and directions to perform a specific electronic mail function.

Standard: Proficiency will be demonstrated by the student successfully using the Mail screen prompts to create, send, and retrieve mail.

3.3.1 Major Teaching Points

To reach this objective, the following major teaching points will be included in the lesson:

a.   interpreting the information on the main display

b.   reading a Mail message

c.   using the editor to create Mail messages

d.   sending a Mail message registered and unregistered

e.   printing a Mail message

f.   saving a Mail message

g.   renumbering Mail messages

h.   deleting a Mail message from a specified folder

3.3.2 Test Scenarios

a.   The student will be required to use Mail software to create a mail message.

b.   The student will be required to use Mail software to open a mail message.

c.   The student will be required to use Mail software to send a mail message.

3.4   ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 4, the student shall demonstrate the bility to access additional applications and programs availab e on the main menu and to access network information.

Lesson 4:   LEAVE THE NETWORK

> Behavior: The student will use the main menu to access specific application programs.

> Condition: Given a graphic of the Banyan main menu and a scenario

> Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.4.1   Major Teaching Points

Lesson 4 will be limited to an <u>overview</u> of each specific option selected from the Banyan main menu.

3.4.2   Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.5 ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 5, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 5: BULLETIN BOARD (updated weekly)

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.5.1 Major Teaching Points

Lesson 5 will be limited to an _overview_ of each specific option selected from the Banyan main menu.

3.5.2 Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.6 ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 6, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 6: NETWORK DIRECTORIES

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.6.1 Major Teaching Points

Lesson 6 will be limited to an overview of each specific option selected from the Banyan main menu.

3.6.2 Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.7   ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 7, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 7:   RESOURCE AND EXECUTIVE SCHEDULER

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.7.1   Major Teaching Points

Lesson 7 will be limited to an <u>overview</u> of each specific option selected from the Banyan main menu.

3.7.2   Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.8   ENABLING LEARNING OBJECTIVE #7

Upon completion ⸌f Topic 2, Lesson 8, the student shall
demonstrate the   ᴐility to access additional applications and
programs availab ᴇ on the main menu and to access network
information.

Lesson 8:   SUPPORTED NETWORK APPLICATIONS

Behavior: The student will use the main menu to access
              specific application programs.

Condition: Given a graphic of the Banyan main menu and a
              scenario.

Standard: Proficiency will be demonstrated by the
              student successfully using the main menu to
              select the option appropriate for the given
              scenario.

3.8.1   Major Teaching Points

Lesson 8 will be limited to an overview of each specific option
selected from the Banyan main menu.

3.8.2   Test Scenarios

The student will be shown a graphic of the main menu and will be
required to access the appropriate menu option for a particular
scenario.

3.9 ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 9, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 9: MAKING CONNECTIONS TO NETWORK PRINTERS

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.9.1 Major Teaching Points

Lesson 9 will be limited to an overview of each specific option selected from the Banyan main menu.

3.9.2 Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.10 ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 10, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 10: ACTIVITIES MENU

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.10.1 Major Teaching Points

Lesson 10 will be limited to an overview of each specific option selected from the Banyan main menu. For lesson 10, Activities Menu, the overview will include instructions for customizing the menu.

3.10.2 Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.11 ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 11, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 11: OPERATING SYSTEM FUNCTIONS

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.11.1 Major Teaching Points

Lesson 11 will be limited to an overview of each specific option selected from the Banyan main menu.

3.11.2 Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

3.12   ENABLING LEARNING OBJECTIVE #7

Upon completion of Topic 2, Lesson 12, the student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Lesson 12:   HELPFUL HINTS AND LAN PROCEDURES

Behavior: The student will use the main menu to access specific application programs.

Condition: Given a graphic of the Banyan main menu and a scenario.

Standard: Proficiency will be demonstrated by the student successfully using the main menu to select the option appropriate for the given scenario.

3.12.1   Major Teaching Points

Lesson 12 will be limited to an <u>overview</u> of each specific option selected from the Banyan main menu.

3.12.2   Test Scenarios

The student will be shown a graphic of the main menu and will be required to access the appropriate menu option for a particular scenario.

Appendix F

SAMPLE OF A COURSEWARE DESIGN DOCUMENT

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5230-02, the Project Deliverable
Style Manual. This sample document does not include the front
cover, the cover letter, the title page, nor the record of
changes page, all of which are mandatory. Page numbering has
been altered for the purposes of this appendix. Actual
informational content within a courseware design document may
vary from the information presented in this appendix. The
information contained within this appendix is for **illustration
purposes only** and should not be mistaken as a standard in terms
of authoring systems, methodologies, or presentation style to be
used. This appendix does illustrate the types of information
that this document must contain and the format for its
presentation.

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PUBLICATION TABLE OF CONTENTS

COURSEWARE DESIGN DOCUMENT
Computer-based Training Course
Banyan Local Area Network

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SECTION 1. COURSEWARE LEVEL OF INTERACTIVITY STATEMENT

The branches in this course are divided into three categories:
lessons, practice exercises, and pre/posttest questions. The
student moves through the course and from lesson to lesson by
selecting options from a series of hierarchical menus. Once in a
lesson, the student has, at a minimum, a choice of six options
from every lesson screen. These options, presented as a legend
at the bottom of each lesson screen, consist of the following:

    a.   [PgDn].   This option branches to the next lesson screen.
    b.   [PgUp].   This option branches back to the last lesson
                   screen.
    c.   [^G].   This option branches to an on-line glossary.
    d.   [^T].   This option branches to an on-line text version
                   of the lesson.
    e.   [^M].   This option branches back to the last menu.
    f.   [^X].   This option exits the course and returns to
                   DOS.

The lessons are divided into two categories: information
and simulation. The information lessons present information
linearly with interactive lesson activities at the end. The
simulation lessons begin with a brief linear introduction to the
lesson and then present the actual computer screens that the
student sees. In these lessons, the student is required to use
network options just as they would in the real work environment.

Since several of the options available on the legend go
beyond those required to move through a lesson, every screen in
the course presents the opportunity to interact. The course,
therefore, is 100 percent interactive overall. On some screens,
the student can elect to interact by selecting course options,
such as the on-line glossary to text. On other screens, the
student is prompted for input and is given feedback in response
to his input. Screens that prompt for input and provide response
in accordance with the input constitute 40 percent of the course
interactions.

1-1

1.1 COURSEWARE GENERAL DESIGN OF FLOW CHARTS

The flowcharts are contained in Appendix A.

1.2 PREDEVELOPMENT WALKTHROUGH

The predevelopment walkthrough checklists are contained in Appendix B [not included in this sample].

1.3 COURSEWARE DETAILED DESIGN OF STORYBOARDS

The storyboards are contained in Appendix C.

SECTION 2. SUMMARY OF ACTIVITIES PRACTICE EXERCISES AND PRE/POSTTEST QUESTIONS BY TOPIC, LESSON, AND ELO

2.1 INTRODUCTION TO BANYAN

Lesson 1: Hardware

    Activity
    Storyboard Number: 49
    Multiple choice question. The student is asked to identify
    the component that provides the storage area for files and
    applications.

    Practice
    Storyboard Number: 129
    Multiple choice question. The student is asked to type the
    letter that defines what a workstation is.

    Pretest/Posttest
    Storyboard Number: P1
    ELO Number: 1
    Multiple choice question. The student is asked to type the
    letter that describes the purpose of an adapter card.

    Storyboard Number: P2
    ELO Number: 1
    Graphic shows hardware components of a network. The student
    is asked to match up the name of each component with the
    respective picture.

Lesson 2: Software

    Activity
    Storyboard Number: 97
    Graphic of open directories and files window and active
    window with a list of files in a directory called DOEDIR.
    The student is asked to change the active window so that the
    previous one, directories and files, is active instead.

    Practice
    Storyboard Number: 134
    Graphic of Banyan Main Menu. The student is asked to
    activate the command bar for this menu.

Pretest/Posttest
Storyboard Number: P3
ELO Number: 2
Graphic of I nyan Main Menu. The student is asked to open
the.director es and files window.

Storyboard Number: P4
ELO Number: 2
Graphic directory and files open to file level.
The student is asked to change the active window so that the
previous one is active.

Storyboard Number: P6
ELO Number: 2
Graphic of the BUDGET directory window. The student is
asked to expand the window to see the size of the files.

Storyboard Number: P7
ELO Number: 2
Graphic of directory and files at the files window with a
listing of four files. The student is asked to highlight
the option from the command bar that lets you reorder these
files alphabetically by extension.

Lesson 3:   Backup

Activity
Storyboard Number: 125
Multiple choice question. The student is asked to select the
letter of the type of backup that avoids backing up partial
files.

. Practice
Storyboard Number: 134
Multiple choice question. The student is asked how often
files on the local drive should be backed up.

Pretest/Posttest
Storyboard Number: PP12
ELO Number: 3
Multiple choice question. The student is asked which out of
the four drives presented is backed up automatically.

Storyboard Number: PP13.
ELO Number: 3
Multiple choice question. The student is asked what
procedure the network Administrator would perform to replace
a lost file.

2-2

2.2   USING THE BANYAN MENUS

Lesson 1:   Directories and Files

Activity
Storyboard Number: 226
Grabber of File listing for BUDGET directory. The student
is asked to get a listing of the dates that these files were
created.

Practice
Storyboard Number: 343
Grabber of memos directory. The student is asked to
highlight the option on the command bar that will let you
identify specific files to be copied.

Pretest/Posttest
Storyboard Number: PP8
ELO Number: 4
Grabber of directories and files. The student is asked to
highlight the correct option to view a list of the files in
the directory called CIVPERS.

Storyboard Number: PP9
ELO Number: 4
Grabber of directories and files at files window. The
student is asked to highlight the option on the command bar
that will remove all deletion marks.

Lesson 2:   Printer Connections

Practice
Storyboard Number: 361
Grabber of printer connections window. The student is asked
to display the print queue for LPT2.

Pretest/Posttest
Storyboard Number: PP10
ELO Number: 5
Grabber of print queue with a list of printers. The student
is asked to open the window to view the print queue for
LPT1.

Storyboard Number: PP11
ELO Number: 5
Grabber of print queue. The student is asked to delete the
highlighted print job from the queue.

Lesson 3:   Mail

Activity
Storyboard Number: 313
Grabber of main display with an asterisk beside one message.
The student is asked to open the message so they can read
it.

Activity
Storyboard Number: 315
The student is asked to press the correct function key to
read a message.

Practice
Storyboard Number: 366
Grabber of mail menu. The student is asked to select the
option from the command bar that requires the recipient to
acknowledge receipt of a message.

Pretest/Posttest
Storyboard Number: PP16
ELO Number: 6
Grabber of mail menu. The student is asked to read the
message that has not been read.

Storyboard Number: PP17
ELO Number: 6
Grabber of mail menu. The student is asked to press the
correct function key to compose a new mail message.

Storyboard Number: PP18
ELO Number: 6
Multiple choice. Grabber of mail message header. The
student is asked to select the fields that are required.

Storyboard Number: PP19
ELO Number: 6
The student is asked to highlight the option on the command
bar that lets you send a letter registered mail.

Lesson 4: Leave the Network

Pretest/Posttest
Storyboard Number: PP20
ELO Number: 7
Graphic-Leave the Network Form. The student is asked to
fill out the log out form to leave the network and work on a
file in a directory called MEMOS in drive C.

Lesson 5:   Bulletin Board

    Practice
    Storyboard Number: 380
    Grabber of Banyan Main Menu. The student is asked to
    highlight the menu option that provides information on
    different courses.

Lesson 6:   Network Directories

    Practice
    Storyboard Number: 384
    Grabber of Banyan Main Menu. The student is asked to
    highlight the menu option that provides a roster of network
    users. Once the option is highlighted, press <RETURN>.

Lesson 8: Supported Network Applications

    Pretest/Posttest
    Storyboard Number: PP14
    ELO Number: 7
    Grabber of Banyan Main Menu. The student is asked to
    highlight the option that provides access to applications on
    the network.

Lesson 10: Activities Menu

    Pretest/Posttest
    Storyboard Number: PP15
    ELO Number: 7
    Grabber of Banyan Main Menu. The student is asked to
    highlight the option that provides access to the
    applications on their hard disk.

    Storyboard Number: P5
    ELO Number: 7
    Graphic Banyan activity menu with slash bar.
    Open is highlighted. The student is asked to highlight the
    option on the command bar that lets student change the
    activity menu at the workstation.

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APPENDIX A

Flowchart 1: Main Menu

```
                    Main Menu

              1. How to Use the Course
              2. Introduction to _____
              3. Topic 1
              4. Topic 2
```

| 1 | 2 | 3 | 4 |

How to Use the Course

Introduction

A

A

A-1
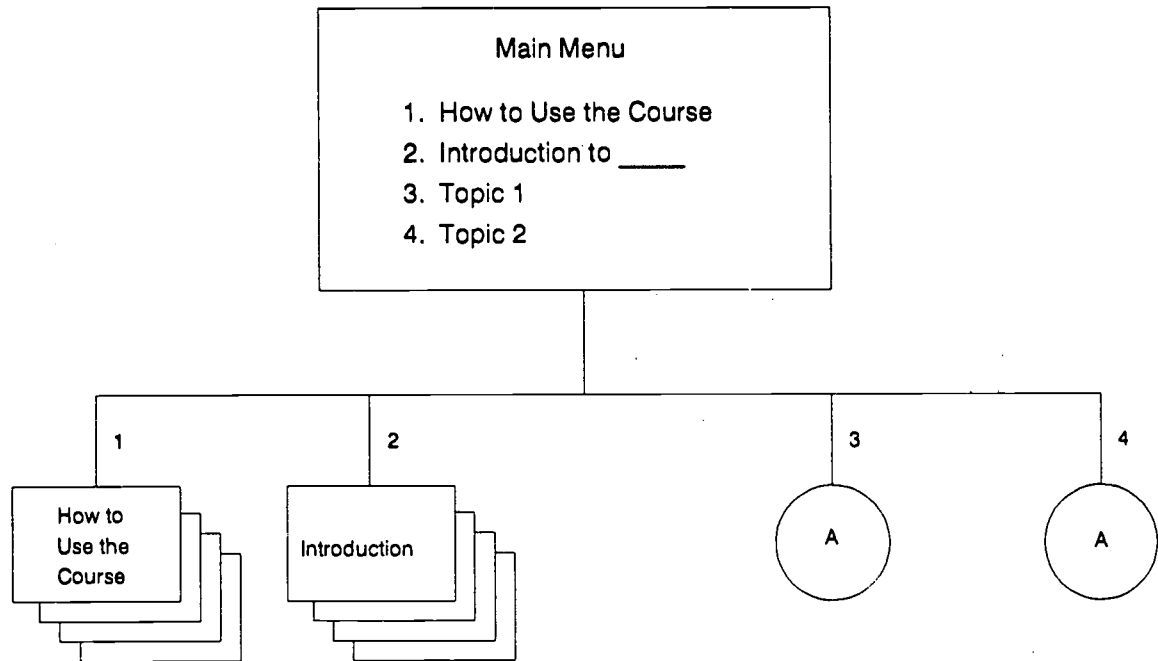
APPENDIX A

Flowchart 2: Lesson Menu

```
              ( A )
                │
      ┌─────────────────────┐
      │  1. Lesson 1        │
      │  2. Lesson 2        │
      │  3. Lesson 3        │
      └─────────────────────┘
                │
      ┌─────────────────────┐
      │  1. Learn it        │
      │  2. Review it       │
      │  3. Read it         │
      │  4. Try it          │
      └─────────────────────┘
                │
   ┌──────┬─────────┬─────────┬──────┐
   1      2         3         4
```

Learn It   Review It   Read It   Try It

(B)   (C)
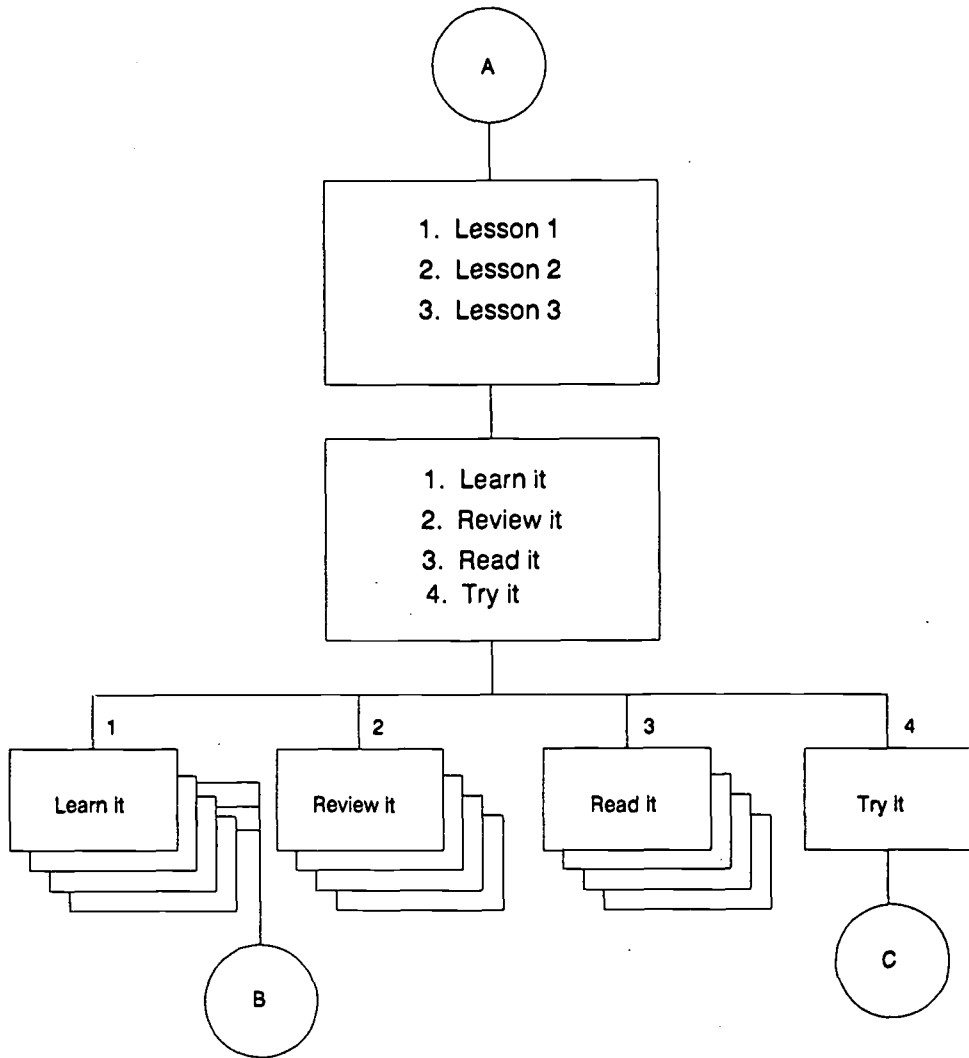
APPENDIX A

Flowchart 3: Lesson Activity

```
                                              ( B )
                                               |
  To                  ┌──────────────┐   Correct  ╱──────────────╲
 Next    ◄────────────│   Correct    │◄──────────┤    Activity    │
Screen                │   Feedback   │            ╲──────────────╱
                      └──────────────┘                   │
                             ▲                         Incorrect
                             │                            │
                             │                            ▼
                             │                      ┌──────────┐
                             │                      │   Hint   │
                             │                      └──────────┘
                             │                            │
                             │                            │
              Correct        │                          ◇
             ┌───────────────┘              ╱╲
             └──────────────────────────────  
                                                      Incorrect
                                                         │
                                                         ▼
                                                  ┌──────────────┐
                                                  │  Incorrect   │
                                                  │  Feedback    │
                                                  └──────────────┘
                                                         │
                                                         ▼
                                                 To Next Screen
```

A-3
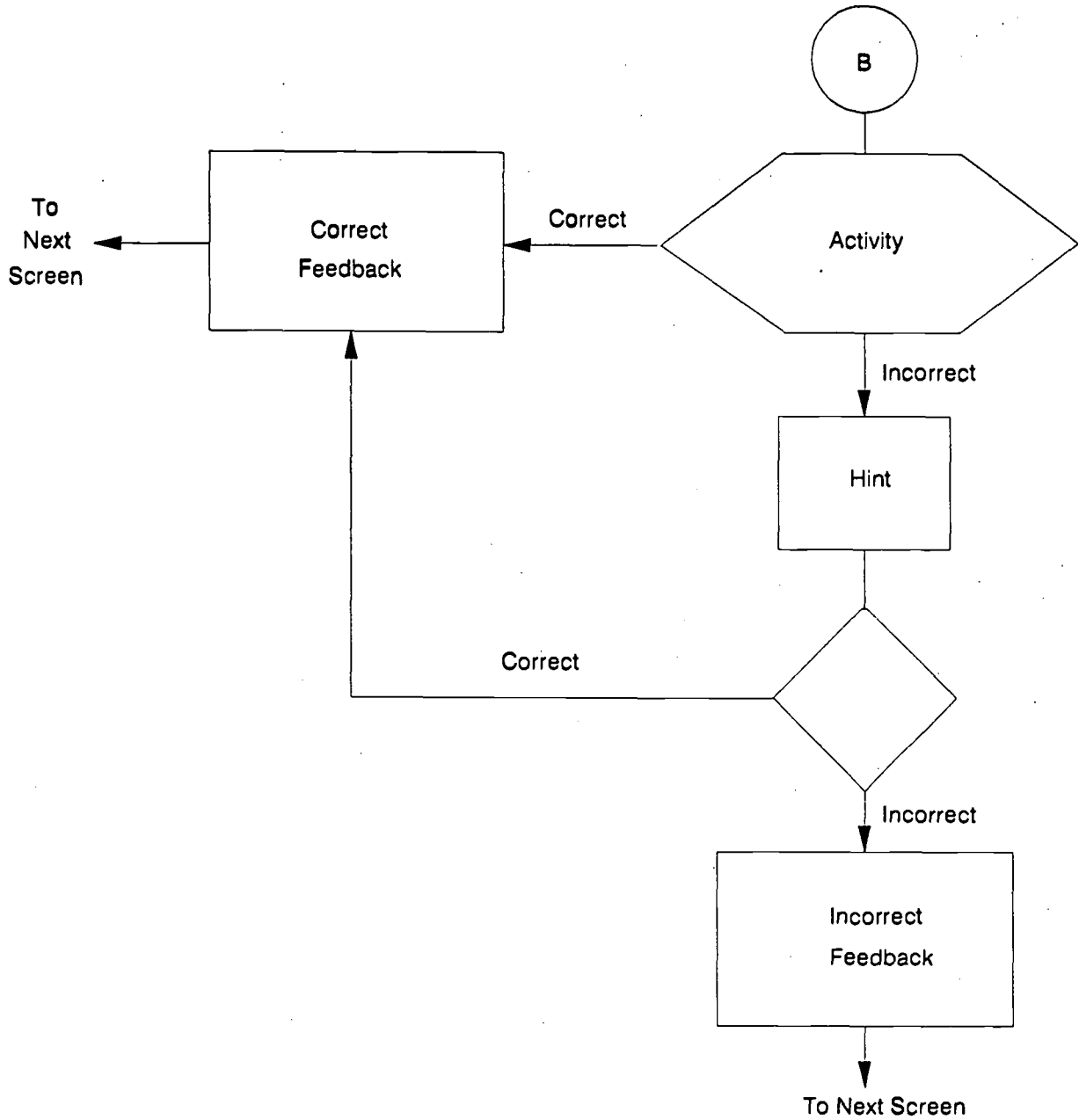
APPENDIX A

Flowchart 4: Practice Exercise

A-4
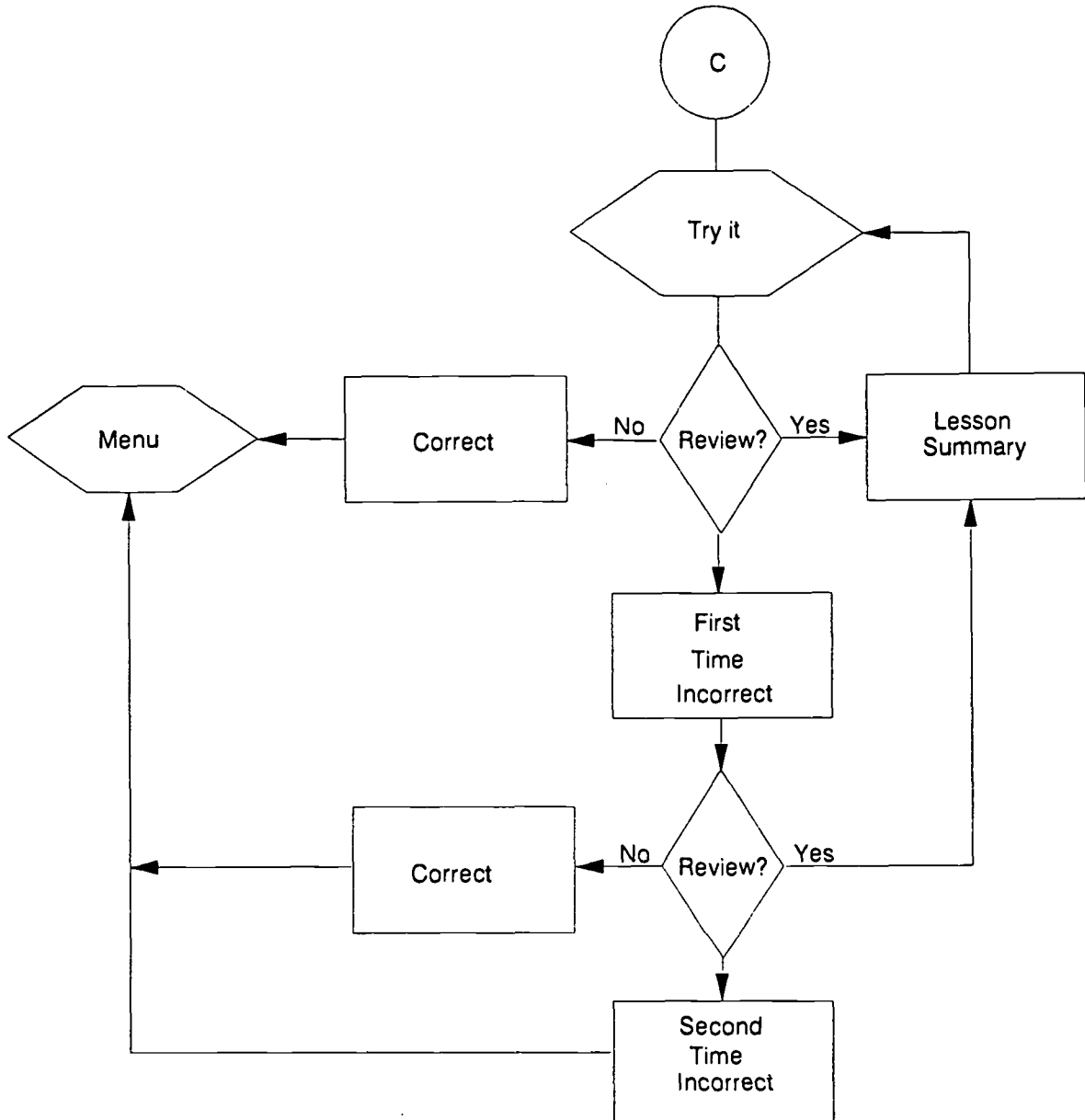
APPENDIX A

Flowchart 5: Lesson Screen Legend

```
                    ┌──────────────┐
                    │   Lesson     │
                    │   Screen     │
                    │   Legend     │
                    └──────┬───────┘
        ┌──────────┬───────┼───────┬──────────┬──────────┐
   ┌────┴───┐  ┌───┴────┐ ┌┴───┐ ┌─┴───┐  ┌───┴───┐  ┌───┴───┐
   │  PgDn  │  │  PgUp  │ │Alt R│ │Alt G│  │ Alt M │  │ Alt E │
   └────┬───┘  └───┬────┘ └─┬──┘ └──┬──┘  └───┬───┘  └───┬───┘
        ▼          ▼        │       │         ▼          ▼
   ┌────────┐  ┌────────┐   │       │     ┌───────┐  ┌───────┐
   │  Next  │  │Previous│   │       │     │ Last  │  │Exit to│
   │  Page  │  │  Page  │   │       │     │ Menu  │  │  DOS  │
   └────────┘  └────────┘   ▼       ▼     └───────┘  └───────┘
                       ┌────────┐ ┌────────┐
                       │ Online │ │ Online │
                       │Reference│ │Glossary│
                       └────────┘ └────────┘
```

A-5
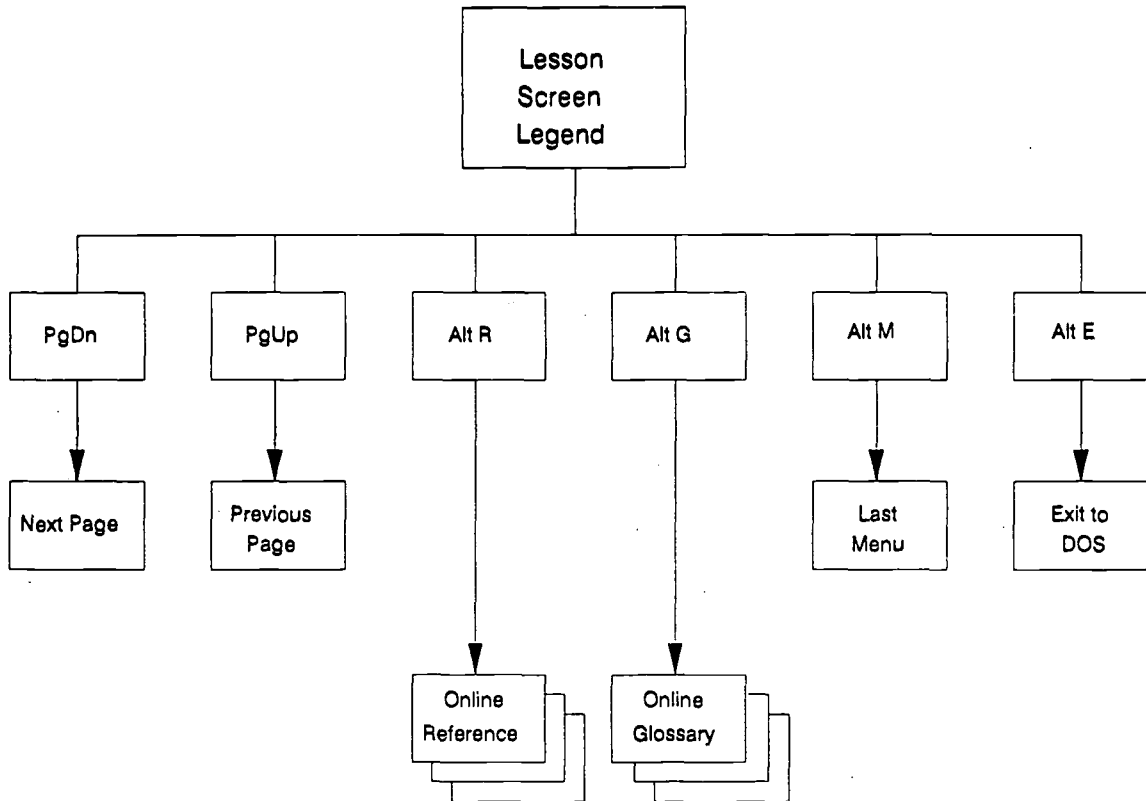
APPENDIX A

Flowchart 6: Try it Screen Legend

```
                    ┌──────────────┐
                    │  Try it Screen│
                    │    Legend     │
                    └──────┬───────┘
        ┌──────────┬───────┴───────┬──────────┐
    ┌───────┐  ┌───────┐      ┌───────┐   ┌───────┐
    │ Alt R │  │ Alt S │      │ Alt M │   │ Alt E │
    └───┬───┘  └───┬───┘      └───┬───┘   └───┬───┘
    ┌───▼───┐  ┌───▼───┐      ┌───▼───┐   ┌───▼───┐
    │Online │  │Lesson │      │ Last  │   │Exit to│
    │Referen│  │Summary│      │ Menu  │   │ DOS   │
    └───────┘  └───────┘      └───────┘   └───────┘
```

A-6
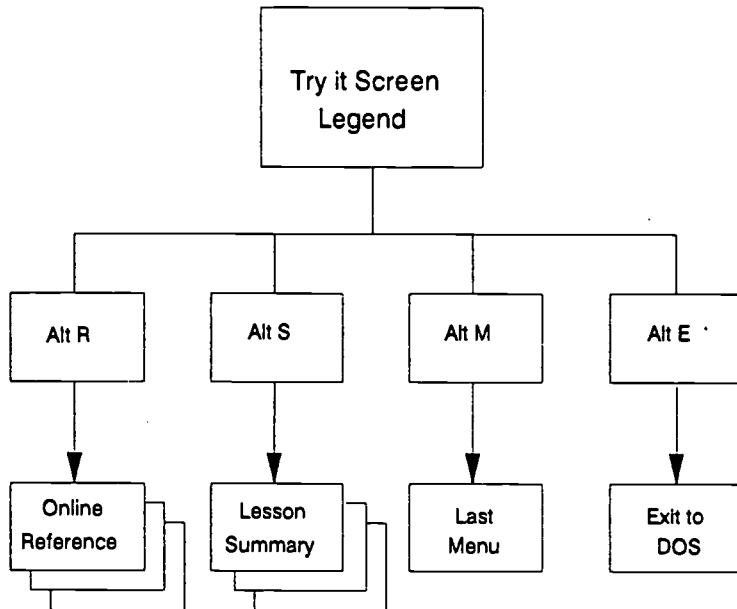
APPENDIX A

Flowchart 7: Summary Screen Legend
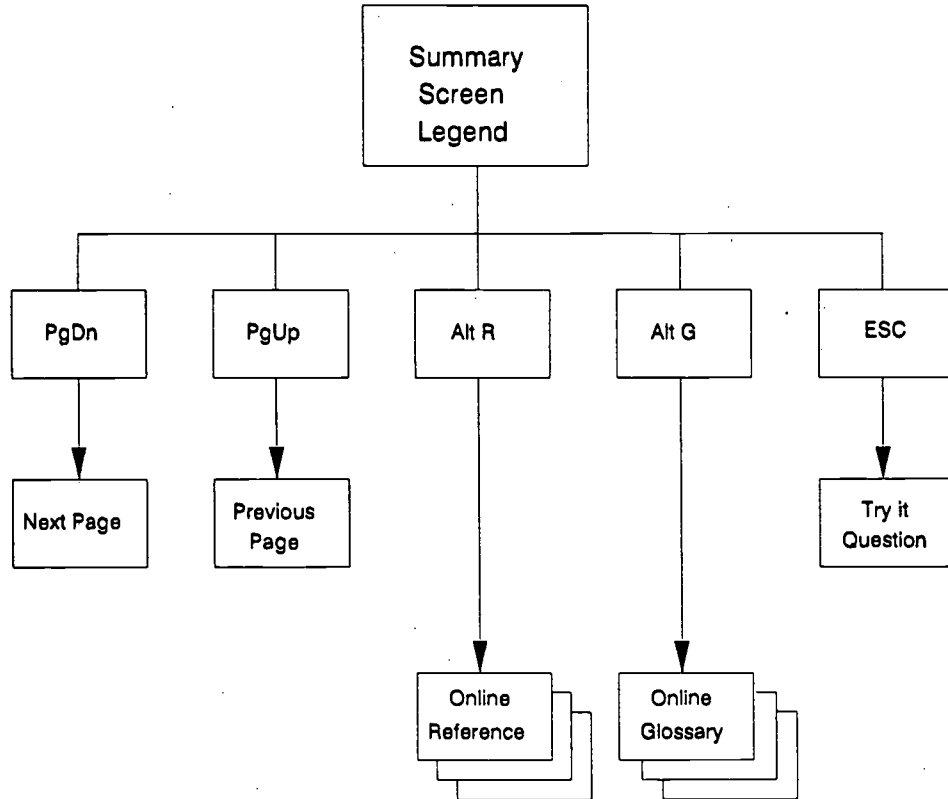
```
                    ┌──────────────┐
                    │   Summary    │
                    │   Screen     │
                    │   Legend     │
                    └──────┬───────┘
                           │
    ┌─────────┬────────────┼────────────┬─────────────┐
    │         │            │            │             │
┌───────┐ ┌───────┐   ┌───────┐    ┌───────┐     ┌───────┐
│ PgDn  │ │ PgUp  │   │ Alt R │    │ Alt G │     │  ESC  │
└───┬───┘ └───┬───┘   └───┬───┘    └───┬───┘     └───┬───┘
    │         │           │            │             │
    ▼         ▼           │            │             ▼
┌───────┐ ┌────────┐      │            │        ┌──────────┐
│ Next  │ │Previous│      │            │        │  Try it  │
│ Page  │ │ Page   │      │            │        │ Question │
└───────┘ └────────┘      ▼            ▼        └──────────┘
                    ┌──────────┐ ┌──────────┐
                    │  Online  │ │  Online  │
                    │Reference │ │ Glossary │
                    └──────────┘ └──────────┘
```

A-7

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APPENDIX C. INTERACTIVE STORYBOARDS. This section contains the storyboards used for the development of the Banyan training.

INTERACTIVE STORYBOARD

```
┌──────┐
│  32  │                              Came from:  12
└──────┘
```

Module: _User_

Topic: _1_

Lesson: _2_

Screen
Name:
 soft1

Text
Name:
_____

Graphic
Name:
 soft1

```
┌─Graphic──────────────────────────────────────────┐
│ Topic: Introduction to Banyan    Lesson: Software │
│ ───────────────────────────────────────────────── │
│                                                   │
│                                                   │
│                                                   │
│                                                   │
│                                                   │
│                                                   │
└───────────────────────────────────────────────────┘
```

1 goto
____

2 goto
____

3 goto
____

4 goto
____

5 goto
____

6 goto
____

7 goto
 _11_

```
┌─── Text ──────────────────────────────────────┐
│ In this lesson, you will be introduced to the  │
│ software that you will use to communicate with │
│ the Banyan network.                            │
│                                                │
└────────────────────────────────────────────────┘
```

```
┌── Special Instructions ───────────────────────┐
│ Line under the header is green - SUMMIT 10     │
│ This header will appear on all soft* screens.  │
│                                                │
│ Defined words:  `network                       │
│ Menu - 9 goto                                  │
└────────────────────────────────────────────────┘
```

No branch marked goes to Next

C-1

INTERACTIVE STORYBOARD

33

Came from:

Module: User

Topic: 1

Lesson: 2

Screen
Name:
soft2

Text
Name:
_____

Graphic
Name:
soft2.pcx

```
┌─── Graphic ────────────────────────────────────┐
│                                                 │
│  HEADER                                         │
│                                                 │
│   ┌═ Manpower & Reserve Affairs ═══════════┐    │
│   ║                                        ║    │
│   ║   Directories and Files                ║    │
│   ║   Printer Connections                  ║    │
│   ║   LEAVE THE NETWORK                     ║    │
│   ║   Bulletin Board (Updated weekly)       ║    │
│   ║   MAIL                                  ║    │
│   ║   Network Directories                  ║    │
│   ║   Resource and Executive Scheduler     ║    │
│   ║   Supported Network Applications       ║    │
│   ║   Making Connections to NETWORK PRINTERS║   │
│   ║   Activities Menu                      ║    │
│   ║   Operating System Functions           ║    │
│   ║   Helpful Hints and LAN Procedures     ║    │
│   └════════════════════════════════════════┘    │
└─────────────────────────────────────────────────┘
```

1 goto
____

2 goto
____

3 goto
____

4 goto
____

5 goto
____

6 goto
____

7 goto
11

```
┌─── Text ────────────────────────────────────────┐
│                                                  │
│   You will usually use a series of menus called  │
│   Menus to talk to the network.  These menus     │
│   are called "windows".  In Banyan, a window     │
│   is a boxed-in area on the computer screen.     │
│                                                  │
└──────────────────────────────────────────────────┘
```

```
┌─── Special Instructions ────────────────────────┐
│                                                  │
│                                                  │
│                                                  │
│                                                  │
│                                                  │
│   Defined words:  network  window               │
│   Menu - 7 goto                                  │
└──────────────────────────────────────────────────┘
```

No branch marked goes to Next

C-2

INTERACTIVE STORYBOARD

34

Came from:

Module: __User__

Topic: __1__

Lesson: __2__

Screen
Name:
__soft3__

Text
Name:
_____

Graphic
Name:
__soft2.pcx__

1 goto
____

2 goto
____

3 goto
____

4 goto
____

5 goto
____

6 goto
____

7 goto
____

8 goto
__11__

┌─ Graphic ──────────────────────────────┐
│   │
│ HEADER   │
│   │
│   │
│ ┌═ Manpower & Reserve Affairs ═══════┐ │
│ │   │ │
│ │   Directories and Files   │ │
│ │   Printer Connections   │ │
│ │   LEAVE THE NETWORK   │ │
│ │   Bulletin Board (Updated weekly) │ │
│ │   MAIL   │ │
│ │   Network Directories   │ │
│ │   Resource and Executive Scheduler│ │
│ │   Supported Network Applications │ │
│ │   Making Connections to NETWORK PRINTERS│ │
│ │   Activities Menu   │ │
│ │   Operating System Functions   │ │
│ │   Helpful Hints and LAN Procedures│ │
│ └────────────────────────────────────┘ │
└───┘

┌─ Text ──────────────────────────────────┐
│   │
│ A window is considered open when you can read │
│ its contents. The menu window on the screen now │
│ is considered open because you can read its │
│ options.   │
│   │
└──┘

┌─ Special Instructions ──────────────────┐
│   │
│   │
│   │
│   │
│   Defined words: window   │
│   Menu - 8 goto   │
└──┘

No branch marked goes to Next

C-3

INTERACTIVE STORYBOARD

Came from:

35

Module: User

Topic: 1

Lesson: 2

Screen
Name:
soft4

Text
Name:

Graphic
Name:

1 goto

2 goto

3 goto

4 goto

5 goto

6 goto

7 goto

8 goto

┌─ Graphic ──────────────────────────────┐
│ HEADER   │
│   │
│   │
│   │
│   │
│   │
│   │
│   │
│   │
│   │
│   │
└───┘

┌─ Text ─────────────────────────────────┐
│ When the window disappears from the screen and │
│ you can no longer read it, it's considered │
│ closed. │
└───┘

┌─ Special Instructions ─────────────────┐
│   │
│ Make this a blank screen   │
│   │
│   │
│ Defined words: window   │
│ Menu - 8 goto   │
└───┘

No branch marked goes to Next

C-4

INTERACTIVE STORYBOARD

36

Came from:

Module: _User_

Topic: _1_

Lesson: _2_

Screen
Name:
soft5

Text
Name:
_____

Graphic
Name:
soft2.pcx

```
┌── Graphic ─────────────────────────────────┐
│                                             │
│  HEADER                                     │
│                                             │
│   ┌═ Manpower & Reserve Affairs ═══════┐    │
│   ║                                    ║    │
│   ║   Directories and Files            ║    │
│   ║   Printer Connections              ║    │
│   ║   LEAVE THE NETWORK                ║    │
│   ║   Bulletin Board (Updated weekly)  ║    │
│   ║   MAIL                             ║    │
│   ║   Network Directories              ║    │
│   ║   Resource and Executive Scheduler ║    │
│   ║   Supported Network Applications   ║    │
│   ║   Making Connections to NETWORK PRINTERS║
│   ║   Activities Menu                  ║    │
│   ║   Operating System Functions       ║    │
│   ║   Helpful Hints and LAN Procedures ║    │
│   └════════════════════════════════════┘    │
│                                             │
└─────────────────────────────────────────────┘
```

1 goto
  _37_

2 goto
  ___

3 goto
  ___

4 goto
  ___

5 goto
  ___

6 goto
  ___

7 goto
  _28_

8 goto
  _38_

```
┌── Text ─────────────────────────────────────┐
│                                             │
│ When a menu window is open, you can use the up│
│ and down arrow keys on your keyboard to select a│
│ menu option.  Try using your arrow keys now with│
│ this menu.  When you're ready to go on with the│
│ lesson, press [PgDn].                       │
│                                             │
└─────────────────────────────────────────────┘
```

```
┌── Special Instructions ─────────────────────┐
│                                             │
│ Highlight options as they are selected.     │
│                                             │
│ If keys other than the up and down arrow are│
│ used, branch to 1 goto.                     │
│                                             │
│ Defined words:                              │
│ Menu - 8 goto                               │
└─────────────────────────────────────────────┘
```

No branch marked goes to Next

C-5

INTERACTIVE STORYBOARD

```
┌─────────┐
│   37    │                                      Came from:
└─────────┘
```

Module: __User__

┌─ Graphic ──┐
│   │
Topic: _1_   HEADER
│   │
Lesson: _2_
│   ┌═ Manpower & Reserve Affairs ═══════════┐   │
Screen │   │   │
Name: │ Directories and Files   │   │
soft6 │ Printer Connections   │   │
        │ LEAVE THE NETWORK   │   │
Text   │ Bulletin Board (Updated weekly) ·   │   │
Name: │ MAIL   │   │
_____ │ Network Directories   │   │
        │ Resource and Executive Scheduler   │   │
Graphic │ Supported Network Applications   │   │
Name: │ Making Connections to NETWORK PRINTERS │   │
soft2.pcx│ Activities Menu   │   │
        │ Operating System Functions   │   │
        │ Helpful Hints and LAN Procedures   │   │
1 goto └═══┘   │
_____ └──┘

2 goto   ┌─ Text ────────────────────────────────────┐
_____   │   │
               │ Be sure you're using the up and down arrow keys
3 goto   │ to select a menu option. The arrow keys are
_____   │ located on the numeric keypad. Try using the
               │ arrow keys again.   │
4 goto   │   │
_____   │   │
               └──┘
5 goto
_____   ┌─ Special Instructions ────────────────────┐
               │   │
6 goto   │   │
_____   │   │
               │   │
7 goto   │   │
_____   │   │
               │ Defined words: │
8 goto   │ Menu - 8 goto   │
__11__   └──┘

No branch marked goes to Next
```

C-6

INTERACTIVE STORYBOARD

38

Came from:

Module: __User__

Topic: __1__

Lesson: __2__

Screen
Name:
__soft7__

Text
Name:

_____

Graphic
Name:
__soft2.pcx__

1 goto
__37__

2 goto
__39__

3 goto
__40__

4 goto
__41__

5 goto
__42__

6 goto
__43__

7 goto
__44__

8 goto
__36__

9 goto
__52__

┌─ Graphic ────────────────────────────────┐
│                                           │
│  HEADER                                    │
│                                           │
│  ╔═══ Manpower & Reserve Affairs ═══════╗ │
│     3 ║ Directories and Files           ║ │
│     4 ║ Printer Connections             ║ │
│     5 ║ LEAVE THE NETWORK               ║ │
│     6 ║ Bulletin Board (Updated weekly) ║ │
│     7 ║ MAIL                            ║ │
│  stbd39║ Network Directories            ║ │
│        ║ Resource and Executive Scheduler║ │
│        ║ Supported Network Applications  ║ │
│        ║ Making Connections to NETWORK PRINTERS║
│        ║ Activities Menu                 ║ │
│        ║ Operating System Functions      ║ │
│        ║ Helpful Hints and LAN Procedures║ │
│        ╚═════════════════════════════════╝ │
└───────────────────────────────────────────┘

┌─ Text ────────────────────────────────────┐
│                                           │
│  When you use the arrow keys to select a menu │
│  option, that option will be highlighted.  Now, │
│  once an option is highlighted, you can press │
│  the [Return] key to execute it.  Try using the │
│  arrow keys again to select an option, but this │
│  time press [Return] when an option is high- │
│  lighted.  If you prefer to go on with the lesson │
│  instead, press PgDn.                     │
│                                           │
└───────────────────────────────────────────┘

┌─── Special Instructions ──────────────────┐
│  Highlight options as they are selected.   │
│                                           │
│  If keys other than the up and down arrow are used, │
│  branch to 1 goto.                        │
│                                           │
│  If key other than [Return] is used, branch to 2 goto. │
│   Defined words:                          │
│   PgUp - 8 goto       PgDn - 9 goto       │
└───────────────────────────────────────────┘

No branch marked goes to Next     Branching continued on 39
C-7

INTERACTIVE STORYBOARD

```
┌─────┐
│ 39  │                                    Came from:
└─────┘
Module: User
```

```
Topic:  1        ┌─ Graphic ──────────────────────────────────────┐
                 │                                                │
Lesson: 2        │  HEADER                                        │
                 │                                                │
Screen           │      ╔═ Manpower & Reserve Affairs ═════════╗  │
Name:            │      ║                                      ║  │
  soft8          │      ║     Directories and Files            ║  │
                 │      ║     Printer Connections              ║  │
Text             │      ║     LEAVE THE NETWORK                 ║  │
Name:            │      ║     Bulletin Board (Updated weekly)  ║  │
                 │      ║     MAIL                             ║  │
_____         │    8 ║     Network Directories              ║  │
                 │    9 ║     Resource and Executive Scheduler ║  │
Graphic          │   10 ║     Supported Network Applications   ║  │
Name:            │   11 ║     Making Connections to NETWORK PRINTERS
  soft2.pcx      │   12 ║     Activities Menu                  ║  │
                 │   13 ║     Operating System Functions       ║  │
8 goto           │   14 ║     Helpful Hints and LAN Procedures ║  │
  45             │      ╚══════════════════════════════════════╝  │
                 └────────────────────────────────────────────────┘
9 goto
  46             ┌─ Text ─────────────────────────────────────────┐
                 │                                                │
10 goto          │  You must press the [Return] key to execute an │
   47            │  option.  Try pressing [Return] again.         │
                 │                                                │
11 goto          │                                                │
   48            │                                                │
                 │                                                │
12 goto          │                                                │
   49            │                                                │
                 │                                                │
13 goto          │                                                │
   50            │                                                │
                 └────────────────────────────────────────────────┘
14 goto
   51            ┌─ Special Instructions ─────────────────────────┐
                 │                                                │
15 goto          │   PgUp - 15 goto                               │
   36            │   PgDn - 16 goto                               │
                 │                                                │
16 goto          │                                                │
   52            │                                                │
                 │   Defined words:                               │
                 │                                                │
                 └────────────────────────────────────────────────┘
```

No branch marked goes to Next   Branching continued from 38
                                 C-8

Appendix G

SAMPLE OF A COURSEWARE USER'S GUIDE

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5231-07A, the Users Manual.
Appendix A of IRM 5231-07A lays out a general users manual table
of contents with the fundamental elements found in most users
manuals marked. Appendix B of IRM 5231-07A describes the content
of each section identified in Appendix A of IRM 5231-07A. Page
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PUBLICATION TABLE OF CONTENTS

USER'S GUIDE
Computer-based Training Courseware
Banyan Local Area Network

(This page intentionally left blank)

USER'S GUIDE
Computer-based Training Courseware
Banyan Local Area Network

LIST OF FIGURES

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SECTION 1. HARDWARE REQUIREMENTS AND SOFTWARE INSTALLATION

1.1 HARDWARE

The Banyan computer-based training (CBT) courseware requires the following hardware:

a. IBM PC or compatible with a hard disk and at least one 5 1/4 inch diskette drive or an IBM PC or compatible linked to the network server on which the courseware resides

b. 512K available memory

c. EGA or VGA color adapter card

d. EGA or VGA color monitor

1.2 SOFTWARE INSTALLATION

The courseware consists of four diskettes, labeled one through four. You can install the software on either a hard disk or a network server. The directions below describe installation on the hard disk drive C:. To install the software on a different hard disk drive or on a network, substitute the C: in the example with the drive of your choice.

a. On drive C: make a subdirectory named TUTOR.

```
C:\>md tutor
```

b. On drive C: make another subdirectory named RECORDS.

```
C:\>md records
```

c. Change directories to the TUTOR subdirectory.

```
C:\>cd\tutor
```

This step will change the C: prompt to the TUTOR prompt.

d. Insert the diskette labeled 1 of 4 into the A: drive and close the lever.

e. At the TUTOR prompt, type RESTORE A: C:.

```
C:\TUTOR> restore a: c:
```

This step will copy the files on diskette 1 into the TUTOR subdirectory.

f. When diskette 1 has finished copying, you will be prompted to insert diskette 2. Follow the prompts until all of the diskettes are copied.

g. When the diskettes are copied, change directories to RECORDS.

        C:\TUTOR> **cd records**

h. Insert the diskette labeled 1 of 1 into the A: drive and close the lever.

i. At the RECORDS prompt, type RESTORE A: C:.

        C:\RECORDS> **restore a: c:**

    This step will copy the files on the diskette into the RECORDS subdirectory.

1.3   ACCESSING THE COURSEWARE

Before you access the courseware, be sure that the **[NumLock]** key is off. NumLock is short for Numeric Lock. It acts as a toggle for the keys in the number pad at the right side of the keyboard. When **[NumLock]** is on, the number pad is active; and the keys on the number pad return numbers. When **[NumLock]** is off, the keys on the number pad provide cursor and page movement. NumLock is on when the light above the word "NumLock" on the keyboard is on. To turn NumLock off, press the **[NumLock]** key. Once the **[NumLock]** key is off, follow these steps to access the courseware:

a. From the C: prompt, change directories to the subdirectory TUTOR.

        C:\> **cd\tutor**

b. At the TUTOR prompt, type "Banyan".

        C:\tutor> **Banyan**

SECTION 2. COURSE CONVENTIONS

The Banyan course is interactive. That means that you tell the course what lessons you want to see and in what order you want to see them. During the lessons you will be asked to respond to activities and questions, and you will receive feedback according to those responses. Additionally, the course will guide you to review and remedial lessons at your request.

2.1 LOGGING IN

Each time that you enter the course, you will be required to provide your name and the two-letter code for your division. If you are logging in to the course for the first time, you will see the following message:

> **Your record cannot be found in the database.**
>
> **If you would like to create a record with this name then press [Return].**
>
> **Otherwise, press [Esc] to redo these entries.**

    Pressing **[Return]** will take you to the course title screen. Pressing **[Esc]** will return you to the log on screen.

2.2 MENUS

You will access the lessons through menus. Figure 2-1 is an example of the course main menu.

```
Using the Banyan Network System

   1.   How to Use the Course

   2.   Overview of Networks

   3.   Introduction to Banyan

   4.   Using the Banyan Menus

   5.   Pretest
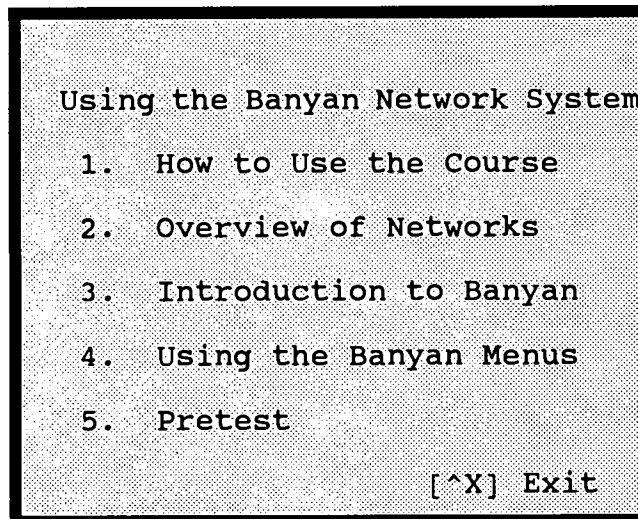
                              [^X] Exit
```

Figure 2-1. Main Menu

2-1

Option 1 on the menu, How to Use the Course, and option 2, Overview of Networks, provide introductory course and network information. Option 3, Introduction to Banyan, and option 4, Using the Banyan Menus, contain the course material. Notice that this menu has a pretest option. The pretest option is available when you initially enter the course and after you select the items 1 and 2. After that, the pretest option is replaced with the posttest option. If you want to take the pretest, be sure you select it before you select options 3 or 4.

2.3 PRETEST/POSTTEST

The pretest and the posttest consist of 20 questions each. These questions cover the scope of the course. Both of these tests are graded, and the grades are recorded in your student file.

2.4 COURSE STRUCTURE

The course is divided into two topics: Introduction to Banyan and Using the Banyan Menus. Both topics have practice exercise options on the menus. If you chose to take the practice exercises, you have two chances to answer these questions correctly. You also have the option to review the parts of the lesson that pertain to a particular exercise. The practice exercises are not graded. It is a good idea to go through the practice exercises before you take the posttest since the question styles are similar. The topics are then further divided into lessons. Some of the lessons have activities at the end. You have two chances to answer an activity correctly. These activities are not graded.

2.5 LESSON SCREENS

A typical lesson screen has a header across the top. This header tells you the name of the topic and lesson you are currently in. The center of the lesson screen is reserved for graphics and text. A legend across the bottom of the screen lists the keys that you will use to move from screen to screen. Figure 2-2 shows a typical lesson screen.

2.6   THE LEGEND

The legend at the bottom of each lesson screen provides a list of the keys that you will use to go from screen to screen, to return to a menu, to access the glossary and text version of the course, and to exit the course.

   The first two keys on the legend are **[PgDn]** and **[PgUp]**. **[PgDn]** goes to the next screen in the lesson, and **[PgUp]** goes to the previous screen.

   The next key, **[^G]**, gives you access to an on-line glossary of terms. The ^ symbol is the symbol for the **[Alt]** key. To access the glossary, you must press the **[Alt]** key and the **[G]** key at the same time.

Topic: Using the Banyan Menus   Lesson: Activities Menu

Graphic Graphic Graphic
Graphic Graphic Graphic

On a lesson screen, the text will appear below the graphic.

[PgDn] Next [PgUp] Last [^G] Glossary [^T] Text [^M] Menu [^X] Exit

Figure 2-2.   Typical Lesson Screen

2-3

The [^T] key gives you access to an on-line text version of the lesson you are in. To access the text, you must press the [Alt] key and the [T] key at the same time. This option can save you time when you are reviewing the information in the lesson or refreshing your memory.

Pressing the [^M] key will return you to the last menu from which you made a selection. To return to the menu, you must press the [Alt] key and the [M] key at the same time.

If you press the [^X] key, you will exit the course and return to the DOS prompt. Like the other keys, you must press the [Alt] key and the [X] key at the same time.

2.7 COLOR CONVENTIONS

Although the glossary is available from every lesson screen, words defined in the glossary will be green as they appear on the screen. In the text option, defined words will be red. This way you will know before entering the glossary whether or not a particular word is defined.

2.8 BOOKMARK

When you exit the course, the program will remember the screen that you were on when you exited. The next time you log in, you will see the following message:

```
Do you want to resume
where
you left off last time?
Please press [y] or [n].
```

Figure 2-3. Bookmark Screen

If you press [y], you will return to the screen from which you exited. If you press [n], you will branch to the beginning of the course.

SECTION 3. LESSON OBJECTIVES AND SUMMARIES

3.1 INTRODUCTION TO BANYAN

Lesson 1: Hardware

Objective: The student shall be able to identify the hardware elements that make up a network system, describe the functions of the hardware, and describe basic troubleshooting procedures.

Summary: This lesson uses a combination of graphics and text to illustrate and describe the function of the basic network components. Basic troubleshooting is included in the lesson.

Lesson 2: Software

Objective: The student shall demonstrate a familiarity with the Banyan network software by using the menus to select menu options and by activating and deactivating windows made available through their selections.

Summary: This lesson uses carbon copy screens from the network to demonstrate how options are selected from menus, how menu windows are made active, and how the command bar can be accessed and used.

Lesson 3: Backup

Objective: The student shall demonstrate a familiarity of backup and restore procedures by selecting the type of backup or restore most appropriate to a given situation.

Summary: This lesson uses a combination of graphics and text to describe what backup and restore are, to explain their importance, and to explain the steps required in both procedures. The lesson also explains what local and network drives are and how often local drives should be backed up.

3.2 USING THE BANYAN MENUS

Lesson 1: Directories and Files

   Objective: The student shall demonstrate the ability to use
   the Directories and Files option on the main menu by working
   with directory and file options.

   Summary: This lesson uses carbon copy network menu screens
   to simulate the actual Directories and Files option on the
   network. During the lesson, you will be required to open
   specific directory windows, expand windows, mark files for
   rearrangement and deletion, and add directories to specified
   drives.

Lesson 2: Printer Connections

   Objective: The student shall demonstrate the ability to use
   the Printer Connections option on the main menu by
   interpreting the information in a print queue and by deleting
   a print job.

   Summary: This lesson uses carbon copy network menu screens
   to simulate the actual Printer Connections option on the
   network. You will be required to access print queues for
   specific printers and to delete print jobs from those queues.

Lesson 3: Mail

   Objective: The student shall demonstrate the ability to use
   the Mail option on the main menu by reading, creating, and
   sending electronic mail messages.

   Summary: This lesson uses carbon copy network menu screens
   to simulate the actual Mail option on the network. During
   this lesson, you will be required to use the appropriate
   function keys to retrieve and read mail and to create and
   send messages.

Lesson 4: Leave the Network

   Objective: The student shall demonstrate the ability to
   access additional applications and programs available on the
   main menu and to access network information.

   Summary: This lesson is limited to an overview of each
   specific option selected from the menu. When you select this
   option, you will see duplicates of the screens that you see
   when you are actually in the network; and you will be shown
   how the options are used.

Lesson 5:   Bulletin Board (Updated Weekly)

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 6:   Network Directories

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 7:   Resource and Executive Scheduler

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 8:   Supported Network Applications

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 9: Making Connections to Network Printers

Objective: The student shall demonstrate the ability to access addit .onal applications and programs available on the main menu ar i to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 10: Activities Menu

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 11: Operating System Functions

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 12: Helpful Hints and LAN Procedures

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: This lesson is limited to an overview of each specific option selected from the menu. When you select this option, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

APPENDIX A

Course Glossary

Active window   The window from which selections can be made and commands can be executed.

Administrator   A network user who can access commands that allow him to set up and manage the network.

Command bar   Available commands listed across the top of a menu if the slash [/] key is pressed.

Data   The numbers and text processed by a computer.

Folder   In Mail, the subdirectory that contains a user's mail messages.

LAN   Local area network.

Local drive   The drive physically connected to a workstation.

Message line   The line below the command bar that displays a description of the highlighted command.

Network   Servers and workstations connected by cable and linked through software to allow a sharing of resources.

Queue   A list of files waiting to be printed.

Server   A computer that provides a central storage area for network applications and files.

Window   A boxed-in area on the computer screen.

A-1

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Appendix H

SAMPLE OF A COURSEWARE INSTRUCTOR'S/ADMINISTRATOR'S GUIDE

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5231-07A, the Users Manual.
Appendix A of IRM 5231-07A lays out a general users manual table
of contents with the fundamental elements found in most users
manuals marked. Appendix B of IRM 5231-07A describes the content
of each section identified in Appendix A of IRM 5231-07A. Page
numbering has been altered for the purposes of this appendix.
Actual informational content within this sample document may vary
from the information presented in this appendix. The information
contained within this appendix is for **illustration purposes only**
and should not be mistaken as a standard in terms of authoring
systems, methodologies, or presentation style to be used. This
appendix does illustrate the types of information that this
document must contain and the format for its presentation.

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PUBLICATION TABLE OF CONTENTS

INSTRUCTOR'S/ADMINISTRATOR'S GUIDE
Computer-based Training Courseware
Banyan Local Area Network

v

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INSTRUCTOR'S/ADMINISTRATOR'S GUIDE
Computer-based Training Courseware
Banyan Local Area Network

LIST OF FIGURES

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SECTION 1. HARDWARE REQUIREMENTS AND SOFTWARE INSTALLATION

1.1 HARDWARE

The Banyan computer-based training (CBT) software requires the following hardware:

 a. IBM PC or compatible with a hard disk and at least one 5 1/4 inch diskette drive or an IBM PC or compatible linked to the network server on which the courseware resides

 b. EGA or VGA color adapter card

 c. EGA or VGA color monitor

1.2 OVERVIEW OF COURSE SOFTWARE

The Banyan course software consists of four diskettes, labeled 1 of 4, 2 of 4, 3 of 4, and 4 of 4. You can install the course software diskettes on either a hard disk or a network server. The directions below describe installation on the hard disk drive C:. To install the Banyan software on a different hard disk drive or on a network, substitute the C: in the example with the drive of your choice.

 a. Create two new directories on the drive that the Banyan software will be copied to. One should be named "tutor"; one should be named "records".

   C:\>**md tutor**

   C:\>**md records**

 b. At the C: prompt type **cd\tutor**.

   C:\>**cd\tutor**

   This step will change the current directory to "tutor."

 c. Insert diskette 1 of 4 into the diskette drive.

 d. At the c:\tutor>: prompt, type **restore a: c:**.

   C:\tutor>;**restore a: c:**.

 The files contained on the diskette will now copy into C:\tutor. When all files on this diskette are copied, the system will prompt you to insert diskette 2, diskette 3, and then diskette 4. When all diskettes have been restored, the system will again display the c:\tutor> prompt.

1-1

1.2.1 Installation of Administrator's Software

The Banyan administrator software consists of one diskette, labeled 1 of 1.   You can install the administrator diskette on either a hard disk or a network server.   The directions below describe installation on the hard disk drive C:.   To install the Banyan administrator software on a different hard disk drive or on a network, substitute the C: in the example with the drive of your choice.

     a.   At the c:\tutor> prompt, type **cd\records**.

        C:\tutor>:**cd\records**

        This step will change the current directory to "records."

     b.   Insert diskette 1 of 1 into the diskette drive.

     c.   At the c:\records> prompt, type **restore a: c:**.

        C:\records>:**restore a: c:**

    The files contained on the diskette will now copy into C:\records.   When the diskette has been restored, the system will again display the c:\records> prompt.

1.2.2 Accessing the Courseware

The following steps detail only how to enter the Banyan Computer-based Training Course.   For further information about use of the course, refer to the Banyan Computer-based Training User's Guide.

     a.   From the C: prompt, change directories to the subdirectory TUTOR.

        C:\>**cd\tutor**

     b.   At the TUTOR prompt, type **Banyan**.

        C:\tutor>**Banyan**

SECTION 2. STUDENT RECORDKEEPING

2.1 ACCESSING THE ADMINISTRATOR SOFTWARE

The administrator software accumulates student data from the courseware. It also provides the ability to view student usage data and to obtain student performance reports from course tests.

    a.   From the C: prompt, change directories to the subdirectory RECORDS.

            C:\>cd**records**

    b.   At the RECORDS prompt, type **report**.

            C:\records>**report**

2.2 ADMINISTRATOR SOFTWARE OPTIONS

Once you have entered the administrator software, an Instructor Program Menu will appear that displays the various options available to you. Figure 2-1 is an example of the Instructor Program Menu.

Instructor Program Menu

    1) Create/edit student records
    2) Display/print student records
    3) Display/print CMI data
    4) Review/delete lesson comments
    5) Edit configuration parameters
    0) Exit

Select an item via mouse, or use cursor/number keys and press <Return>

Figure 2-1. Instructor Program Menu

Option 1 on the menu, Create/edit student records, provides the administrator with the ability to edit student record parameters. Option 2, Display/print student records, provides the administrator with either a display or printout of a report containing scores, specific test responses, total time spent in

2-1

the course, and the number of course sessions completed by a
student or group of students. Option 3, Display/print CMI data,
is not applicable to the Banyan CBT courseware. Option 4,
Review/delete le son comments, is not applicable to the Banyan
CBT courseware. Option 5, Edit configuration parameters, is not
applicable to th Banyan CBT courseware. Option 0, Exit, is used
to exit the Instructor Program menu and return to DOS.

2.2.1 Create/Edit Student Records

If the Banyan courseware and administrative software are
installed on a drive other than C:, lesson usage parameters must
be reconfigured. You can access these parameters through Option
1, Create/edit student records. Follow these steps:

a. At the program menu, highlight and select **Create/edit
    student records.**

    This step will access the student record menu.

b. At the student record menu, highlight and select
    Configure student lesson usage parameters.

c. At the path to use prompt, type **correct drive:\records.**

    path to use...**?:\records**

d. Press **[F3]** <u>twice</u>.

    Steps e and f ensure that all student records are
    written to the records directory on the appropriate
    drive and then returns to the student record menu.

e. At the student record menu, select 0 to exit.

f. At the program menu, highlight and select **Edit
    configuration parameters.**

g. At the lesson configuration menu, select **1 - Set lesson
    default values.**

h. At the lesson default value menu, item 1, **Default
    lesson disk directory path,** type the **correct
    drive:\tutor.**

    ?:\tutor

i. At the lesson default value menu, item 6, **Student
    records disk path,** type the **correct drive:\records.**

2-2

j. At the lesson default value menu, item 14, **Image buffer disk path**, type the **correct drive:\records**.

k. Press **[F3]** to continue.

l. At the path prompt type the **correct drive\tutor**.

    ?:\tutor

m. Press **[F3]** to continue.

n. When the message **Done!** appears on the screen, press **[F1]** to backup.

o. Press **[F3]** to continue.

p. At the path prompt type the **correct drive\records**.

    ?:\records

q. Press **[F3]** to continue.

Steps f through q set the lesson configuration parameters for both the tutor and the records directory. The installation and configuration of the courseware and administrative software is now complete.

2-3

2.2.2 Display/Print Student Records

Option 2, Display/print student records, is the recordkeeping
administrative option used in the Banyan course. To access
Option 2, use your arrow keys to ensure that the selection marker
is directly next to **2) Display/print student records** and press
[RETURN]. See Figure 2-2.

Instructor Program Menu

> 1) Create/edit student records
> > 2) Display/print student records
> 3) Display/print CMI data
> 4) Review/delete lesson comments
> 5) Edit configuration parameters
> 0) Exit

Select an item via mouse, or use cursor/number keys and press < Return > > 2

Figure 2-2. Accessing Display/Print Student Records

2-4

Once you have entered Option 2, a report generation form will appear on your screen. You have two report formats to choose from: the Custom Report and the Standard Student Report. Before you can receive a student performance report, you must first enter the information to be included in the report on this form. See Figure 2-3.

2.0 Student record report generation

Screen Library Disk C:\records\, Library 01

Enter the information below to generate a report. Use '*' as a wildcard.

    1) Student's first name ....   ***

    2) Student's last name ....   ***

    3) Group..........................   ***

    4) Identification #.............   ***

    5) Send output to device........   **scrn:**

    6) Vars or |Template screens....

    7) New page between students? ..Y

    <F1> back up   <F3> continue   <F5> directory

Figure 2-3. Student Report Menu

To generate the Banyan custom report, type "|report" after number 6, Vars or |Template screens....

2-5

Studer : Joe Brown
Last Logged in: 02-08-1991 13:26
Pretest Score: 60
Posttest Score: 90
Number of Sessions: 1
Time Spent in Course: 45.5 minutes
Posttest Questions Incorrect: 5, 13

Figure 2-4.   Sample Custom Report

To generate the standard student report, press [F3] to continue at the student report menu.   See Figure 2-5.

Summit Student Records Report............02-14-1991

Name: Stewart   Grp: mi   ID:
Last: 02-14-1991 13:26   Mins: 3   Sess: 1   Created: 02-14-1991 13:20

<F1> back up   <F3> continue

Figure 2-5.   Sample Standard Student Report

SECTION 3. LESSON OBJECTIVES AND SUMMARIES

3.1 INTRODUCTION TO BANYAN

Lesson 1: Hardware

Objective: The student shall be able to identify the
hardware elements that make up a network system, describe
the functions of the hardware, and describe basic
troubleshooting procedures.

Summary: This lesson uses a combination of graphics and
text to illustrate and describe the function of the basic
network components. Basic troubleshooting is included in
the lesson.

Lesson 2: Software

Objective: The student shall demonstrate a familiarity with
the Banyan network software by using the menus to select
menu options and by activating and deactivating windows made
available through their selections.

Summary: This lesson uses carbon copy screens from the
network to demonstrate how options are selected from menus,
how menu windows are made active, and how the command bar
can be accessed and used.

Lesson 3: Backup

Objective: The student shall demonstrate a familiarity of
backup and restore procedures by selecting the type of
backup or restore most appropriate to a given situation.

Summary: This lesson uses a combination of graphics and
text to describe what backup and restore are, to explain
their importance, and to explain the steps required in both
procedures. The lesson also explains what local and network
drives are and how often local drives should be backed up.

3.2 USING THE BANYAN MENUS

Lesson 1: Directories and Files

Objective: The student shall demonstrate the ability to use the Directories and Files option on the main menu by working with directory and file options.

Summary: This lesson uses carbon copy network menu screens to simulate the actual Directories and Files option on the network. During the lesson, you will be required to open specific directory windows, expand windows, mark files for rearrangement and deletion, and add directories to specified drives.

Lesson 2: Printer Connections

Objective: The student shall demonstrate the ability to use the Printer Connections option on the main menu by interpreting the information in a print queue and by deleting a print job.

Summary: This lesson uses carbon copy network menu screens to simulate the actual Printer Connections option on the network. You will be required to access print queues for specific printers and to delete print jobs from those queues.

Lesson 3: Mail

Objective: The student shall demonstrate the ability to use the Mail option on the main menu by reading, creating, and sending electronic mail messages.

Summary: This lesson uses carbon copy network menu screens to simulate the actual Mail option on the network. During this lesson, you will be required to use the appropriate function keys to retrieve and read mail and to create and send messages.

Lesson 4: Leave The Network

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 5:   Bulletin Board (Updated Weekly)

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 6:   Network Directories

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 7:   Resource and Executive Scheduler

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 8:   Supported Network Applications

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 9:   Making Connections to Network Printers

Objective: The student shall demonstrate the ability to access addi ional applications and programs available on the main menu a ! to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 10:   Activities Menu

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 11:   Operating System Functions

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

Lesson 12:   Helpful Hints and LAN Procedures

Objective: The student shall demonstrate the ability to access additional applications and programs available on the main menu and to access network information.

Summary: These lessons are limited to an overview of each specific option selected from the menu. When you select these options, you will see duplicates of the screens that you see when you are actually in the network; and you will be shown how the options are used.

SECTION 4. QUESTION SUMMARY

4.1 INTRODUCTION

The Banyan student recordkeeping program provides a list of the posttest question numbers that each student answered incorrectly. For your convenience in tracking student progress, each posttest question number, the topic and lesson from which it came, and the corresponding enabling learning objective are listed below.

Question 1

Topic:	Introduction to Banyan
Lesson:	Hardware
Objective:	To identify the hardware elements that make up a network system, to describe the functions of the hardware, and to describe basic troubleshooting procedures.

Question 2

Topic:	Introduction to Banyan
Lesson:	Hardware
Objective:	To identify the hardware elements that make up a network system, to describe the functions of the hardware, and to describe basic troubleshooting procedures.

Question 3

Topic:	Using the Banyan Menus
Lesson:	Directories and Files
Objective:	To demonstrate the ability to use the Directories and Files option by working with directory and file options.

Question 4

Topic:	Introduction to Banyan
Lesson:	Software
Objective:	To demonstrate a familiarity with the Banyan network software by using the menus to select a menu option and by activitating and deactivitating windows.

Question 5

Topic:	Using the Banyan Menus
Lesson:	Activities Menu
Objective:	To demonstrate the ability to access additional applications and programs available on the network menu.

4-1

Question 6

Topic: Using the Banyan Menus
Lesson: Directories and Files
Objective: To demonstrate the ability to use the Directories
            and Files option by working with directory and
            file options.

Question 7

Topic: Using the Banyan Menus
Lesson: Directories and Files
Objective: To demonstrate the ability to use the Directories
            and Files option by working with directory and
            file options.

Question 8

Topic: Using the Banyan Menus
Lesson: Directories and Files
Objective: To demonstrate the ability to use the Directories
            and Files option by working with directory and
            file options.

Question 9

Topic: Using the Banyan Menus
Lesson: Directories and Files
Objective: To demonstrate the ability to use the Directories
            and Files option by working with directory and
            file options.

Question 10

Topic: Using the Banyan Menus
Lesson: Printer Connections
Objective: To demonstrate the ability to use the Printer
            Connections option by interpreting the
            information in a print queue and by deleting a
            print job.

Question 11

Topic: Using the Banyan Menus
Lesson: Printer Connections
Objective: To demonstrate the ability to use the Printer
            Connections option by interpreting the
            information in a print queue and by deleting a
            print job.

Question 12

    Topic: Introduction to Banyan
    Lesson: Backup
    Objective: To demonstrate familiarity of backup and restore
                  procedures by selecting the type of backup or
                  restore for a given situation.

Question 13

    Topic: Introduction to Banyan
    Lesson: Backup
    Objective: To demonstrate familiarity of backup and restore
                  procedures by selecting the type of backup or
                  restore for a given situation.

Question 14

    Topic: Using the Banyan Menus
    Lesson: Supported Network Applications
    Objective: To demonstrate the ability to access additional
                  applications and programs available on the
                  network menu.

Question 15

    Topic: Using the Banyan Menus
    Lesson: Activities Menu
    Objective: To demonstrate the ability to access additional
                  applications and programs available on the
                  network menu.

Question 16

    Topic: Using the Banyan Menus
    Lesson: Mail
    Objective: To demonstrate the ability to use the Mail option
                  by reading, creating, and sending electronic mail
                  messages.

Question 17

    Topic: Using the Banyan Menus
    Lesson: Mail
    Objective: To demonstrate the ability to use the Mail option
                  by reading, creating, and sending electronic mail
                  messages.

Question 18

    Topic: Using the Banyan Menus
    Lesson: ail
    Objective: demonstrate the ability to use the Mail option
               y reading, creating, and sending electronic mail
               messages.

Question 19

    Topic: Using the Banyan Menus
    Lesson: Mail
    Objective: To demonstrate the ability to use the Mail option
               by reading, creating, and sending electronic mail
               messages.

Question 20

    Topic: Using the Banyan Menus
    Lesson: Leave the Network
    Objective: To demonstrate the ability to access additional
               applications and programs available on the
               network menu.

Appendix I

SAMPLE OF A COURSEWARE VALIDATION DOCUMENT

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5230-02, the Project Deliverable
Style Manual. This sample document does not include the front
cover, the cover letter, the title page, nor the record of
changes page, all of which are mandatory. Page numbering has
been altered for the purposes of this appendix. Actual
informational content within a courseware validation document may
vary from the information presented in this appendix. The
information contained within this appendix is for **illustration
purposes only** and should not be mistaken as a standard in terms
of authoring systems, methodologies, or presentation style to be
used. This appendix does illustrate the types of information
that this document must contain and the format for its
presentation.

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PUBLICATION TABLE OF CONTENTS

COURSE VALIDATION DOCUMENT
Computer-based Training Course
Banyan Local Area Network

v

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SECTION 1. REQUIRED PERSONNEL

1.1 REQUIRED PERSONNEL

A total of 15 Banyan users will be required for pre/posttest validation, and 10 of the 15 Banyan users will be required for course validation. Ten of the 15 users will be classified as the target audience, and five will be classified as the control group. The 10 users who participate in course validation will be selected from the target audience.

1.2 TARGET AUDIENCE

The target audience will consist of 10 typical Banyan users. As defined in Section 5 of the "Concept Analysis Document," typical Banyan users vary in age and educational level. Typical users also have rudimentary understanding of DOS and little or no Banyan and LAN experience.

1.3 CONTROL GROUP

The control group will consist of five Banyan users who have experience using the Banyan system and have demonstrated proficiency.

1.4 LOCATION AND EQUIPMENT

The validation will be conducted at a site selected by the Marine Corps. Representatives will be notified 2 weeks before validation begins.

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SECTION 2. VALIDATING THE COURSE

The pretest and posttest will be used to validate the course. In order to validate the course, students will be administered a pretest, followed by the course, and finally administered a posttest. The <u>course</u> validates only if there is a significant difference between the pretest and the posttest scores. The course will be judged on two factors: user friendliness and teaching effectiveness.

2.1 USER FRIENDLINESS

To determine student reaction to the course, students will be given questionnaires to be completed at the end of the practice exercises for each topic. See Appendix B for an example of the questionaire.

2.2 TEST VALIDATION

Before the course is validated, the test itself must be validated to ensure it serves as an acceptable measurement tool. Test validation will be accomplished by administering the tests to two separate groups of people. One group will consist of "experts" in the subject matter and the other group will consist of "novices." The test validates only if the experts scores are significantly greater than the novices' scores. To validate the test, follow the steps outlined below.

    a. Administer the test to two groups, one group consisting
        of approximately five experts, and the other group
        consisting of approximately ten novices. Place the
        test scores into the following sample work sheet and
        calculate the mean score for each group.

NUMBER OF OBSERVATIONS	EXPERT SCORES	NOVICE SCORES
1	99	65
2	95	52
3	98	64
4	94	57
5	100	68
6	96	59
7	90	70
8	92	48
9		72
10		67
SUM	764	622

MEAN SCORE   764/8 = 95.5   622/10 = 62.2

2-1

b. Square each score and calculate the sum of the squares by using the following sample worksheet.

NUMBER OBSERVATIONS	EXPERT SCORES	$(EXPERT SCORES)^2$	NOVICE SCORES	$(NOVICE SCORES)^2$
1	99	9801	65	4225
2	95	9025	52	2704
3	98	9604	64	4096
4	94	8836	57	3249
5	100	10000	68	4624
6	96	9216	59	3481
7	90	8100	70	4900
8	92	8464	48	2304
9			72	5184
10			67	4489
SUM OF THE SQUARES		73046		39256

c. Square the mean score for each group (see step A) as indicated below.

EXPERT MEAN SCORE	$(EXPERT MEAN SCORE)^2$	NOVICE MEAN SCORE	$(NOVICE MEAN SCORE)^2$
95.5	9120.25	62.2	3868.84

d. Multiply the square of the mean score for each group (see step C) by the number of observations in each group.

$(EXPERT MEAN SCORE)^2$	X	NUMBER OF OBSERVATIONS	$(NOVICE MEAN SCORE)^2$	X	NUMBER OF OBSERVATIONS
9120.25	X 8	= 72962	3868.84	X 10	= 38688.4

e. Subtract this number from the sum of the squares of each group (see step B).

EXPERTS   NOVICES

73046-72962 = 84   39256-38688.4 = 567.6

f. Add these two numbers to one another to derive the numerator of the pooled estimate of the population variance.

Numerator = 84 + 567.6 = 651.6

2-2

g. Calculate degrees of freedom by summing the number of expert observations and the number of novice observations and subtracting 2.

DEGREES OF FREEDOM = 8 + 10 - 2 = 16

h. Calculate the pooled estimate of the population variance by dividing the numerator (see step F) by the degrees of freedom (see step G).

POOLED ESTIMATE OF THE POPULATION VARIANCE = 651.6/16 = 40.725

i. Divide this number by the number of expert scores and by the number of novice scores.

$$\frac{40.725}{8} = 5.1$$

$$\frac{40.725}{10} = 4.1$$

j. Add these two numbers

5.1 + 4.1 = 9.2

k. Calculate the square root of this number to derive the estimated standard error of the difference.

ESTIMATED STANDARD ERROR OF THE DIFFERENCE
$$= \sqrt{9.2} = 3$$

l. Subtract the mean score for novices (see step A) from the mean score for experts (see step A).

95.5 - 62.2 = 33.3

m.   Divide this number by the estimated standard error of
     the difference (see step K) to calculate the "t" value.

$$t = \frac{33.3}{3} = 11.1$$

n.   Assuming 10% level of significance and 16 degrees of
     freedom, the critical "t" value, extracted from the
     table in Appendix A, is 1.337.

o.   If the calculated "t" in step M (11.1) is greater than
     the critical "t" in step N (1.337), then the experts'
     scores are significantly greater than the novices'
     scores and the test is proven to be valid; otherwise,
     the test is not valid. In this example, the test is
     valid.

2.3 COURSE VALIDATION

Once the test is proven to be valid, it can be used as a tool for validating the course. To validate a course, first give the students a pretest, then administer the course, and finally give the students a posttest. In order for the course to validate, posttest scores should be significantly greater than pretest scores. To validate a course follow the steps outlined in the example below.

    a.   Administer both the pretest and posttest to the same group of students. Place the scores into the following worksheet and calculate the mean of the differences.

NUMBER OF PAIRED OBSERVATIONS	PRETEST SCORES	POSTTEST SCORES	DIFFERENCE
1	48	98	50
2	59	98	39
3	52	95	43
4	65	90	25
5	64	92	28
SUM OF THE DIFFERENCES			185

MEAN OF THE DIFFERENCES   185/5 = 37

    b.   Calculate degrees of freedom by subtracting one from the number of paired observations.

DEGREES OF FREEDOM = 5-1 = 4

    c.   Calculate the sum of the $(DEVIATION)^2$ by using the following worksheet and data from step A.

DIFFERENCE MINUS MEAN OF DIFFERENCES	=	DEVIATION	$(DEVIATION)^2$
50 MINUS 37	=	13	169
39 MINUS 37	=	2	4
43 MINUS 37	=	6	36
25 MINUS 37	=	12	144
28 MINUS 37	=	9	81
SUM OF $(DEVIATIONS)^2$	=		434

2-5

d. Calculate the standard deviation by dividing the sum of the (DEVIATIONS)^2 (see step C) by the number of paired observations minus 1 and then taking the square root.

STANDARD DEVIATION
$$=\sqrt{\frac{434}{5-1}}=10.4$$

e. Divide this number by the square root of the number of paired observations to derive the standard error of the mean difference between paired observations.

STANDARD ERROR OF THE MEAN DIFFERENCE BETWEEN PAIRED OBSERVATIONS
$$=\frac{10.4}{\sqrt{5}}=4.7$$

f. Divide this number into the mean of the differences (see step A) to calculate the "t" value.

$$t=\frac{37}{4.7}=7.9$$

g. Assuming a 10% level of significance and 4 degrees of freedom, the critical "t" value, extracted from Appendix A, is 1.533.

h. If the calculated "t" in step F (7.9) is greater than the critical "t" in step G (1.533) then the posttest scores are significantly greater then the pretest scores and the course is proven to be valid; otherwise, the course is not valid. In this example, the course is valid.

SECTION 3. POSTVALIDATION REVISIONS

3.1 QUESTIONNAIRES

Student questionnaires will be reviewed with the Marine Corps representative. Upon agreement between the representative and the IS-PT, revisions will be made.

3.2 POSTTEST

If the course does not validate, the questions missed on the posttest will be paired with their corresponding objectives. A lesson will be revised if 50 percent or more of the students missed questions pertaining to the same objective.

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3-2

APPENDIX A

Critical "t" Values

df	0.10	0.05	0.025	0.01	0.005	df	0.10	0.05	0.025	0.01	0.005
1	3.078	6.314	12.708	31.821	63.657	18	1.330	1.734	2.101	2.552	2.878
2	1.886	2.920	4.303	6.965	9.925	19	1.326	1.729	2.093	2.539	2.861
3	1.638	2.353	3.182	4.541	5.841	20	1.325	1.725	2.086	2.528	2.845
4	1.533	2.132	2.776	3.747	4.604	21	1.323	1.721	2.080	2.518	2.831
5	1.476	2.015	2.571	3.365	4.032	22	1.321	1.717	2.074	2.508	2.819
6	1.440	1.943	2.447	3.143	3.707	23	1.319	1.714	2.069	2.500	2.807
7	1.415	1.895	2.365	2.998	3.499	24	1.318	1.711	2.064	2.492	2.797
8	1.397	1.860	2.306	2.896	3.358	25	1.316	1.708	2.060	2.486	2.787
9	1.383	1.833	2.262	2.821	3.250	26	1.315	1.706	2.058	2.479	2.779
10	1.372	1.812	2.228	2.764	3.169	27	1.314	1.703	2.052	2.473	2.771
11	1.363	1.796	2.201	2.718	3.106	28	1.313	1.701	2.048	2.467	2.763
12	1.356	1.782	2.179	2.681	3.056	29	1.311	1.699	2.045	2.462	2.756
13	1.350	1.771	2.160	2.650	3.012	30	1.310	1.697	2.042	2.457	2.750
14	1.345	1.761	2.145	2.624	2.977	40	1.303	1.684	2.021	2.423	2.704
15	1.341	1.753	2.131	2.602	2.947	60	1.296	1.671	2.000	2.390	2.660
16	1.337	1.746	2.120	2.583	2.921	120	1.289	1.658	1.980	2.358	2.617
17	1.333	1.740	2.110	2.567	2.898	-	1.282	1.645	1.960	2.326	2.576

A-1

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A-2

APPENDIX B
Courseware Rating Form

Rate the following items. If they do not apply to your course, mark NA.

	YES	NO	NA
The software installation directions provided in the User's Guide were clear and concise.			
The instructions provided in the User's Guide for using the course were helpful.			
The wording in the lessons was clear and concise.			
The lessons held my interest.			
The graphics supported the point of the text.			
When I was asked to do something, the directions were clear.			
The computer screens did NOT create eye strain.			
The computer screens were attractive in terms of color and lettering used.			
The end-of-lesson activities were appropriate for the lesson.			
The feedback for the end-of-lesson activities was helpful.			
The practice exercises were appropriate for the topic.			
The feedback for the practice exercises was helpful.			
Overall, the course was user friendly.			

Comments:

B-1

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APPENDIX C
Postdevelopment Walkthrough Checklist

Topic:

Lesson:

	YES	NO	NA
The subject matter was technically correct.			
The instruction centered around the objectives.			
The subject matter was appropriate to the average student.			
The reading grade level was appropriate to the average student.			
The wording was clear and concise.			
The interactions were appropriate to lesson content.			
The end-of-lesson activity was pertinent to the lesson.			
The end-of-lesson activity was technically correct.			
The feedback for the activity reinforced student response.			
The feedback for the activity was technically correct.			

Summary:

C-1

APPENDIX C

Practice Exercise Review Form

Topic:

	YES	NO	NA
The practice exercises were pertinent to the topic.			
The pactice exercises were technically correct.			
The feedback for the practice exercises reinforced student response.			
The feedback for the practice exercises was technically correct.			
The review screens for the practice exercises present material appropriate to the question.			

Summary:

C-2

APPENDIX C

Pre/Posttest Review Form

Course:

	YES	NO	NA
The questions were pertinent to the course objectives.			
The questions were technically correct.			

Summary:

C-3

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Appendix J

SAMPLE OF A COURSEWARE IMPLEMENTATION PLAN

A. GENERAL. All documents must comply with the formatting and
style standards laid out in IRM 5230-02, the Project Deliverable
Style Manual. This sample document does not include the front
cover, the cover letter, the title page, nor the record of
changes page, all of which are mandatory. Page numbering has
been altered for the purposes of this appendix. Actual
informational content within a courseware implementation plan may
vary from the information presented in this appendix. The
information contained within this appendix is for **illustration
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of authoring systems, methodologies, or presentation style to be
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that this document must contain and the format for its
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COURSEWARE IMPLEMENTATION PLAN
Computer-based Training Course
Banyan Local Area Network ·

Publication Table of Contents

v

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SECTION 1. MATERIAL DISTRIBUTION SCHEDULE

1.1 INTRODUCTION

The Banyan computer-based training (CBT) package consists of four 5 1/4 inch diskettes, a user's guide, and an administrator's guide. The software requires 512K of available RAM and 5M of disk space.

1.2 HARDWARE

To install the Banyan CBT package, the following hardware is required:

     a. IBM PC or compatible with a hard disk and at least one 5 1/4 inch diskette drive or an IBM PC or compatible linked to the network server on which the courseware resides.

     b. EGA or VGA color adapter card

     c. EGA or VGA color monitor

1.3 SOFTWARE

The software will be delivered and installed on the date specified by the Marine Corps representative. Installation and testing will require one workday.

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SECTION 2. INSTRUCTOR/ADMINISTRATOR TRAINING SCHEDULE

2.1 INTRODUCTION

Since this course will not be used in conjunction with formal training, an instructor training schedule is not required. Instead, two course administrators will be trained in using the courseware and in performing the various student record keeping functions. The training sessions will require 2 hours and will be conducted following software installation. Both training and installation will be conducted on a day specified by the Marine Corps representative.

2.2 COURSEWARE TRAINING

A walkthrough of the courseware will be provided. During this walkthrough, the following features will be explained:

 a. Menu structure

 b. Lesson formats

 c. Activity and practice formats

 d. Pretest/posttest formats and "review, retry" feature

 e. On-line glossary and text features

2.3 RECORD KEEPING TRAINING

A walkthrough of the record keeping program will be provided. During this walkthrough, the following items will be explained:

 a. Accessing the record keeping database

 b. Accumulating the data

 c. Accessing individual student records

 d. Accessing individual student responses to questions

 e. Accessing group responses to questions

 f. Deleting individual student records

 g. Deleting group records

 h. Bookmarking

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SECTION 3. COURSEWARE IMPLEMENTATION PLAN

3.1 SCHEDULE

The Banyan CBT will be installed on the LAN on or after February 15, at the convenience of the Marine Corps. It will be implemented at the completion of validation.

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Appendix K

SAMPLE OF A COURSEWARE EVALUATION PLAN

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style standards laid out in IRM 5230-02, the Project Deliverable
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COURSEWARE EVALUATION PLAN
Computer-based Training Course
Banyan Local Area Network

Publication Table of Contents

v

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LIST OF FIGURES

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SECTION 1. METHOD OF EVALUATION

1.1 METHOD OF EVALUATION

A course evaluation will be conducted 1 year after the course is implemented. Two tools will be used to measure the internal effectiveness of the course:

    a. An analysis of student records, and

    b. Student evaluation forms submitted at the end of training.

1.2 EXTERNAL EFFECTIVENESS

Two additional tools will be used to measure the external effectiveness of the course:

    a. Student evaluation forms submitted 6 months after the training, and

    b. Supervisor/manager evaluation of employee effectiveness 6 months after training.

    An Evaluation Report will be submitted within 4 weeks from the beginning of the evaluation.

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SECTION 2. INTERNAL EVALUATION

2.1 INTERNAL EVALUATION

The internal effectiveness of the course will be determined
through an analysis of student records and through student
evaluation forms.

2.2 ANALYSIS OF STUDENT RECORDS

For the purpose of course evaluation, the records of twenty-five
students who have taken the posttest more than once will be drawn
from the student records database. These records will then be
used to evaluate training effectiveness.

2.3 MEASURING STUDENT PERFORMANCE

Three performance measures will be applied to each record for
each posttest attempt:

   a. percent of all answers correct,

   b. individual's time spend in training,

   c. individual's number of correct and incorrect answers per
       minute.

2.3.1 Percent Correct

The percent correct will be calculated on the posttest only.
This figure is available in the "score" field on the student
record.

2.3.2 Time Spent In Instruction

This time will include all time spent in the course, including
the lessons, activities, practice exercises, and tests. The time
spent in the course is available in the "time in course" field on
the student report. A student report will be considered usable
for analysis if the student spent no less than 1 hour and no more
than 3 hours in the course. If a report is determined unusable,
a new report that meets these criteria and the criteria
established in 2.1 will be selected.

2.3.3 Frequency per Minute of Correct and Incorrect Answers

These figures will measure both the accuracy and speed of
performance. The number for time spent in posttest is available
in the "test time" field on the student record. To calculate the
frequency of correct answers per minute, the number of correct
answers will be divided by the number of minutes that the student
is in the test. The frequency of incorrect answers will be
calculated the same way.

2-1

2.4 RESULTS OF ANALYSIS

The "percent correct" for each posttest attempt will be evaluated
to determine if each posttest score was higher than the previous
score. "Time spent in instruction" will be evaluated to ensure
that all of the 25 student records are usable for analysis. The
25 calculations for frequency of correct and incorrect answers
for each posttest attempt will be compared. If the CBT is
effective, the posttest score will improve on each attempt, and
the frequencies for correct answers will accelerate. In the
event that both cases are not true, the evaluation team will look
for a pattern by creating a matrix that plots the actual
questions recorded as incorrect on all of the 25 records. If a
pattern exists, they will then determine if the pattern was
created by a deficiency in the courseware and whether that
deficiency was caused by a technical inaccuracy or ineffective
presentation. Results of the analysis will be presented in the
Evaluation Report.

2.5 STUDENT EVALUATION FORMS

At the completion of the course, each student will be given a
questionnaire. A sample of the questionnaire is shown in figure
2-1.   These questionnaires will be collected by the evaluation
team and will be analyzed. During the analysis, the evaluation
team will look for a pattern in the responses noted in the NO
box. If a pattern exists, they will then determine if the
pattern was created by a deficiency in the courseware and whether
that deficiency was caused by a technical inaccuracy or
ineffective presentation. The findings will be presented in the
Evaluation Report.

	YES	NO	NA
Objectives were clearly stated in the program or the documentation.			
The objectives correctly identified my actual job tasks.			
The lessons centered around the objectives.			
The screens were formatted for clarity.			
The wording was clear and concise.			
The graphics were appropriate for the text.			
The activities and practice exercises were pertinent to my actual job tasks.			
The question feedback helped to identify what I had done incorrectly.			
The interactions reinforced my understanding of the material.			
The course held my interest.			

Figure 2-1.   Student Evaluation Form

2-3

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SECTION 3.   EXTERNAL EVALUATION

3.1   EXTERNAL EVALUATION

The external effectiveness of the course will be determined
through student evaluation forms completed 6 months after the
training and through supervisor/manager evaluation of an
employee's job effectiveness 6 months after training.

3.2   STUDENT EVALUATION FORMS

Six months after a student has completed the course, he will be
given a questionnaire. A sample of the questionnaire is shown in
figure 3-1. These questionnaires will be collected by the
evaluation team and will be analyzed. During the analysis, the
evaluation team will look for a pattern in the responses noted in
the NO box. They will then determine if the pattern was created
by a deficiency in the courseware and whether that deficiency was
caused by a technical inaccuracy or ineffective presentation.
The findings will be presented in the Evaluation Report.

	YES	NO	NA
Do you feel more confident performing job tasks since you completed the CBT?			
Do you complete tasks more accurately since you completed the CBT?			
Do you complete tasks more quickly since you completed the CBT?			
Did the CBT accurately simulate the steps that you must take to complete a particular task?			
Could you apply what you learned in the CBT to your daily tasks?			
Did you learn as quickly using the CBT as you could have learned using the real equipment?			
If a co-worker had the opportunity to use either the CBT or on-the-job training, would you advise using the CBT?			

Figure 3-1.   Student Questionnaire Form

3-1

3.3 SUPERVISOR/MANAGER EVALUATION FORMS

Six months after a student has completed the course, his supervisor/manager will be given a questionnaire. A sample of the questionnaire is shown in figure 3-2. These questionnaires will be collected by the evaluation team and will be analyzed. During the analysis, the evaluation team will look for a pattern in the responses noted in the NO box. They will then determine if the pattern was created by a deficiency in the courseware and whether that deficiency was caused by a technical inaccuracy or ineffective presentation. The findings will be presented in the Evaluation Report.

	YES	NO	NA
Does the employee seem more confident in performing tasks since completing the CBT?			
Does the employee complete tasks more accurately since completing the CBT?			
Does the employee complete tasks more quickly since completing the CBT?			
Does the employee perform tasks as accurately as employees who were trained on the job?			
Does the employee perform tasks as quickly as employees who were trained on the job?			
Has the employee's attitude toward his work improved since completing the CBT?			
If you had other employees who needed training, would you recommend CBT?			

Figure 3-2. Supervisor/Manager Evaluation Form

3-2

Appendix L

SAMPLE OF A COURSEWARE PROBLEM REPORT

A. PURPOSE. The Courseware Problem Report (CWPR) will document problems arising from the Validation portion of the courseware acceptance testing process. The courseware will not be accepted if there are outstanding CWPRs unless the Functional Manager or Formal School Administrator approves the decision to conditionally accept and release the courseware to the field sites. The developer-documented actions and schedule for solving the problem must accompany the request for approval. The CWPR is divided into two sections. Each section is described below:

    1.   Section 1 - User Information

    2.   Section 2 - Courseware Identification

B. INSTRUCTIONS. The instructions are described below by section and item number. See FIGURE L-01 for an example of the CWPR form.

CWPR CONTROL NUMBER: A sequential number assigned to the CWPR. The Functional Manager or Formal School Administrator will assign this number.

Section 1 - User Information

The Functional User will fill out the following six items:

    1.   Organization or Office: Self-explanatory.

    2.   Originator: The name of the Courseware User and/or Functional Manager who originates a CWPR.

    3.   Address: Self-explanatory.

    4.   Date: The date the CWPR is originated.

    5.   Phone: The telephone number of the point of contact for notification or inquiries about this CWPR.

    6.   Point of Contact: The name of the individual handling this request or change.

Section 2 - Courseware Identification

7. Name of Courseware/Version Affected: Identify the exact courseware and version.

8. Program/Module: Identify the exact program/module affected.

9. Date Problem Occurred: Record the actual date the problem is discovered.

10. Security Level: Indicate the security level of the courseware (unclassified, confidential, secret).

11. Problem Description: Describe the problem in sufficient detail in order that other personnel who are unfamiliar with the problem may understand it.

12. Priority: Check the priority for eliminating the problem.

13. Mission Impact: Describe the overall impact of the courseware problem.

14. Suggested Resolution: If the resolution can be described, explain it in as much detail as required.

15. CWPR Preparer's Signature and Date: The preparer's signature and date will be required to investigate the problem.

COURSEWARE PROBLEM REPORT SECTION 1. USER INFORMATION		CWPR #
1. ORGANIZATION OR OFFICE:	2. ORIGINATOR:	
3. ADDRESS:		4. DATE:
5. PHONE:	6. POINT OF CONTACT:	

COURSEWARE IDENTIFICATION SECTION 2.	
7. NAME OF COURSEWARE/VERSION AFFECTED:	
8. PROGRAM/MODULE:	
9. DATE PROBLEM OCCURRED:	10. SECURITY LEVEL:

11. PROBLEM DESCRIPTION (PLEASE USE ADDITIONAL PAGES IF NECESSARY)

12. PRIORITY: EMERGENCY _____ URGENT _____ ROUTINE _____

13. MISSION IMPACT (PLEASE USE ADDITIONAL PAGES IF NECESSARY)

14. SUGGESTED RESOLUTION (PLEASE USE ADDITIONAL PAGES IF NECESSARY)

15. CWPR PREPARER'S SIGNATURE: (DATE)

FIGURE L-01
Sample Courseware Problem Report

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Appendix M

COURSEWARE CHANGE REQUEST (CWCR) INSTRUCTIONS

A. PURPOSE. The purpose of this form is to provide a single turnaround document that will be used by all elements in the Change Control process. The document is divided into four sections. Each section is described below.

    1.   Section 1 - Functional Manager/Requestor

    2.   Section 2 - Government Programming Agency/Contractor

    3.   Section 3 - System Sponsor/COTR

    4.   Section 4 - Functional Manager/Requestor

B. INSTRUCTIONS. The instructions are described below by section and item numbers. See FIGURE M-01 for an example of the CWCR form.

CWCR CONTROL NUMBER: A sequential number assigned to a CWCR. This will be set up automatically through the use of a data base. The Data Administrator will determine the format for a control number.

Section 1 - Functional Manager/Requestor

The Module User and/or Functional Manager will fill out the following 11 items:

    1.   ORIGINATOR - The name of the Model User and/or Function Manager who originates a CWCR.

    2.   DATE OF REQUEST - The date the CWCR was originated.

    3.   ORIGINATOR'S CONTROL NBR. - A sequential number assigned to this particular CWCR from the originator's organization. Each organization or focal point is responsible for keeping track of a submitted CWCR. This is for the organization or focal point's reference use. This is not the same as the CWCR control number. The format for a control number is to be determined.

    4.   CODE OF REQUESTING ORGANIZATION - Self-explanatory.

5. POINT OF CONTACT - The name of the individual handling this request or change.
TELEPHONE NBR. - The telephone number of the point of contact for notification or inquiries about this CWCR.

6. PRIORITY - The Functional Manager is responsible for assigning one of the following priorities to the CWCR:

   * EMERGENCY - Situations where immediate corrective action is required.

   * URGENT - An Urgent request category shall be assigned for any of the following reasons:

     1. To effect an interface change, which, if delayed, would cause a schedule slippage or increase cost.

     2. To effect system savings where expedited processing of the change will be a major factor in realizing lower cost.

     3. To implement a new or changed regulatory requirement issued by an authority higher than that of the functional proponent.

   * ROUTINE - All changes other than those classified as Emergency or Urgent. These changes are generically referred to as "Nice to Have" or start work when all Emergency and Urgent are completed.

7. SYSTEM TO BE MODIFIED - Identify the system to be modified.

8. DESCRIPTION OF PROBLEM/CHANGE - Describe the problem or enhancement in sufficient detail in order that other personnel who are unfamiliar with the problem or enhancement may understand it.

9. REQUESTED COMPLETION DATE - Self-explanatory.

10. JUSTIFICATION - A brief description to justify the requested change.

11. KNOWN SYSTEM INTERFACES - Identify any known system interfaces.

When items 1 through 11 are filled out, the CWCR is then forwarded to the System Sponsor/Contracting Officer's Technical Representative (COTR) for review. The System Sponsor/COTR will request an impact and cost analysis. This analysis should be returned no later than 5 working days from receipt with items 12 through 14 completed. The actual cost will be filled in when final completion of the CWCR has taken place.

Section 2 - Government Programming Agency/Contractor

12. IMPACT ASSESSMENT - Enter the estimated cost, in man-hours and dollars, required to implement the CWCR. The estimated start date and completion date will also need to be filled out.

13. IMPACT ANALYSIS - An analysis of any conflict or impact against work in process will be noted.

   The System Sponsor/COTR will review the analysis and approve or disapprove the CWCR. No work will begin on the CWCR without prior approval.

14. PRIORITY CONFLICT - Identify any known priority conflict with other CWCRs.

Section 3 - System Sponsor/COTR

15. SYSTEM SPONSOR/COTR APPROVAL - The following annotates approval or disapproval of the CWCR:

   APPROVED FOR WORK - The System Sponsor/COTR approves the work, including the estimated budget.

   DISAPPROVED - The System Sponsor/COTR will be responsible for notifying the requestor.

   PUBLICATION REQUIRED - This CWCR may require providing a publication or revision to an existing publication.

   RE-EVALUATE - This CWCR may require more analysis and re-evaluation of the proposed changes.

   The System Sponsor/COTR's signature and date of approval or disapproval will be required to implement the CWCR.

Section 4 - Functional Manager/Requestor

16. ACCEPTANCE APPROVAL - Once the CWCR has gone through
the implementation and verification process, the
signature of the requestor is required. This action
constitutes acceptance of the work performed.

CWCR CONTROL NUMBER _____

SECTION 1.   FUNCTIONAL MANAGER/REQUESTOR

1. ORIGINATOR:	2. DATE OF REQUEST: _____	3. ORIGINATOR'S CONTROL NBR: _____

4. CODE OF REQUESTING ORGANIZATION: _____	5. POINT OF CONTACT: _____ TELEPHONE NBR: ( )_____	6. PRIORITY (CHECK ONE) _____ EMERGENCY _____ URGENT _____ ROUTINE
7. SYSTEM TO BE MODIFIED:		

8. DESCRIPTION OF PROBLEM/CHANGE   **9. REQUESTED COMPLETION DATE:** _____

10. JUSTIFICATION:

11. KNOWN SYSTEM INTERFACES:

SECTION 2.   GOVERNMENT PROGRAMMING AGENCY/CONTRACTOR

12. IMPACT ASSESSMENT	ESTIMATED START DATE:	ESTIMATED COMPLETION DATE:

ESTIMATE			ACTUAL		
LABOR CATEGORY	HOURS	MATERIAL COST	LABOR CATEGORY	HOURS	MATERIAL COST
TOTAL			TOTAL		

13. IMPACT ANALYSIS

14. PRIORITY CONFLICT:

SECTION 3.   SYSTEM SPONSOR/COTR

15. SYSTEM SPONSOR/COTR APPROVAL
       _____ APPROVED FOR WORK   _____ NO ACTION REQUIRED   _____ RE-EVALUATE
       _____ DISAPPROVED   _____ PUBLICATION REQUIRED

    COMMENTS:

    SIGNATURE: _____   DATE: _____

SECTION 4.   FUNCTIONAL MANAGER/REQUESTOR

16. ACCEPTANCE AGREEMENT

    SIGNATURE: _____   DATE: _____

FIGURE M-01
Sample Courseware Change Request (CWCR) Form

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CBT DEVELOPMENT STANDARDS
IRM 5231-22

COMMENTS/REVISIONS

Technical publications under the Information Resources Management (IRM) Standards and Guidelines Program (MCO 5271.1) are reviewed annually. Your comments and/or recommendations are strongly encouraged.

IRM Tech Pub Name:_____

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COMMENTS/RECOMMENDATIONS:_____

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_____

_____

_____

Name/Rank:_____ (Optional)

Unit:_____ (Optional)

Mail to: Commandant of the Marine Corps (Code CCI)
           Headquarters, United States Marine Corps
           Washington, DC   20380-0001

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