

1992

# Creating high performance@Sun : a computer-based training lesson

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**Creating high performance at Sun: A computer-based training  
lesson**

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San Jose State University, 1992

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**CREATING HIGH PERFORMANCE@SUN:  
A COMPUTER-BASED TRAINING LESSON**

A Project Report

Presented to

The Office of Graduate Studies and Research

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

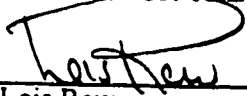
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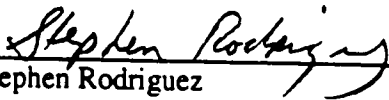
Gayle Van Briggie

August, 1992

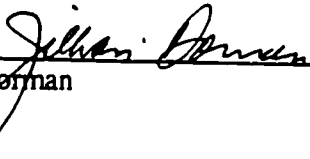
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## **Abstract**

### **Creating High Performance@Sun A Computer-Based Training Lesson**

by Gayle A. Van Briggie

Computer-based training is becoming increasingly popular in corporate organizations, and in this thesis project the researcher has applied the instructional design process to design and develop a computer-based training program for use at SunU, which is the employee training and development department of Sun Microsystems, Inc.

The steps of the instructional design process addressed in this thesis project are analysis, design, development, evaluation, and implementation. Each step has associated documentation, which is included in this thesis report. The end result of the thesis project was a prototype computer-based training lesson. This lesson is intended as a follow-up to a course titled Creating High Performance@Sun, which is offered by SunU.



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## **Part 1: Project Overview**

### **Introduction**

Because employee training and development are becoming more and more important in companies throughout the world, instructional designers are looking for the most effective and efficient methods for delivering training. The traditional method is instructor-led lecture; however, this method requires travel by either the instructor (travelling to the learners) or the learners (travelling to the instructor), and travel costs are expensive. Another popular traditional method is self-paced instruction with printed materials. A problem with this method is that learners often have questions or need assistance, and there is seldom an instructor available to provide help. Within the past ten years another method has been gaining popularity. This method is computer-based, or computer-delivered, training.

Computer-based training (CBT) is slowly becoming one of the most popular methods of delivering training to remote locations because of its related advantages. The following is a discussion of the advantages of CBT over one of the most common delivery systems, instructor-led lecture. (Note: There are several other possible delivery systems; however, this discussion is limited to instructor-led lecturing because it is the most common form of training encountered in the corporate training environment.)

- CBT can be delivered to learners in their workplaces. Instructor-led lectures require travel by either the instructor(s) or the learners.
- CBT allows learners to work at their own pace. Instructor-led lectures force learners to keep pace with others in the class.
- CBT provides a savings of both time and money because learners are not

required to take a large amount of time out of their daily schedules to travel to remote training locations. Instructor-led lectures require learners to travel to the training location (whether it be remote or local) where they are usually required to stay in the training session for a minimum of two to four hours.

- CBT can be delivered simultaneously to a large, widely dispersed training audience. Instructor-led lectures would require several large training sessions where many learners travel to the remote training location, or several small training sessions could be conducted where the instructor travelled to the remote location.

These advantages are even more important if the training materials are consistent, stable, and do not require human interaction for effective learning.

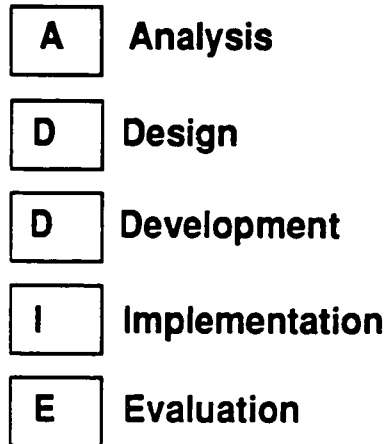
### **Methodology**

According to C.M. Charles, author of *Introduction to Educational Research*, there are six types of educational research, and this thesis project fits into the sixth category: research and development. "Unlike the previous five types, whose purpose was to bring new information to light, the purpose of research and development is to develop new products and procedures and test their effectiveness." (Charles 1988)

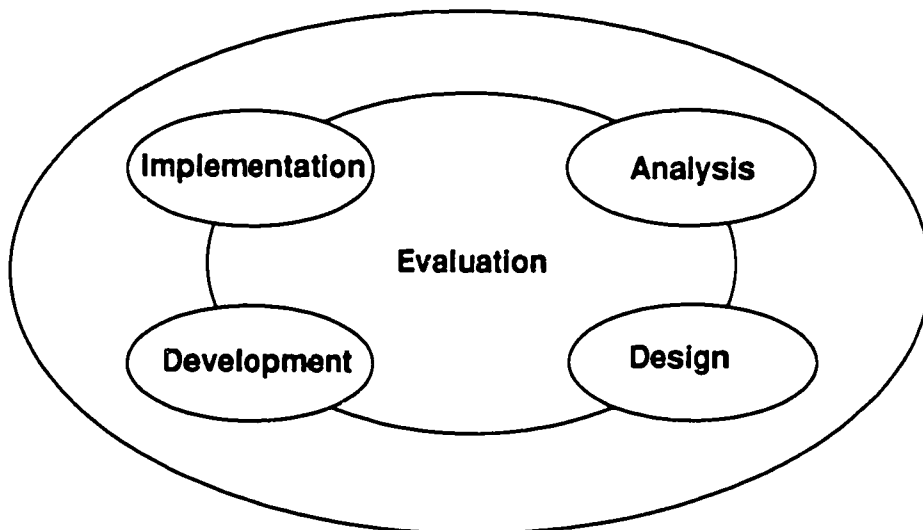
The purpose of this thesis project was to design and develop a computer-based training lesson, which is a new product. As part of the design and development process, the effectiveness of this lesson will be tested during formative evaluation.

Although this is a research and development project, the research and development cycle was not used to design the CBT lesson. Instead, the instructional

systems development (ISD) model was used (this model is also used by SunU). According to Allison Rosset, author of *Training Needs Assessment*, the ISD model is structured as follows:



Although it is presented in a linear fashion, this model is iterative because evaluation is ongoing from the analysis phase up to and beyond the implementation phase. In fact SunU's version of the ISD model is diagrammed as follows:



This version of the model makes the iterative nature of the process more

apparent, and placing evaluation in the center of the model helps clarify the importance and ongoing nature of the evaluation phase.

Associated with each phase are different project documents, and these documents are listed below.

- **Analysis Phase**
  - Project Proposal
  - Needs Assessment Report
- **Design Phase**
  - Subject Matter Analysis
  - Goal and Objectives
  - Instructional Analysis
  - Instructional Strategy
- **Development Phase**
  - Flowcharts
  - Storyboards
  - HyperCard Prototype
- **Evaluation**
  - Formative Evaluation Plan
- **Implementation**
  - Implementation Plan

This thesis project will incorporate each of the above phases and documents with the exception of the implementation phase. The CBT platform used by SunU is still under development; therefore, there are no processes in place to plan and control implementation of the lesson.

Each of the documents listed above was written for this project, and each is

included in this thesis report as a separate appendix. The first page of each document includes a short description of the purpose of the document, a description of the audience the document was written for, and a brief description of the procedures followed to complete the document. A brief description of each document is also included in this overview.

### *Analysis*

The first phase in the instructional systems development model is analysis. The purpose of the analysis phase is to identify the problem in question and determine whether or not training is the appropriate solution to the problem. For example, if the problem is due to a lack of skills, it can be solved by training. However, if the problem is due to a lack of proper equipment and supplies, training will not solve the problem. Another potential problem which cannot be solved by training is lack of performance support. In this case, employees are not lacking equipment and supplies, they are lacking the resources (such as guidance, reference materials, assistance with software and hardware questions, etc.) they need to do their job properly.

This is also the phase where the instructional designer must evaluate potential delivery systems to determine which delivery system would most effectively solve the training problem. Delivery systems which must be considered are instructor-led lectures, self-paced print materials, computer-based training, hands-on laboratory exercises, and workshops.

The main documents written during the analysis phase are the project proposal and needs assessment report.

The **project proposal** identifies the following aspects of the training pro-

gram:

- What the goals of the proposed training program are
- Who the audience is
- Why the program is necessary

The **needs assessment report** describes the problem in question and describes whether the problem can be solved by training. Resources used to identify the problem are documents and records; questionnaires and surveys; interviews and research; and observations. This document also describes how the problem was identified and explains the proposed training solution.

### *Design*

The purpose of the design phase is to identify the following aspects of the proposed training program:

- Learning goals and objectives
- Delivery methods
- Teaching and learning activities
- Evaluation methods

The following four documents are written during this phase:

- Subject Matter Analysis
- Goal and Objectives
- Instructional Analysis
- Instructional Strategy

A **subject matter analysis** identifies the information that must be taught in the CBT lesson. To complete a subject matter analysis report, interviews with subject matter experts are conducted and any available documentation is read.

After identifying and compiling the necessary information, subject matter experts review the information to ensure that it is accurate and complete.

The **goals and objectives** are statements of what learners should be able to do after completing a training program. The goals is a broad, general statement about expected the learner outcome, and the objectives are specific statements, derived from the goal, of what learners should know when they finish a program.

The **instructional analysis** identifies the instructional goal of the CBT lesson and all the subordinate information and knowledge, including prerequisite and entry information, that must be taught to achieve the goal. This information is traditionally presented in flowchart form.

The **instructional strategy** describes the following aspects of the CBT lesson: preinstructional activities (if necessary), information presentation, student participation, testing, and follow-through training (remediation).

### *Development*

The main purpose of the development phase is to produce instructional materials that meet the specifications set forth in the project proposal. There are three deliverables for this phase of the instructional design process. The first two, flowcharts and storyboards, are print-based prototypes of the CBT lesson. The third deliverable is a prototype CBT lesson done on HyperCard (a computer program for Apple Macintosh computers).

The paper prototype is done in two separate pieces, **flowcharts and storyboards**. Although both documents are written at the same time, each serves a specific purpose. Flowcharts demonstrate the branching of the CBT lesson. In



other words, flowcharts graphically demonstrate how each screen (page) of the lesson will be linked together. Storyboards are a graphic representation of what each screen of the lesson will look like.

Flowcharts and storyboards also demonstrate interactivity and learner control. Interactivity and learner control are closely related, and they depend on how many decisions learners are allowed to make. If learners are not required to make decisions (i.e., they are only reading text), the lesson is not interactive, and the learners have no control over what they see on the screen. However, if the learners must make decisions, they are interacting with the lesson, which usually means that they can control (to some degree) what they see on the screen.

The **HyperCard prototype** is completed on a Macintosh computer, and it is used to test the CBT lesson before much time and money are spent implementing the lesson. It is difficult for some people to understand how the lesson will work when limited to a review with flowcharts and storyboards; therefore, the HyperCard prototype will provide a secondary method for reviewing the lesson before it is implemented. The HyperCard prototype provides an opportunity for reviewers to see the branching of the lesson, evaluate the level of interactivity and learner control, and see what the lesson will look like on a computer screen. This deliverable will be included in this thesis report on a computer disk.

### *Evaluation*

The evaluation phase of the instructional systems development model has two parts: formative evaluation and summative evaluation. Formative evaluation is primarily conducted during the design and development phases of the project, and its main purpose is to test the lesson with members of the training audience to ensure that it is an effective lesson. Summative evaluation is con-

ducted after the lesson has been implemented and used in the field for several months. The purpose of summative evaluation is to determine learners' reactions to the lesson and to determine how well learners apply the new skills and knowledge back on the job.

A **formative evaluation plan** is written during this phase of the instructional design process. This plan describes how the CBT lesson will be tested to make sure it meets the instructional goal, objectives, and specifications described in earlier phases of the instructional design process.

A summative evaluation plan would typically be written during this phase of the process; however, SunU has not determined procedures for implementation of CBT lessons. Until an implementation process is in place, this researcher has no way of knowing how and when the lesson will be implemented. It is imperative that an implementation strategy be determined prior to considering a summative evaluation plan.

### *Implementation*

The purpose of the implementation phase is to introduce the new training program to the intended audience. Considerations of the implementation phase include staffing, delivery, logistics, and course management (marketing, monitoring, financial management, and quality control). The only document written during this phase is the implementation plan.

An implementation plan will not be written for this thesis project because the implementation process for CBT programs has not yet been described by SunU.

## **Project Description**

For this thesis project a computer-based training lesson was designed and developed to enhance a training course offered by SunU (SunU is the employee training and development department of Sun Microsystems, Inc.). The class offered by SunU is titled *Creating High Performance@Sun*, and it is recommended for every manager working at Sun in the United States below the Vice President level.

### **Creating High Performance@Sun**

The computer-based training program designed for this thesis project is a follow-up lesson for the *Creating High Performance@Sun* course. This course describes the Performance Management process and encourages managers at Sun to incorporate the process into their everyday jobs. The course goals are as follows:

By the end of the *Creating High Performance@Sun* course managers will know how to

1. Establish goals and performance expectations
2. Conduct periodic progress review meetings
3. Appraise performance
4. Empower subordinates to take performance responsibility

The CBT lesson reinforces the second goal listed above by acting as both a job-aid and a review tool. Managers will use the CBT lesson to prepare for focal review meetings with their employees. Focal review meetings are mandatory, and they are held at least once a year to review employee performance and establish new performance objectives. To prepare for focal review meetings,

managers must write performance objectives; therefore, review of information about writing performance objectives is incorporated into the CBT lesson.

### **Conclusion**

The following documents will be written for this thesis project:

- Project Proposal
- Needs Assessment Report
- Subject Matter Analysis
- Goals and Objectives
- Instructional Analysis
- Instructional Strategy
- Flowcharts
- Storyboards
- HyperCard Prototype
- Formative Evaluation Plan

Each of these documents is included in this thesis report as a separate appendix, and the first page of each document includes a short description of the document's purpose, the audience the document was written for, and a short description of the procedures followed to complete the document.

## **Appendices**

## **Appendix A: Project Proposal**

### **Purpose**

This document describes the following aspects of the CBT lesson being designed and developed for this thesis project:

- Project Background
- Training audience
- Proposed project
- Project team members

This document sets forth the initial specifications for the proposed CBT lesson. It was presented to the client who requested the training, and it was approved before the researcher continued working on the project.

### **Audience**

This document is written for several different audiences. The primary audience is the client who requested the training. Secondary audiences include project team members and any SunU staff member interested in the proposed project.

### **Procedure**

This project proposal was written in response to a client's request for a CBT enhancement to an existing course. After discussing the existing course with the client, this researcher asked the client the following questions:

- What aspects of the course should be enhanced?
- Who is the training audience? What are their significant characteristics in respects to this course?

- Who is on the project team?

Based on the client's responses, this researcher was able to propose a project that would meet the client's expectations and requirements.

### **Project Background**

After consulting the project team for SunU's *Creating High Performance@Sun* course, the topic for this thesis project was identified. A follow-up lesson, delivered via a computer-based training application recently purchased by SunU, was designed and developed for the *Creating High Performance@Sun* course. This follow-up lesson will help participants recall the skills and knowledge learned during the course by helping them prepare for focal review meetings with employees. They will review information from the class as they prepare for the meeting.

The idea of follow-up review is not new to the field of instructional design. It is one of the adult learning principles identified by Jerrold Kemp, author of *The Instructional Design Process*, and it is known as "spaced practice." According to Kemp, "For a fact or skill to become a confirmed part of an individual's knowledge base or competency level usually more than one exposure is required . . . Practice is most effective when spaced over intervals of time" (Kemp 1985).

The lack of spaced practice is the problem addressed by this project. Following a training course, SunU course participants often return to a hectic office, and they forget the information taught in a course before they are able to incorporate it into their everyday jobs. Some SunU courses have included an in-class follow-up session to reinforce skills learned during the course, but

participants have been reluctant to spend more time away from their offices for a class they already attended. However, if a follow-up session was delivered to participants on their workstations, and it was available for them to use at their own pace, they might be more likely to practice the skills.

This project is important because it will enhance and improve the *Creating High Performance@Sun* course. Another reason this project is important is because it could set a standard for providing follow-up learning opportunities (spaced practice) for SunU courses, and these follow-ups are necessary if learners are to use the information taught in SunU courses.

### **Training Audience**

As defined by the course development team, "Participants for this program will be managers who have at least one direct report. They will be from first level to middle level managers, i.e., from first line to Director level." Translated into plain English, this course is recommended for every manager at Sun Microsystems below the level of Vice President. Characteristics of the training audience, which are important for this project, are as follows:

- All members of the training audience are extremely busy; therefore, they do not have much time to spend on training.
- Most members of the training audience are males, and most members of the audience are between the ages of 30 and 50.
- All members of the audience have a graduate degree; therefore, they are highly educated.



## Proposed Project

The deliverables for this follow-up lesson include a project proposal, needs assessment report, goal and objectives, subject matter analysis, instructional strategy, instructional analysis, flowcharts, storyboards, a formative evaluation plan, and a functioning HyperCard prototype (HyperCard is a Macintosh-based program). A brief description of each deliverable is provided below.

**Project Proposal:** describes the intended project, defines the project team, defines the intended training audience, and provides a timeline.

**Needs Assessment Report:** summarizes the information gathered during a needs assessment. The needs assessment was composed of four different interviews with key members of the Creating High Performance@Sun development team.

**Goals and Objectives:** includes the initial goals and objectives for the project. The project team will review the proposed goals and objectives and revise them to meet the needs of the audience.

**Subject Matter Analysis:** defines the information necessary to design and develop an effective lesson. The analysis will be done with subject matter experts and the development team.

**Instructional Strategy:** a plan for instruction, including planned delivery methods, designed to achieve specified instructional goals and objectives.

**Instructional Analysis:** diagrams, hierarchically, the instructional goal and the related subordinate skills necessary to achieve the instructional goal.

**Flowcharts:** diagrams branching of a computer-based training lesson (i.e., how the lesson will be presented to learners).

**Storyboards:** represents what each screen in the CBT lesson will look like. Storyboards also help describe what text will appear on each screen, where the text will appear, learner control, interactivity, etc.

**Formative Evaluation Plan:** proposes a schedule and strategy for testing and evaluating the CBT lesson before it is released to course participants. The formative evaluation will include one-on-one testing and small group testing.

**HyperCard Prototype:** provides a prototype of the CBT lesson. Because the CBT system used by SunU is not yet fully operational, this lesson will be implemented on HyperCard for the purposes of this thesis project. When SunU's CBT system is operational, the lesson will be implemented within Sun Microsystems, Inc.

### **Project Team Members**

The following people were involved in this project:

Gayle Van Briggie, Contract Training Designer and graduate student, designed and developed project; wrote project/thesis report.

David Wick, Senior Training Specialist at SunU, provided subject matter expertise and design and development feedback/ideas. David Wick was also the client for this project.

Jillian Dorman, Manager of Training Design and Technology at SunU, provided design, development, evaluation, and implementation expertise, feedback, and suggestions.

Dr. Stephen Rodriguez, Professor of Instructional Technology at San Jose State University, provided design, development, and evaluation expertise, feedback, and suggestions.

## **Appendix B: Needs Assessment Report**

### **Purpose**

This document provides an overview of the thesis project. It describes the problem that initiated a need for the CBT lesson; it describes the interviews used to collect information about the problem; and it describes the results of the needs assessment.

### **Audience**

This document is written for the project team members and the client who requested the training. The results of the needs assessment were reviewed with the project team to ensure that everyone agreed on the problems identified. Agreement was necessary before the instructional designer continued working on the project.

### **Procedure**

Having consulted the client for information for the project proposal, this researcher had an idea of the needs this project would address; therefore, a short list of questions was prepared and four members of the *Creating High Performance@Sun* project team were interviewed. Results from the interview were tallied, and the project was identified. All members of the project team agreed on the need and the appropriate CBT lesson necessary to address the need.

### **Project Overview**

For this thesis project, a follow-up lesson was designed and developed for a

training course titled *Creating High Performance@Sun*, which is offered by SunU. This follow-up lesson is computer-based. The *Creating High Performance@Sun* course is already in use at SunU, and this researcher was invited to design and develop a lesson to augment the course. This needs assessment focused on determining what type of CBT lesson would best enhance and improve the course.

Because the need for the additional lesson had already been determined by the development team, a traditional needs assessment was not required. This means that neither a questionnaire nor a survey was distributed. Rather, this needs assessment focused on relevant documentation and interviews with members of the course project team.

### **The Initiating Problem**

After lengthy investigation of SunU courses and interviews with instructional designers at SunU, the need for a follow-up, spaced practice opportunity for *Creating High Performance@Sun* course participants was identified. Follow-up lessons are valuable opportunities for course participants to practice new skills and knowledge learned during a training course. However, the fast workspace at Sun makes it difficult for employees to justify time away from their jobs for course follow-ups. It is hoped that delivering follow-up lessons via the computer will encourage employees to spend the time to complete the lesson, thus enhancing the skills and knowledge they learned during the course.

## The Interviews

Having identified the need for follow-up lessons, four members of the *Creating High Performance@Sun* team were asked the following questions.

- Do you have any ideas of how you would like to see CBT incorporated into the course?
- What part of the course would you most like to see stressed with CBT?
- Was there information that you were not able to elaborate on during the course that you would like to see addressed via CBT?
- Can you think of a course subject that could be reinforced via CBT?
- Would you rather see CBT implemented as prework or follow-up work?
- What pros and cons do you anticipate for prework?
- What pros and cons do you anticipate for follow-up work?
- These are some of the ideas that have been suggested. Please rate the usefulness of each idea on a scale of 1 to 5, with 5 being very useful and 1 being not useful.

Introduction Module (prework)	1	2	3	4	5
Reinforcement Module (follow-up)	1	2	3	4	5
*Template Module (follow-up)	1	2	3	4	5
**New Ideas Module (follow-up)	1	2	3	4	5

\* The template module would be a fill-in-the-blank action plan that stressed important points from the course.

\*\* The new ideas module would expand on an idea presented during the

course, and it would incorporate new information about that topic that was not presented during the course due to lack of time.

The following people were interviewed for this thesis project:

- Jeanne Brenneman, Senior Training Designer (SunU): Jeanne is in charge of the instructional design of the *Creating High Performance@Sun* course.
- David Wick, Senior Training Specialist (SunU): David is the Course Manager for the *Creating High Performance@Sun* course, and he is in charge of its development and implementation within SunU and Sun.
- Lisa Cavallaro, Employee Development Specialist (SunU): Lisa is second in charge of the course after David.
- Carrie Perzow (Sun Microsystems): Carrie is a representative of Sun Human Resources.

## Results

After completing the interviews and research, this researcher tallied the results of the interviews, and all those interviewed agreed that the best use of a CBT enhancement for this course is a follow-up lesson which combines a job-aid with a review. One of the most important modules from the *Creating High Performance@Sun* course was chosen, "Establishing Performance Objectives and Plans." Using information from this module, the CBT lesson allows the training audience to prepare for focal review meetings (a required part of their jobs) while they review the steps for writing performance objectives.

## **Appendix C: Subject Matter Analysis**

### **Purpose**

This document was written after all the research was completed, and it is a compilation of all the information that must be taught in the CBT lesson.

### **Audience**

This document is written for the instructional designer and the project team. It is also reviewed by subject matter experts to ensure accuracy and relevance of content.

### **Procedure**

Having completed the project proposal and needs assessment, this researcher already knew the module from the *Creating High Performance@Sun* course that was to be used in the CBT lesson. At this point, the participant materials from the course were used to determine exactly what information from the specified module should be covered.

### **Goal**

Prepare for a focal review meeting with an employee, reviewing skills presented in the *Creating High Performance@Sun* class as necessary.

NOTE: There are examples missing from this document because the subject matter experts are still compiling a more extensive, useful list of examples and nonexamples. In addition, some of the current examples will be replaced with examples from more complex job areas (i.e., the examples referring to clerks will be replaced with examples about engineering, sales, management, etc.).

## **Module 1: Prepare for a focal review meeting with an employee**

NOTE: Pages in this module will have a short description of each step; there will be a space for managers to type in their statements/questions; there will be examples and non-examples (examples of badly written performance objectives) for each step; and there will be buttons on the page that link to corresponding review pages in module 2.

1. Write a statement that establishes the purpose of the discussion: Early in the meeting, explain that the purpose of the meeting is to reach agreement on the objectives that will be used to evaluate the employee's performance in the upcoming performance period.

An example of this step is as follows:

- "I'd like to review the initial objectives you've put together for the upcoming performance period. We can discuss the objectives and come up with a final list that is realistic, which we both feel good about. After we decide on the objectives, we can talk about how you plan to achieve them."

2. Write questions that check employee's understanding of the discussion's purpose: You should check to be sure the employee understands the purpose of the discussion. During this step you should also check to see that the employee understands the process for reaching an agreement on objectives and also understands the results you are looking for at the end of the discussion.

For example, ask

- "How does this sound?"
- "Do you understand how we are going to decide on your objectives?"
- "So we will end up with a list of objectives and a plan for how you can achieve those objectives in the upcoming performance period."



3. Write statements that introduce each new performance objective: Review and discuss each objective proposed, then offer and discuss potential changes. This step ensures that: 1. alternative objectives are explored (if necessary); 2. each objective is properly evaluated; 3. the employee is focused on the most important objectives.

Examples include the following:

- "Perhaps you could consider cross-training, so you'll have backup people available during peak hours."
- "I'm not sure the second objective is all that challenging. You were already at that level last quarter, with a smaller staff."
- "How would you measure the 'cooperative attitude' in objective four?"
- "Given the importance and complexity of these first four objectives, do you think these others are realistic?"

4. Write questions that ask how the employee plans to achieve each performance objective: Ask the employee how he/she intends to meet each objective. This step helps the employee think through the achievability and relevance of each objective, ensuring that he/she will not return later with doubts or questions. (Some of these issues already may have come up in Step 3.)

Some examples for step 4 include

- "How do you plan to reduce customer complaints?"
- "What will be your first step in setting up this coordination with Personnel Administration?"
- "What will you do if the budget for the training sessions isn't approved?"

5. Write statements that summarize the discussion: During this step you will

1. Summarize the discussion
2. Resolve any conflicts that may have arisen
3. Express confidence that the employee can meet the objectives.

This step ensures that the employee understands the objectives, it closes the discussion on a positive note, and it counteracts any doubts that may have been expressed during the discussion.

Examples include

- "To summarize this discussion, your four objectives are . . ."
- "Well, I think we have a good list of objectives here, and I believe you'll do a good job in meeting them."

## **Module 2: Review Skills for establishing performance objectives**

1. State the 4 steps in establishing performance objectives. The four steps for establishing performance objectives are as follows:

1. Determine job tasks and their importance.
2. Determine what to measure in terms of quality, quantity, and timeliness.
3. Establish level to be attained for each area.
4. Test against SSMART. (SS=Sun-Specific; M=Measurable; A=Achievable; R=Results-Oriented; T=Time-Bound)

1.1 Determine job tasks and their importance (2-3 pages). Before you can develop performance objectives, you must know the tasks involved in performing a particular job, and you must know the relative importance of each task.

Identifying job tasks ensures that you are

- Focusing on performance.
- Not leaving out a critical part of the job.

Some organizations have a task list for each job; however, when no task list exists, one must be created. Here are the steps for creating a task list:

1. Ask one or several employees to draw up a task list.
2. Gather general resources, such as job descriptions and job leveling charts.
3. Think through the job. List the main duties of the job, and list the major tasks under each duty.
4. Review your final list with one or several employees to verify relevance.

No set of objectives can measure all possible performances, so you will need to select a few critical tasks as the base of your performance evaluation system. Set priorities by looking at your task list and evaluating each item in terms of importance (that is, think through the consequences of poor performance on each task). Then select five to ten of the most critical tasks.

This selection process involves a trade-off. You want to keep the number of tasks you evaluate to a minimum, but you should also be sure that the tasks you select are critical to the job and that they represent the employee's performance fairly.

1.2 Determine what to measure in terms of quality, quantity, and timeliness (4 pages). Once you have established the task list, you must determine how to measure the performance of those tasks. Most measurements fall in to one of three categories

- Quantitative: How much should be done?
- Qualitative: How well should it be done?
- Timeliness: When should it be done?

1.2.1 Quantitative measurements. How much should be done? Quantitative measurements involve counting the outcomes of the process and/or task

performance. These measurements are concerned with amounts of output.

Example: The number of forms completed by a clerk.

1.2.2 Qualitative measurements. How well should it be done? Qualitative measurements reflect satisfaction. For example, how well was a task done, or how good was the output? Qualitative measurements might check whether or not work was done within budget or whether work was done in accordance with company policies and regulations.

Example: The accuracy of forms completed by a clerk.

1.2.3 Timeliness measurements. When should it be done? Timeliness is a special kind of quantitative measurement. It defines the responsiveness of performance.

Example: The time between when a clerk received forms and when the forms were completed.

1.3 Establish level to be attained for each area (1 page). Some organizations have set standards for various jobs and some organizations don't. If your organization does not have established standards or required levels of performance, you must select some. To decide on an appropriate level of accomplishment, consider

- The level of work being done now. (If the current level is too low, think about how big a change your employees are capable of at one time.)
- A reasonable expectancy for this type of work.
- What your organization needs to accomplish its mission.

It is a good idea to have your standards reviewed by an employee who is currently doing the job to determine if the standards are realistic and relevant.

Examples:

1.4 Test against SSMART (6 pages). To measure employee performance using standards and objectives, you must have a way to test your work measurements to ensure that you are being fair and accurate. Each job standard and objective you establish should be

- SS: Sun-Specific
- M: Measurable
- A: Achievable
- R: Results-Oriented
- T: Time-Bound

1.4.1 Define Sun-Specific. Every objective you set must be relevant to the Sun environment, and it must support, either directly or indirectly, the organization's strategic direction. Objectives must also be precise, definite, and exact, leaving nothing up to interpretation. The ambiguity created by general statements about performance requirements can lead to difficulties at performance appraisal time.

Example of a Sun-specific objective vs. a general objective:

1.4.2 Define Measurable. To hold employees accountable for their performance objectives, you need to measure what they are doing in a way that everyone agrees on. Specific objectives are usually measurable; however, some objectives are written in specific terms, but they leave the measurement process in doubt.

Example of measurable objective vs. non-measurable objective:

1.4.3 Define Achievable. Achievable objectives are reasonable, realistic, and controllable. In other words, objectives cannot be too easy or too difficult, and they cannot involve elements over which the employee has little or no control.

An uncontrollable objective would hold a clerical worker accountable for producing 30 pages of new input per day; however, if the clerk is not given at least 30 pages of work each day, s/he would be unable to achieve the objective.

1.4.4 Define Results-Oriented. Objectives should be stated in terms of the employee's work output or results because results are easier to measure than the work process itself. In addition, managers are usually more interested in knowing *that* the job got done instead of *how* the job got done.

Example of a results-oriented objective vs. a process-oriented objective:

1.4.5 Define Time-Bound. Most managers and employees have time parameters, or deadlines, that they associate with successful completion of a task. A good objective makes those parameters explicit.

Example of a time-bound objective vs. a time-independent objective.

2. State differences between standards and objectives (3 pages). Standards are measurement criteria which apply to all employees with the same job title. Objectives, on the other hand, are set for each individual employee, regardless of job title.

2.1 Define objectives. Objectives are set individually for each employee in a job category, and they usually describe what the employee is expected to accomplish. For example, two employees may have the same title but slightly different jobs. Individual objectives, therefore, could take into account the differences in their jobs, abilities, work situations, and past performance.

Objectives are usually established through a discussion between an employee and his or her supervisor, and they may change from one performance period to another. Objectives also tend to be associated with specific projects and time periods.

An example objective is as follows:

- Successfully install a software program.

2.2 Define standards. Standards are used in situations where the same measurement criteria can be applied to all employees who hold the same job title (for example, secretaries, administrative assistants, assembly line workers, data-entry personnel). Standards are also used when the job does not have specific projects or objectives that an employee can focus on (as in the case of staff positions).

Standards do not change from one employee to another, or from one performance period to another, unless a change is agreed on by both the manager and the employee.

An examples job standard is as follows:

- Return customer calls within two hours.

## **Appendix D: Goal and Objective**

### **Purpose**

The purpose of this document is to state what learners should be able to do after completing the CBT lesson in terms of an instructional goal and instructional objectives. The goal is a broad, general statement of the expected learner outcomes, and the objectives are specific statements, derived from the goal, of what learners should know when they finish the CBT lesson.

### **Audience**

This document was written for the project team and the instructional designers. All members of the document audience agreed that the instructional goal and objectives were valid before the instructional designer continued working on the project.

### **Procedure**

The instructional goal and objectives were written after consulting the client, determining the training need in question, and identifying the course content that would be used in the lesson. Once the need and content were identified, a goal and corresponding objectives were written that solved the need using the specified content.

### **Lesson Goal**

Prepare for an effective focal review meeting with an employee, reviewing skills presented in the Creating High Performance@Sun class as necessary.



## Lesson Objectives

After completing this lesson, managers will be able to do the following:

A. Apply the five action steps of an effective meeting to focal review meetings with their employees.

1. State purpose.
2. Check for employee's understanding.
3. Introduce new performance objectives.
4. Determine how employee plans to achieve objectives.
5. Summarize discussion.

B. Write effective performance objectives.

1. Distinguish performance objectives from job standards.
2. Determine job tasks and their importance.
3. Determine what to measure in terms of quality, quantity, and timeliness.
4. Establish level to be attained for each area.
5. Test against SSMART.

SS: Sun-Specific

M: Measurable

A: Achievable

R: Results-Oriented

T: Time-Bound

## **Appendix E: Instructional Analysis**

### **Purpose**

This document was written by the instructional designer to identify the subordinate skills and knowledge that must be taught in the CBT lesson to meet the instructional goal. This step ensured that all relevant information was included in the CBT lesson. A more detailed description of this document's purpose is included below.

### **Audience**

This document was written for the instructional designer and project team. Subject matter experts were asked to read the document to ensure that all relevant information was included and no important information was left out; however, these people were only checking for accuracy, they were not part of the intended audience.

### **Procedure**

Starting with the materials from the *Creating High Performance@Sun* course and the identified instructional goal and objectives, this researcher determined the entry level information that had to be taught for learners to achieve the goal and objectives. The identified information was then organized hierarchically starting with the most complex information and ending with the simplest information.

## Description

According to Walter Dick and Lou Carey, authors of *The Systematic Design of Instruction*, an instructional analysis is “the procedure applied to an instructional goal in order to identify the relevant skills and their subordinate skills and information required for a student to achieve the goal.”

Traditionally the results of an instructional analysis are diagramed hierarchically in flowchart fashion. The instructional goal appears at the top of the diagram, and each subsequent goal, skill, and/or piece of information follows the goal according to its importance in instruction. For example, complex skills necessary to meet the instructional goal are placed directly beneath the goal, and the simplest skills and the most basic information appear at the bottom of the flowchart.

The instructional goal of this project is as follows:

Prepare for an effective focal review meeting with an employee, reviewing skills presented in the *Creating High Performance@Sun* class as necessary.

The most complex skill required to meet this goal is the ability to prepare for a focal review meeting, and the related skills are the ability to set performance objectives and the ability to hold successful meetings.

The menu of the CBT lesson will have the following options:

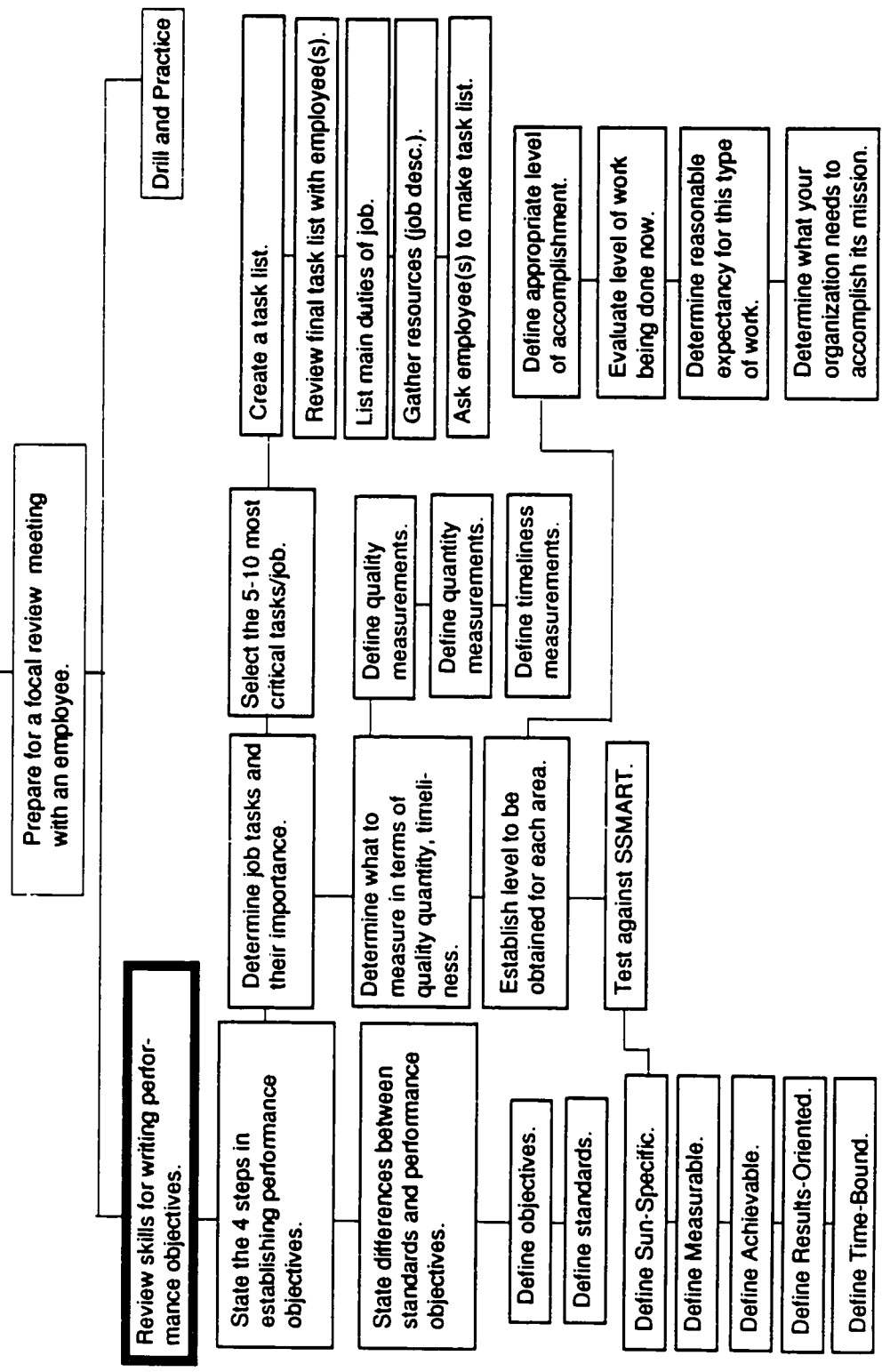
- Module 1: Preparing for the Meeting
- Module 2: Writing Performance Objectives
- Module 3: Drill and Practice

If the learner chooses to go straight to the first module, he/she will find buttons on certain pages that link to corresponding review pages in the second

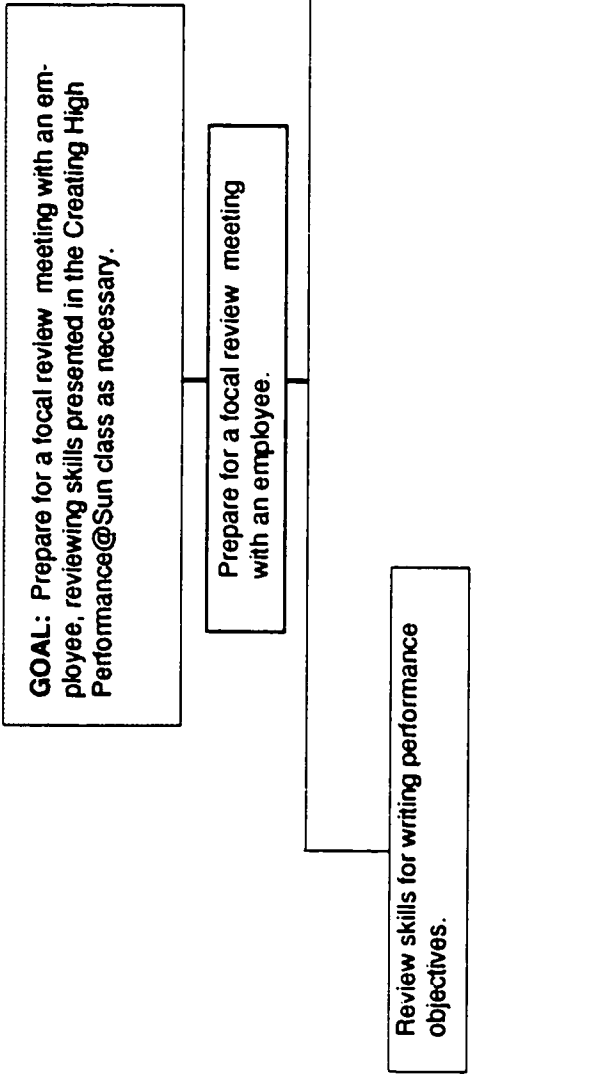
module. For example, in the first module, one page will ask the learner to establish new performance objectives. If the learner has forgotten how to write performance objectives, he/she will be able to click on a button on the bottom of the page to access the review information related to writing performance objectives. This feature allows learners to access review information on an "as needed" basis; therefore, they are not forced to spend time reviewing information they are already familiar with.

# Module 2

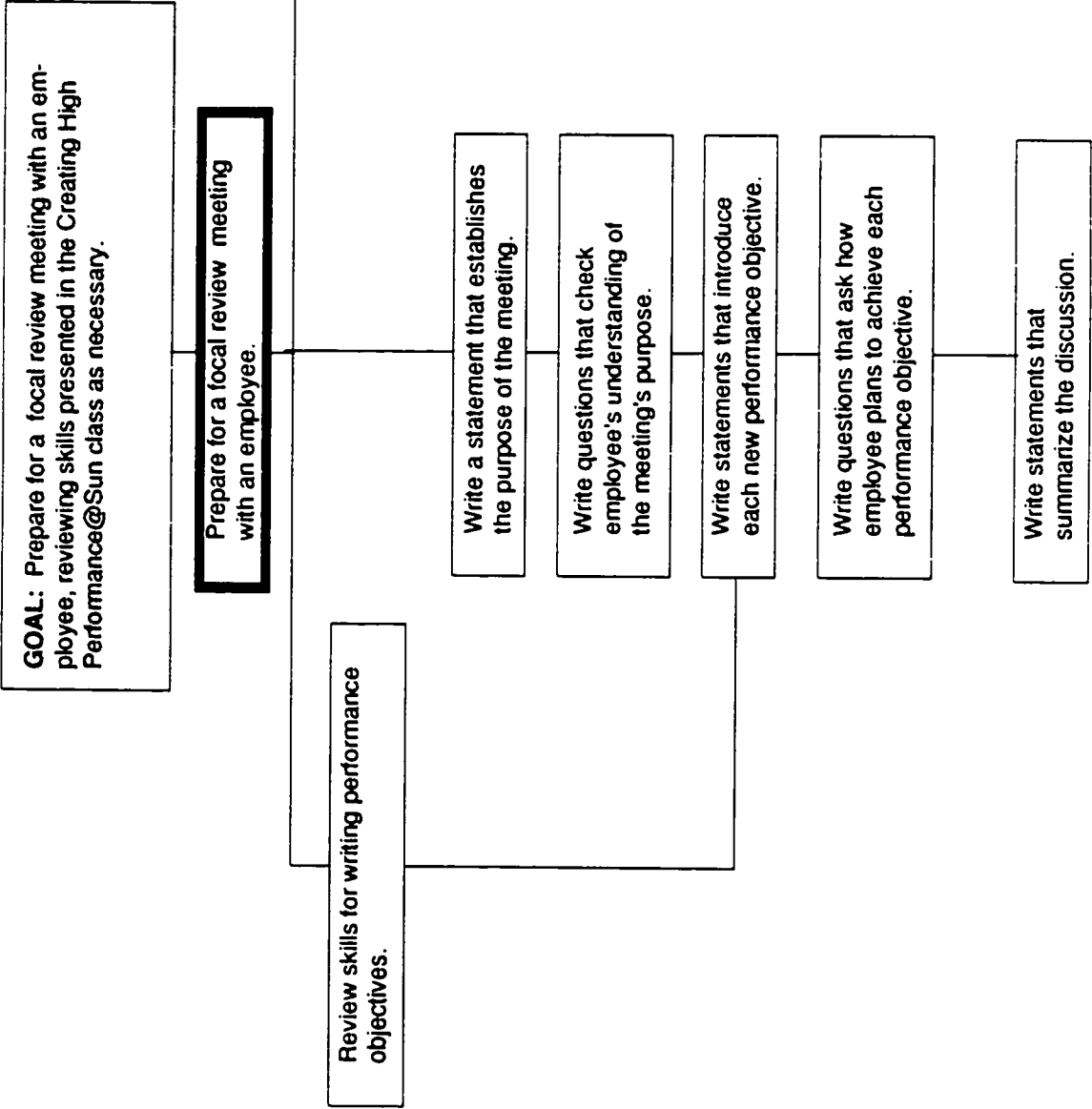
**GOAL:** Prepare for a focal review meeting with an employee, reviewing skills presented in the Creating High Performance@Sun class as necessary.



# Module 3



# Module 1



## **Appendix F: Instructional Strategy**

### **Purpose**

According to Walter Dick and Lou Carey, authors of *The Systematic Design of Instruction*, an instructional strategy is "An overall plan of activities to achieve an instructional goal" (Dick and Carey 1990). The following aspects of this thesis project are described in this document:

- Preinstructional activities: how learner motivation was established; how learners were informed of the objectives; and how learners were informed of the prerequisite skills they need to complete the CBT lesson.
- Information presentation: how the information was presented to learners in the CBT lesson.
- Student participation: how interaction with the students (learners) was incorporated into the CBT lesson.
- Testing: how learners were tested (if necessary).
- Follow-through: how learners can enhance their skills and knowledge after completing the CBT lesson.

### **Audience**

This document is written for the client who requested the training and the project team members. It allowed the instructional designer to present proposed training ideas, and these ideas were approved by the client before the instructional designer proceeded with the project.

### **Procedure**

There was no set procedure followed to produce this document. This re-



searcher knew the content that had to be addressed, and she used creativity to arrange it into a strategy that she felt would be effective.

### **Background**

This result of this thesis project is a computer-based training (CBT) lesson that is a follow-up to the *Creating High Performance@Sun* course offered by SunU. This lesson helps managers prepare for focal review meetings, which occur at least once a year, while it provides review information (from the *Creating High Performance@Sun* course) that managers can access if necessary. At Sun, employee raises are based on performance reviews, and performance objective setting meetings are a required step in the performance review process. When they have completed the CBT lesson, managers can print their responses and use the printout at their performance objective setting meetings.

### **Preinstructional Activities**

The three elements considered in this phase of an instructional strategy are learner motivation, informing learners of the objectives, and informing learners of prerequisite skills.

Learner motivation was established in two ways. First this lesson helps make a required part of the manager's job easier by providing "just-in-time" help when preparing for focal review meetings. Second, when the lesson is over, managers can print their responses from the lesson and use the printout to facilitate their focal review meetings.

Learners are informed of the objectives of the CBT lesson at two different times. During the *Creating High Performance@Sun* course, the instructor will

describe the CBT lesson, its objectives, and its benefits. The objectives are described again in the first few pages of the lesson itself.

The first few pages of the CBT lesson remind learners of the main points presented in the *Creating High Performance@Sun* course while introducing the goals and objectives of the lesson.

### **Information Presentation**

Instructional sequence: The information for this lesson is presented in three modules, and the information in each module is presented either hierarchically or procedurally. The three modules are

1. Preparing for the Meeting (procedural)
2. Writing Performance Objectives (hierarchical)
3. Self-Test (hierarchical)

The size of each module varies; however, the whole lesson should not take more than 30 minutes to complete. The second module is the largest when measured by page count because it includes the most content. The first module will take the longest to complete because it involves the most interactivity.

The information included in this CBT lesson is covered in the subject matter analysis (Appendix C). The content was approved by the subject matter experts on the project team. Both examples and nonexamples (examples of badly written objectives) are used throughout the lesson to help learners understand new ideas.

### **Student Participation**

The main module of the CBT lesson is interactive, providing an opportunity for learners to practice the skills and knowledge they learned during the *Creating*

*High Performance@Sun* course. Because of the course content, this module does not incorporate feedback. Instead, each page has examples and nonexamples to help learners type in their own statements/questions.

The other two modules provide review information, which learners can access if necessary. Instead of presenting the review information screen by screen, it is presented in true/false, multiple choice, and short answer questions, requiring interactivity from learners.

### Testing

The only testing in this lesson is incorporated into the review material, and questions are in the form of true/false, multiple choice, and short answer.

There is no pretest for this CBT lesson because all learners using the lesson must have attended the *Creating High Performance@Sun* course; therefore, it is assumed that all learners using the CBT lesson will have the same basic level of knowledge. Likewise, because the lesson is more of a job aid than hard-core training, there is no post test.

Attitudinal evaluation is planned to assess the learners' reaction to the CBT lesson. Because CBT is new to SunU, there is great interest in learning what the users think about it. Questions asked will include the following:

- Was the timing of this lesson appropriate? Should it have been offered sooner? Later?
- Was the lesson easy to use? If not, please explain any difficulties you experienced.
- Did this lesson help you prepare for your performance review meetings? If yes, how? If not, why?

### **Follow-Through**

Because this lesson does not measure performance, there is no remediation .  
If necessary, learners can refer to the materials they received from the *Creating High Performance@Sun* course for more information.

At this time, SunU is not planning another course or lesson learners can use to enrich their performance management skills.

## **Appendix G: Flowcharts**

### **Purpose**

The purpose of this document is to demonstrate the branching of the CBT lesson (i.e., how the pages of the CBT lesson will be sequenced). The programmer who enters the information into the computer uses this document as a guide while s/he programs the lesson.

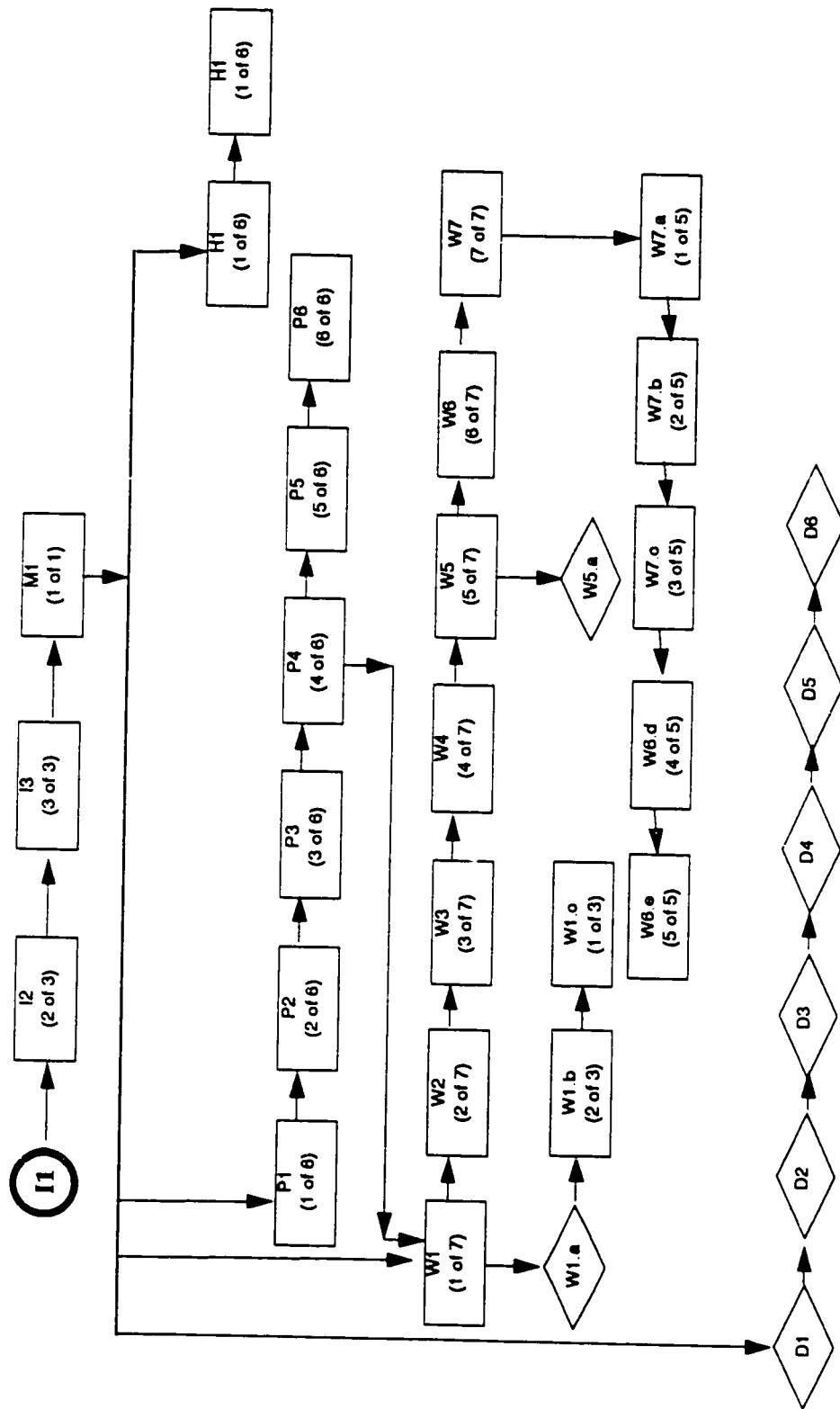
### **Audience**

This document was written for the instructional designer and the programmer who enters the information into the CBT application. Other members of the project team observed the sequencing of the CBT lesson by using the HyperCard prototype produced during the development phase.

### **Procedure**

After completing all the documents required for the design phase of the instructional systems development model, this researcher knew exactly what information needed to be included in the CBT lesson. At this point, creativity with the information was necessary to incorporate learner control and interactivity into the lesson.

This document and the storyboard document were written simultaneously to ensure that the lesson information was presented in a logical, effective sequence.



## **Appendix H: Storyboards**

### **Purpose**

This document demonstrates what each screen of the CBT lesson will look like. It also demonstrates the learner control and interactivity incorporated into the lesson.

This is a printout of the HyperCard prototype produced for this thesis project.

### **Audience**

This document was written for and reviewed by all members of the project team, including the client who requested the training.

### **Procedure**

As was the case with the flowchart document, this document was written after the course content had been identified, and this researcher knew exactly what needed to be included in the lesson. She relied on creativity to organize the information in an effective, logical manner.

SunU has a standard storyboard layout, and because this lesson will be implemented in the SunU CBT application, this researcher designed the storyboards and HyperCard prototype to match the SunU layout. According to the SunU layout, user information is placed on the left side of the screen, content information is placed on the right side of the screen, the navigation buttons are placed in the lower right side of the screen, and the module title is placed in the upper left side of the screen.

Welcome to  
Creating High Performance@Sun  
a follow-up, computer-based training  
lesson

Designed and Developed by  
Gayle Van Briggie  
for SunU METD

Click to continue

### Intended Audience

This follow-up lesson is intended for all managers and HR folks who have attended the three day Creating High Performance@Sun course offered by SunU Management and Executive Training and Development.

Click to continue



## Introduction

This lesson has two purposes:

1. To help you prepare for focal review meetings.

You will type your ideas for each of the five action steps listed on the right. At the end of the lesson you can print these ideas to use during your meetings.

2. To review the steps in writing effective performance objectives.

You can review this information as necessary as you prepare for your focal review meetings.

The five action steps are

1. Establish the purpose of the meeting.

2. Check employee's understanding of the purpose.

3. Introduce new objectives.

4. Determine how employee plans to meet objectives.

5. Summarize the meeting.

Click to continue

## Main Menu


- How to Use this Application
- Module 1: Preparing for the Meeting
- Module 2: Writing Performance Objectives
- Module 3: Self-Test


Quit


Click on one of the check boxes above to continue

### How to Use this Application




This lesson is arranged in three different modules, and you can move through these modules by clicking on the three buttons in the bottom right corner of the screen and/or the buttons on the main menu.


The  button will move you back one screen at a time. If you are on the first page of a module, this button will take you back to the main menu.

The  button will move you forward one screen at a time. If you are on the last page of a module, this button will take you back to the main menu.



### How to Use this Application

The  button has two functions. Some modules have review loops of information, and these loops are a level below the main modules. If you are in a review loop, the  button will take you back to the main modules. If you are in one of the primary modules, the  button will take you to the main menu.



### Preparing for the Meeting

There are 5 steps to follow when preparing for a focal review meeting, and they correspond to the 5 action steps of an effective meeting.

The 5 action steps are

1. Write statements that establish the purpose of the meeting.
2. Write questions that check the employee's understanding of the meeting's purpose.
3. Write statements that introduce new objectives.
4. Write questions to find out how the employee plans to meet the objectives.
5. Write statements that summarize the meeting.

← ↑ →

### Preparing for the Meeting

Step 1: Establish Purpose

To conduct an effective meeting, the first thing to do is establish the meeting's purpose. The purposes of this meeting are

- To discuss objectives
- To establish objectives
- To discuss how objectives will be achieved

In the space on the right, write a few different statements that you can use to establish the purpose of the meeting with an employee.

Type statements here

1

2

Examples ← ↑ →

**Preparing for the Meeting** Step 2: Check Understanding

Before you start to discuss new objectives, check to be sure your employee understands the following:




- The purpose of the meeting
- The process for reaching an agreement on objectives
- The results you are looking for at the end of the discussion

In the space on the right, write a few different questions that check the employee's understanding of the above mentioned items.

Type questions here:

1.

2.

[Examples](#)   

**Preparing for the Meeting** Step 3: Introduce Objective

Examples of Step 3 include




- I'm not sure the second objective is all that challenging. You were already at that level last quarter with a smaller staff.
- How would you ensure the cooperative attitude in objective four?
- Given the importance and complexity of the first four objectives, do you think these others are realistic?

[Click to close window](#)

Type statements here:

1.

2.

[Review](#) [Examples](#)   

**Preparing for the Meeting** Step 4: Ask How

After discussing objectives you should ask the employee how s/he plans to achieve each objective. This step accomplishes the following:

- Helps employee think through the achievability of each objective
- Helps employee consider the relevance of each objective
- Ensures that employee will not return later with doubts and questions

Write two sample questions in the space on the right.

Type questions here:

1.

2.

(Examples) ↩ ↲ ↻

**Preparing for the Meeting** Step 5: Summarize

Before ending the meeting it is important to summarize the major points made. The summary:

- Resolves any conflicts or doubts that may have arisen
- Expresses confidence that the employee can meet the objectives
- Ensures that the employee understands the objectives
- Closes the discussion on a positive note

Write two sample summaries in the space on the right.

Type statements here:

1.

2.

(Examples) ↩ ↲ ↻

### Writing Performance Objectives

Before reviewing the four steps for writing performance objectives it is important to review the five elements of effective performance objectives. The five necessary elements of effective performance objectives are listed on the right.

It is also important to review the difference between standards and objectives. Click the "Review" button for a short review of standards and objectives.

Effective performance objectives are:

- S: Specific
- M: Measurable
- A: Achievable
- R: Results-Oriented
- T: Time-Bound

Review

### Standards vs. Objectives

Standards are measurement criteria, which apply to all employees with the same job title. Objectives, on the other hand, are set for each individual employee, regardless of job title.

Which of the following is an objective? Click on the correct answer.

- Return customer calls within two hours.
- Successfully install a software program by the established deadline.
- File weekly reports by 3 PM Friday.


### Standards vs. Objectives

Standards are applied to all employees who hold the same job title. Standards are also used when a job does not have specific projects or objectives that an employee can focus on.

Standards do not change from one employee to another, or from one performance period to another, and they are usually unique to a particular job.

**Example standards:**

- Return customer calls within two hours.
- Check the monthly budget variances and explain them within 1 day of receipt.
- File weekly reports by 3 PM Friday




### Standards vs. Objectives

Objectives are set individually for each employee, and they describe what an employee is expected to accomplish in a given time period. They are used to account for varying abilities, work situations, and past performance of employees who have the same job title.

Objectives are usually established through a discussion between an employee and his or her supervisor, and they may change from one performance period to another.

**Example objectives:**

- Successfully install a software program.
- Achieve an annual sales objective.
- Implement a new computer system.




### Writing Performance Objectives

There are four steps for writing effective performance objectives, and each step is reviewed in this section.

To write effective performance objectives, follow these steps:

1. Determine the job tasks for a particular job, and determine the importance of each job task.
2. Decide how to measure each task in terms of quality, quantity, and timeliness.
3. Establish an acceptable level of accomplishment for each task.
4. Test each objective against SSMART.



### Writing Performance Objectives


Step 1: Determine Job Tasks

Before you can write performance objectives, you must know the tasks involved in performing a particular job, and you must know the relative importance of each task. Identifying job tasks ensures that you are

- Focusing on performance
- Not leaving out a critical part of the job

Steps for creating a task list include

1. Ask one or more employees to compile a task list.
2. Gather general resources, such as job descriptions and job leveling charts.
3. Think through the job. List the main duties of the job, and list the major tasks under each duty.
4. Review your final list with one or more employees to verify relevance.





### Writing Performance Objectives Step 1: Continued

After compiling a task list, select 5-10 of the most critical tasks as the base of your performance evaluation system. Set priorities by looking at your task list and evaluating each item in terms of importance.

- Keep the number of tasks to a minimum
- Select tasks that are critical to the job
- Select tasks that represent the employee's performance fairly

Focusing on one job within your department, list the 5 most important tasks related to that job:

- 1.
- 2.
- 3.
- 4.
- 5.

← ↑ →

### Writing Performance Objectives Step 2: Determine What to Measure

Once you have established the task list, you must determine how to measure the performance of those tasks. Most measurements fall into one of three categories:

- Quantitative: How much should be done?
- Qualitative: How well should it be done?
- Timeliness: When should it be done?

To review these categories, click on the "Review" button.

Examples of the three categories:

- Quantitative: The number of forms completed by a clerk.
- Qualitative: The accuracy of forms completed by a clerk.
- Timeliness: The time between when a clerk received forms and when the forms were completed.

Review ← ↑ →

### Writing Performance Objectives Review: Measurement Categories

This objective measures performance in one of the three measurement categories. Click on the correct category in the space on the right.

- Take the SunU Quality course by the time the next release process starts up.

Click on the correct category.

- Quality
- Quantity
- Timeliness

◀ ▶ ↻

### Writing Performance Objectives Step 2: Establish Acceptable Levels

Set job standards are often used as the acceptable level of performance for a specific job title. However, you may need to modify set job standards to meet the needs of your department, or you may need to establish new standards and acceptable levels of performance.

To review the differences between standards and objectives, click on the review button below

If you have to establish standards for your employees, consider the following:

- The level of work being done now
- A reasonable expectancy for this type of work
- What your organization needs to accomplish its mission

It is a good idea to have your standards reviewed by employees doing the job to check their relevance.

**Review**


◀ ▶ ↻

**Writing Performance Objectives** Step 4: Test Against SMART

Fairness and accuracy are essential when measuring employee performance with objectives. To ensure that every objective you write is fair and accurate, remember the five essential elements of effective performance objectives (see the list on the right).

To review one of the SMART elements, click on one of the buttons below.

- S: Specific
- M: Measurable
- A: Achievable
- R: Results-Oriented
- T: Time-Bound



**Writing Performance Objectives** SB: Sun-Specific


Every objective you write must be relevant to the Sun environment, and it must support, either directly or indirectly, the organization's strategic direction. Objectives must also be precise, definite, and exact, leaving nothing up to interpretation.

These objectives are Sun-Specific:

- Transition from a bug fixing function to more of a development function.
- Try to use experienced engineers as mentors.

These objectives are not Sun-Specific:

- Have a weekly meeting with your manager to review projects.
- Handle a minimum of 1000 customer calls per month.



**Writing Performance Objectives** M: Measurable

To hold employees accountable for their performance objectives, you need to measure what they are doing in a way that everyone agrees on. Specify the measurement process by incorporating one of the three measurement categories in each performance objective. The three categories are

- Quantity
- Quality
- Timeliness

These objectives are measurable:

- Customer calls must be returned within 2 hours.
- Have a weekly meeting with your manager to review projects.

These objectives are not measurable:

- Do your best to assure that all team members attend each team meeting.
- Work with the Imagination team to develop an architecture document.

↩ ⬆ ⬇

**Writing Performance Objectives** A: Achievable

Achievable objectives are reasonable, realistic, and controllable. In other words, they cannot be too easy or too difficult, and they cannot involve elements over which the employee has little or no control.

An unachievable objective would hold a clerical worker accountable for producing 30 pages of new input per day with no guarantee that the clerk would receive that many pages of information.

These objectives are achievable:

- Try to use experienced engineers as mentors.
- Send a software patch to a customer within 3 to 5 working days of the request.

These objectives are not achievable:

- Nurture the more junior people in the group.
- Handle a minimum of 1000 customer calls per month.

↩ ⬆ ⬇

### Writing Performance Objectives R: Results-Oriented

Objectives can be stated in terms of an employee's work output/results (Results-Oriented) or in terms of the employee's work process (Process-Oriented). Performance objectives should be results-oriented because results are easier to measure than the work process itself.

In addition, managers are usually more interested in knowing that the job got done instead of how the job got done.

These objectives are results-oriented

- Be comfortable talking to TSE's about NeWSprint by 12/90.
- Work with the Imagination team to develop an architecture document.

These objectives are not results-oriented:

- Customer calls must be returned within 2 hours.
- Nurture the more junior people in the group.

### Writing Performance Objectives T: Time-Based

Most managers and employees have time parameters, or deadlines, that they associate with successful completion of a task. Good performance objectives make those parameters and deadlines explicit.

Time-independent objectives, which don't make time parameters explicit, are often unmeasurable.

These objectives are time-bound

- Send a software patch to a customer within 3 to 5 working days of the request.
- Be comfortable talking to TSE's about NeWSprint by 12/90

These objectives are not time-bound:


- Do your best to have team members attend all team meetings
- Transition from a bug fixing function to more of a development function.

**Self-Test**

What does SMART stand for?

S:  
M:  
A:  
R:  
T:

**Check Answer**



**Self-Test**

The following objective is missing one of the SMART elements. Which element is missing?

- Engineering Support Rep. Customer calls must be returned within 2 hours.


a. Specific

b. Measurable

c. Achievable

d. Results-Oriented

e. Time-Bound




**Self-Test**

This objective is also missing one of the SMART elements. Which element is missing?

- Engineering Support Rep: Handle a minimum of 100 customer calls per month.


- a. Specific
- b. Measurable
- c. Achievable
- d. Results-Oriented
- e. Time-Bound



**Self-Test**

Standards are written to measure the performance of individual employees.

- True
- False




Self-Test

This objective measures which of the three measurement categories?

- Complete the testing for NeWSprint 1.1 by the PCS date.

Quality  
 Quantity  
 Timeliness




Self-Test

The following is a performance objective

- Be ready to handle the first customer call of the day by 8:00 AM.

True  
 False





## **Appendix I: Formative Evaluation Plan**

### **Purpose**

This document is the proposed plan of how the CBT lesson should be tested by members of the training audience before it is implemented company-wide. This plan tests the CBT lesson to make sure that it meets the instructional goal, objectives, and specifications described in earlier phases of the instructional design process.

### **Audience**

This document was written for the project team and the instructional designer. Approval by the project team was not mandatory before the instructional designer proceeded with the formative evaluation.

### **Procedure**

Formative evaluation plans typically address the subjects of one-on-one testing and small group testing in a similar manner; therefore, this researcher followed example evaluation plans to determine a plan for evaluating the effectiveness of this CBT lesson.

NOTE: Most evaluation plans address both formative evaluation (ongoing throughout the design and development of a training project) and summative evaluation (conducted after implementation of a training project). This plan does not address summative evaluation because SunU has not developed a plan for implementing CBT into the Sun Microsystems environment. It is nearly impossible to plan for summative evaluation when one does not know how/if the lesson will be implemented; therefore, a summative evaluation plan will be

written when a CBT implementation process has been developed.

### **One-to-One Testing**

NOTE: The formative evaluation of this CBT lesson will not begin until the lesson is programmed in SunU's CBT application; therefore, this document is written in the future tense.

The first step in conducting a formative evaluation for this CBT lesson will be to carry out one-to-one testing. The project team for the *Creating High Performance@Sun* course will be consulted, and they will be asked to recommend 12 managers: 4 with excellent performance management skills, 4 with average performance management skills, and 4 with poor performance management skills. Two managers from each ability level will be selected to evaluate the lesson. Managers evaluating this CBT lesson must have attended the *Creating High Performance@Sun* course to have the prerequisite knowledge required to complete the CBT lesson.

Managers at Sun Microsystems are extremely busy, and some are not willing to aid in the evaluation of training programs; therefore, each manager will be asked, and those willing and able to spare 90 minutes will be chosen for the one-to-one testing.

Besides managers, these people will be asked to evaluate the CBT lesson:

Jeanne Brenneman: She is on the project team, and she will also provide instructional design suggestions/feedback.

David Wick: He is the Course Manager for the *Creating High Performance@Sun* course, and he is one of the subject matter experts.

Lisa Cavallaro: She is the secondary Course Manager for the course.

Ellen Foley: She is the contractor designing the course, and she is one of the subject matter experts.

Rob Harris: He is a subject matter expert in the functionality of SunU's CBT system, and he will provide suggestions/feedback regarding programming of the lesson.

Test subjects will be met in their offices, eliminating the need for travel. They will be asked to go through the lesson, screen by screen, speaking aloud as they work. Before they begin, they will be asked to think of, and comment on, the following issues as they work:

- Are explanations/directions clear?
- Is the branching logical? Confusing?
- Are the examples appropriate? Helpful? Are there enough examples?
- Is the lesson interesting? Helpful? Worth the time?

When subjects have finished, they will be asked the above questions (phrased as open-ended questions), to determine the overall effectiveness of the lesson.

### **Small Group**

The second step in formative evaluation is small group testing; however, because this CBT lesson is designed for individual, self-paced use, a small group evaluation will not be conducted. Instead, a second round of one-to-one testing will be conducted with new managers from each ability level. The purpose of the second round of testing is to ensure that members of the audience can use the lesson without the help of an instructor, and to test the usefulness of revisions made after the first round of one-to-one testing.

In the second round of one-to-one testing managers will be asked to work through the lesson, speaking aloud if they wish. They will also be asked to mark any questions/comments/suggestions on a printout of the CBT lesson. When each manager has finished, they will be asked to complete a short questionnaire which addresses the issues listed above.

## Bibliography

Blank, George. "Computer-based training for non-computer subjects." *Creative Computing*, 10 (August 1984), s4-s7.

This article is a review of software packages, none of which are useful for this thesis.

Borsook, Terry and Higginbotham-Wheat, Nancy. "Interactivity: what is it and what can it do for computer-based instruction?." *Educational Technology*, (October 1991), 11-17.

This article is full of guidelines and definitions. The authors provide definitions for the "critical features of interaction," "Berlo's Levels of Communicative Interdependence," and a "Recipe for Interactivity." While stressing the importance of timely feedback, the authors also caution against giving the user too much control, because too much freedom and control often leads users into hyperspace. Therefore, there is a balance of interactivity that the developers must define early in the design process.

Bruhn, Gay. "Computer based training simulation." *Performance and Instruction Journal*, 23 (December 1984), 1-3.

As one of the other articles focused on drill and practice with CBT applications, this article focuses on simulations in regards to CBT applications. She discusses how problem solving should be approached and incorporated into CBT, and she discusses how the theory of instructional design effects simulation and CBT. Specifically she briefly addresses the steps of analysis, design, production, formative evaluation, implementation, and summative evaluation of simulation CBT applications.

Carr, Clay. "Hypertext: a new training tool?" *Educational Technology*, 28 (August 1988), 7-11.

The article defines hypertext and provides an example of how it can be used with CBT.

Charles, C.M. 1988. *Introduction to educational research*. White Plains, New York: Longman Inc.

This text was used to define "research and development" as this subject applies to the research done for this thesis project.

Dean, Claire Treseler. "Storyboarding for computer-based training: a technique in transition." *Performance & Instruction*, 27 (May/June 1988), 8-14.

After explaining what storyboarding is, the author explains that storyboarding was done on paper in the past. She defines the elements that need to be addressed on the storyboard (text, images, definition of interaction and individualized feedback, definition of sequence and links). Now storyboarding is done using computer programs, specifically HyperCard. The article is basically about HyperCard. She discusses its printing, graphics, animation, audio, and other capabilities.

Dick, Walter and Carey, Lou. 1990. *The systematic design of instruction*. New York: Scott, Foresman and Company.

This text provided definitions of the terms "instructional analysis" and "instructional strategy."

Kamouri, Anita. "Computer-based training: a cognitive framework for evaluating systems' designs." *Journal of Educational Technology Systems*, 12 (No. 4, 1984), 287-305.

This article was too old, and the information too outdated, to be used in this thesis.

Kearsley, Greg and Hillelsohn, Michael. "Human factors considerations for computer-based training." *Journal of Computer-Based Instruction*, 8 (May 1982), 74-83.

The authors discuss the following human factors as they relate to computer-based training: training administration, management, instructional design and development, testing and evaluation, motivation, and hardware. The discussion of instructional design and development are particularly important in relation to this thesis.

Kemp, Jerrold. 1985. *The instructional design process*. New York: Harper & Row.

This text provided a definition for the term "spaced practice."

Ladd, Barbara. "Early CBT remembered: how we got here from there."  
*Training*, 27 (May 1990), s8-s11.

This article provides a brief history of CBT, starting with its introduction during World War II and ending with how CBT was used at Ford Motor Company. The author discusses how cost of the computers was the most important limiting factor to the early use of CBT; however, the limiting factor is now teaching people to use, understand, and appreciate the effectiveness of CBT.

Lanza, Antonietta. "Some Guidelines for the Design of Effective Hypercourses."  
*Educational Technology*, XX (October 1991), 18-22.

The author begins by pointing out that instructional designers must not develop hypertext courses simply to use the hypertext medium; hypercourses are still subject to the same rules of instructional design (specifically, they must be developed in response to an acknowledged need). She defines nodes, links, and tools and how each is involved with hypercourses, and she ends with perspectives and conclusions about hypertext's relationship to instructional design.

Mahoney, Francis and Lyday, Nancy. "Design is what counts in CBT." *Training and Development Journal*, 38 (July 1984), 40-41.

This article provides details about how designers can incorporate the four elements of CBT into their course. The four elements are transfer, interactivity, problem solving, and stimulation. The authors describe how each of the elements should be used in CBT to produce an efficient and effective learning experience.

Ng, Raymond. "Instructional design considerations in converting non-CBT materials into CBT courses." Paper presented at the Annual Conference of the National Society for Performance and Instruction (March 31 - April 5, 1986), 7 pp.

The author discusses eight factors which must be considered when converting print materials into CBT. These are physical and cosmetic adaptations, not design changes. The eight factors are as follows:

1. Continuity of instructional flow
2. Interaction (questions and feedback)
3. Screen design (incorporating animation and color)
4. Use of graphics (consider amount of disc space necessary)
5. Hardware limitations
6. Software limitations
7. Learner limitations (computer phobia and learner fatigue)
8. Documentation and packaging

He suggests sampling a small segment of material to make sure the conversion is effective before converting all the materials.

Pearlstein, Gloria. "Preston Trucking Shifts to Performance Management."  
*Performance & Instruction*, XX (Aug. 1989), 1-5.

The author introduces and discusses the idea of performance management by describing how the process was incorporated into a struggling shipping company. The most important aspects of a performance management system are: positive reinforcement and recognition for good performance; negative, known consequences for poor performance; incorporating employee opinions/ ideas into the management system; tracking performance so each employee knows where he/she stands.

Putman, Anthony. "Computer based coaching: the trainer's missing piece."  
*Training and Development Journal*, 43 (March 1989), 34-37.

This article describes the differences between CBT and computer-based coaching, which are two different forms of computer assisted instruction. The main difference is that CBT is used to teach learners how to do something. Computer-based coaching, on the other hand, is used by the learner as a reference when the learner needs information or reinforcement after learning the initial information.



Reinhart, Carlene. "Developing CBT - the quality way." *Training and Development Journal*, 43 (November 1989), 85-90.

This article is written by a Xerox employee, and it is a discussion of how Xerox developed a particular CBT program. Xerox processes are highlighted; however, most of the processes are not described in enough detail to be useful. The two exceptions are identifying the "Cost of quality" and "Identifying customer requirements."

Rossett, Allison. 1987. *Training needs assessment*. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc.

This text was used as a reference for the subject of "Instructional Systems Development" or ISD, which is one of the theories of instructional design.

Schulman, Jane. "Getting your feet wet with CBT: how to keep the process orderly." *Interactive Technologies*, 26 (Sept. 1989), 19-22.

Schulman discusses how to incorporate CBT into an organization, starting with exploring CBT options and ending with implementing the system. This is an overview article that only touches on each of five stages (exploring, recognizing, defining commitment, developing, and growing the system). She does not discuss any of the five stages in detail.

Shlecheter, Theodore. "The relative instructional efficiency of small group computer- based training." *Journal of Educational Computing Research*, 6 (No. 3, 1990), 329-341.

This article is a discussion of three experiments done by the military with soldiers. The experiments were to determine which was more effective and efficient: small group (4 people) CBT or individual CBT. They discovered that small group CBT was more efficient by 5 times; however, they were not able to prove that the group remembered the materials any longer than the individuals. The results of this study support CBT usage in that it can save money to have learners work in groups (saving both time and the need for more workstations).

Stevens, George. "Applying hypermedia for performance improvement." *Performance & Instruction*, 28 (July 1989), 42-50.

Stevens points out the importance of designing hypermedia applications for use by several different audiences. For example, he touches on providing alternate wording of questions. He suggests that one of the most important functions of hypermedia is that it provides more than one way of presenting information to learners. Some people learn better by reading, therefore text is provided on screen; however, some people learn better by seeing and hearing, therefore video and audio options are provided. It is also noted that hypermedia can be linked to large databases, making the application useful to several different groups of people in an organization (sales, marketing, executives, etc.).

Vazques-Abad, Jesus and LaFleur, Marc. "Design of a performance-responsive drill and practice algorithm for computer-based training." *Computers and Education*, 14 (Feb. 89), 43-52.

This article is about the use of drill and practice in CBT. The authors discuss how drill and practice is incorporated into scripted training courseware, and they provide guidelines for forming a pool of items to be used in the exercise. An algorithm is suggested for alternating and eliminating items as the user answers them correctly. The algorithm is an involved mathematical equation; however, the strategy behind the algorithm is helpful.

Wolfe, Harold. "Computer-based testing." *Training*, 24 (Nov. 1987), 69-72.

According to the author, computer-based testing is one of the easiest and most cost-effective ways to introduce CBT into the work environment. Because CBT development is so time intensive, it is wiser to start with a small CBT sample, in the form of a test, and move up to large samples, in the form of complete courses. He provides actual examples to support his ideas.