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ABSTRACT

This memorandum reports on the third phase, the design, of a four-phase project to design project management training materials for local educational agencies. The first section of the memorandum explains some considerations regarding management education and the organization of the report. Section 2 presents the design specifications for the Executive Orientation Training Package. The basic assumption made in developing this package is that its fundamental purpose is to provide an orientation to the staff of the local educational agency after the decision has been made to implement a project managment capability. Section 3 presents the design specifications for the Project Manager Training Package. The package includes a determination of entry level component as well as a case simulation component. Each of these instructional packages can stand alone. The final section presents an example lesson developed for the orientation package. (Author/IRT)

INSTRUCTIONAL SYSTEM DESIGN for EXECUTIVE ORIENTATION and PROJECT MANAGEMENT TRAINING PACKAGES

Technical Memorandum #3

Project Management Training Packages for Local Education Agency Personnel

RF Project No. 3131-A1

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March 17, 1971

Interim Report on Work Performed Pursuant to a Contract With
Research for Better Schools, Inc.
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I. PURPOSE OF THE DESIGN PHASE

The major efforts of the project staff have up to this point focused upon the Analysis and Conceptual Phases as outlined in the project proposal. The Analysis Phase focused upon the functions and duties of the project manager in the local education agency along with a description of the nature and type of organizational support needed to have a project management capability. The Conceptual Phase focused upon the development of a set of behavioral objectives for both the Orientation and Project Manager Training Packages. In this latter phase, a preliminary step to the development of the behavioral objectives was the preparation of a task analyses for both the project director and top-level administrative personnel. Technical Memorandums 1 and 2 report the results of these two phases respectively.

The conduct of the Analysis and Conceptual Phases were deemed necessary as prior steps to the development of an instructional design to guide the actual production of the Orientation and Project Manager Training Packages. The Design Phase was to develop an outline of the general structure for the two training packages, including a determination of the instructional strategies and processes to be employed, the establishment of specifications, and related tasks. The essential purpose, therefore, of the Design Phase of the project was to create two <u>instructional systems</u>.

Recognizing that different approaches and/or models have been developed for the purpose of helping an individual or agency create an instructional system, a decision was made to use as a principal resource the document

prepared by Robert Smith titled The Design of Instructional Systems.[1] In this document, Smith defines an instructional system to consist of the several elements of objectives, materials, media, examinations, and related constituent parts. The end product of the developmental process for an instructional system consists of an instructional package.

In addition to defining an instructional system as noted above, Smith identifies six operational considerations which have to be thought through as one develops the instructional package or system. Briefly outlined, these six considerations involve the following activities:

1. Establishment of behavioral or performance objectives.
2. Development of opportunities to practice performance.
3. Development of opportunities to practice knowledge.
4. Development of a means of presenting knowledge to the student.
5. Development of a procedure for moving the student through the instructional package or materials.
6. Development of a means of maintaining quality control for the instructional package.

The instructional system designs presented in this report were derived utilizing the approach suggested by Smith. His model and procedures, however, were not slavishly followed. The project staff drew upon the expertise and knowledge of the project advisory board to assist in the development. The instructional designs presented in the report are considered to be only preliminary. Undoubtedly, as the instructional materials are produced modifications will have to be made in

[1]Robert G. Smith, Jr. The Design of Instructional Systems, Technical Report, 66-18, Human Resources Research Office, George Washington University, Washington, D. C., November 1966.

some of the design specifications. The report presents therefore what the project staff currently sees as a reasonable set of design specifications for the two instructional packages. Next we will begin the actual production of training materials.

A. Some Considerations Regarding Management Education

The specific instructional design that is presented in this memorandum can be considered to be a sub-element of a still larger instructional problem - that of preparing persons for managerial roles or management education. It would not be possible to summarize the entire available literature with regard to past and current practice in the area of management education but it might be helpful to briefly examine selected current literature on this topic.

In a recent publication by Miner[2] titled Studies in Management Education, approximately 40 studies dealing with management education and its influence on managerial styles and behavior are reviewed. In summarizing these research studies, the following selected conclusions have relevance for the current training design:

1. Knowledge changes do appear frequently in the studies cited. In some cases, the knowledge change is not as great as it might have been because appropriate motivation to learn may not have been present or in some cases instructors were not fully informed regarding the subject matter.
2. The studies provide repeated demonstrations of increases in

[2]John B. Miner, Studies in Management Education, Springer Publishing Co., New York, 1965, Chapter 1.

what might be called human relations attitudes. Changes in sensitivity to others, skills and creative work, problem solving, decision making, and leadership have been noted.

3. Retention of knowledge and behavior changes over time was not easily determinable because most of the studies did not include any follow-up.
4. A wide variety of instructional techniques were found to produce change with no one approach being essential. Lectures, discussion techniques, role-playing, case analysis, and even T-groups are shown to have impact.

Miner reports in this same publication the results of his own research in regard to developing a scale based largely upon sentence completion methods to measure the effectiveness of management education. Several research studies are cited to show that the Miner Sentence Completion Scale relates to selected indexes of managerial success. The basic orientation to the research is derived from the theory of managerial motivation.

While Miner's study indicates that changes can take place as a consequence of management education, it is important also to determine the base from which management education operates which is largely the nature of the managers job or task. Stewart[3] recently presented a list of six basic assumptions regarding the managerial role or function which seem to be influential on current management education and training. The six assumptions are as follows:

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[3]Rosemary Stewart, "Management Education and Our Knowledge of the Manager's Job," International Social Science Journal, Vol. 20, No. 1, 1968.

1. Management is one profession for which students should have a common training.
2. The most important aspect of a manager's job is making decisions. Therefore training should emphasize problem analysis as well as determining information needed for a particular problem.
3. Some understanding of quantitative methods is an essential for a manager today.
4. It is most important that the manager understand institutional relations in general and relations with subordinates in particular.
5. The main difference between managerial jobs that is relevant for post-experience education is the difference between levels.
6. Specialization is one of the major problems in post-experience management education. That is, there needs to be an emphasis upon broader understandings and knowledge.

Stewart then proceeds to review the methodology employed in studying managerial activities, the types of questions asked by those who study management activities, the general research findings, and their relevance for management education. She cites as general findings from these studies of management roles and positions four main findings:

1. Managers spend most of their time working with other people.
2. Managers are active people who deal with a lot of different incidents.
3. Most managerial positions involve horizontal as well as vertical contacts in the organization.

4. Generalizations about managerial jobs are difficult to make because these positions vary in the amount of time spent on different activities, the kinds of problems dealt with, the types of people involved, and the relationships established.
5. Various features of an organization affect what the manager does.
6. Managers may be prone to particular types of inefficiency.

Using these six generalized findings, Stewart points out that the present research is not "...sufficiently authoritative for us to be able to say that any of the assumptions of management education described at the beginning ... are wrong." She does go on to point out that in her opinion the most important finding for management education revolves around the evidence of differences between managerial jobs. While admitting that there are common aspects of management, she indicates that attention should be paid to the special problems associated with certain jobs and what can be done to help this situation.

The general observations made by Stewart in her review of management education would tend to support the position taken with the overall design of having two training packages - one devoted to executive orientation and the other to developing project management skills. The observations of Miner and Stewart with regard to our lack of knowledge of providing adequate management education as further reinforced by Willings[4] in his remarks regarding the use of case studies in training for management decision making.

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[4]David Willings, How To Use the Case Study In Training For Decision-Making, Business Publications, Limited; London, 1968.

> Teaching the broad-base principles of management theory can be carried out by conventional lectures, discussions, seminars or a combination of all three. When it comes to the practice of management we must start by admitting that this cannot be taught by conventional methods. We cannot present a set of formulae for solving a set of management problems. We have not yet arrived at a state of knowledge where we can fully claim to understand the problems, still less the dependent factors. Giving practical management training is like performing a surgical operation in a darkened room. Our state of knowledge is so limited that we must experience or stagnate...I am first to agree that the methods for giving practical training in the human aspects of management are inadequate and need a great deal of examination. There is always scope for new methods and new approaches. One can only find out their effectiveness by trying them. A great deal of research in this sphere is urgently needed. (p. 4)

Willings proceeds to discuss the nature of case studies, their organization, preparation, presentation, use, and general types of techniques.

Admittedly, the above studies are a limited sampling of publications relating to the problem of management education. They do, however, point out that there seems to be a paucity of research with regard to the types of management education which is most effective for different types of managerial positions. The present research available therefore, while having some value, does not provide a specific set of guidelines useful in constructing an instructional package for education in the area of project management.

B. Organization of Report

Section II of the report presents the design specifications for the Orientation Package. Section III presents the design specifications for the Project Manager Training Package. Included in Section III is a determination of entry level and case-simulation component. Each of the instructional packages is considered to be a stand-alone product. Section IV presents an example lesson developed for the Orientation package.

II. ORIENTATION PACKAGE DESIGN

A. Basic Assumption Underlying Design

The development of an instructional design requires that certain assumptions be made about the background and qualifications of the persons or students who will be involved in the instruction as well as about the general purpose of the instructional package itself. In developing the design for the Orientation Package, there appears to be some confusion with regard to the exact function that the package is designed to serve. From a reading of the proposal as well as discussions held in the advisory committee meeting, there seems to be two possible approaches or even conflicting views.

One possible view point is that the basic function or purpose of the package is to do a selling job to top-level administrators in a local education agency. The product to be sold in this case is the concept and practice of project management within the organizational structure. In short, the purpose is to convince an LEA that project management is the way to go. A second view point derives from the probability that a top-level administration decision has already been made to have a project management capability. There is a need then to provide an orientation to central office personnel who would provide support to the individual project managers. It is possible for both view points to be incorporated within the same set of instructional materials but some incompatability would exist. Put another way the question is, Does the orientation package lead to a decision or does it in fact implement or help to implement a decision that has already been made?

The basic assumption made in developing the Orientation Package design as outlined in this section is that the fundamental purpose or

function is to provide an orientation to the staff of the LEA after the decision has been made to implement a project management capability. The function of the package therefore is to provide an orientation for those administrative and central office personnel who are being asked to implement a decision.

While focusing in upon this basic starting point, the possibility of utilizing the same materials to provide an orientation or information to make a decision regarding project management installation in an LEA is not necessarily ruled out. Perhaps another way to look at the "selling" job involved is to see it as building conviction and developing knowledge about project management operation in an organizational structure.

The acceptance of the assumption stated above required a slight modification in behavioral objectives presented in Technical Memorandum No. 2. These modifications are noted in Section B dealing with objectives hierarchy and sequence for the Orientation Package Instructional design.

B. Objectives Hierarchy and Sequence

The primacy of determining objectives for instructional sequences is an accepted principle of instructional design. As noted earlier, an initial set of behavioral objectives was established for the orientation package as a result of the Conceptual Phase. These previously established objectives were re-examined in order to establish both a hierarchy and sequence of accomplishment.

The hierarchy of objectives as presently conceived is presented in Table I. In addition to some modifications of the original list presented

TABLE I

HIERARCHY OF BEHAVIORAL OBJECTIVES FOR ORIENTATION SEMINAR

A. Building Conviction

1. Defines the concepts of project and project management.

2. Cites examples of how the project management system can and has been used successfully in industry and government.

3. Cites examples of how the project management system can and has been used successfully in the field of education.

4. States examples of LEA effort which could be identified as projects.

5. States the important advantages for and limitations of using a project-type management system.

6. States where project management as a discipline can assist in the LEA operations.

B. Organizational Structuring

1. Creates acceptable definitions of "Management" and the general functions of planning, organizing, directing and controlling.

2. Identify and describe patterns of structure for incorporation of project management in the LEA organization.

3. Cite the necessary elements for installing a PM capability within the LEA.

4. Create an outline of a plan for implementing a project management system into a LEA.

C. Organizational Relationships

1. Cites information and guidance needed in planning a project.

2. States the support and assistance needed which should aid the project director in the operational aspects of a project.

3. Cites potential conflicts existing between the LEA structure and project activity which crosses functional organizational lines.

D. Gain More Information

1. States locations where information and help is available for assistance in project management.

in Technical Memorandum No. 2 the objectives were grouped into a 2-level hierarchy. Objective A-1 originally included reference only to defining the concept of project. Objective 2 in the original list was deleted. Objective B-1 was created and inserted as a replacement for that objective. Objective 10 in the original listing was deleted. Original Objective 8 was re-structured and sub-divided into two separate objectives, one dealing with planning and the other dealing with operation. Minor wording changes were made in some of the other objectives.

The sequence of objectives was developed using a means-ends relationship as presented in the hierarchy as well as by developing a flow chart reflecting a proposed sequence. The flow chart developed is presented as Figure 1. In the chart, the objectives are identified by number and the lesson content abbreviated. Inspection of the chart reveals that the general pattern is to focus first upon objectives dealing with building conviction, moving then to structural problems in project management, followed by objectives related to relationship problems, and terminating with information source objectives.

In developing the objectives sequence, recognition was given to the possibility that some students working through the instructional materials might not have a minimum of knowledge regarding the nature and functions of management. A branching arrangement was therefore built into the sequence at a point which would permit the student not familiar with general management principles to review a sub-set of materials presenting that knowledge. He would then re-enter the sequence at the start of the objectives dealing with organizational structure. A form of entry test

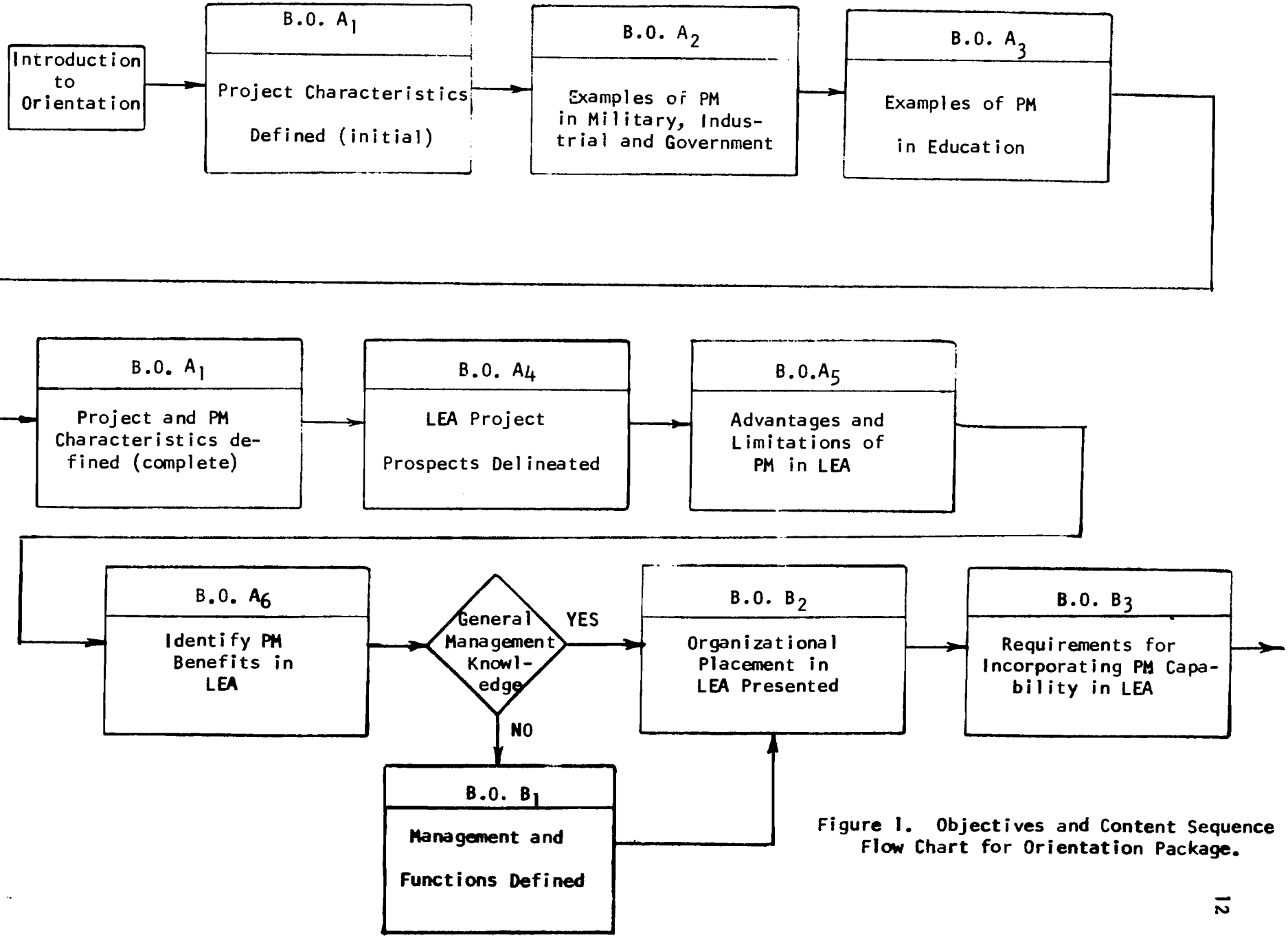

Figure 1. Objectives and Content Sequence Flow Chart for Orientation Package.

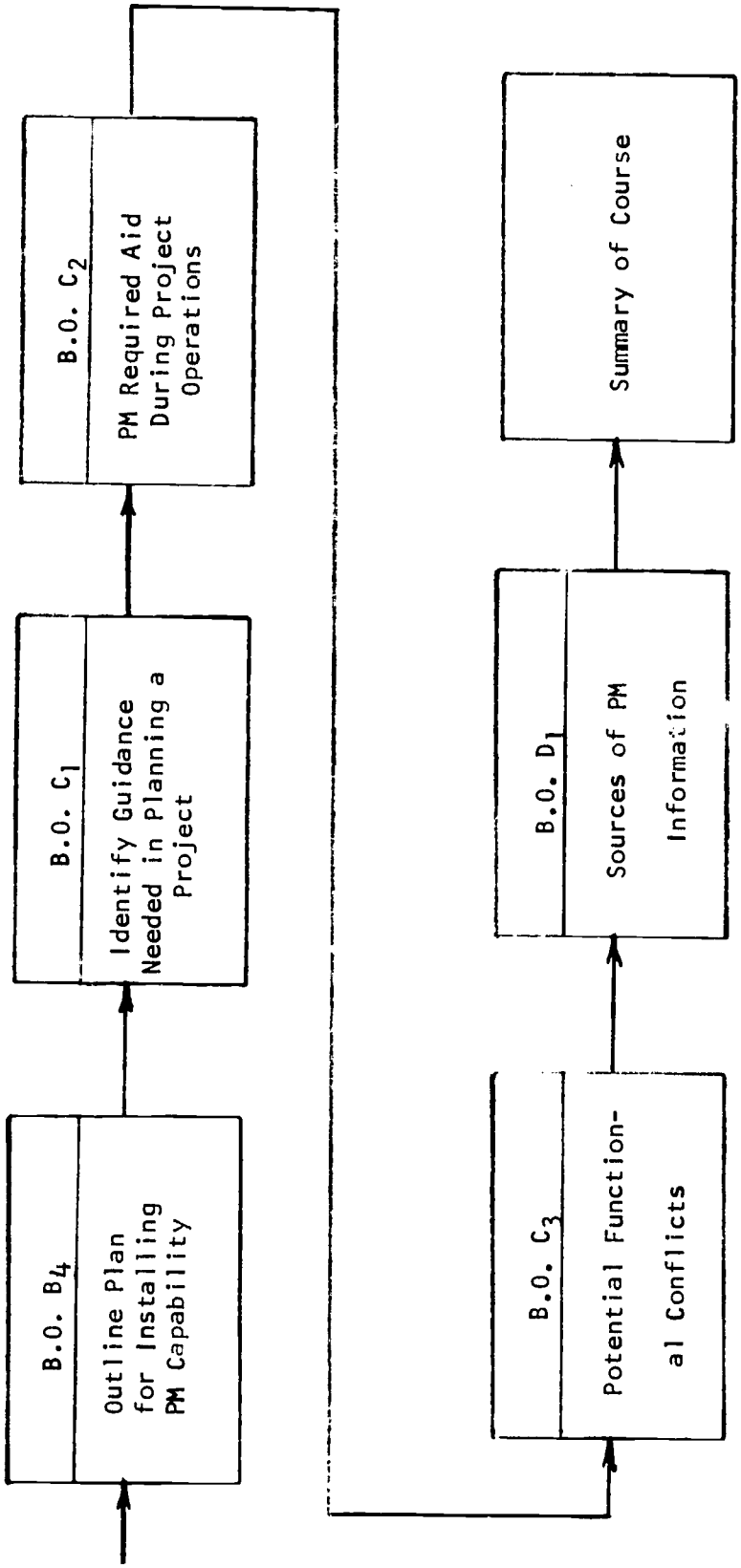

Figure 1 con't

will be developed so that the student can determine whether or not he should read the supplemental materials.

C. Presentation of Knowledge

Under Smith's structure, the presentation of knowledge deals primarily with the techniques and procedures to be used in presenting information to the student, including the various forms of media to be employed.

After examination of the objectives hierarchy and sequence, a decision was made to have a general structure for presentation of knowledge consisting of four lessons. The first lesson is devoted to building conviction, the second to organizational structuring, the third to organizational relationships, and the fourth to information sources as well as serving as a summary. The general structure for these lessons in presented in Figure 2. For each lesson, a lesson outline is developed which covers the principal considerations as outlined by Smith and presented earlier in this report.

In addition to the overall structure, tentative outlines with regard to each lesson have been developed. These are presented in Tables 2a through 2d. Each table shows a suggested sequence for the presentation of content and practice. In addition to the general content and practice opportunities, a discrimination is made as to assessment or reinforcement nature of the practice. The lesson outline provides suggestion with regard to utilization of instructional media in both the individual and group settings, objectives to be satisfied, and estimated time. It is anticipated that the actual lesson materials, exercises, graphic materials, and related items can be produced from these lesson outlines.

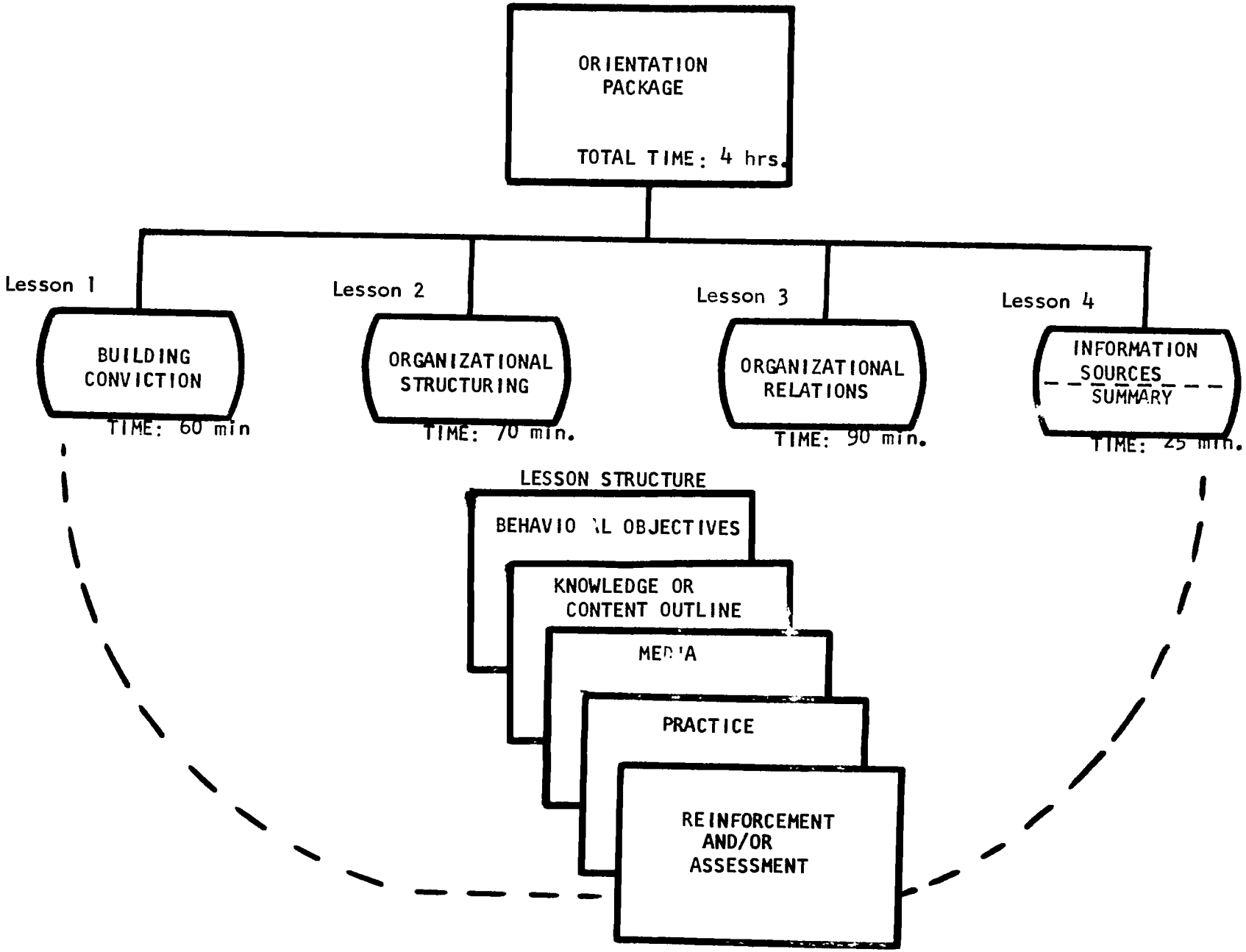

FIGURE 2. ORIENTATION PACKAGE - LESSON STRUCTURE

Table 2a. Orientation Package Outline

Lesson No. 1

Date Prepared 1/28/71

Lesson Title Building Conviction

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
1	Project Characteristics: 1. Goal orientation, toward end product. 2. There is uncertainty about path. 3. Accomplish goal within: a. time scheduled for start and completion. b. cost allocation. c. performance level established. 4. Contrasted with an established curriculum/program which continues in operation, and: a. doesn't have a completion time. b. costs are not examined except to operate the program. c. program evaluation with respect to a goal is not carefully regulated.			Tape booklet	A_1	3-5 min.
2	Good examples of project management in military, industry and government. 1. Polaris - Admiral Raburn in charge, select staff from any agency, set a goal, planned, developed management procedures, reviewed, evaluated (goal, met in 3 years instead of 6) 2. Apollo - S. Phillips in charge, staff selected from NASA and astronaut team, set a goal, planned various missions, developed time schedule, reviewed, evaluated modified to accomplish the goal (goal - man on the moon in 1969) 3. Construction of World Fair sites, World Trade Center or Disney's Disney World, scheduled for opening Oct. 1971. 4. Product Development (small car entry into market). Product manager, assigned staff from parent company, set plans, target data, reviewed and evaluated	Use the newspaper or a weekly news magazine and find a project described therein.		Tape booklet	A_2	3-5 min.

Lesson No. 1

Lesson Title Building Conviction

Date Prepared 1/28/71

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
3	Good examples of project management in Educational field. 1. ESEA efforts. 2. Katherine Ripley, JC Study ES 70 3. New building construction. (name one) 4. Toledo Teacher Educ. Proj.	Use an educational professional magazine, or a news magazine and find an educational project described therein.		Tape booklet	A_3	3-5 min.
4	Project and Project Management Characteristics: 1. Projects have project directors (also called managers) whose job begins in the project planning and ceases with project termination. 2. Programs (non-projects) have program coordinators, (also called supervisors, administrators, directors) whose job exists in spite of the status of particular programs. 3. Role of the Project Director - duties (actions) are: a. Integrator b. Decision maker c. Evaluator d. Implementor e. (Others from Tech. Memo #1) 4. Phases of Project Management (use Fig. 1 of TM #2) a. Planning (including project definition) b. Implementation c. Operational control d. Termination			Tape Booklet Visuals	A_1	8-10 min.

Lesson No. 1

Date Prepared 1/28/71

Lesson Title Building Conviction

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
	5. Project Management Techniques: a. time scheduling b. funds allocating c. resource allocating d. plans and actions e. responsibility delineations f. evaluation and reviewing g. directing h. controlling	1. Given a list of descriptive activities in a school setting, select those which are projects and those which are non-projects. 2. List those concepts (elements) of the activities selected as projects which were used in discriminating them as projects. 3. List the duties (actions) of the persons serving the role of project director of the activities selected as projects.				
5	Some LEA efforts which are not departmental efforts or are programs could be operated as projects.	Given a list of LEA activities check which ones could be restructured to be projects. For those not considered capable of becoming projects, what necessary elements are missing?		Booklet	A_4	5-8 min.
6	Important advantages and limitations for using project management in a given LEA activity: 1. Project Definition identifies what activity is a project. A project has a definite start and stop date, a specific goal or end product, and defined time, cost and performance requirements. 2. Thinking of an activity as a project forces the LEA to ask - What do I want to get? How do I want to get it? What are the possible methods of performance? What is not to be included? What are the milestones and what is to be delivered?			Tape Booklet Visuals	A_5	5-8 min.

Lesson No. 1

Lesson Title Building Conviction

Date Prepared 1/28/71

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
	3. The LEA activity effort is focused: a. on the goal. b. on plans for time, resource and performance. c. orderly timely control of the effort in comparison with plan. d. higher probability of accomplishment of the activity. e. knowledge of the cost/benefit of the activity thus capable of P.R. for whole school operation. 4. Project management can not be applied to all activities of the LEA as some activities are difficult to identify with goals, start/stop date and end products.					
7	Project Management used widely in the LEA could: 1. Direct activities toward goal orientation i.e. each segment of LEA specifies goal. 2. Spotlight resource needs for the support of each segment of LEA. 3. Tighten the evaluation of an LEA activity in terms of performance. 4. Spotlight the deviation of operation as compared to plan. 5. Pinpoint the problem areas of the LEA activity segment which contributes to reducing the achievement (of goal). 6. Gain in management summed across all the activities (projects) could be quite substantial in terms of clear goal statements, better resource allocations, significant evaluation, timely corrective action and achievement.	Select from a given list the LEA activities which could be applicable to project management and the possible LEA overall gain for these activities being treated as projects. Also, give reasons why each was selected.		Tape booklet	A_6	8-10 min.

Table 26. Orientation Package Outline

Lesson No. 2

Date Prepared 1-29-71

Lesson Title Organizational Structuring

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A)	Media	Objectives	Est. Time
1		Student self-determines knowledge of functions of management. Multiple choice list provided.	Compares test questions with those given and establishes score. If score too low, student proceeds to sequence #2 if students score is acceptable level student proceeds to Sequence #4. (A)	Booklet writes	B_1	5-8 min.
2	A definition of management and functions. Management: Functions of management defined: Planning Organizing Directing (Motivating) Controlling Reference provided for further study such as: D. L. Cook's, Educational Project Management, Chapter 2.			Tape & summary Printed visuals	B_1	3-5 min.
3		Student re-tested. True-false list provided to check knowledge of management functions.	Compares against correct list. (A)	Booklet writes	B_1	1-2 min.

Table 26. Orientation Package Outline

Lesson No. 2

Date Prepared 1-29-71

Lesson Title Organizational Structuring

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
4	Present organizational placement of projects in general LEA situation: a. Separate organization b. Vertical organization c. Matrix organization 1. Identify variations to above project arrangements such as executive staff and project staffs. 2. Present advantages and disadvantages of the organizational placements and staffing variations.	(Organizational Diagrams Showing relationships) (Listing advantages and disadvantages of each variation.)	→	Tape & summary printed Visuals	B_2	15-20 min
5		Test: Provide description of diagrams of three organizational placements of a project within the LEA organizational and have student identify.	Check against corrected placements. (A)	Booklet writes	B_2	5-8 min.
6		Student to identify which would be the most practical placement for the students' LEA and reasons why.	Discuss with individual who is knowledgeable in field of Project Management or instructor. (R)	Booklet writes	B_2	5-10 min.

Lesson No. 2

Date Prepared 1/29/71

Lesson Title Organizational Structuring

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
7	Present requirements for incorporating Project Management in LEAs. 1. Commitment 2. Staff Acceptance 3. Training 4. Policies and Procedures 5. Organizational Adaptation 6. Assessment 7. Purpose			Tape & printed summary	B_3	12-15 min.
8		From a list of elements, student picks the 7 elements considered necessary for project management capability.	Compares to those elements presented in previous sequence. (A)	Booklet writes	B_3	3-5 min.
9		From an outline of elements necessary for the installation of a typical project management capability, student is to identify those elements which were missing.	Checks with answers. (A)	Booklet	B_4	3-5 min.
10		Provide a list of questions such that the student makes a self-assessment of the need for a project management capability in his LEA.	Discusses with his colleagues. (R)	Questionnaire	B_4	10-15 min.
					EST. --- TOTAL TIME	62-93 min.

Table 2c. Orientation Package Outline

Lesson No. 3

Date Prepared 1/31/71

Lesson Title Organizational Relationships

Prepared by Peter Stoycheff

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
1	Examples to point up the problem that some projects have encountered because LEA executives do not aid the project properly.			Tape	C_1 C_2 C_3	7 min.
2	Briefly describe the four phases of a project again.			Booklet Tape	C_1 C_2	3 min.
3	In the planning phase of a project explain the purpose, give examples and point up the aid that an executive might furnish to each of the following sub-divisions of planning: a) Setting Goal and objectives. Creating a hierarchial breakdown of objectives. Specifying work activity to the lowest steps of the breakdown. b) Arranging the work activity into a sequence. c) Estimating time, personnel and other resources required for each work activity. d) Scheduling and combining resources into a commonality table. e) Estimating cost for the resources. f) Creating a budget and an expenditure rate table. g) Consolidating the planning activities into a proposal and processing of the proposal through to funding.			Booklet Tape	C_1	20 min.
						23

Lesson No. 3

Date Prepared 1/31/71

Lesson Title Organizational Relationships

Prepared by Peter Stoycheff

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
4		Recalls from the presentation situations where the trainee may aid in the planning and proposal writing of a project.	Checks his list of situations with a given list. (R)	List of situations	C_1	3 min.
5		Lists other situations where the trainee could give aid to a project that was not described in the presentation.	Checks with a colleague knowledgeable in project management if possible. (R)	List & conversation	C_1	3 min.
6	In the gear-up and implementation phase of a project; explain the purpose, give examples and point up the aid that an executive might furnish to each of the following areas: a) Creating and executing of a gear-up plan. Establishing the project into the LEA. b) Creating of a project information system. Delineating staff responsibilities. Organizing the staff. Establishing administration policy and procedures.			Tape & Booklet	C_1 C_2	12 min.
7		Short answer quiz on the definition and concepts presented in Steps 3 and 6.	Answer on a sheet. (A)	Paper Quiz	C_1 C_2	2 min.
8		Recalls from the presentation situation where the trainee may aid this phase of the project.	Checks situations with a given list. (R)	List of situations	C_1 C_2	3 min.

Lesson No. 3

Date Prepared 1/31/71

Lesson Title Organizational Relationships

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Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
9		Lists other situation where the trainee could give aid to a project that was not described in the presentation.	Checks with a colleague knowledgeable in project management if possible. (R)	List & conversation	C_1 C_2	3 min.
10	In the control phase of the project, explain the purpose, give examples and point up the aid that an executive might furnish to each of the following subdivisions of control: a) Operating of the information system b) Recognizing of deviations from plan and their significance. c) Developing of several alternative courses of action. d) Making of decisions. e) Creating a plan for implementing and executing the decision. f) Re-cycling process of control.			Tape & Booklet	C_2	12 min.
11		Recall from the presentation situations where the trainee may aid this phase of the project.	Check his list with a given list. (R)	List of situations	C_2	3 min.
12		Lists other situations where the trainee could give aid to a project that was not discribed in the presentation.	Checks with a colleague knowledgeable in project management if possible. (R)		C_2	3 min.

Lesson No. 3

Date Prepared 1/31/71

Lesson Title Organizational Relationships

Prepared by Peter Stoycheff

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
13	In the termination phase of a project, explain the purpose, give examples and point up the aid that an executive might furnish to each of the following areas of termination: a) Preparing final reports b) Re-assigning of personnel and facilities c) Storage of records and preparing of project history report for the LEA.			Tape & booklet	C_2	5 min.
14		Short answer quiz on the definitions and the concepts presented in 10 and 13 steps.	Answers on a sheet (A)	Paper Quiz	C_2	2 min.
15		Recalls from the presentation and situations where the trainee may aid this phase of the project.	Checks his list with a given list and for others not on the list. (R)	Booklet	C_2	2 min.
16		Lists other situations where the trainee could give aid to a project that was not described in the presentation.	Checks with a colleague knowledgeable in project management if possible. (R)	List & conversation	C_2	2 min.
17	Examples of projects having difficulties because LEA executive did not help in getting them accepted by line personnel in the LEA.			Tape Booklet	C_3	3 min.
18	General discussion of aid that the executive can give to make sure that project is accepted by principals, teachers and other personnel in the LEA emphasizing the importance of this activity.			Tape Booklet	C_3	4 min.

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19		Cites a project with which the trainee is familiar and lists all of the situations in which he gave aid. Lists the situations where he could have given aid to the project. In abreviated form and in order, list several situations where he can aid projects in the future.	Compares his two lists. Checks against the previous lists and then discusses his list with a colleague knowledgeable in project management if possible. (R)	Paper	C_1 C_2 C_3	6 min.

Table 2d. Orientation Package Outline

Lesson No. 4

Date Prepared 1/29/71

Lesson Title Summary and More Information

Prepared by Peter Stoycheff

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	Overview of locations for more information about project management.			Tape	D_1	10 min.
2		Quiz. Answer questions like where would you write or go to get information on state policy and procedures on Title III or more on networking, etc.	Give the trainee the answer to the questions. (A)	Tape Booklet	D_1	5 min.
3	Summary of the course. Hits the main points and concentrates on the executive's responsibilities toward project management.		Trainee hears the main points again that hopefully he has already considered. (R)	Tape & Booklet		15 min.

D. Practice of Performance and Knowledge

One of the generally recognized principles of learning is that the student be given an opportunity to practice these skills he is acquiring and utilize the knowledge that is being presented to him. In some instructional systems, it is fairly easy to create and install opportunities to practice skills and learned knowledges while in others it is more difficult to arrange. To some degree, whether or not practice is called for depends upon the nature of the behavioral objectives involved. The ingenuity of the instructional development team is called into play in either case to develop opportunities in situations to permit practice.

As contrasted to the Project Manager Training Package, the level of abstraction for skills and competencies is at a much higher level in the Orientation Package. Upon first inspection, the Orientation Package appears not to have any opportunities for the student to practice the skills and knowledges being acquired, since its basic function is that of providing an orientation to project management within the educational structure. There are however opportunities for individuals to practice and still remain within the general specifications for the total package.

An example or two might be helpful to illustrate the types of practice situations to be arranged within the orientation package. One objective deals with the student's ability to define and/or identify the project concept. Written materials would be developed to present the major basic characteristics of projects for the student to read and study. Upon completing the element of instruction, the student might be asked to identify those types of activties that might be classified as project

from a list of activities which involve both project and non-project type activities. Another way to develop practice might be to ask the student to identify an acceptable definition of the project from a list of alternative definitions some of which would not be acceptable by experts in the field. A second behavioral objective deals with his being able to identify situations which might cause conflict arising out of projects being within the organizational structure. An opportunity to practice might be developed here by asking the student to identify possible conflicts or conflict situations from a list of potential conflict and non-conflict situations in a project-type atmosphere.

The types of practices described in the above examples is rather limited and would largely have to be self-contained within the lesson element. Developing such arrangements for practice would make the orientation seminar a much more useful type of activity and would avoid the straight-forward lecture type presentation.

E. Reinforcement or Knowledge of Results

It is generally recognized today that a good instructional sequence will provide the student with knowledge of results or feedback regarding his performance and the sooner that feedback or knowledge is presented the more effective the learning on the part of the student. As was the case for practice, developing procedures for securing reinforcement or knowledge of results in the orientation seminar package is not as readily evident as would be the case of the project manager training package. The ultimate reinforcement or knowledge of results would be in the development of a project management capability within the LEA and having it successfully operate depends to a large extent upon the students

successfully being oriented to the concept of project management. Such delayed results are not considered to be a part of the package. The problem here is to develop some immediate feedback with regard to the concepts, skills, and principles being presented in the package.

Knowledge of results requires that the student have some basis for comparing his performance against a set or desirable standard. In the example previously cited with regard to acquiring the concept of a project, knowledge of results might be handled by having the student compare his elected list of potential project from a list provided by the instructional team as part of the written material. A similar procedure for reinforcement might be an integral part of the practice situation described for conflict potential in the organizational structure. The two practice situations however do contain some difficulty with regard to providing feedback. Experts would more likely be in agreement upon the nature of a project than they would upon potential sources of conflict involving projects and their organizational structures. The rightness or correctness of the answer and hence the meaningfulness of the reinforcement would be on different levels.

In view of the general nature of the orientation package and the types of situations which might be developed for practice as described above, it would appear that the methodology for providing feedback or knowledge of results would take the form largely of providing some form of "school" solution to problems contained within the written materials.

F. Quality Control

The initial and continuing development of instructional materials

requires that a form of quality control be exercised with regard to both student learning and the total instructional system. The purpose of this section is to set forth suggested procedures for maintenance of quality control in the orientation package.

1. Student Learning. The nature of the orientation package does not lend itself particularly well to the utilization of normal types of self-measurement (test questions). The employment of practice exercises with some type of immediate feedback can be used as a vehicle for maintaining some quality of student learning. Because of the rather unique nature of the orientation package, it is proposed that a checklist be developed which would reflect the student's opinion of how well he has achieved the objectives established for the training package. An illustrative form of such an instrument is presented in the following pages (Sample Checklist for Instructional Package Quality Control). In addition to rating his own achievement, the form would provide space for suggested improvements in the package.

2. Instructional Package. Ideally, quality control for the total package could best be achieved by noting the degree and efficiency with which project management is installed and operated within a local education agency. Perhaps failure to accomplish this goal would require that the material be revised. Such type of a procedure however is of a long range and distant nature. In order to provide more direct and immediate feedback for desirable package revision, it is proposed that each lesson contain a "participant reaction" sheet and that there be a total package reaction sheet. After completing each lesson as well as the total package, the student would be directed to return these sheets to the agency providing the instructional package. These comments could be collected over a period of time and

necessary revisions in the instructional package instituted. In terms of mechanics, the reaction sheets would be separate detachable items pre-addressed so that it would require a minimum of effort to return to the source providing the instruct onal materials.

I. SAMPLE CHECKLIST FOR INSTRUCTIONAL PACKAGE QUALITY CONTROL

Directions: It is planned that as a consequence of having completed the Orientation Package you should have developed the ability to perform a series of tasks associated with the use of project management in an LEA. Ideally, determining whether or not the package has been effective would consist of seeing how you would actually behave on your job. Lacking the ability to do that in almost all cases, the several objectives are listed on the next page so that you might indicate the degree to which you feel the <u>total package</u> aided you in achieving the desired behaviors.

Directions: For each of the objectives listed, circle the response position which best represents your accomplishment of the task as based upon the instructional materials. A response of 1 would indicate that the behavior had been achieved while a rating of 5 would indicate that the behavior was not achieved. Use the values in between to indicate your achievement of the tasks in other degrees.

NO.	OBJECTIVE	RESPONSE				
1	Define the concepts of project and project management.	1	2	3	4	5
2	State the relationship of general management principles to project management.	1	2	3	4	5
3	Cite examples of how the project management system can be and has been used successfully in industry and government.	1	2	3	4	5
4	Cite examples of how the project management system can be and has been used successfully in the field of education.	1	2	3	4	5
5	State important advantages and limitations of using a project management approach.	1	2	3	4	5
6	State where project management as a discipline can assist in the LEA operation.	1	2	3	4	5
7	Create a plan for implementing a project management system into at least one aspect of a given LEA situation.	1	2	3	4	5
8	Cite the specific information and guidance input needed to aid the project director in the planning and operation of a project.	1	2	3	4	5
9	Cite potential conflicts existing between the LEA structure and project activity which crosses function organizational lines.	1	2	3	4	5
10	State the support and assistance which could aid the project director in solving potential conflict.	1	2	3	4	5
11	State locations where information and help is available for assistance in project management.	1	2	3	4	5

For each of the items circled with a number other than 1 or 2 please indicate how the lesson or package might be improved to help other future students to achieve the behavior.

ITEM NO.	SUGGESTION FOR IMPROVEMENT

After completing both sides of the form return it to your instructor in a workshop or mail to the address below if you are completing the package on a self-instructional basis.

III. PROJECT MANAGER (DIRECTOR) TRAINING PACKAGE

A. Overview

The purpose of this section is to present a preliminary design concept with specifications for the instructional system created for the project manager (director) training package or component. Before presenting the design specifications, some comments with regard to purpose of the package, constraints involved in the design, and the general configuration are presented in this part of the section.

1. Purpose. As previously stated in Technical Memorandums 1 and 2, the overall function of the project manager training package is to provide actual and potential project managers with a set of skills and knowledge which would enable them to successfully create and execute a project-type activity in an LEA. Creation in this case focuses upon the first phase of the overall project management mission concerned with project planning. Execution is primarily concerned with the three phases of gear-up, operational control and termination as identified in the project management mission. It is not the prime intent of the project manager training package to provide the trainee with knowledge and skill to install a project management capability within an LEA but to provide him with the information necessary to fully comprehend the duties and responsibilities of a project manager or director.

2. Constraints. Besides the function constraint identified in the above paragraph, additional constraints operated to influence the presently conceived instructional system design. Foremost among these was the fact that the instructional package developed should be of a nature that

the individual trainee could work through it without the presence of a live instructor. This constraint was particularly important for the lesson component as noted below and was of necessity relaxed in the case of the second major component, the case-simulation. A second constraint was that the major overall time frame for actual operation of the total instructional package was considered to be a four to five day training session or approximately 40 hours of instructional time. Within this constraint, approximately half the time was to be given to some type of simulation or case problem. While no rigid specific constraint existed, there was a reasonable desire to have the instructional package make an effective use of a variety of media for presentation of knowledge and practice of performance and knowledge. The above represent major constraints operating above the instructional design. Additional constraints will be identified as needed in the succeeding sections.

3. General Configuration. An overall presentation of the instructional design for the project management component is presented in Figure 3. Two basic elements or sub-components or stand alone items are considered to make up the overall training package. One component consists of the self-instructional materials while the second component consists of a case-simulation of the materials. The self-instructional materials component is further sub-divided into a series of lesson packages and a supporting glossary of management terms and concepts. The presence of these two sub-elements does not mean that the management terms will not be included in the lesson material since they will be. As presently conceived, there will be a separate package produced which will contain the terms and serve as a handy dictionary both during the lessons and for use upon completion

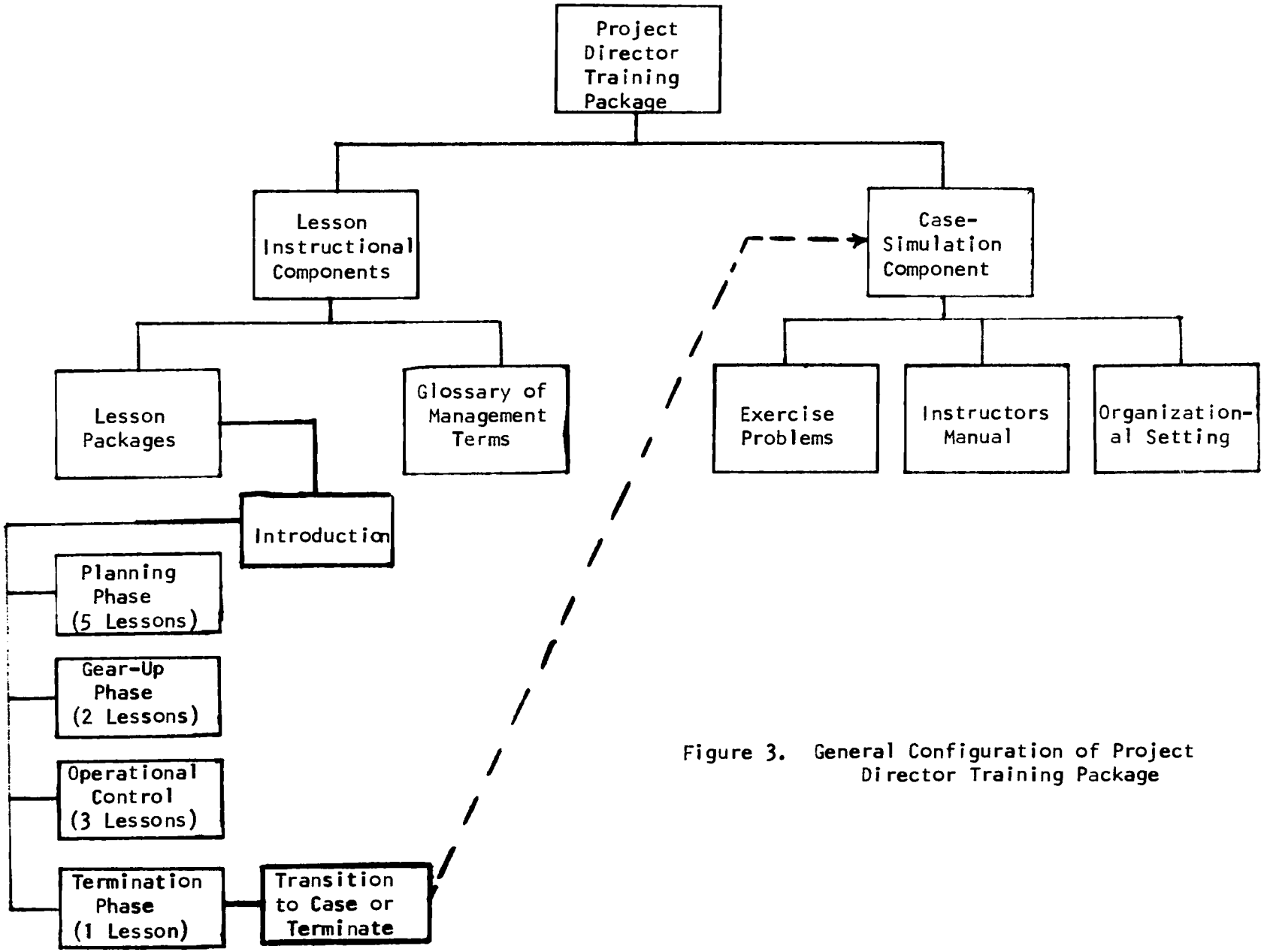


Figure 3. General Configuration of Project Director Training Package

of the package. The lesson packages will be further sub-divided into a total of eleven lessons. Five lessons will be devoted to the planning phase, two lessons to the implementation and gear-up phase, three lessons to the operational control phase, and one lesson to the termination phase. Preliminary outlines for each of these individual lessons are presented below in Tables 3a through 3l.

The case-simulation component will consist of three sub-products. One product will be the problem materials to be used by the student. Supplemental to the student materials will be materials which could be used by the instructor to guide or manage the operation of the case-simulation in a workshop setting. It will provide directions for administration, suggested solutions to the problems for discussion, hints for conducting activities, and related items. The third item will be a package setting forth a hypothetical LEA so that the student would have a setting in which to handle the problem.

To some degree, the self-instructional materials component will have a primary focus upon the development of individual skills while the case-simulation component will permit the trainee to synthesize the skills in an actual problem situation.

Presentation of the instructional design for the Project Manager Training Package will follow a sequence similar to that of the Orientation Package with one exception. The first section below presents a procedure for determining entry level for the total package and individual lessons. This item did not appear for the Orientation Package. Following the section on entry level determination, sections outlining the objectives sequence, presentation of knowledge, practice of perform-

ance and knowledge, reinforcement or knowledge of results, and quality control are presented.

B. Determination of Entry Level

The developer of self-instructional materials must recognize the problem of individual student differences in such learning variables as mental ability, experience, learning styles, motivation and interest in the topic of concern. This problem becomes very acute when there is a likelihood that the potential target audience will be rather heterogeneous in nature. The development of self-instructional materials for the project manager training package will not be an exception to this problem. The purpose of this paper is to propose a way of dealing with the entry level problem.

It is proposed that the methodology take two major dimensions. One dimension deals with eatablishing an entry point to the overall package while the other deals with individual lesson entry points. Each of these procedures is discussed below.

1. Total Package Entry. The procedure for determining an entry level or point for the package will be the establishment of an Individual learner profile. The profile will consist of the tasks identified in the task analysis. In order to eliminate some degree of item placement effect, the individual tasks will be randomly placed in list form. The student will check off, using some type of response those tasks he feels competent in doing and those he feels the need for more training. He will then "score" his responses and make a profile. The profile form will be set up to show the four major phases of the project management sequence. The

profile will be plotted using the scores. A preliminary edition of the project management task profile (Project Management Inventory*) is included in the following pages.

The profile analysis will be placed first in the overall instructional package. When completed the student will be directed to enter initially that phase in which he feels least competent or where he could move the fastest in terms of already being familiar with the concepts and principles in that phase.

2. Lesson Entry. In addition to the profile, each lesson will have established some type of "pre-test" which could serve as a check upon the student's entry level as established by the profile. This pre-test might take the form of a series of true-false items which if answered at a mastery level of 90 percent could suggest that the student not enter the lesson. It might instead consist of some type of exercise which the student could complete, check against a suggested solution, and if in reasonable agreement, could skip that lesson. For example, in the workflow phase, the student might be given a series of tasks and asked to place them in proper sequential order. If he could do this, he would then skip the lesson on flow-graphing. If his response was not at a suggested mastery level nor his completed exercise reasonably close to the suggested answer, he would then be directed to enter the lesson.

*From herein Project Management Inventory will also be designated by its acronym PMI.

2. PROJECT MANAGEMENT INVENTORY

In developing the lesson materials, recognition was given to the possibility that the student may have already acquired some of the skills needed for effective management of projects through reading, conferences, and/or direct management experience. The purpose of this inventory is to secure some measure of what you may already be able to do before starting the lessons. Should you already possess selected skills and concepts, it may be possible for you to skip some of the lessons.

Listed on the following pages are various skills and tasks that a project manager should possess. For each task, rate your own possession of the skills by using the scale provided. Be honest since your own training is involved. After you have completed all items, turn to page __ to determine how to score your paper and make a profile. If this exercise is completed in a workshop situation, the instructor will give you directions for scoring and constructing the profile.

Rate yourself on each item by circling the number which you feel best represents your competency at the task according to the following interpretation of the numbers.

1 - I can and/or have performed the task in the past at a high level of competency.

2 - I can and/or have performed the task at an above average level of competency.

3 - I can and/or have performed the task at an above average level that persons with my experience and training can do.

4 - I can and/or have performed the task but at a level that reflects only a minimal level of competency.

5 - I cannot and/or have not performed the task.

TASK	RATING
1. Recognize constraints on expenditure schedules and rates imposed by federal, state and local regulations.	5 4 3 2 1
2. Establish an expenditure plan (budget) which is a single document that lists all cost estimates.	5 4 3 2 1
3. Realize that it is necessary to have personnel and resources on start up date.	5 4 3 2 1
4. Create a plan for project "gear-up."	5 4 3 2 1
5. Assemble and store those project records which are required to be retained by contractor and parent organization.	5 4 3 2 1
6. Start work-action on plan.	5 4 3 2 1
7. Design, set up, and initiate a project information system for the project.	5 4 3 2 1
8. Determine cost for contracted services (computer, printing/reproduction, consultants).	5 4 3 2 1
9. Make use of reference materials or consultants to obtain information on manpower/skill work rates.	5 4 3 2 1
10. Create a plan for the implementation of a decision.	5 4 3 2 1
11. Break down the broad project goal into sub-goals (missions) and breakdown the missions into sub-missions (tasks).	5 4 3 2 1
12. Recognize significance of deviation from the plan.	5 4 3 2 1
13. Make a decision from alternatives and set criteria for decision.	5 4 3 2 1
14. Determine the full time, part time, or on consultant basis skill persons required.	5 4 3 2 1
15. Recognize deviation from the plan.	5 4 3 2 1
16. Establish the administrative routine, policies, and procedure statements or handbook.	5 4 3 2 1
17. Translate a work breakdown structure into a logic flow chart complete with milestones.	5 4 3 2 1

	TASK	RATING
18.	Use the project flow chart and the project task-event resource calendar to adjust those task-events which are time flexible so as to fully utilize the resources and to accomplish a somewhat uniform rate of resource utilization.	5 4 3 2 1
19.	Establish criteria for examining cost/benefits of rental or purchase of equipment.	5 4 3 2 1
20.	Determine cost of materials and supplies.	5 4 3 2 1
21.	Estimate the resources (facilities, skills, equipment, etc.) necessary for the accomplishment of each task.	5 4 3 2 1
22.	Investigate and determine costs associated with needed equipment.	5 4 3 2 1
23.	Specify for each project task the conditions under which the performance is measured and the acceptability standard for the performance.	5 4 3 2 1
24.	Establish a set of nominal codes for the resource items required for the project.	5 4 3 2 1
25.	Create a work breakdown structure document, including a chart, which contains the goal, missions, and tasks arranged in hierarchial order.	5 4 3 2 1
26.	Initiate and control data collection on work activity by reports, observations, discussion, staff meetings and literature.	5 4 3 2 1
27.	Release facilities and equipment to parent organization or to other projects as directed.	5 4 3 2 1
28.	Estimate the time required for task accomplishment.	5 4 3 2 1
29.	Check flow chart for complete and orderly logic by tracing an example sequence of activities through the flow chart.	5 4 3 2 1
30.	Determine the high and low counts (or requirements) for each resource item at various times across the calendar.	5 4 3 2 1
31.	Make up project task-event calendar using project start date, logic flow chart, task accomplishment times, and total project time.	5 4 3 2 1

	TASK	RATING				
32.	Obtain information on salary/wage/fee rates for the required skilled persons and costs of fringe benefits.	5	4	3	2	1
33.	Designate from the flow chart those events (start or completion of an activity) which are milestones.	5	4	3	2	1
34.	Develop several alternative courses of action for problem solution involving the trade off of performance, schedule and cost.	5	4	3	2	1
35.	Cost out fringe benefits, personnel travel expense, and other expenses.	5	4	3	2	1
36.	Create status and action reports listing the information, alternatives, and decision to distribute to the contracting body for information and possible approval and to the project personnel to inform them of the changes made to better achieve the overall goal.	5	4	3	2	1
37.	Determine costs associated with required facilities.	5	4	3	2	1
38.	Prepare necessary and required final reports for the project.	5	4	3	2	1
39.	Estimate a "best" time for task accomplishment for each task in a flow chart by applying an effective resource application rate to required times for these tasks.	5	4	3	2	1
40.	Execute the project gear-up plan.	5	4	3	2	1
41.	Delineate responsibility for personnel.	5	4	3	2	1
42.	Investigate and consider the local school system for availability of personnel skills required.	5	4	3	2	1
43.	Estimate total project (goal) time.	5	4	3	2	1
44.	Determine the lead time required for the acquisition of each type of resource or skill.	5	4	3	2	1
45.	Determine the extent to which several types of skills can be combined into a single skilled person.	5	4	3	2	1

TASK	RATING
46. Combine the task resource requirements with the project task-event calendar using the nominal codes.	5 4 3 2 1
47. Execute planned action of a decision or selected alternative.	5 4 3 2 1
48. Fit project organization into existing LEA structure.	5 4 3 2 1
49. Operate within various federal, state, and local guidelines concerning expenditures and budgets.	5 4 3 2 1
50. Re-arrange the sequence and flow logic of the tasks so that the work accomplishes the overall goal.	5 4 3 2 1
51. Create an expenditure schedule that plans for distribution of resources over the total project.	5 4 3 2 1
52. Work with functional organization units in arranging for disposition of project personnel by seeking other assignments within organization.	5 4 3 2 1
53. Identify and establish a broad project goal.	5 4 3 2 1
54. Purge project files of unnecessary materials and items.	5 4 3 2 1
55. Organize the staff into a control and communication hierarchy.	5 4 3 2 1
56. Cost out the salaries, wages, and fees for personnel resource requirements for the project.	5 4 3 2 1
57. Compare the actual performance, work schedule, and expenditure rate to project plan.	5 4 3 2 1
58. Determine indirect costs for the project (by either applying a percent to total personnel costs or by specifying an amount).	5 4 3 2 1
59. Draw a pictorial sequence (flow chart) which logically connects the tasks (activities) and events (identified as a point in time when something starts or is completed).	5 4 3 2 1

MY PROFILE FOR PROJECT MANAGEMENT

Directions: Prepare a profile of your present project management skills by adding up the numbers you circled for the items included under that phase as shown. Then divide by the number of items as shown. Plot your average score on the profile for each phase and connect the points. The dotted line across the profile indicates regions of strength and weakness and indicates where time might be spent in study and practice.

Planning

A. Objectives and Work Flow: (Items 11, 17, 23, 25, 29, 33, 50, 53, 59)

Sum: _____ divided by 9 = _____

B. Schedule and Budget: (Items 1, 2, 8, 9, 14, 18, 19, 20, 21, 22, 24, 28, 30, 31, 32, 35, 37, 39, 42, 43, 45, 46, 49, 51, 56, 58)

Sum: _____ divided by 26 = _____

Gear-up and Implementation: (Items 3, 4, 7, 16, 40, 41, 44, 48, 55)

Sum: _____ divided by 9 = _____

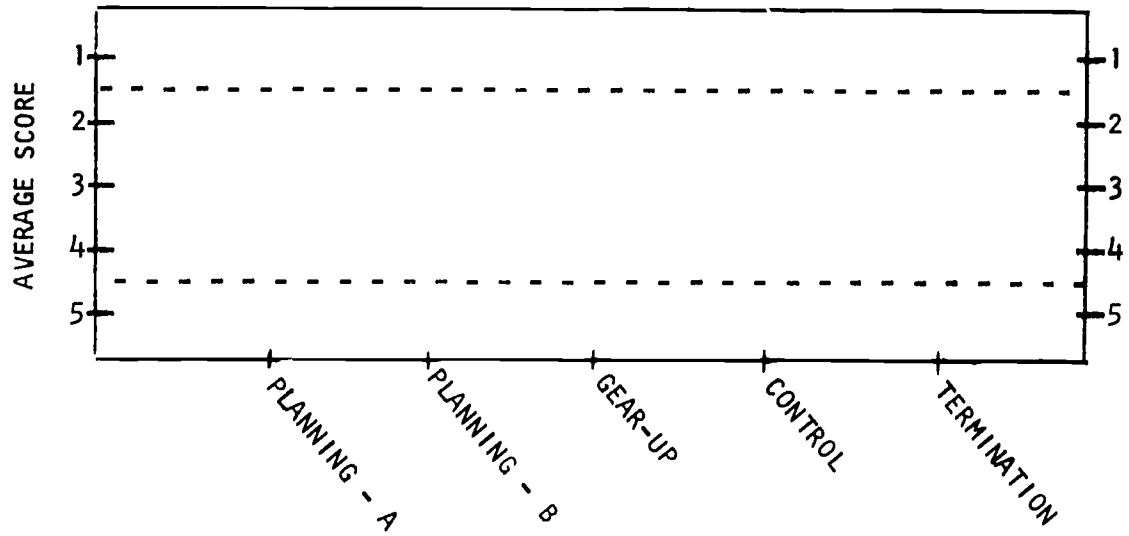
Operations and Control: (Items 6, 10, 12, 13, 15 26, 34, 36, 47, 57)

Sum: _____ divided by 10 = _____

Termination: (Items 5, 27, 38, 52, 54)

Sum: _____ divided by 5 = _____

Profile



C. Objective Sequence

In diagram form, Figure 3 - Overall Sequence Diagram - shows the layout and sequence of the Project Managers Training Package. First, the trainee completes a cognitive test for later use in quality control. He then proceeds to the first lesson identified as an introductory lesson which orients him to the general concepts of project management. After Lesson 0 is completed he then takes the Project Managers Inventory (PMI) which will indicate to the trainee his knowledge levels in the four phases of project management: 1) planning, 2) implementation, 3) control, and 4) termination. He then can skip any of the lessons related to the phases in which the PMI indicates he is competent. The trainee then proceeds to the appropriate lessons of the four phases. The sequencing of the behavioral objectives satisfying the phases of project management are presented in Figure 5. The sequencing indicates in what order the behavioral objectives will be satisfied in each of the four phases and is divided into twelve (12) lessons. The subject matter necessary to satisfy the behavioral objectives is located in Tables 3a through 3m.

The first phase is Planning and is presented in five (5) lessons which are titled: 1) Project Definition, 2) Work Flow, 3) Time Estimating, 4) Resource Estimation, and 5) Cost Estimates and Budget. The lesson outlines for this phase is located in Tables 3b through 3f.

The second phase is Implementation and consists of two lessons: 1) Gear-up, and 2) Initial Organization Activity. The lesson outlines for these lessons are located in Tables 3g and 3h.

The third phase is identified as the Operational Control Phase of the project and is divided into three lessons. The three lessons are:

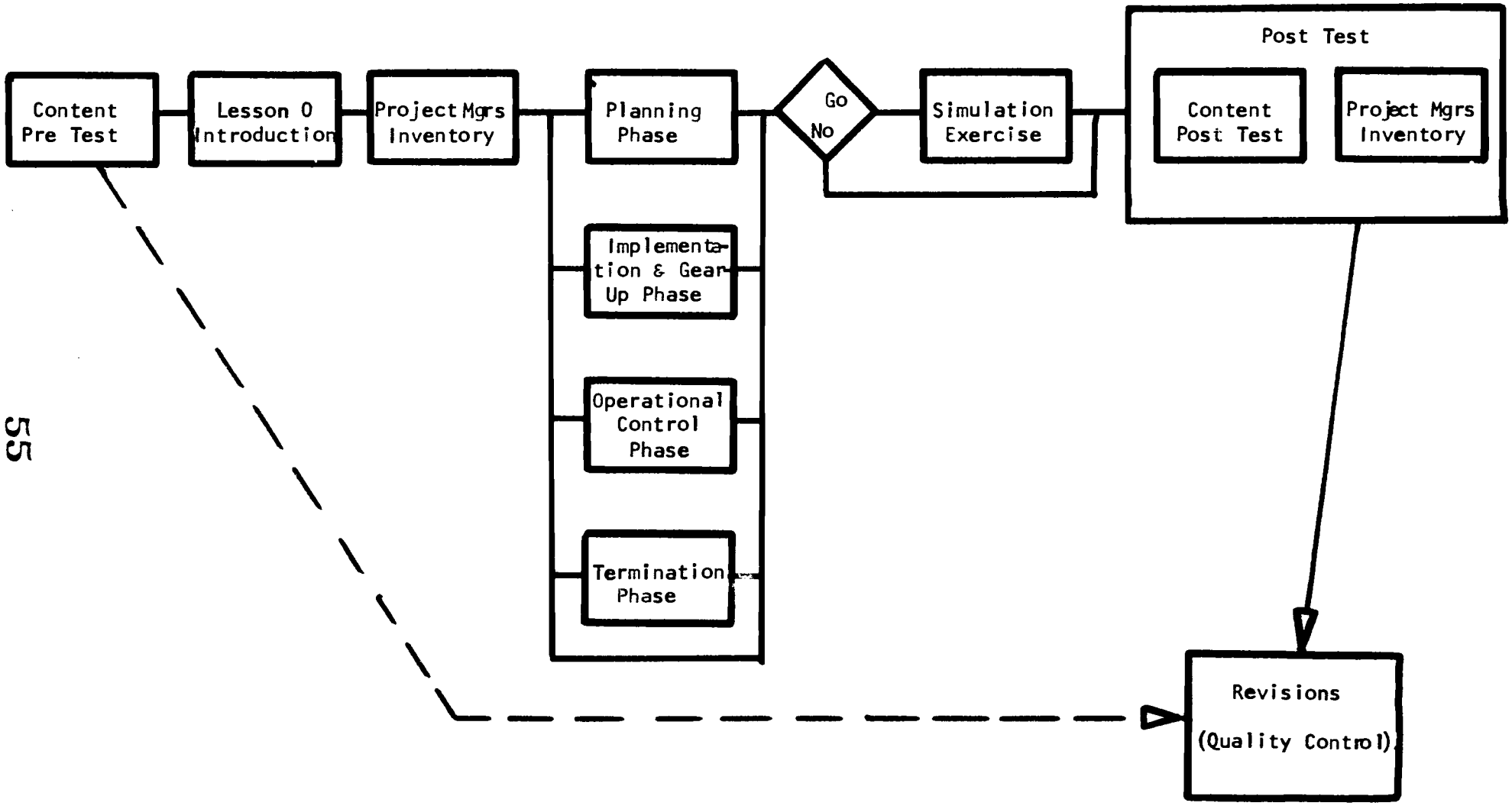
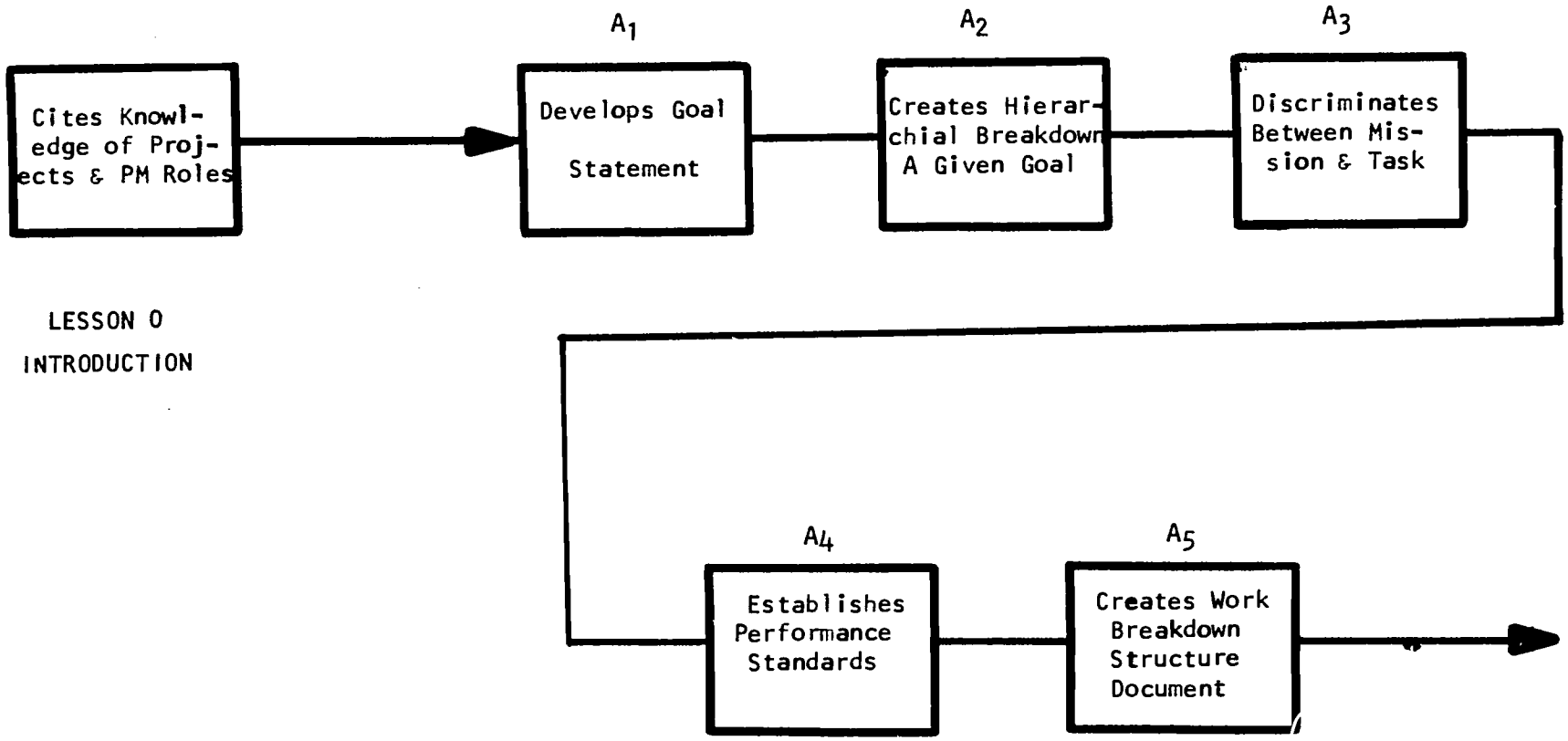
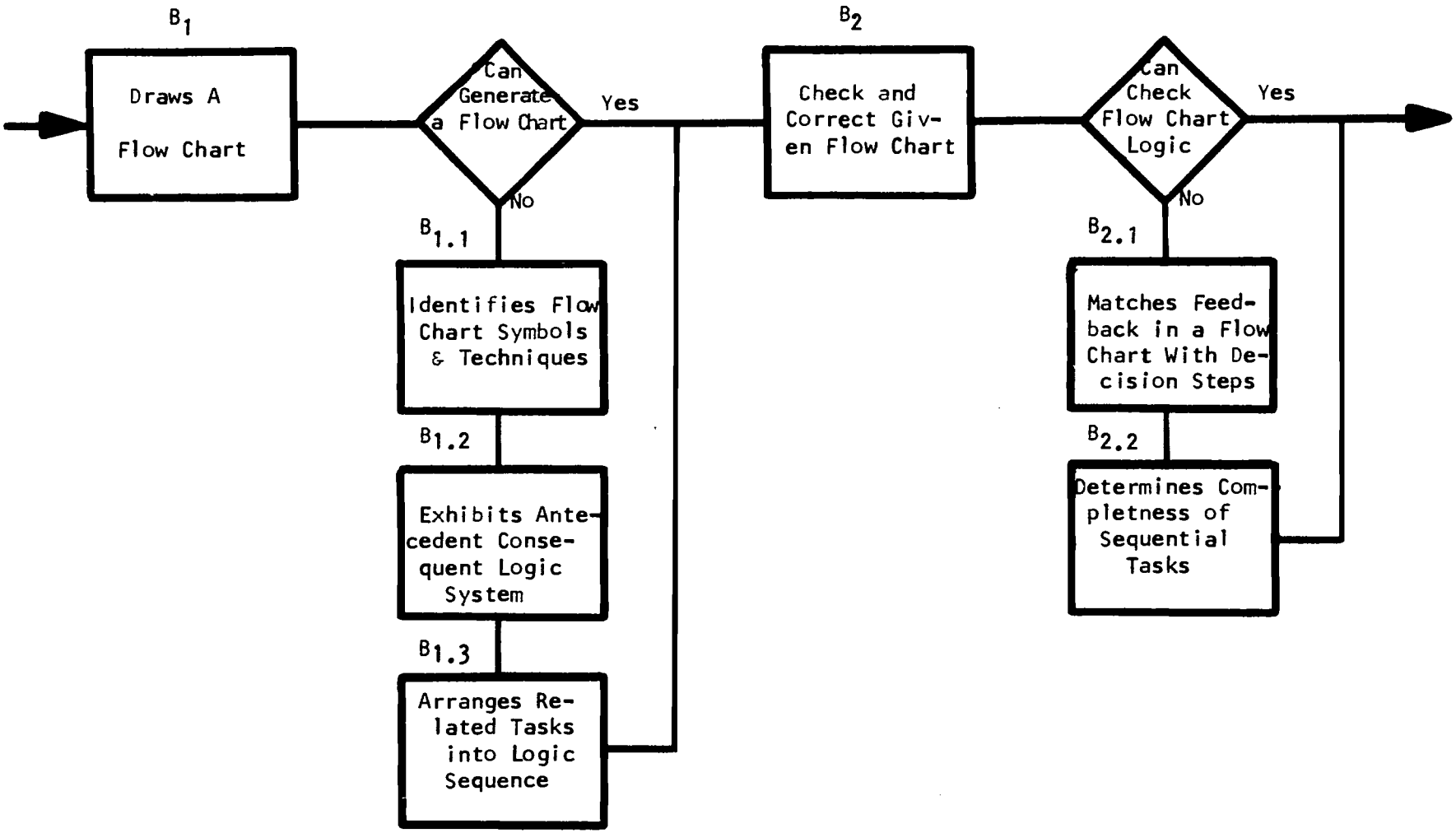


Figure 4. Overall Sequence Diagram. Project Managers Training Package.



Page 1 of Figure 5

Figure 5. Behavioral Objectives Sequence Flow Chart for Project Managers Training Package

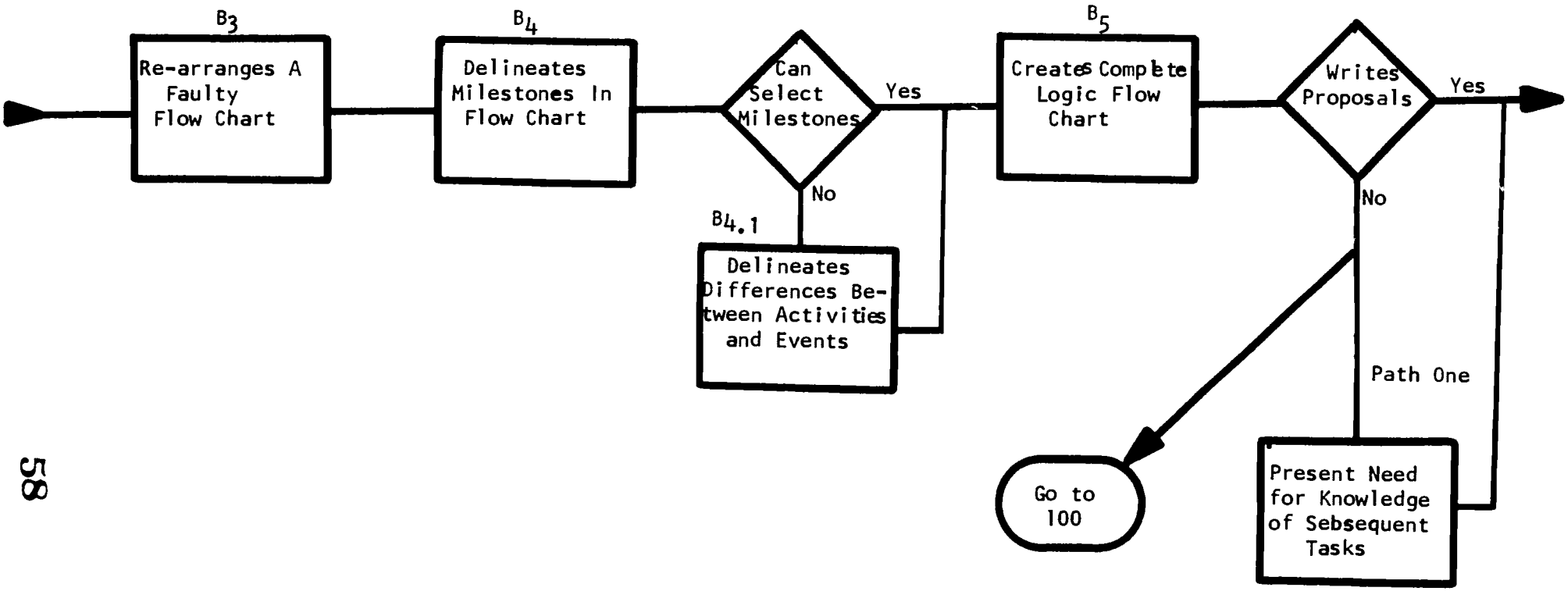


LESSON 2

$B_1 - B_5$

WORK FLOW

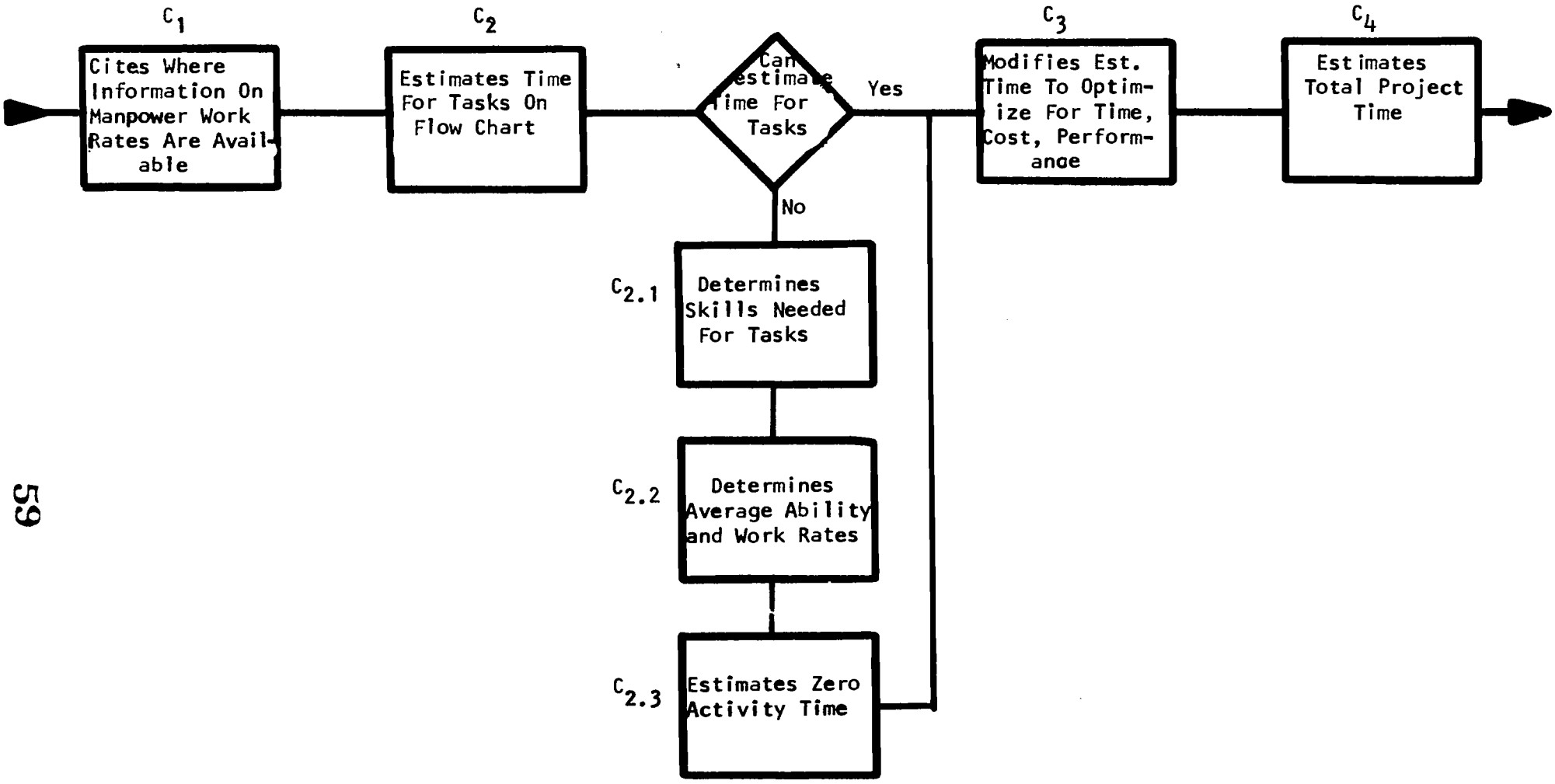
Page 2 of Figure 5



LESSON 2 (con't)

$B_1 - B_5$

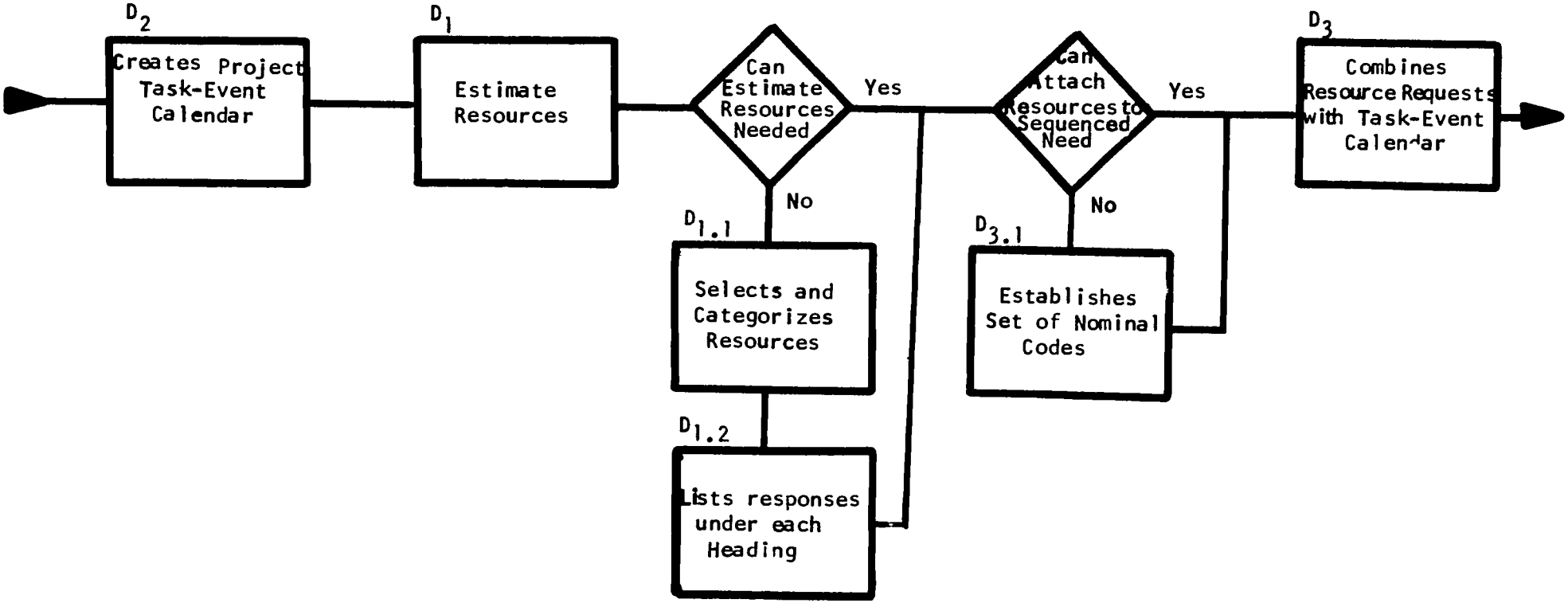
Page 3 of Figure 5



Page 4 of Figure 5

LESSON 3 TIME ESTIMATING

- C_4

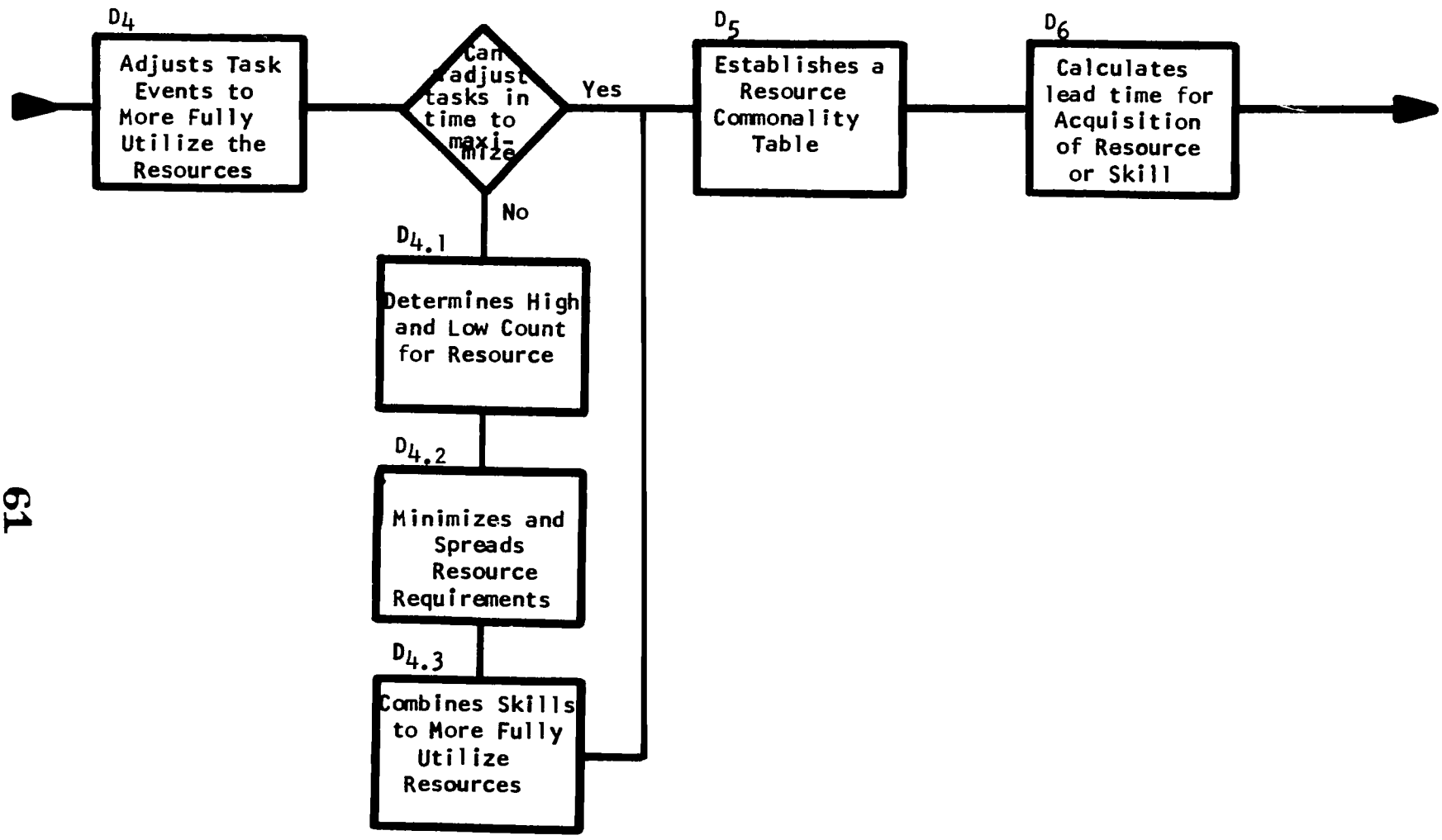


LESSON 4 (cont'd.)

D_1-D_6

RESOURCE ESTIMATION

Page 5 of Figure 5



LESSON 4

D_1-D_6

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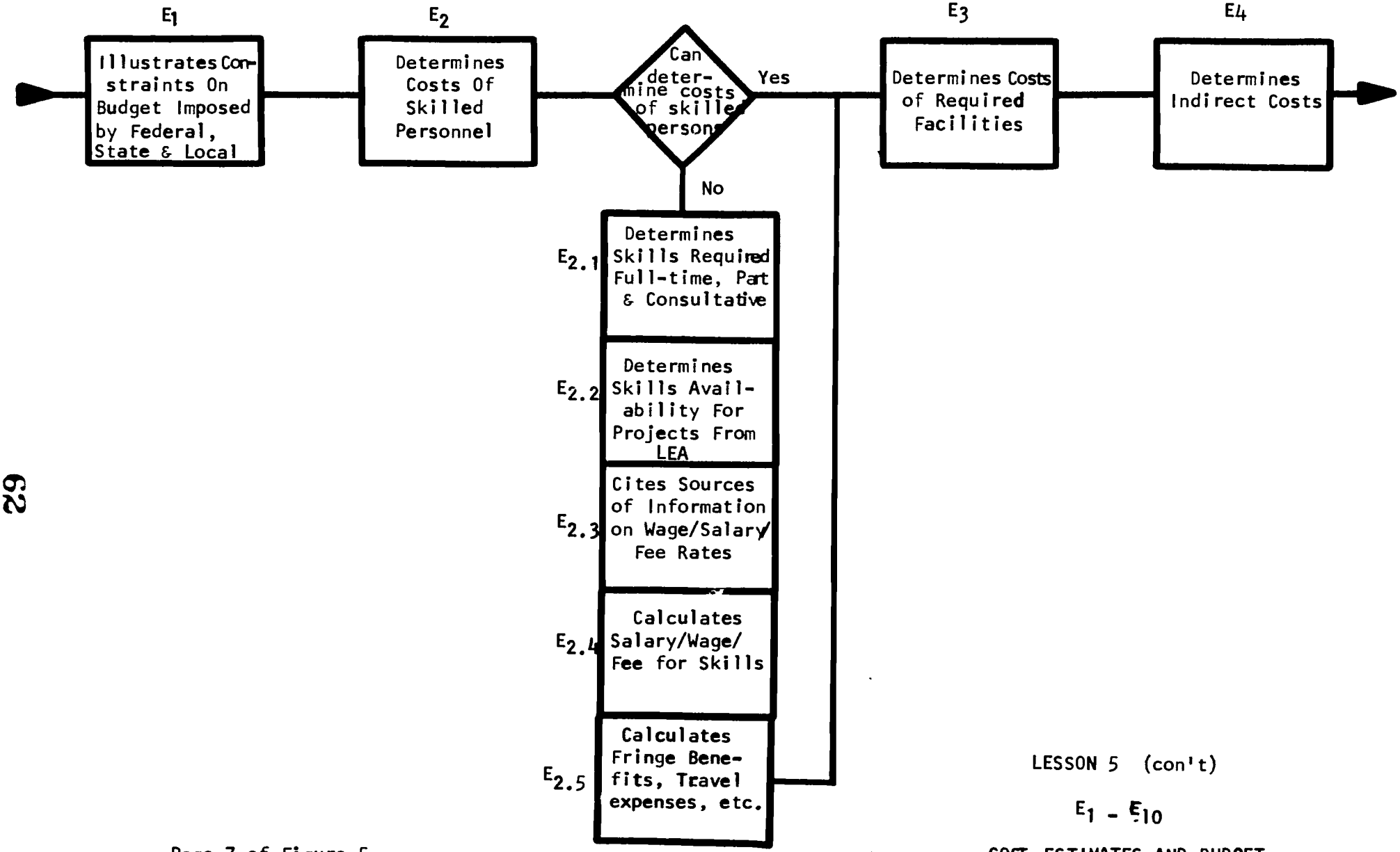
RESOURCE ESTIMATION



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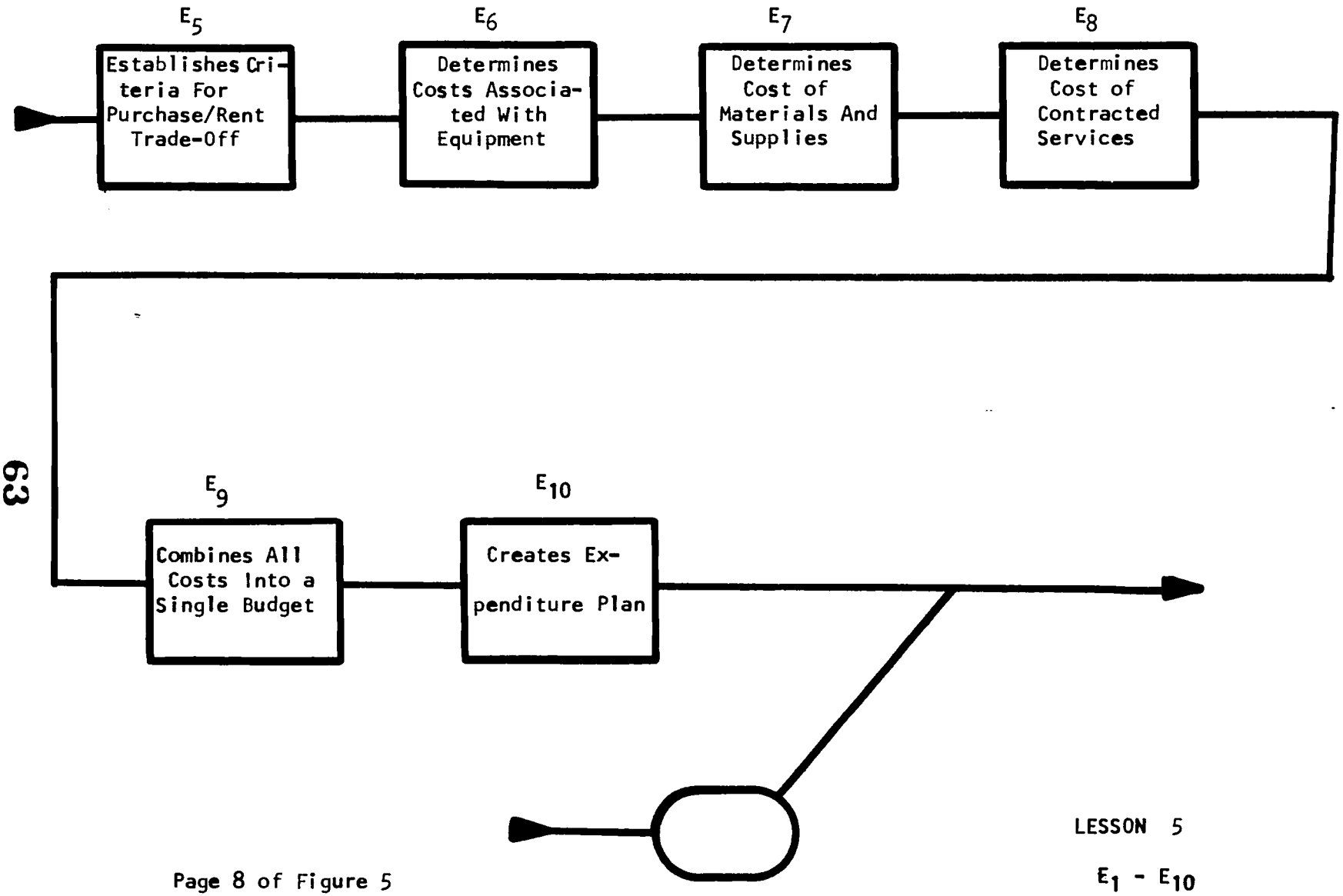

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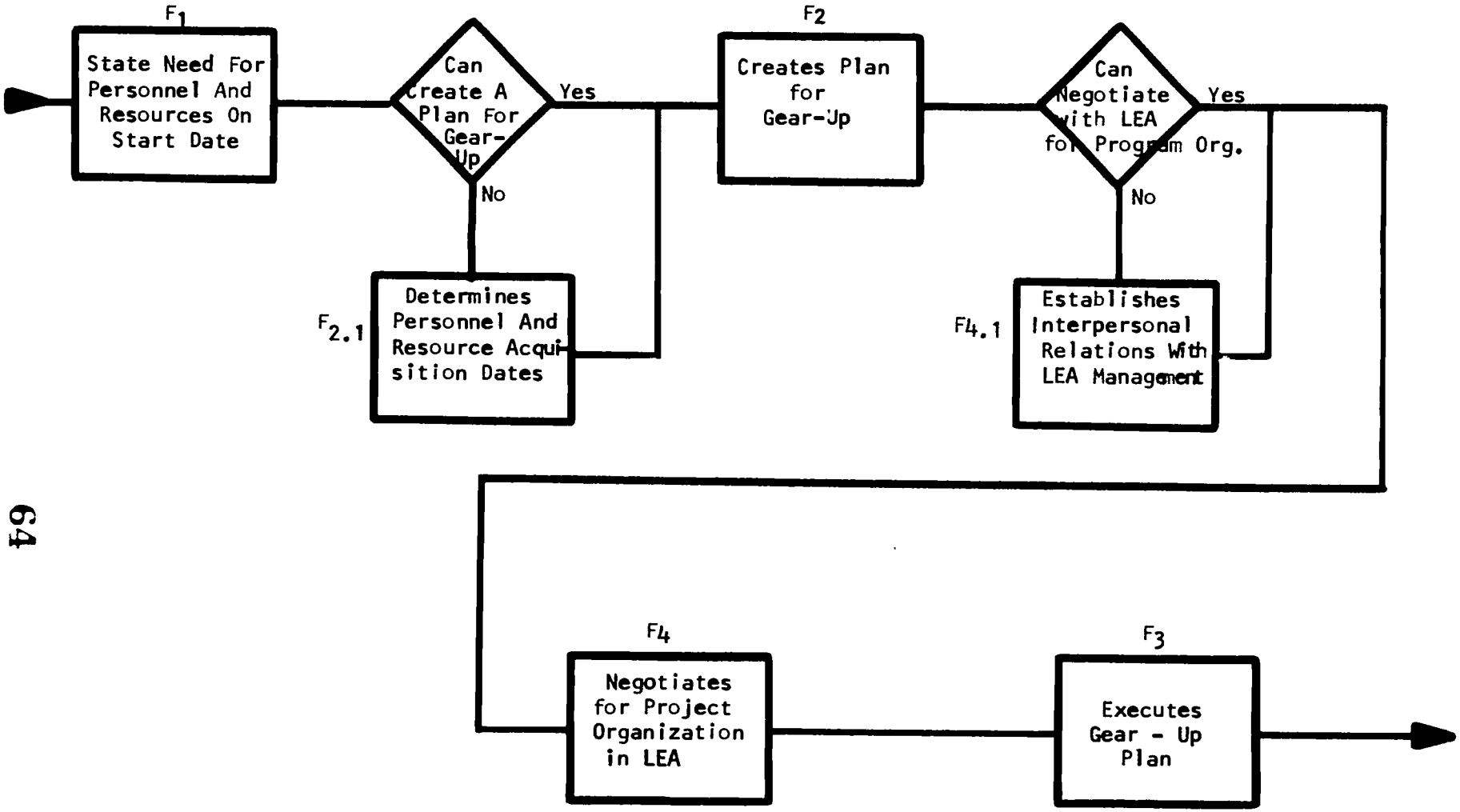
LESSON 5

$E_1 - E_{10}$



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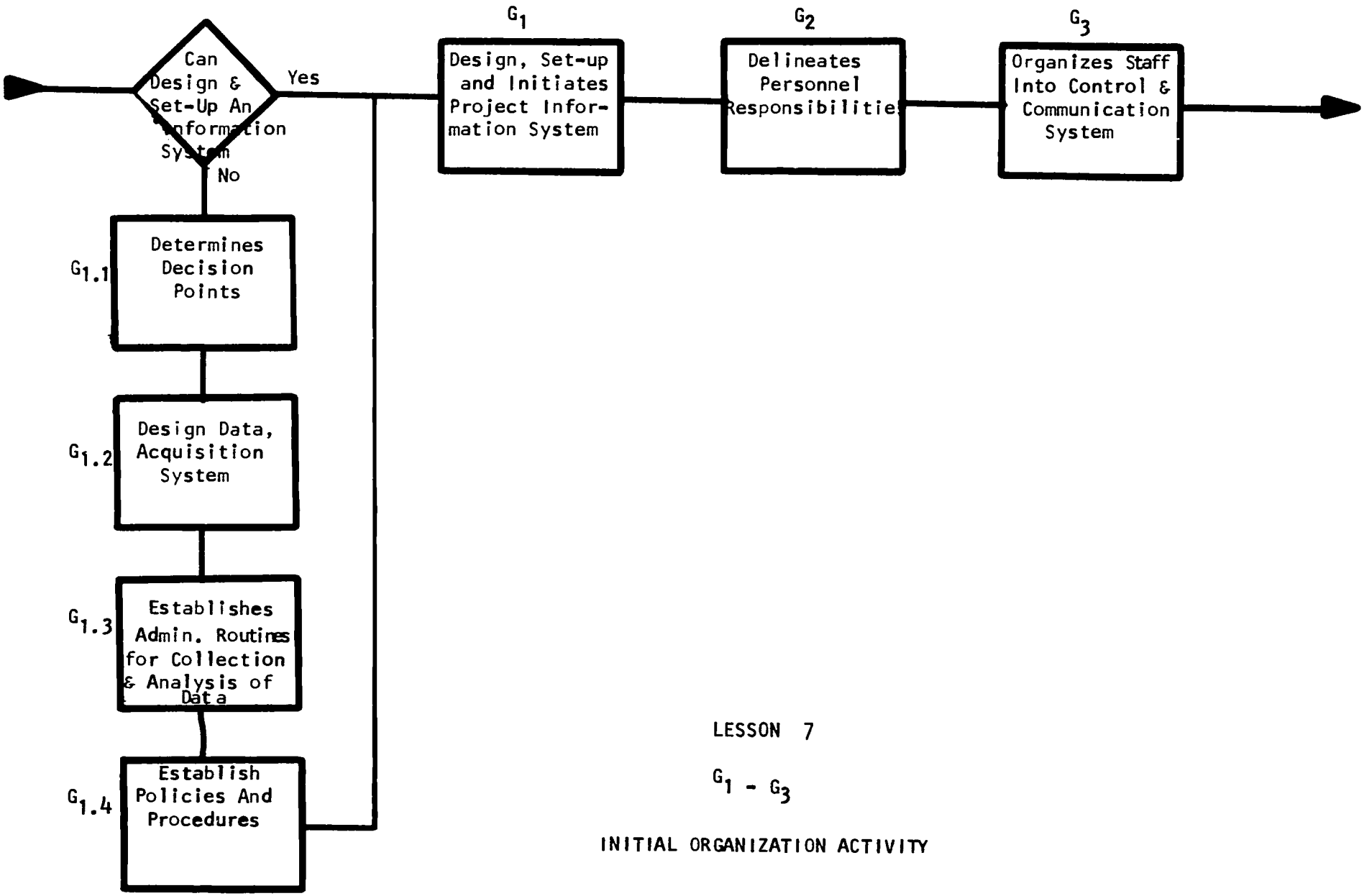
LESSON 6 IMPLEMENTATION AND GEAR-UP

$F_1 - F_4$



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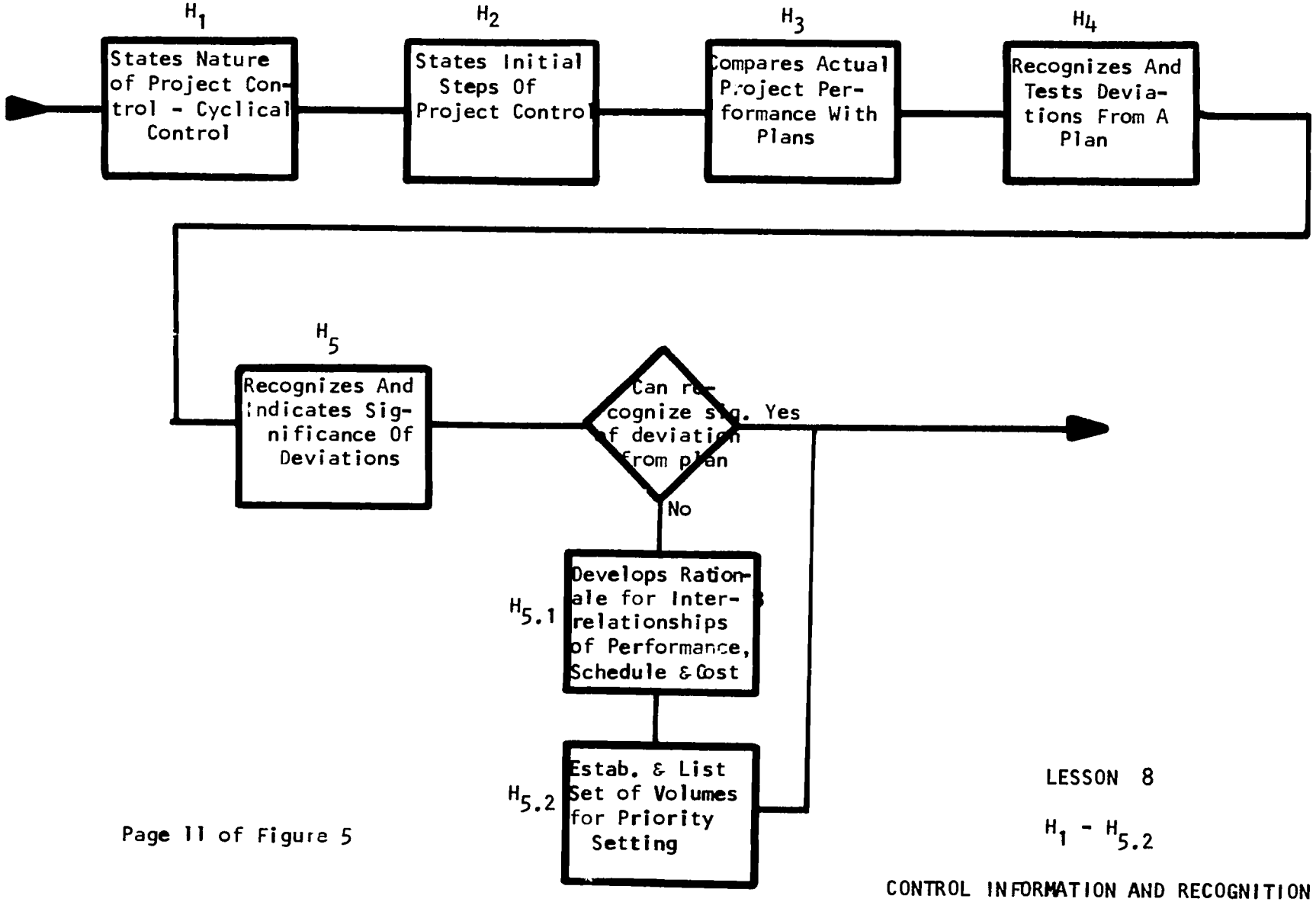
LESSON 7

$G_1 - G_3$

INITIAL ORGANIZATION ACTIVITY



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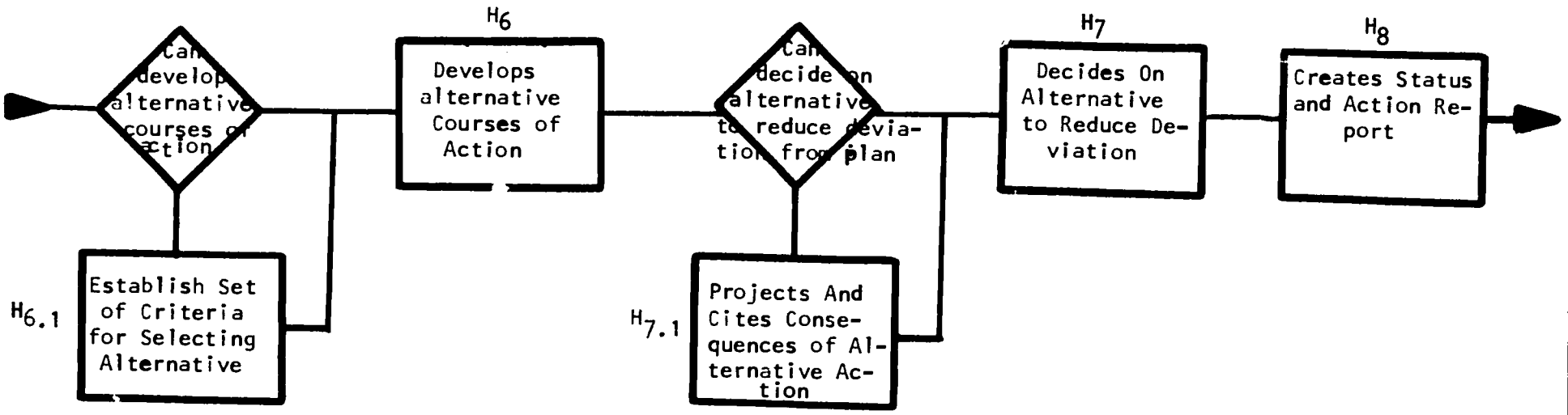
LESSON 8

$H_1 - H_{5.2}$

CONTROL INFORMATION AND RECOGNITION



LESSON 9

$H_6 - H_8$

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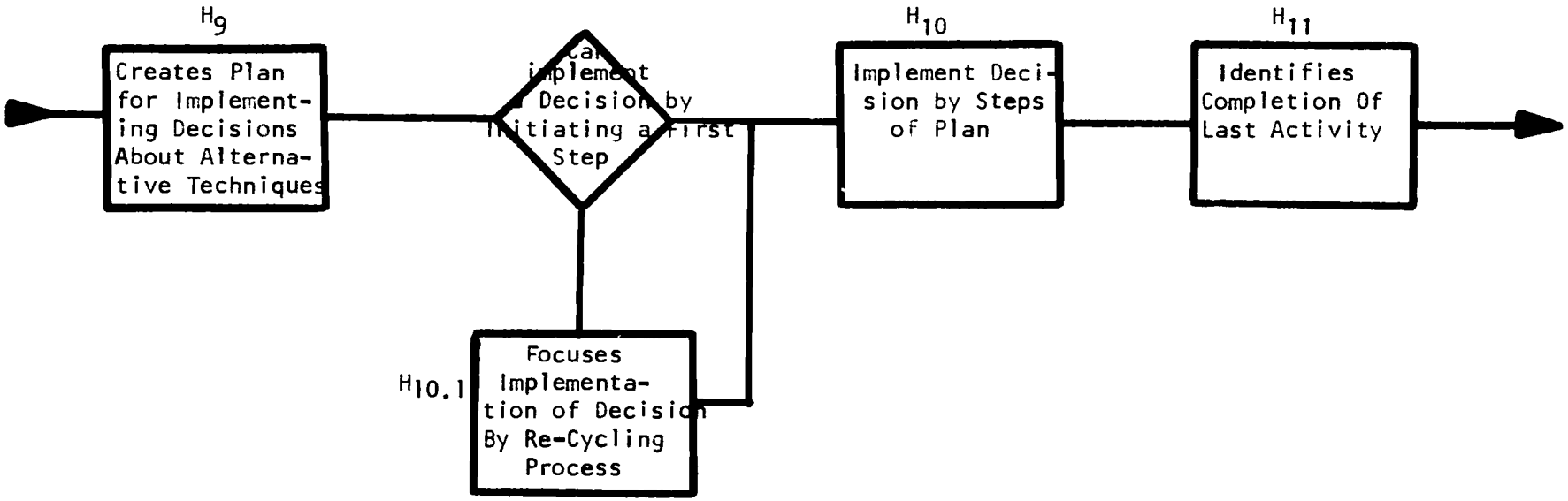
CONTROL ALTERNATIVES AND DECISIONS



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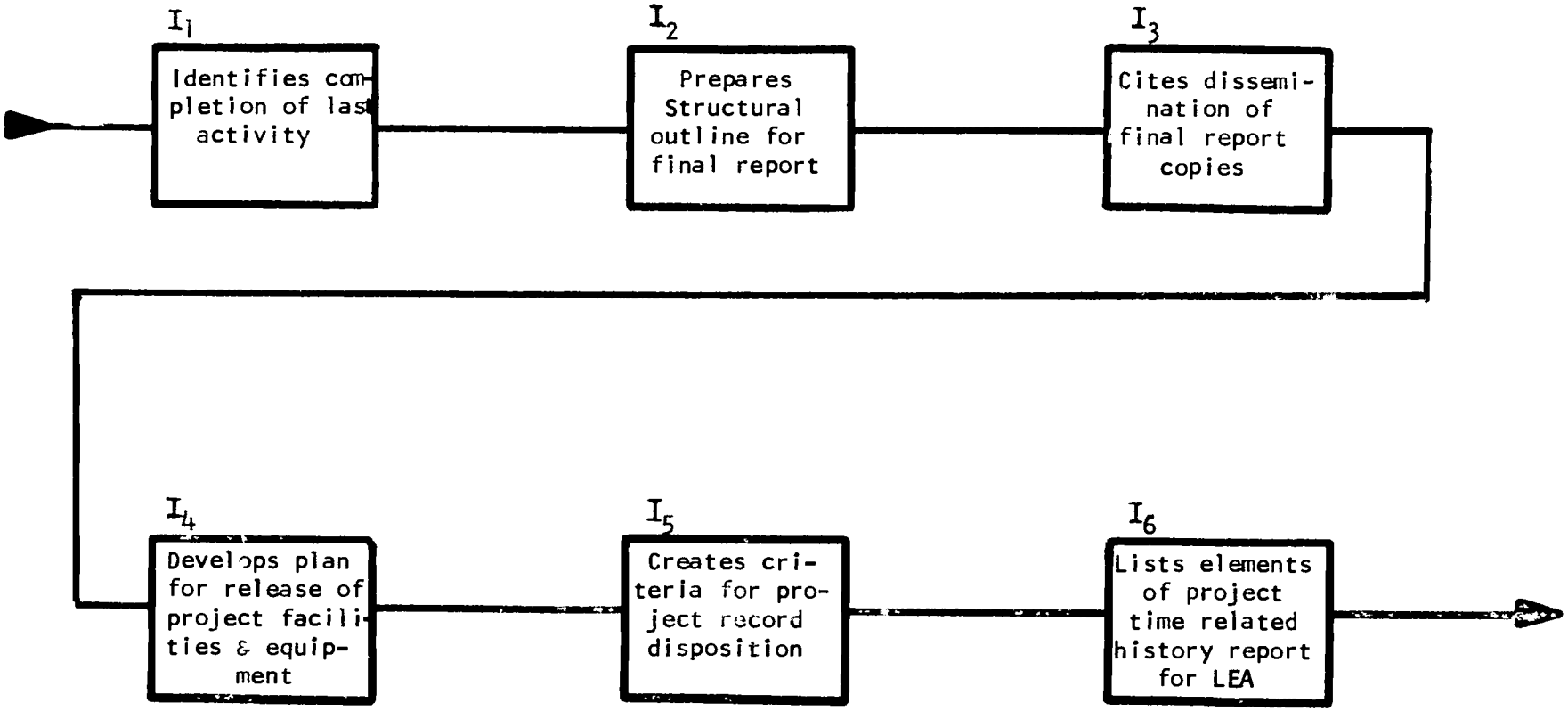
LESSON 10 DECISION IMPLEMENTATION

$H_9 - H_{11}$



LESSON 11 PROJECT TERMINATION

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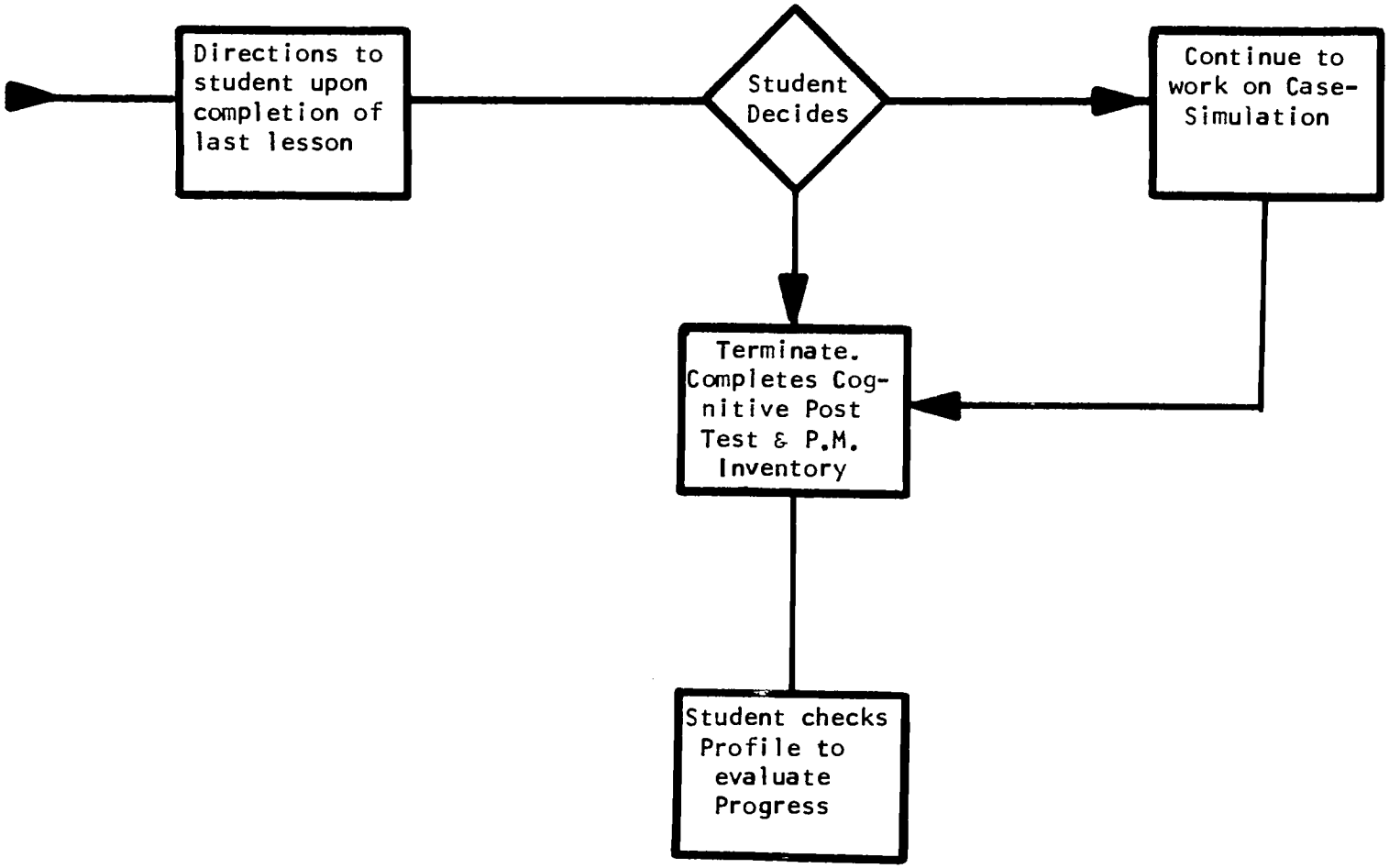
T_1-T_6



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LESSON 12

1) Control Information and Recognition, 2) Control Alternatives and Decisions, 3) Decision Implementation. The lesson outlines of this phase are located in Tables 3i through 3k.

The fourth and last phase is the Termination of the project and is outlined in Table 3b.

By inspecting the outlines one can readily see that there is a great deal of branching within each lesson. With the PMI and the branching within the lessons the package provides a great deal of individualization.

After the trainee completes his particular set of the lessons he is ready to proceed to the simulation-case studies. He may elect to skip this section if he wishes but he misses an opportunity to apply what he has learned. The simulation will be described in a later section of this Memorandum.

The trainee then takes the PMI again to provide him with feedback on his success. He also takes the cognitive posttest and this information will be used for quality control. He then fills out a quality control form to indicate the quality of the package and notes any improvements that may be needed. Quality control will be covered in a later section of this Memorandum.

D. Presentation of Knowledge

The principles of knowledge presentation and the lesson format to be utilized in the two packages being prepared as part of the current total effort were originally discussed in the section presenting the Executive Orientation Package. Those basic considerations will not be repeated here. In general, the same basic format for lessons developed

for the Orientation Package has been employed for the Project Managers Training Package.

The general structure for knowledge presentation takes the form or configuration outlined in Section C above. A total of 11 lessons have been developed following that structure. In addition, two other lessons have been created. One is focused upon introducing the learner to the concept of project management and precedes the first of the eleven lessons noted. A final lesson has been incorporated to direct the student upon termination of the last lesson. It indicates the options he has with regard to the case-simulation and posttesting activities. The lesson outlines showing presentation of knowledge are included in this report as Tables 3a through 3m.

The media employed is largely of the tape/slide mode for presentation coupled with appropriate exercises for practice and application of skills as required in the behavioral objectives. In several lessons, branching procedures have been incorporated as deemed desirable in order to permit a more flexible movement through the content.

The case-simulation described below should not be viewed basically as a vehicle for the presentation of knowledge as is true in the case of the lessons. Its prime function is to provide the student with an opportunity to integrate and synthesize the skills, ideas, and concepts learned from the lessons. It might better be considered as a form of practice and reinforcement but at a higher level than the mini-exercises contained in the individual lessons.

Table 3a.

Lesson No. 0

Date Prepared 2/17/71

Lesson Title Introduction/Project Definition

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
0	Introduction to Project Management A. Project is: goal directed, uncertain path time and resource allocation, produces end product, has performance level. B. Project Management 1. Organization structure which encourages and supports projects. 2. Uses project managers a. project manager is integrator, planner, evaluator, decision-maker, implementor. b. responsibility of project managers: to accomplish project goals within time, cost and performance plans. c. duties of: time scheduling funds allocating resource allocating plans and actions responsibility delineations evaluating and reviewing directing controlling 3. Example of Project Management Lockeed Aircraft "C54" project as quoted by Toffler, Future Shock. C. The Organization of Projects Missions involved in project management as grouped in four phases.	Attendees will be given a list of activities and will select those which meet the requirements of a project.	Slides 1-7 Slides 8-12 Slides 18-22 Slides 13-17	Booklet Slides Tape Presentation Slides Total		10 min 6 min 16 min

Table 3b. P.M. Package Outline

Lesson No. 1

Date Prepared 2/17/71

Lesson Title Project Definition

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
1	Project Definition A. Description of what the project is about, i.e. goal of the project. 1) goal determined by group effort of people at different levels in organization (this involvement enhances the likelihood of positive assistance during project operation). 2) Precision is important. - divides what is to be achieved from that which isn't. - is the foundation upon which all subsequent project work is built. - inadequate definition usually results in unnecessary problems. - helps develop consensus of thought on the subject. 3) Quote "about one half of planning time should be devoted to goal statement preparation." B. Example of project definition. Given the description of an activity a goal statement will be developed.			Booklet Tape	A_1	10 min.
2		The attendee will be given a description of an educationa activity that is to be treated as a project and will write an overall goal statement for the project.	The attendee will be given 3 overall goal statements which are all considered appropriate for the activity. (A)	Booklet	A_1	8 min.

Table 3b. con't — P.M. Package Outline — Page 2 of 3

Lesson No. 1

Lesson Title Project Definition

Date Prepared 2/17/71

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Objectives	Est. Time
3	A. Overall goal is broken down into sub-goals, called missions. Also missions are broken down into sub-missions called tasks. Where necessary tasks are broken down into sub-tasks. B. The goal breakdown is analogous to: 1) system analysis techniques Overall System Sub system A Sub system B Sub system B_1, B_2 --- B_n Sub system N 2) Functional Delineations where a system is described by its various functions. Project Function A Function B Function C 3. p. 60-78 Cook's book.	The attendee is given an overall goal statement and is to break the goal down into from 3 to 8 missions which are sub-goals.	The attendee will be given 3 goal breakdown solutions to the exercise. (A)	Booklet Slides Tape	A_2	20 min.
4.	A. The difference between mission and task is determined by an orientation for the person performing the activity. 1) A mission is group effort using a considerable amount of project resources. 2) A task is a small amount of effort and involves limited project resources.	The attendee is given a list of activities which includes an overall goal statement, a set of mission statements, and a set of task statements. The attendee is to discriminate the missions from the tasks.	The attendee will be given a suggested solution to the exercise. (A)	Booklet Slides	A_3	15 min.

Table 3b. con't

Lesson No. 1

Date Prepared 3/8/71

Lesson Title Project Definition

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
5	A. Performance is specified for each task listed in the work breakdown structure. One should: 1. focus on a product for each task 2. treat each task separate from others as much as possible. 3. prepare a work package. B. Conditions surrounding the accomplishment of the task are listed as: 1. time constraints 2. environmental factors			Booklet Tape	A_4	5 min
6	Requirement for a work breakdown structure document which has: 1. hierarchial goal to task chart. 2. work packages for each task detailing work, performance and conditions.	The attendee will be given a goal statement and situational description and is to create a work breakdown document.	The attendee will be given three suggested solutions to the exercise (A)	Booklet	A_5	20 min

Table 3c. P.M. Package Outline

Lesson No. 2

Date Prepared 2/18/71

Lesson Title Work Flow

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	Define Work Flow 1) Use a set of construction principles to draw. 2) Has functions: a) shows visually the logic of the planner. b) forces the formation of a plan. c) serves as communications between planners, between workers and planners, and among workers. d) serves as a device for marking project progress. (a control device)			Booklet	B_1	3 min
2		The attendee will be given a work breakdown structure of a specified activity and will draw a project flow chart which puts the tasks in logical work sequence.	The attendee will be given a suggested work flow solution to the exercise (A).	Booklet	B_1	8 min
3	Decision Point. Provided the attendee feels confident about his ability to draw work flow using a project definition and work breakdown he should branch to Sequence 7. Otherwise, he should continue with Sequence 4.					0
4	A. Work Flow Diagrams types and examples: 1) event oriented. 2) activity oriented 3) see attached description.			Booklet	$B_{1.1}$	30 min

Table 3c.

Lesson No. 2

Date Prepared 2/18/71

Lesson Title Work Flow

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
Con't 4	B. Activity Oriented Flow Chart Symbols: 1) activity or process box. 2) line arrow for input/output. 3) start and stop symbols 4) decision diamonds with two states. C. Flow Chart Techniques D. Event Oriented Network Symbols 1) line arrow for the activity 2) circle (nodes) for completion of events. 3) completion time along the activity lines. E. Network techniques. F. References (1) Cook, Educational Project Management, 1971, p. 81-104. (2) Cook & Trzebiatowski, Elementary Concepts, Principles and Procedures for Systems Flow Charting, 1970.	The attendee will be given a list of activities in order and will convert the activities into work flow diagrams, one a network diagram for events and the other an activity flow chart diagram.	The attendee will be given a suggested work flow and network diagram for the exercise (A).			
5	Antecedent-Consequent Logic A. Description of stimulus-response. B. Examples of: 1) chemical reaction 2) psycho-motor reflexes 3) assembly of a "parts provided" item.	The attendee will be givenaa mixed list of antecedents and consequences and will match corresponding pairs.	The attendee will be given a suggested set of matched items (A).	Bookle Tape	$B_{1.2}$	10 min
6	Logical Arrangement of Related Tasks A. Use antecedent-consequent logic B. Determine task to task order relationship. - The input of subsequent task is the output of a previous task.	The attendee will be given a unsequenced list of tasks all of which are related to a specified activity and will arrange the list into sequenced order using antecedent -consequent logic.	The attendee will be given a suggested sequence for the tasks of the exercise (A).	Booklet Tape	$B_{1.3}$	10 min

Table 3c. con't
Lesson No. 2

Date Prepared 2/19/71

Lesson Title Work Flow

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
7		The attendee will be given an incomplete flow chart of a specified moderately complex activity and he will trace an example of work effort through the flow chart so as to identify and add missing processes, input, output or feedback, or decision points (Face Validity Test).	The attendee will be given a flow chart which contains the suggested solution to the exercise (A).	Booklet	B_2	8 min
8	Decision Point. Provided the attendee feels confident about his ability to check the completeness of a work flow chart which has been previously prepared he should branch to segment 10. Otherwise, he should continue with sequence 9.			Booklet	B_2	0
9	A. Concept of Feedback 1) related to a decision 2) results in multiple inputs to a process box. B. Concept of output of one process becoming the input of the next sequence-process. C. References, (1) Miller, David W. & Starr, Martin, The Structure of Human Decisions, 1967, pp. 14-20.	The attendee is given a set of flow chart segments which have certain components such as decision points, feedback loops and process box, and he is to check F for those segments which have feedback and I for those which are sequenced with output/input as differentiated from those which have incorrect components.	The attendee will be given a suggested solution to the exercise (A).	Booklet	$B_{2.1}$ $B_{2.2}$	8 min
						74

Table 3c con't.
Lesson No. 2

Date Prepared 2/19/71

Lesson Title Work Flow

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
10	A. Upon encountering faulty flow charts that: 1) do not accomplish the stated end product. 2) have broken flow as evidenced by more than one stop point. 3) that lack decision points where the context implies branching. B. Then, one or more of the following are indicated: 1) add tasks (steps) to the flow 2) remove tasks (steps) to the flow 3) add decisions to the flow 4) remove decisions from the flow 5) connect process boxes with information or input/output lines.	The attendee is given a faulty flow chart of a specified complex activity and he is to correct the flow chart so that it directs work-task effort so as to produce an end product which fulfills the requirements of the project definition (goal).	The attendee is given a suggested solution to the exercise. (A) The attendee is presented with a tape discussion of the various considerations to be given to each of the identified faults in the exercise flow chart (R) (A).	Booklet Tape Total	B_3	20 min 15 min 35 min
11	A. Concept of Milestones 1) Major tasks of crucial importance to accomplishment of task. 2) Often gathering point of several task outputs or divergent point of outputs. 3) often identified as interim reports or project conferences, etc. B. Identify milestones - flag a process box that is to be a milestone when the task is completed. C. Event is the fact of completion of a task (or process). D. References, (1) Cook, Educational Project Management, 1971, p. 87.	The attendee is given a completed flow chart and he is to identify with a flag five process boxes as milestones events.	The attendee is given a suggested solution to the exercise.	Booklet Tape	B_4 $B_{4.1}$	10 min

Table 3c con't

P.M. Package Outline

Lesson No. 2

Date Prepared 2/19/71

Lesson Title Work Flow

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
12		The attendee is given a moderately simple project definition and he is to create (1) a work breakdown structure of at least three levels and 10 elements of lowest level; (2) a logical flow chart which has as last output the end product of the goal and has at least 12 symbols of process or decisions; (3) an identification of at least three milestone events.	The attendee will be given three suggested solutions to the exercise (A). The attendee will be presented with a tape discussion of the various considerations appropriate to the exercise effort in creating a work breakdown structure, a flow chart, and selection of milestones.	Booklet Tape Total	B_5	20 mi 15 mi 35 mi

Table 3d.

Lesson No. 3

Lesson Title Time Estimating

Date Prepared 2/18/71

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	A. Resource Materials on File. Project Manager needs manpower study manuals, work efficiency study reports, standard skilled task time manuals. B. Reference:			Booklet Tape	C_1	3 min
2	Project manager requires own or consultant's skill in estimating time for the accomplishment of tasks: 1. experienced based estimate 2. reference book calculation 3. intelligent guess But includes: 1. some degree of uncertainty. 2. two kinds of time estimating deterministic and probabilistic. 3. the time varies as a function of a particular task or activity.	The attendee will be given a list of tasks and will estimate the type skilled persons needed and the length of time required to perform the tasks.	The attendee will be given a suggested solution to the exercise. (A)	Booklet Tape	C_2	12 min
3	Decision Point. Provided the attendee feels confident about his ability to estimate type of skilled persons needed and the time required for various tasks he should branch to sequence 6. Otherwise, he should continue with sequence 4.					0

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Table 3d con't.
Lesson No. 3

Date Prepared 2/18/71

Lesson Title Time Estimating

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
4	Job roles normally encountered in educational projects and attending skills, work rates, etc. Secretary, typist/clerk statisticians researcher evaluators subject area instructor/specialists etc.	The attendee will be given a list of tasks and a list of job roles, he will designate the skilled persons needed for each task.	The attendee will be given a suggested solution to the exercise (A)	Booklet	$C_{2.1}$	10 min.
5	Skilled persons job performance measures. Average work ability by roles Average work rate by roles	Attendee will be given a set of tasks and is to list the skilled persons needed for the tasks and the length of time needed to accomplish each.	The attendee will be given a suggested solution to the exercise. (A)	Booklet	$C_{2.2}$	15 min
6	Tasks can be completed in a faster time frame with high utilization of skilled persons or slower time frame with low utilization. The time for task accomplishment is flexible with varying utilization of skilled persons and resources. A "best" task time is one which conserves resources input to the next related task.	Attendee will be given a set of related tasks and the work-flow diagram for the tasks. He will modify the estimated time for task accomplishment so that the interrelated tasks are treated to efficient use of skilled persons time.	The attendee will be given a suggested solution to the exercise. (A)	Booklet	C_3	15 min
7	A. Total project time is some combination of: 1. adding times for all tasks in the project given a maximum time. 2. adding times for those tasks which fall along the longest path in the work flow diagram. This determines the critical path.	Attendee will be given a work flow diagram with "best" task times given. He will determine the total project: 1. maximum possible time 2. critical path time, and 3. estimated time.	The attendee will be given a suggested solution to the exercise. (A)	Booklet	C_4	12 min

Lesson No. 3 Date Prepared 2/18/71

Lesson Title Time Estimating Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
7 continued	3. estimates total project time using own or a consultant's experience. B. PERT techniques for total project time, can be used for determining an optimistic, most likely, and pessimistic time. C. Reference: Cook, Educational Project Management, 1971, p. 107-110. PERT time techniques, p. 110-118 time adjustment, p. 118-121					

Table 3e.

Lesson No. 4

Date Prepared 2/18/71

Lesson Title Resource Estimation

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	A. Resource estimating is linked with scheduling, through process of assigning resources to tasks planned B. The schedule for task accomplishment is put in visual form using a GNATT type chart (task-event calendar). The ends of the task symbol stands for the start and complete events.	Attendee is given a goal statement, a set of tasks and a work flow sequence. He is to put the tasks on a calendar.	The attendee is given a suggested solution to the exercise (A).	Booklet Tape	D_2	5 min
2	A list is determined which for each task estimates; - skills needed and length of time - facilities needed - equipment needed - materials and supplies needed - specialized services (computer, printing, consultants) needed.	Attendee is given a set of tasks and he is to prepare a list of estimated resources needed for each task.	The attendee is given a suggested solution to the exercise. (A)	Booklet Tape	D_1	2 min
3	Decision Point. Provided the attendee feels confident about his ability to list the total estimated resources needed for given tasks he should branch to sequence 5. Otherwise, he should continue with sequence 4.					
4	A. Types of resources and examples of each: 1. Skilled persons salary, wages, etc. 2. Equipment 3. Facilities 4. Materials and supplies 5. Specialized services.	Attendee is given a list of specific resources and will put each under the given broad headings. He is also asked to identify a few additional specific resources under each heading.	Attendee is given a suggested solution to the exercise. (A)	Booklet	$D_{1.1}$ $D_{1.2}$	8 min

Table 3e. con't

Lesson No. 4

Date Prepared 2/18/71

Lesson Title Resource Estimation

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
5	Resources can be coded to allow for visual matching of the tasks and events with the needed resources. 1. color codes 2. number or letter codes When a calendar contains the tasks coded both for start and stop event times and resources it is known as a task-event-resource calendar.	Attendee is given a task-event calendar and a set of resources needed for each task. He is to devise a code for the resources and integrate the coded resources with the task-event-resource calendar.	Attendee is given a suggested solution to the exercise (A).	Booklet Tape Visuals	D_3 $D_{3.1}$	15 min
6	The task-event-resource calendar can be used to modify the start and stop times of certain time adjustible tasks so as to accomplish a uniform rate of resource use.	The attendee is given a task-event-resource calendar and a logic workflow diagram. He is to adjust some tasks to accomplish a somewhat uniform rate of resource use.	Attendee is given a suggested solution to the exercise (A).	Booklet Visuals	D_4	12 min.
7	Decision Point. Provided the attendee feels confident about his ability to adjust task events so as to obtain a somewhat uniform rate of resource utilization he is to branch to sequence . Otherwise, he should continue with sequence 8.			Booklet		0
8	Some skilled persons are capable of performing several job specifications. Where possible, these several job specifications can be combined to a single skilled person so as to utilize a single resource need. The task-event-calendar can be recoded to account for this flexibility.			Tape		8 min

Table 3e. con't
Lesson No. 4

Date Prepared 2/18/71

Lesson Title Resource Estimation

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
9	The high and low count of particular resource usage can be obtained by counting the resource vertically down the task-event-resource calendar and by strips across the calendar.			Booklet Tape	$D_{4.1}$	10 min
10	The high counts of resource items can be used to examine the related tasks to determine whether some tasks can be shifted in time to low counts of the same resource items. Adjustment of this type can reduce the total quantity of the particular resource needed.			Booklet Tape	$D_{4.2}$	12 min
11		The attendee is given a task-event-resource calendar and a logic work flow diagram. He is to adjust various skilled persons into one job and is to adjust some tasks to accomplish a somewhat uniform rate of resource use.	Attendee is given a suggested solution to the exercise (A)	Booklet Visuals	D_4	20 min
12	Resource Commonality table is a cummulative listing of the various types of resources needed and the frequency of need.	The attendee is given a task-event-resource calendar that is somewhat uniform in resource use. He is to determine the total needed resources by types and number.	Attendee is given a suggested solution to the exercise (A).	Booklet Visuals	D_5	20 min
13	Determine lead time for resource acquisition: 1. need shopping catalog for equipment materials. 2. personnel directors procedures 3. organizations 4. task-event-resource calendar	The attendee is given a task-event-resource calendar and commonality table and is to apply lead time to the earliest time for each specific resource. He should make the procurement chart to indicate the total plan for procurement.	Attendee is given a suggested solution to the exercise (A).	Booklet	D_6	15 min

Table 3f.

Lesson No. 5

Date Prepared 3/9/71

Lesson Title Cost Estimates and Budget

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	Project Financial constraints imposed by laws, guidelines, expenditure rates, etc. a. federal b. state c. local			Booklet Tape	E_1	5 min
2	Personnel costs Using the commonality table for resources and current wage/salary scales determine costs for total project personnel, travel and fringe benefits.	The attendee is given a project commonality table and a wage/salary scale and he is to cost out the project personnel costs, travel and fringe benefits.	The attendee is given a suggested solution to the exercise (A).	Booklet Tape	E_2	10 min
3	Decision Point Provided the attendee feels confident about his ability to determine project personnel costs he should branch to sequence number . Otherwise, he should continue with sequence number 4.			Booklet		0
4	Project personnel list The skilled persons indicated by the task-event-resource calendar can be placed on a list as: full time for a year, full time for part of a year, part time, and days of consultants.			Booklet Tape	$E_{2.1}$	3 min
5	Local Educational Agency personnel as skilled persons for project use. Using local personnel roster full time in the summer , and part time personnel for the project could be identified for employment.			Booklet Tape	$E_{2.2}$	3 min

Table 3f. con't
Lesson No. 5

Date Prepared 3/9/71

Lesson Title Cost Estimates and Budget

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
6	Reference manuals on consultant services available and current wage/salary rates and fringe benefits scales can be obtained from: 1. Government Printing Office 2. business libraries 3. State Unemployment Offices			Booklet Tape Visuals	$E_{2.2}$	3 min
7	Personnel Costs Using the commonality table, task-event-resource calendar, and the wage/salary rate schedule the personnel costs can be determined for the project effort. Also, the travel and fringe benefits are calculated to support the project personnel.	The attendee is given a commonality table, a task-event-resource calendar and wage/salary and benefit schedules. He is to determine project costs for personnel, travel and fringe benefits.	The attendee is given a suggested solution to the exercise (A).	Booklet Visuals	$E_{2.4}$ $E_{2.5}$	20 min
8	Project Facilities 1. Using the resource commonality table the required project facilities are determined. 2. The availability of local facilities are investigated and associated costs determined. 3. When necessary private facilities are identified and associated costs determined.			Booklet Tape Visuals	E_3	6 min
9	Indirect Costs Projects supported by a local agency occupy space and incure indirect expense. Payment to the supporting agency can be in the form of a specific amount or a percent of personnel costs.			Booklet Tape	E_4	4 min

Table 3f. con't

Lesson No. 5

Date Prepared 3/9/71

Lesson Title Cost Estimates and Budget

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
10	Equipment selection methods. The equipment required for a project can be rented or purchased depending on the nature of: 1. comparable costs 2. follow-on project possibilities 3. governmental and local regulations There is a requirement to establish criteria for the decision to buy or rent needed equipment using catalogs.	The attendee is given information on equipment and is to establish a set of criteria for a decision on buying or renting the needed equipment.	The attendee is given three suggested solutions to the exercise.	Booklet Tape Visuals	E_5	15 min
11	Equipment Costs The cost associated with equipment needed for the project can be determined using the equipment resource requirements, the selection criteria, and equipment catalogs.			Booklet Tape Visuals	E_6	4 min
12	Materials and supplies cost. The costs associated with the materials and supplies needed for the project can be determined using purchase catalogs and the resource commonality table.			Booklet Tape Visuals	E_7	4 min
13	Contracted services cost. The costs associated with computer services, printing, and consultants can be determined by using the resource commonality table, a statement of LEA availability, and reference catalogs.			Booklet Tape Visuals	E_8	4 min

Lesson Title Cost Estimates and Budget

Date Prepared 3/9/71

Prepared by Charles McLean

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
14	Budget Preparation. The total budget is prepared by combining the costs of the various categorical costs.	The attendee is given a resource commonality table, a personnel cost list, an equipment criteria statement, and price catalogs. He is to determine the project's indirect costs, equipment costs, materials/supplies costs and contracted services costs and is to prepare a total project budget.	The attendee is given a suggested solution to the exercise (A).	Booklet Visuals	E_9	30 min
15	Expenditure Plan A. The budget allocates expenditures by category. B. The expenditure plan allocates, expenditures over time utilizing some of the following: - along functional lines - by tasks or missions - by time periods (weeks, months, etc). - by time periods and within a task or mission. C. Regulations by government or local agency Constraint expenditure plan. - a top dollar limit on equipment purchase per month, or last month of a project. D. Savings of time and money with bulk purchases. E. Advantages to personnei or project for certain methods of pay expenditure.			Booklet Tape Visuals	E_{10}	15 min

Lesson No. 6 Date Prepared 2/17/71

Lesson Title Implementation and Gear-up Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1	Delineate things to consider for implementation or gear-up plan of a project in the LEA. 1) review proposal and contract. 2) identify differences between the proposal and funded Go ahead: a) objective change b) schedule change c) manpower requirements change d) funding change e) performance requirements change f) other changes 3) Resolve differences between proposal and contract, using available resources.			Tape Summary Visuals	F_1	10-15 min.
2		Given a project proposal and contract situation - create a gear-up plan. Identifying: 1) required manpower 2) source of manpower 3) when manpower is needed 4) establish resources requirements and lead time to first activity date. 5) establish method of procuring equipment (buy, rent, or lease).	Compare plan with one that is given - identifying some necessary elements of a gear-up plan (if score is low go to Sequence 3) (A)	Booklet Writes	F_2	20-30 min.
3	Summarize various elements requiring coordination for implementation and gear-up.			Tape Visuals	$F_{2.1}$	5 min.

Lesson No. 6

Date Prepared 2/17/71

Lesson Title Implementation and Gear-up

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
4		Re-test student armed with sequence 3 information. Create an implementation and gear-up plan using the same given situation as in Sequence 2.	Student to check his plan with one given (R)	Booklet	F_2	10 min.
5		Student identifies knowledge of LEA functional organization and problems faced in implementating a project. 1) resistence to change 2) integration of project with functional organization. 3) Lack of information about the benefits and need for the project. 4) lack of proper implementation plan 5) lack of knowledge to use of tools available. 6) lack of time to sell the project.	Student to identify at least half of the problems listed as a check against his list. If the student fails to display the required knowledge, he proceeds to seq. 6. If student does display sufficient knowledge he proceeds to seq. 7. (A)	Booklet Writes	$F_{4.1}$	10 min.
6	Knowledge presented of ways in which a project can be presented and some elements of project management necessary to be negotiated with the LEA functional structure. 1) Formal written presentation sent to all involved. 2) Give face-to-gace presentation to all involved individually. 3) Give face-to-face presentation to all involved in a group meeting.					88

Table 3g. con't
Lesson No. 6

Date Prepared 2/17/71

Lesson Title Implementation and Gear-up

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
Con't 6	Elements to be negotiated with functional organization: 1) personnel - special skills, etc. 2) facilities 3) equipment			Tape & Summary	F_4	10-15 min.
7	Re-cap the items which will help facilitate the implementation of a project into the LEA. 1) selling project need to all functional participants by 2) identifying detailed implementation plan. 3) communicating plans to all individuals involved. 4) delineating clearly objectives to be achieved. 5) identifying schedule and form of feedback required of all participants.			Tape & Summary	F_3	15 min.

Table 3h.

Lesson No. 7

Date Prepared 2/17/71

Lesson Title Initial Organization Activity

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
1		Student self-determines knowledge. Can identify elements or requirements of a management information system: 1) Form a given project setting identifies decision points necessary for an orderly flow of project effort. 2) Identifies necessary data to be included in data base. 3) Identifies procedures and criteria for administering information system.	Compares with answers, if inadequately responds, goes to Sequence 2. If completed satisfactorally, student proceeds to Sequence 5. (A)	Booklet Writes	$G_{1.1}$ $G_{1.2}$ $G_{1.3}$	15 min.
2	Project Information System A. Data Base 1) Need for information in decision making. 2) Information requirements to be considered when designing information system. 3) Data base concept. 4) Information flow control. 5) Fundamental information available. 6) Filtered information available. 7) Timeliness important. 8) Accuracy of data 9) Understandable data-analyzed. 10) Universal nature of system.			Tape & Summary Visuals	G_1 $G_{1.1}$	10-15 min.
3	B. Data Forms Design 1) Schedule - bar chart, Gantt chart, work flow, PERT/CPM. 2) Cost - budget allocation, accum. curve, bar chart. 3) Performance reports			Tape & Summary Visuals	$G_{1.2}$	10-15 min.

Table 3h. con't

Lesson No. 7

Lesson Title Initial Organization Activity

Date Prepared 2/17/71

Prepared by Paul August

Seq. No.	Subject Matter	Practice of Performance and Knowledge	Reinforcement (R) or Assessment (A) to be Provided	Media	Obj.	Est. Time
4	C. Policies and Procedures 1) Performance specification 2) Evaluation criteria 3) Organization/responsibility Guide 4) Procurement procedures 5) Report requirements 6) Administrative procedures 7) Organization chart			Tape & Summary Visuals	$G_{1.3}$ $G_{1.4}$	10-15 min.
5		Test student knowledge of Sequence 2, 3, and 4 - multiple choice questions.	Check against answers. If incorrect, review Sequences 2, 3, and 4 (A).	Booklet Written	G_1 $G_{1.1}$ $G_{1.2}$ $G_{1.3}$	10 min.
6	Present considerations necessary for delineating personnel responsibilities. 1) communications lines (reporting requirements). 2) responsibilities identified (management responsibility guide) 3) authority delineated 4) breakdown of effort 5) organizational chart development and need for.			Tape Visuals	G_2 G_3	
7		Given a project plan - specific work roles are identified by assigning responsibilities for specific tasks. An organization chart is developed showing reporting and working relationships.	Compare with example (A)	Booklet Written Visuals	G_2 G_3	15-20 min.