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TECHNICAL MEMORANDUM

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On-the-Job Training of
Library Personnel

By

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May 31, 1968

SYSTEM

DEVELOPMENT

CORPORATION

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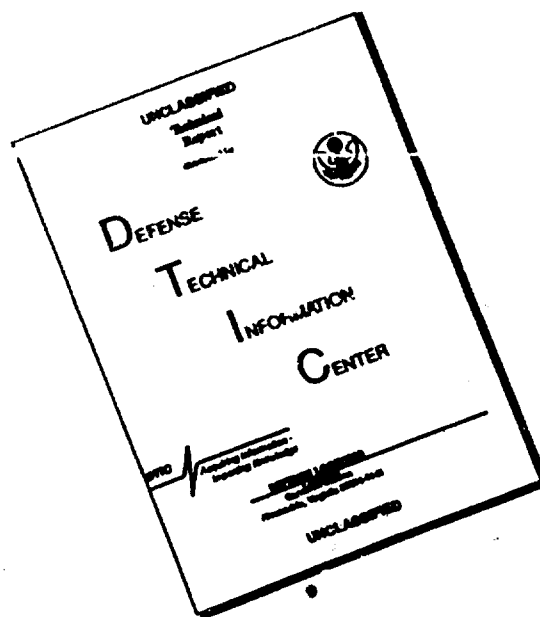
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SUMMARY

Under contract with the U.S. Office of Education and with the support of the U.S. Army, System Development Corporation is conducting research directed to the design, development, testing, and evaluation of instructional materials for on-the-job training of library personnel. The initial efforts are concentrated on the training requirements of scientific and technical libraries and involve development of three training course packages: technology in libraries, reference tools and services, and foreign and technical terminology. Work was begun on the project on June 28, 1967, and will end on March 31, 1969. This first of two interim reports describes progress through May 31, 1968.

The objectives of the instruction are to develop higher levels of task-oriented skills in professional and nonprofessional library personnel and will emphasize both the substance to be learned and the act of learning itself. The several course packages are being developed as modular units so that the instruction may be taken in sequences appropriate to the individual's training needs. Each instructional unit or lesson is designed to occupy a trainee for approximately 30 minutes, and includes diagnostic and post-instructional tests and recommendations for supplementary study. The course materials will exploit several media, including videotape, sound and slides, and conventional paper materials.

As of this reporting, five units have been designed and are in the beginning stages of production. They are a first unit in system analysis, three dealing with reference materials, and one in Russian transliteration. During the next reporting period (through September 30) the design and production of the remaining units will be continued, preliminary tests will be conducted, and a design for field tests will be prepared.

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1. INTRODUCTION

This project is directed toward improving the knowledge and skills of library personnel through the development of on-the-job training courses. The current contract concerns the conduct of research and development for the construction, pilot testing, modification, field testing, and evaluation of a set of experimental instructional packages that will be responsive to the training requirements of scientific and technical libraries. Efforts of the project are concentrated upon developing and testing instructional course packages in three areas: technology in libraries, reference materials and services, and foreign and technical terminology.

Plans for the project have been documented in TM-3762/000/01, Planning for On-the-Job Training of Library Personnel. The present report is the first of two interim reports that will recount the history and state of progress to date and outline plans for the next reporting period. A second interim report will be submitted on September 30, 1968.

The following sections of this report present a summary of the work to date, including review of the work done during the previous reporting period and a description of progress in package development to date. Examples of the first instructional units, or lessons, are given in Appendix A; a selected bibliography of the more useful literature encountered in the course of the project is in Appendix B.

2. REVIEW OF PROGRESS

2.1 Review of Previous Reporting Period

Work on the project during the previous reporting period-- June 28 through December 15, 1967--was occupied with preliminary planning, gathering and reviewing educational and training literature, identifying and effecting liaison with related projects, coordinating with USOE and U.S. Army ATLAS (Army Technical Libraries Improvement Studies project) and exploring the state of in-service training needs in libraries of several kinds. On October 3, 1967, project personnel met with the USOE and ATLAS monitors and agreed that the major efforts of the project for the contract period would be directed toward the training requirements

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of technical and scientific libraries and that the initial course content would be concentrated upon three areas--reference work, language, and technology in libraries. Secondly, it was agreed that, while the initial course content would be directed to the training requirements of scientific and technical libraries, the design of the instruction should take into account the needs of other types of libraries so that the same approaches could be applied to their concerns.

Having agreed upon the direction that the project should take, the project staff continued the activities noted above. The major work was devoted to the planning document, which was submitted for review and concurrence by USOE and the Army on December 15, 1967. It was also distributed to a broad range of Government installations, through ATLAS, for comment and criticism. Reactions were also sought from non-Government libraries by the project staff. The comments were largely interested, constructive, and useful to the project. Concurrence on the work outlined in the plan was reached on February 7, 1968. Pending concurrence, work on the project was conducted at a low level of effort, and was largely devoted to further review of the literature, planning and scheduling for the coming work, and an analysis of the diverse reactions to the planning document itself.

2.2 Review of Current Reporting Period

Through the period from February 7 to May 31, 1968, effort was applied to job and task requirements analysis for the areas of reference, terminology, and technology in libraries. Project staff members interviewed and consulted with personnel in many libraries, principally in the Los Angeles area; they obtained position descriptions, procedure manuals, and outlines of in-service training programs and courses, and directly observed work in the several libraries. (A secondary objective of these visits and interviews was to obtain the cooperation of several libraries for pilot testing and future field testing of the developed instruction.)

The design effort was initiated in mid-March and is currently scheduled to be pursued through October, 1968. It was concerned initially with establishing the objectives and requirements for the instruction and with identifying and analyzing the requirements for production of the course packages and units within the packages.

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It was decided to plan to produce 23 to 25 units of instruction, divided among the three areas. The technology in libraries package will be concerned with instruction in system analysis and will utilize as an example of such analysis the considerations and reasoning that must be brought to bear in deciding whether or not to use a computer for the production of a book catalog in each of two cases--that of a single library, and that of a library with several branches. The reference tools and services package will contain two series of units. The first, on reference tools, will emphasize how to learn to use various kinds of reference works, including bibliographic tools, encyclopedias and handbooks, directories, serials indexes, and indexes to report literature. The second, on reference services, will concern itself with interaction with library users and emphasize the development of communications skills and sensitivity to the factors that affect interpersonal communication. The foreign and technical terminology package will contain three to four units on Russian transliteration and four to six units on technical terminology. The latter will emphasize the terminology of information science and technology.

Work on the production of four units was initiated in May and is now in progress. These include the first unit on system analysis, two on reference tools, and one on Russian transliteration.

2.3 Contacts With Other Projects and Libraries

As has been indicated above, considerable effort was made to interview personnel in related projects, interested organizations, and libraries. These included:

- Aerospace Corporation Library
- USAF Cambridge Research Library
- American Library Association
- Army Map Service Library
- Brooklyn Public Library
- California State Library
- Communication Services Corporation
- Edgewood Arsenal Technical Library
- Federal Aviation Agency
- George Washington University, HUMPRO Project
- Rughes Aircraft Company Technical Library
- John Crerar Library
- John I. Thompson Company
- Library of Congress

Lockheed of California Library
Los Angeles Public Library
McDonnell-Douglas Corporation Library
National Agricultural Library
Naval Ship Systems Command Technical Library
National Institutes of Health Library
National Library of Medicine
Picatinny Arsenal Technical Information Branch
RAND Corporation Library
Saul Herner & Company
University of California at Los Angeles
University of California at San Diego
University of Maryland
University of Southern California

3. DESIGN AND DEVELOPMENT OF INSTRUCTION

The developmental approach that has been adopted to guide the production of the on-the-job training packages comprises three main activities: analysis of training requirements, design of the training materials and procedures, and pilot tryout and revision. The part of the design process related to these activities involves five tasks: (1) determine objectives, (2) state requirements, (3) design the materials, (4) produce the materials, and (5) test the materials. When the training materials being developed are experimental, as they are in this project, the five tasks overlap considerably. The tasks also tend to be iterative--that is, the sequence of tasks is repeated several times as the units of a course package are built.

This section describes the progress that has been made, during the current reporting period, in the development of materials for course packages in Technology in Libraries, Reference Tools and Services, and Foreign and Technical Terminology. The work of the project staff has been devoted both to the development of the materials and to organizing and specifying the principles, procedures, constraints, etc., that must guide the development of instructional materials. Our goal in this has been to do two things. First, we have wanted to anticipate in each task, to the greatest possible extent, the contingencies that might influence later tasks and, eventually, the use of the materials. Second, we have wanted to specify each task in sufficient detail that the

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correct sources of advantages and disadvantages in the materials can be identified--not only by ourselves, but also by the library managers and administrators who will use the materials. Our activities to date, then, have had two results: we have progressed in the early tasks of developing the materials, and at the same time we have clarified the nature of the tasks themselves.

Two departures from the original plans, as they were stated in the planning document, should be noted. The planning document emphasized that the Reference Procedures package would be the first to be developed. It was decided, however, to embark on the Technology in Libraries and Reference Procedures packages simultaneously, and the Technology in Libraries package is farther along in its development at this writing.

While the planning document was being prepared, a small-scale experiment was mounted to explore the ways in which library personnel could be introduced to computing machinery. The experiment required the participation of a few selected professional librarians, using SDC's AN/FSQ-32V computer time-sharing system. Existing retrieval tools, such as the BOLD (Bibliographic On-Line Display) and ORBIT (On-Line Retrieval of Bibliographic Text) systems, which use remote teletypes and cathode-ray-tube displays, were introduced to the subjects with alternate kinds of instruction. The librarians were asked to describe and evaluate their own learning experiences, and their testimony was compared with the staff's observations of their behavior. We hoped that this approach would aid us in determining whether such tools could be effective means of introducing librarians and other library personnel to retrieval concepts and to the potentials of automatic data processing for library applications.

The results of these brief trials were inconclusive, and, since our design of the initial training packages will not require the use of computers, we decided to postpone this line of inquiry.

3.1 Objectives and Requirements

The first principal task of the project has been to determine the objectives, or goals, of on-the-job training and of the course as a whole. The objectives have been formulated primarily on the basis of the testimony of librarians interviewed; they have also been influenced by a review of the relevant literature. The

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three objectives that have been formulated thus far regard (1) the training's usefulness as a means of enhancing the skills and flexibility of library personnel, (2) its educational qualities, and (3) its cost.

Personnel. The training should serve as a practical and effective means of introducing new information and techniques to library personnel regardless of their responsibility or professional skill level. It should also--by increasing the flexibility of personnel--alleviate the shortage of adequately trained personnel in the various library specialties and at various libraries.

Education. The training should encourage library personnel to view their jobs as--in part--learning experiences, and should establish the job setting as a learning environment. Further, it should create in those who undergo it a self-sufficiency with regard to how much they can (or should) learn, the approaches that aid their learning, and the degree to which they will seek out and participate in learning experiences; it should also stimulate in them a continuing desire to learn, and be useful to them in career planning, growth, and development.

Cost. The training should achieve its personnel and educational objectives without employing materials that are expensive to produce or that require expensive equipment, and without requiring that trainees spend unacceptable amounts of time away from their jobs.

In order to ensure that these objectives will be met most effectively, ten specific design and production requirements have been stated:

1. The format of all units in all packages will be consistent. This will help to ensure continuity in the manner and substance of the presentations, which, in turn, will enable trainees to move easily and profitably from unit to unit and from package to package.
2. The information that is to be mastered will be reinforced in as many ways and at as many points as is necessary.

3. The units within a package will be designed in the form of modules, so that a trainee can select the units he needs.
4. Wherever it is both feasible and not unduly expensive, information will be presented in more than one medium.
5. The training will require some active participation by the trainee.
6. The training will be designed in such a way that the time, personnel, and equipment it requires can be realistically allocated.
7. The course packages will be designed for use during normal working hours.
8. The use of the training packages will require a minimum of intervention by project staff members after they have installed them and briefed personnel on how to use them.
9. The use of the packages will not usually require the participation, during the training session, by anyone other than the trainee.
10. The packages will contain materials and references that will stimulate the trainee to augment his training from other sources after he has mastered the material in the course packages themselves.

3.2 Design of Instructional Units

The units within the course packages are being designed in such a way that it will require, on the average, 30 minutes for a trainee to complete each unit. (This time may vary from 20 minutes to 40 minutes, depending on the trainee's ability to master the content of the unit.) Accordingly, each unit is divided into segments of specified durations. In general, each unit contains five segments: (1) a brief introductory segment, called a "hook", that captures the trainee's attention and interest; (2) a slightly longer Purpose segment that states the objective of the unit and that--if the unit is

any other than the first in a package--summarizes previous units; (3) a brief Diagnostic Participation segment that consists of a pre-test of the material and operations to be presented in the unit; (4) a Content segment, of approximately 20 minutes, in which the instruction is presented, and (5) a Summary segment in which the trainee tests himself on what has been presented and that contains suggestions for re-study of those things that he has not mastered. (Each unit is laid out in the form of a time-block, as in Figure 1.) The pre-test in the Diagnostic Participation segment is intended to stimulate the trainee to assess his training needs; its purpose is not to indicate to the trainee whether or not he will benefit from taking the unit, although it may, in some cases, be used for that purpose.

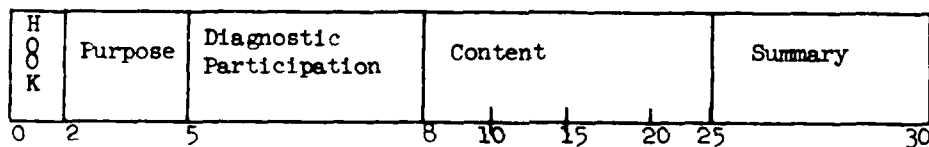


Figure 1. Time-Blocks for a Unit

The decision to construct units that are 30 (to 40) minutes long was based on how long a person can be expected to concentrate his attention profitably on the training experience, and on how long he may be away from his work without harm to the library's operations. Because the units contain references to other materials that will benefit the trainee, it can be expected that the total time he will devote to the unit--including both his taking the unit itself and his perusing the supplementary materials--will be 60 to 75 minutes during the working day.

3.3 Development of Course Packages

The following sections describe the purposes, structure, and content of the three course packages, and indicate the present developmental status of each package.

3.3.1 Technology in Libraries

The Technology in Libraries package is being developed for library administrators and for professionals who are responsible for performing management staff work. Its objective is to introduce these people to the concepts, techniques, and applications of system analysis, and to enable them to communicate successfully with data processing specialists. The package will contain the following five units:

1. Introduction to System Analysis
2. Functional Analysis
3. Task Analysis
4. Flow-Chart Applications
5. Communication with Data Processing Personnel

The package will illustrate system analysis by relating it to the decision of whether or not a computer should be used to produce a book catalog in each of two cases--that of a single library, and that of a library with several branches. The units are designed to be taken in the above sequence. It will be possible, however, for a trainee who wishes to concentrate on communicating with data processing personnel to take units 1 and 5, omitting units 2, 3, and 4.

The design of unit 1 has been completed, and work on the production of materials for it was begun in May. The specifications for the unit are contained in Appendix 4.

3.3.2 Reference Tools and Services

The Reference Tools and Services package is being developed for nonprofessional library personnel and for professionals who are unfamiliar with technical reference tools. Its objectives are to introduce them to the purposes and uses of reference materials and to make them aware of the most effective and efficient ways of helping library users to determine what their needs are and how those needs can best be satisfied. Accordingly, the package is divided into two series of units--one series on reference tools and aids, and one on interaction with users. The reference tools and aids series will contain six to eight units within the following six titles:

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- . Introduction to Kinds of Reference Works
- . Bibliographic Tools and Catalogs
- . Encyclopedias and Handbooks
- . Directories
- . Serials Indexing and Abstracting Sources
- . Reports Indexing and Abstracting Sources

The emphasis in these units will be on how to learn to use reference works, not merely on how to use specific works. It is intended that a trainee who has taken all of the units will have learned not only how to use the types of references that are covered in the units, but also how to determine the best way of using reference works with which he is not familiar.

The reference services series will concentrate on the interaction between library users and library personnel and will contain four to five units. This is an area of behavior where it is uncertain whether self-contained packages alone can provide effective instruction. Also, testing the efficacy of the instruction offers difficulties in that the most important changes one would hope the instruction to effect in trainees are not easily observed in a formal testing situation--those of cognitive and attitudinal sets toward human communication. The media to be used for these units will include video tape, slides, sound, and paper, leaving open the question of whether personal instruction is required until some pilot testing has been done.

The objectives of the first unit in this series will be to impart an understanding of the importance of communication skills, the composition of such skills, and the nature of the task of learning communication skills. Another unit will address the characteristics of scientific and technical library users in their orientations toward seeking services. Other units will seek to develop skills in managing one's learning about interaction and aid the trainee in specifying communication goals, and in identifying attitudinal components in their perceptions of user's message giving behavior in the library service environment. The final units will aim at developing trainees' ability to gain knowledge of their own actions and their results, and to develop more sensitive means of eliciting feedback for more effective interaction with library users.

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The design of three of the Reference Tools units--those on Encyclopedias and Handbooks, Bibliographic Tools, Serials and Reports Indexing and Abstracting Services--has been completed. The production of materials for these units was begun in May. Preliminary specifications for the first two units are contained in Appendix A.

3.3.3 Foreign and Technical Terminology Package

The Foreign and Technical Terminology Package is being developed for library personnel who have little or no experience working in a technical or scientific library. It will consist initially of three to four units on Russian transliteration and four to six units on technical terminology. The latter will begin with two to three units that concentrate upon the terminology of information science and systems work. Learning this terminology is representative of the problem involved in learning the changing vocabularies in many fields. The content will also serve as a reinforcement to the instruction given in systems analysis. Later units in this sequence will give instruction in the use of technical dictionaries and will present guides to acronyms, abbreviations, and other sources of terminology, with subject concentration in the engineering sciences.

Work on this package to date has been confined to Russian transliteration. Two approaches have been taken in learning the Russian alphabet. One might be called table memorization, in which the student attempts to memorize the whole of the alphabet and then exercises himself with text, gradually building up a familiarity with the frequently used letters. (This approach tends to be haphazard in that it is difficult to find a text that is representative of the entire alphabet.) A characteristic of table memorization approaches is that, very often, pronunciation characteristics of the alphabets are exploited to provide some mnemonic reinforcement--by first introducing the letters that are pronounced alike in both English and Russian, then introducing those that are pronounced differently.

The second approach, which is being experimented with in this project, is that of linear-programmed instruction, in which drill is given on three or four letters at a time, and later lessons or

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frames of the instruction utilize the letters encountered earlier in the drill materials.

Work is underway in building the initial unit for Russian transliteration, using the programmed instruction approach. An available table-memorization approach will be compared with the programmed instruction during testing to determine whether the programmed approach is an efficient one for library personnel.

Another consideration in transliteration is the convention to be used. Several Russian transliteration conventions exist, but for library use the Library of Congress's convention, which omits diacritical marks, appears to offer a most practical convention to adopt.

4. PLANS FOR NEXT REPORTING PERIOD

Over the next reporting period, design and development of instructional units will be continued. The units concerned with system analysis and with reference materials will be developed and produced concurrently. When they are completed, the reference service interaction units and Russian transliteration units will be developed and produced. The final units that will be produced are those concerned with the terminology of information science and systems work and with technical terminology of the engineering sciences. The field test design will be developed concurrently with these efforts.

4.1 Preliminary Testing and Revision

As units of instruction are completed, they will be administered to individuals whose education and experience are representative of that of library personnel. These initial tests will aid in developing the most effective configuration for the particular materials or procedures to which each unit is directed. More specifically, they will provide diagnoses of whether:

- (1) The instructions and materials are clearly understood by individuals at the lower end of the distribution of skill and preparation.

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- (2) The target length of 30 minutes required by trainees for covering a unit is being overrun or underrun, and if so by how much.
- (3) The sequences, media, and content are stimulating interest and concentration in trainees.
- (4) The unit as a whole is providing adequate closure in the trainees for problems and questions raised by the instruction.
- (5) The self-testing materials in the unit cause difficulties for the trainees that the design of the instruction did not anticipate.

Depending upon the degree to which this diagnostic procedure reveals flaws in the instruction, the content will be revised to improve, shorten, lengthen, or otherwise bring the unit nearer to the design objectives and requirements. Where requirements are clearly not being met, retesting may be required after revision to ensure quality. This cycle of preliminary testing and revision is expected to be pursued through October, 1968.

4.2 Modification and Packaging

It is anticipated that pilot tests and revisions may lead to the modification of some units as they are found to be too long, too short, etc. After modification the courses will be packaged for field testing. It is planned to produce five sets of each course package for field testing. The field tests themselves are expected to indicate further need for modification and repackaging. This activity will be conducted through February, 1969.

4.3 Field-Test Design and Administration

Design effort for field tests will occupy the period July-September 1968. Each person receiving the instruction will be pretested to assess his general knowledge and his knowledge of the subject matter addressed in the instruction. Part of the field test design effort, therefore, will be devoted to selecting appropriate

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standard tests, candidates for which have been obtained and are being considered. Another effort will involve the construction of tests specific to the instructional material. Still another task will be to elaborate the experimental design for the field tests, employing residual gains as the main method of statistical analysis. The only anticipated change in procedure from that outlined in the planning document will be that, for both the pre-test and post-test phases of the experiment, the specially constructed achievement tests planned to assess course-specific knowledge acquisition will be replaced. In their place will be substituted rate-of-learning tests and problem-solving tests specific to the content areas. In the rate-of-learning tests, the individual is given fresh material in the content area and allowed a certain amount of time to master it before being tested. The reason for substituting rate-of-learning tests for achievement tests is that in the original design--using achievement tests--it could have been readily predicted that the trained group would show a significantly large increase in acquisition of course content over the non-trained controls. By substituting rate-of-learning tests and problem-solving tests, we can test the effects of the course packages in producing learning "sets" and applied orientations toward certain kinds of content areas themselves. These effects are of great interest, since a major objective of the training is to prepare the trainee to engage in an active self-teaching program.

Several libraries have already agreed to cooperate with the project staff in testing the course packages and in appraising the project's efforts. These libraries include:

National Agricultural Library
Edgewood Arsenal Technical Library
Picatinny Arsenal Technical Information Branch
Aerospace Corporation Library
RAND Corporation Library
University of California at Los Angeles Library
University of California at San Diego Library
Los Angeles Public Library
SDC Library

These libraries are expected to provide staff members for field testing the initial instructional sequences in the period October 1968 through January 1969. No difficulty is anticipated in obtaining the cooperation of other libraries in the Los Angeles area as needed.

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APPENDIX A

UNIT DESIGN SPECIFICATIONS

A detailed description of each unit will be developed concurrently with the production of the actual training materials. The specification for each unit will include the unit number, unit title, segment identification, and media, as well as the content and training objectives for each segment.

Specifications for each unit to be documented after completion of the training materials will relate training objectives to major concepts, training tactics, specific content, and instructional media and technique. Unit segments and production bits will also be related to time in minutes, topic, and medium.

A detailed specification for the unit titled "Introduction to System Analysis" follows. Similar descriptions are presented for two of the units in the reference tools package at a level of detail reflecting their state of development.

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TECHNOLOGY IN LIBRARIES

UNIT DESCRIPTION

UNIT NUMBER: 1

TITLE: Introduction to System Analysis

Segment 1 Hook

Media: Slides/sound

Content: Introduces the problem of deciding if a computer should be used to produce a book catalog in two cases: that of a single library and that of a central library with three branches.

Training Objectives:

1. Attract attention and interest of viewer.
2. Relate abstract concept of "system analysis" to concrete world of library.
3. Define problem that might be solved using system analysis.
4. Introduce two-sided situation so that pros and cons of automation can be developed.

Segment 2 Purpose of Unit

Media: Slides/sound

Content: Purpose is to introduce viewer to concept of system analysis. Included are descriptions of both package and unit. Explain that system analysis is a management tool to aid in decision-making process.

Training Objectives:

1. Focus attention of viewer on package and unit objectives.
2. Define assumed role of viewer with respect to package.

3. Explain how unit is to be viewed.
4. Make explicit the values to be derived by user as result of study of the unit.
5. Preview contents of, and method of using, the unit.

Segment 3 Diagnostic Participation

Media: Paper/sound

Content: Open-ended questions, constructed response items, and multiple choice items that require written participation by viewer. Concepts to be presented in later unit segments will be sampled and viewer will be asked to relate them by inference to the case study problem faced by Library A and Library B. Best answers will be explained in audio tape following period of silence during which viewer is expected to write answers in the Trainees Manual.

Training Objectives:

1. Acquaint viewer with content to be covered in the unit.
2. Assist viewer in assessing his competence with respect to this content.
3. Direct viewers attention to possibility of applying content to solve concrete problems by relating concepts to case studies.
4. Reinforce concepts introduced in earlier segments.
5. Provide participative learning experience by requiring active response of viewer.
6. Furnish viewer with immediate feedback and knowledge of results to increase effectiveness of learning.
7. Diagnose content areas where viewer requires special effort to gain mastery.

Segment 4 Facts, Skills, and AttitudesMedia: Slides/sound and paper

Content: Definition of terms "system" and "analysis". Introduction to system approach, showing that it is a management tool useful in the decision-making process when decisions are constrained. The system approach involves identification of available choices and assessment of the potential success of each. The system approach involves objectives, analysis, synthesis, and management planning and control. Elements essential to the system approach include objectives (purpose), time, system management (decisions, plans, and controls), system analysis, system synthesis (design), and system interaction (iteration). This unit tells about system analysis, a process that involves phases (time), functions (activities), and tasks (jobs). Case study examples are related to these concepts to relate these abstractions to concrete situations having prima facie relevance to librarians. Performance practice sets of constructed-response and multiple-choice items will be included to reinforce acquisition of facts and skills.

Training Objectives:

1. Show how system analysis relates to the system approach.
2. Define terms essential to viewer's understanding of system analysis.
3. Reinforce viewer's acquisition, acceptance, and understanding of this nomenclature and concept.
4. Develop a receptive attitude toward the process orientation of the system approach.
5. Describe tasks involved in system analysis and relate these tasks to concrete case study examples relevant to librarians.
6. Assist viewer in applying concepts to search for solution to concrete problems.

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7. Provide skill practice for viewers in actually performing analytical tasks of identification, classification, and iteration.
8. Furnish feedback to viewers regarding their effectiveness in performing system analysis tasks.

Segment 5 Summary Participation

Media: Slides/sound and paper

Content: Recap of unit concepts and principles. Open-ended questions, constructed-response and multiple-choice items to permit viewer to evaluate his progress with respect to mastery of unit contents. Provide additional training materials and cite references appropriate for future study by viewer.

Training Objectives:

1. Provide closure for viewer by summarizing unit contents.
2. Reinforce learning by repetition of material presented earlier in the unit.
3. Furnish feedback to viewer concerning the degree to which unit contents have been mastered.
4. Encourage viewer to learn more about system analysis through study of additional training materials and references.

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ENCYCLOPEDIAS AND HANDBOOKS UNIT DESCRIPTION

- 1) Target Student: Library assistants who have had the equivalent of a high school education or more, and are endowed with good (English) language skills.
- 2) Duration of Instruction: Units tailored so an "average" student can complete his instruction in 30 to 40 minutes. However, illustration and exercises will be appended to the unit which the student can use at his convenience. (Probably 3 to 5 additional such units required for full coverage of this topical area.)
- 3) Objectives:
 - i) To introduce trainee to important characteristics of reference tools used for retrieval of factual and background material, such as encyclopedias and handbooks, highlighting their main features that distinguish them from other kinds of reference tools.
 - ii) To sensitize the trainee to the comparative features of such tools that distinguish them functionally from one another, and to give him criteria for judging authority and usefulness.
 - iii) To provide information about specific examples of such tools, and provide opportunity for the student to practice using them.
 - iv) To introduce the student to materials, aids, and techniques that he can employ in continued self-directed study of such tools.
- 4) Topics to be Covered: Topics will be grouped as follows:
 - Encyclopedias--Introduction, general technical and subject-oriented
 - Encyclopedias--General Technical
 - Encyclopedias--By subject: e.g., chemical technology
 - Handbooks--Introduction, by subject and by type
 - Handbooks--Subject and type examples

Following kinds of content will be covered in this unit and additional units on this topical area.

- Alphabetical and other forms of entry.
- Various cross-referencing arrangements and formats.
- Level of detail and accuracy to be expected in different types of encyclopedias and handbooks.
- Source-references cited for these tools.
- Practices of updating encyclopedias and handbooks, and how to find out.
- Correspondence between stated and practices editorial policy in these tools.
- Practice in generating alternative search headings by using the text.
- Comparative study to show different levels of detail in coverage, and emphasis, for different kinds of encyclopedias and handbooks.
- Use of technical dictionaries in conjunction with technical encyclopedias.
- Question negotiation with content characteristics of encyclopedias and handbooks in mind.

5) Lesson Outline: (Introduction Unit)

Lesson opens with 2-3 minute sound/slide presentation indicating the kinds and range of questions most likely to be satisfied by recourse to encyclopedias and handbooks, as distinguished from report literature and journals, that is, what is the comparative status and nature of information that is summarized in handbooks and encyclopedias?

Introduction is followed by short diagnostic and motivating test of 3-5 minutes duration, to focus attention, and to indicate the kind of performance that will signify acquisition of the content to be imparted in the expositional segment of the unit.

Main expositional section is 18-22 minutes in length. Uses combination of slide projector coordinated with sound track, and in-hands materials in booklet form. General technical encyclopedias to be used as examples are McGraw Hill Encyclopedia of Science and Technology, and the Encyclopedia of Chemical Technology. Handbooks to be used as special subject-oriented examples are Standard Handbook for Mechanical Engineers, and Handbook of the Engineering Sciences. Cycle will show material

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on screen, describe it on sound track, give example of problem on screen and sound track; student will respond with pencil in coordinated booklet.

3-5 minute self-testing section.

BIBLIOGRAPHIC TOOLS--SERIALS UNIT DESCRIPTION

- 1) Target Student: Library assistants who have had the equivalent of a high school education or more, and are endowed with good English language skills.
- 2) Duration of Instruction: This unit will be tailored so that an "average" student can complete his instruction in 30 to 40 minutes. However, illustrations and exercises will be appended to the unit which the student can use at his convenience; these will probably require more variable amounts of time for different trainees.
- 3) Objectives:
 - i) To introduce the trainee to the important characteristics of reference tools used for periodicals and other serial publications.
 - ii) To provide specific information about three tools that are most commonly used in performing the following jobs:
 - . acquisition (through purchase and loan)
 - . bibliographic checking
 - iii) To acquaint the trainee with materials and techniques that he can employ in continued self-directed study, including other OJT units which will help him increase his ability to perform the jobs mentioned in ii).
- 4) Topics to be Covered: Three reference tools will be described and their uses will be illustrated:
 - . Union List of Serials
 - . Ulrich's International Periodicals Directory
 - . New Serials Titles

As many of the following characteristics of these lists of periodicals and serials will be covered in this unit as the 30-40 minute constraint permits:

- . Organization: number of volumes, arrangement of entries--e.g., alphabetic, by subject matter, etc.; cumulative and non-cumulative volumes.

- . Currency of the information with respect to bibliographic information and--in the case of union lists--with respect to reported holdings of libraries.
- . The typical list entry and its format.
- . Special codes used in the entries--e.g., abbreviations for names of libraries holding serials, symbols that designate the extent of a particular library's holdings, symbols that designate where additional holdings information may be found, the country of origin of a particular periodical, etc.

In addition, the distinguishing characteristics for each tool will be stressed (and reinforced later in case study illustrations of searches for information about particular periodicals.) An emphasis will be placed on paying attention to such distinguishing characteristics in learning about new or unfamiliar tools. Also, the use of such tools in combination will be explained--e.g., using Ulrich's International Guide to Periodicals to obtain the latest name for a technical journal (whose name may have changed over the years) and the Union List or New Serials Titles to locate a library possessing a particular issue or volume.

- 5) Lesson Outline: Lessor opens with brief 2-3 minute sound/slide presentation of kinds of question to be satisfied by recourse to serials reference tools, (as distinguished from questions satisfied by encyclopedias, handbooks, etc.)

A short diagnostic test follows (of 3 to 5 minutes duration) designed to focus the student's attention on the information to be imparted in the lesson. A subsidiary role of this test, consisting of multiple choice questions, is to permit those students who score high to skip all or part of the lesson to follow.

The remainder of the lesson will be devoted to the topics mentioned above (approximately 20 minutes), followed by a brief review (5 minutes) of the material covered.

- 6) Additional Materials:

The student will be advised, upon terminating his 30 minutes or so of instruction, to consult a kit consisting of illustrated accounts of actual uses of the three tools in various combinations

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for acquisitions and bibliographic checking jobs. He will be advised to re-enact the events described in these accounts with the materials available in his own library and/or furnished with the OJT package.

He will also be asked to work a set of exercises to be found in workbooks supplied in the kit. Some of these exercises will have complete solutions that can be obtained from proper use of the three tools and will be patterned after the illustrated accounts. These will be arranged in order of increasing difficulty. An attempt will be made to motivate the student to continue self-directed study by including exercises, together with solutions, that call for the use of techniques and selected tools not covered in this unit.

APPENDIX B

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SUMMARY					
<p>Under contract with the U.S. Office of Education and with the support of the U.S. Army, System Development Corporation is conducting research directed to the design, development, testing, and evaluation of instructional materials for on-the-job training of library personnel. The initial efforts are concentrated on the training requirements of scientific and technical libraries and involve development of three training course packages: technology in libraries, reference tools and services, and foreign and technical terminology. Work was begun on the project on June 28, 1967, and will end on March 31, 1969. This first of two interim reports describes progress through May 31, 1968.</p> <p>As of this reporting, five units have been designed and are in the beginning stages of production. They are a first unit in system analysis, three dealing with reference materials, and one in Russian transliteration. During the next reporting period (through September 30) the design and production of the remaining units will be continued, preliminary tests will be conducted, and a design for field tests will be prepared.</p>					

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13. ABSTRACT <p>The objectives of the research are to develop higher levels of task-oriented skills in professional and nonprofessional library personnel and will emphasize both the substance to be learned and the act of learning itself. The several course packages are being developed as modular units so that the instruction may be taken in sequences appropriate to the individual's training needs. Each instructional unit or lesson is designed to occupy a trainee for approximately 30 minutes, and includes diagnostic and post-instructional tests and recommendations for supplementary study. The course materials will exploit several media, including videotape, sound and slides, and conventional paper materials.</p> <p>As of this reporting, five units have been designed and are in the beginning stages of production. They are a first unit in system analysis, three dealing with reference materials, and one in Russian trans-literation. During the next reporting period (through September 30) the design and production of the remaining units will be continued, preliminary tests will be conducted, and a design for field tests will be prepared.</p>		

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