Technical Paper 317

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ARMY RESEARCH INSTITUTE EVALUATION OF AUTOMATED DATA ON INSTRUCTIONAL TECHNOLOGY (ADIT)

Beatrice J. Farr

EDUCATIONAL TECHNOLOGY & TRAINING SIMULATION TECHNICAL AREA

U. S. Army
Research Institute for the Behavioral and Social Sciences

August 1978

U. S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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(14) ARI-TP-317

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: Technical Paper 317	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): ARMY RESEARCH INSTITUTE EVALUATION OF AUTOMATED DATA ON INSTRUCTIONAL TECHNOLOGY (ADIT)	5. TYPE OF REPORT & PERIOD COVERED: --
	6. PERFORMING ORG. REPORT NUMBER: --
7. AUTHOR(s): Beatrice J. Farr	8. CONTRACT OR GRANT NUMBER(s): --
9. PERFORMING ORGANIZATION NAME AND ADDRESS: U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, VA 22333	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 2Q161102B74F, 2313
11. CONTROLLING OFFICE NAME AND ADDRESS: Army Deputy Chief of Staff for Personnel, Washington, DC 20310	12. REPORT DATE: August 1978
	13. NUMBER OF PAGES: 34
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): -- (12) 42p.	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE: --

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

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18. SUPPLEMENTARY NOTES

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Instructional technology
Computerized data base
Evaluation
Training research

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Automated Data on Instructional Technology (ADIT) is a computerized file of technical information on instruction and learning. It has been supported by the three services and the Defense Advanced Research Projects Agency. The database consists of very detailed evaluative abstracts of reports, articles, etc. relating to training and instructional system development. A small-scale evaluation of ADIT was conducted. The evaluation assessed the usefulness of records obtained from the data base, the ease of on-line data retrieval, and the stand-alone quality of the ADIT Guide to Use. Seven research psychologists

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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read the ADIT Guide to Use, performed search strategy exercises, performed the ADIT operations test, and completed two questionnaires evaluating ADIT and the ADIT Guide to Use.

Attitudes toward the ADIT system were generally favorable. Participants felt that the system would be useful to educational researchers, administrators, planners, and developers. The abstracts were thought to be comprehensive; participants believed that data could be retrieved more quickly from ADIT than from either original sources or alternative data bases.

Attitudes toward the ADIT Guide to Use were less favorable. Participants indicated that the guide did not contain adequate information, the instructions were not written with sufficient clarity, and the questions in the exercises were of limited usefulness. Responses to questionnaires and protocol analysis of participants' operations test revealed that most of the problems encountered and many of the errors on the test were probably attributable to shortcomings in the guide. Suggestions for revisions are included.

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Office, Deputy Chief of Staff for Personnel
Department of the Army

August 1978

Army Project Number
2Q161102B74F

Educational Concepts and Evaluation

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FOREWORD

The Educational Technology and Training Simulation Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) conducts research to support training concepts, instructional system development, and technology assessment.

One system being considered to facilitate dissemination of research results in these areas is the Automated Data on Instructional Technology (ADIT) System. ADIT development was initiated by the Air Force Human Resources Laboratory (AFHRL) and has been jointly funded by AFHRL, ARI, the Navy Personnel Research and Development Center (NPRDC), and the Defense Advanced Research Projects Agency (DARPA) since FY 75. ADIT is subsumed under Air Force Office of Scientific Research Project 2313, "Human Resources Task 3, Human Factors in System Design." ARI's portion of the effort is funded as part of ARI project 2Q761101B74F, "Personnel Performance and Training."

Although the full system will not be completed until FY 79, a preliminary evaluation was requested by the Office of the Director of Defense Research and Engineering.

Special thanks go to Mr. John Ferguson, ARI Librarian, for his considerable assistance during the conduct of this evaluation.

JOSEPH ZEIDNER
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ARMY RESEARCH INSTITUTE EVALUATION OF AUTOMATED DATA ON INSTRUCTIONAL TECHNOLOGY (ADIT)

BRIEF

Requirement:

To conduct a "limited" test for assessing the comparative usefulness of the records in Automated Data on Instructional Technology (ADIT). An integral part of this effort was to evaluate:

1. The stand-alone quality of the ADIT Guide to Use and

2. The ease of on-line data retrieval.

The objective was to provide an assessment of the User's Guide and operations for retrieving information from the data base, as well as recommendations for improvement of both if necessary.

Procedures:

Seven research psychologists, grades GS-11 and 14, participated in the study. Each performed a series of tasks that included:

1. Reading the ADIT Guide to Use,

2. Performing search strategy exercises,

3. Performing the ADIT Operations Test, and

4. Completing two questionnaires: (a) Evaluation of ADIT Guide to Use and (b) Evaluation of ADIT.

One briefing session was held, during which participants were told the purpose of the evaluation and taught how to operate the two terminals used in the study. All participants kept logs to record the time spent both in off-line reading and preparation of search strategies, as well as in actual data retrieval. Participants were encouraged to provide written suggestions for improving the data base itself, methods for accessing information, and the User Guide Format.

The ADIT operations test was a 10-part, self-administered on-line test that sought to determine the efficiency of the student's search strategies and the appropriateness of the choices of segments to be displayed. Scoring was based upon guidelines provided by AFHRL. The

questionnaires that evaluated the guide and evaluated the ADIT system used a 10-interval scale with a centered zero reference. Measurements were taken to the nearest whole number.

Findings:

1. The attitudes toward the ADIT system per se were generally favorable. Participants felt that the system would be particularly useful for educational researchers, administrators, planners, and developers.

2. The information in ADIT files was found to be comprehensive and useful. Participants believed that data could be retrieved from ADIT more quickly than from either original sources or alternative data bases, such as Defense Documentation Center (DDC).

3. Attitudes toward the ADIT Guide to Use were less favorable. Participants indicated that (a) the Guide did not contain sufficient information, (b) the instructions were not written with sufficient clarity, and (c) the questions in the exercises were of limited usefulness.

Utilization of Findings:

Responses to the questionnaires, as well as protocol analysis of participants' operations tests, revealed that most of the problems encountered and most of the errors on the test were attributable to shortcomings in the User's Guide. It was generally believed that a more meaningful evaluation of the system itself could be conducted if the guide were revised to incorporate some of the suggested modifications. It is anticipated that the recommendations for improvement of the User's Guide that emerged from this effort will be incorporated with those from concurrent AFHRL and NPRDC evaluations to produce a revised User's Guide.

One of the specific recommendations made in this report has already been accomplished: namely, the system now permits the use of arithmetic operators in segment 28.

ARMY RESEARCH INSTITUTE EVALUATION OF AUTOMATED DATA ON INSTRUCTIONAL TECHNOLOGY (ADIT)

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ARMY RESEARCH INSTITUTE EVALUATION OF AUTOMATED DATA ON INSTRUCTIONAL TECHNOLOGY (ADIT)

INTRODUCTION

Automated Data on Instructional Technology (ADIT), which began in May 1974, is a computerized file of technical (research) information on instruction and learning for use by anyone within the Department of Defense involved with Training and Instructional System Development (ISD). The Air Force Human Resources Laboratory (AFHRL) is accomplishing the effort with support from the Air Force Office of Scientific Research. Additional participative support has been provided by the Army Research Institute for the Behavioral and Social Sciences (ARI), the Navy Personnel Research and Development Center (NPRDC), and the Defense Advanced Research Projects Agency (DARPA).

The file consists of exceptionally detailed evaluative abstracts of technical reports, journal articles, books, etc., relating to training and ISD. Each entry contains up to 35 pieces of information in addition to the abstract and normal bibliographic citation. These abstracts are intended to be so comprehensive that original sources will be unnecessary for most purposes.

Access to the file is via an on-line, interactive, full-text retrieval system (INFOCEN) located at Wright-Patterson Air Force Base. Any dial-up terminal of common configuration may be used, with the only added expense being telephone toll charges. (Later plans call for making ADIT available less expensively through commercial nets.)

Nearly 11,000 abstracts are on-line, with 500 more scheduled for inclusion by 1 October 1978. It is estimated that the total system will consist of 14,000 entries. After the initial phase, a capability will be added for using the data base to obtain prescriptive guidance. The last phase will include refinements that will permit users to query the system about specific instructional design issues, using constrained natural language interaction. Once the system becomes functional, additional relevant information (not yet formally reported) will be included as part of the updating and file maintenance process.

BACKGROUND

On 10 June 1976 the office of the Director of Defense Research and Engineering requested an evaluation of the potential usefulness of the ADIT system. An evaluation team, consisting of one member from each participating organization (AFHRL, ARI, and NPRDC) was convened to draw up an evaluation plan. Given the limited time, personnel, and funding resources, it was agreed that a small-scale test be conducted to examine the utility of ADIT files, the ease of on-line retrieval, and the value

of the ADIT Guide to Use as a teaching instrument. The guide, operations test, and two questionnaires used in the evaluation were developed by AFHRL. An effort would be made to obtain, whenever possible, subjects who would represent different types of users. In the case of ARI, no persons experienced in school instruction (and only one experienced in instructional technology) were available. None had ever had any direct responsibility for planning, developing, or managing military instruction, but all had been involved in training-related research. Essentially, the sample was composed of individuals with advanced degrees in psychology.

DESCRIPTION OF ADIT GUIDE TO USE

The ADIT Guide was prepared as a stand-alone, self-instructional text. Several instructional features have been included as appendixes. The guide contains a section that describes the system and others that give general procedures for starting up, signing in, searching, retrieving, processing, and terminating. More complex operating procedures are handled in later sections of the text. These include several strategies, e.g., formulating the request and organizing the output, browsing, modifying requests, etc. The appendixes contain a complete listing of all ADIT file segment numbers (with explanatory notes), a directory of general terms, review questions on system description and procedures, a checklist for initial practice operation, and 10 practice search problems with suggested solutions.

ADIT EVALUATION

Procedure

Each participant was given a copy of the User's Guide and a set of forms to complete, including a log for time spent both on-line and off-line. All subjects were required to perform the same series of tasks. The sequence was specified, but moderate departures, because of scheduling problems, etc., were anticipated, and allowances were made for them. The scheduled activities are listed below in the suggested order of performance:

1. Complete an "ADIT Evaluation Participation Record."
2. Read the "ADIT Guide to Use" to page 28.
3. Perform the "Checklist for Initial Practice Operation" (Appendix D of the guide).
4. Complete reading the "ADIT Guide to Use."
5. Perform the search strategy exercise in Appendix E of the Guide and verify solutions at the terminal.

6. Perform the "ADIT Operation Test."

7. Complete the questionnaire, "Evaluation of the "ADIT Guide to Use."

8. Work up to 30 minutes on self-identified problem(s) of personal interest.

9. Complete the questionnaire, "Evaluation of ADIT."

Seven scientists (research psychologists, GS-11 and 14) participated in the evaluation. None had any previous experience with on-line accessing of data bases, but they had at least limited experience with computer systems. One briefing session was held, during which the participants were informed about the nature of evaluation, and materials were distributed (see appendixes). An experienced user of the ADIT system was onsite at all times during the evaluation period. The only assistance offered, however, was to refer individuals seeking guidance to the appropriate pages in the Guide, in addition to providing procedural information with regard to operation of the terminal.

Ideally, each participant was to set aside two consecutive working days to perform the bulk of the activities. In actual practice, this did not prove possible; therefore, the period of performance ranged from 10 to 15 days.

Experienced users from AFHRL, Wright-Patterson Air Force Base, advised that actual time spent at the terminal during any given session should be approximately 30 minutes. Because it frequently took that long just to establish contact with Data Central, it was not unusual for participants to spend 2 or more hours during each sitting at the terminal. There is no way to determine accurately the extent to which this may have affected performance in terms of accuracy and efficiency. Expediency dictated, however, that this was the only way to accomplish the work within a reasonable time frame.

The evaluation plan called for each user to work independently at all times. Because of the press of other activities and the availability of only two terminals, it was occasionally necessary for two or more researchers to work together, especially during the practice exercises. To insure that researchers had worked out the search strategies on their own, a joint input was made at the terminal only after it was determined that these search plans were essentially identical. In such cases, the time spent was recorded for each participant. Every attempt was made to reduce or eliminate biasing of the experimental results.

Findings

Operations Test. The operations test was a job-performance test intended for evaluating proficiency in the use of ADIT. Thirteen tasks were included (see Appendix A). Instructions called for participants to formulate a search strategy, select segments to display, and, where called for, perform the search and record the answers. Different questions had different point values, depending upon the complexity of the task. Maximum possible score was 60. Part of the test required participants to plan and execute a search strategy on a topic of their own choosing, a task that most found quite difficult. Table 1 shows the scores for each question, the total score for each participant, and the total time each spent performing all the formal requirements for the study.

A comparison of scores on the operations test with total amount of time spent indicates that, for the most part, higher scores were associated with more time spent in study and practice. Final scores ranged from 37 to 55, with a mean of 45.9. All particpants lost at least some points as a result of not following instructions completely in all instances.

Most participants appeared to find questions 1, 2, 3, 5, and 8 relatively easy. As the questions became more complex, though, the number and variety of errors increased.

Careful examination of the participant-response protocols often yielded clues as to probable causes of confusion. Errors tended to be consistent across subjects and, in many instances, could be at least partially traced to ambiguities or omissions in the guide.

Question 6 proved difficult, possibly because most participants failed to enter appropriate alternative search terms.

The greatest variability was manifested in questions 9a-9d. The total number of answers provided by the system was largely a function of whether participants entered their search statements via modifications. A particular problem area was question 9d, which the scoring key treated as a modification when actually it might have been more productive to enter a completely new search statement.

Performance was notably poor on question 10, which required participants to design and carry out a detailed search plan on individualized training. Examination of responses seemed to indicate that participants had not mastered the skills needed to perform a thorough search. During postevaluation debriefing sessions, however, it became evident that at least part of the poor performance could be ascribed to lack of enthusiasm for the task rather than lack of ability.

Table 1

ADIT Operations Test Scores

Question	Subjects							Mean	Maximum possible score
	1	2	3	4	5	6	7		
1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4
2	4.0	4.0	2.5	4.0	4.0	2.0	4.0	3.5	4
3	5.5	6.0	4.0	6.0	3.0	2.5	5.0	4.6	6
4	4.0	2.5	5.0	5.0	3.5	2.3	5.0	3.9	5
5	3.0	2.0	3.0	3.0	2.4	2.0	2.0	2.5	3
6	5.0	3.0	4.0	4.0	0.0	2.0	5.0	3.3	6
7	6.0	4.0	4.5	4.0	3.7	5.0	3.5	4.4	6
8	5.0	4.0	5.0	5.0	5.0	3.0	5.0	4.6	5
9A	2.0	2.0	2.5	3.0	1.3	2.0	1.5	2.0	3
9B	2.5	2.0	3.0	3.0	2.5	2.5	2.5	2.6	3
9C	4.0	3.5	4.0	4.0	3.0	4.0	4.0	3.8	4
9D	5.0	5.0	2.5	5.0	3.0	4.0	3.0	3.9	5
10	0.5	2.0	5.0	5.0	1.6	2.2	3.5	2.8	6
Total score	50.5	44.0	49.0	55.0	37.0	37.5	48.0		60
Time spent studying guide and performing tasks (in minutes)	1242	1102	668	1545	515	970	1010		

Evaluation of ADIT. Participants each completed a 12-part questionnaire that evaluated the ADIT system and operating procedures. Table 2 provides summary scores and means for all questions that used numerical ratings. Scoring was along a 10-interval scale with a centered zero reference, measured to the nearest whole number. A complete listing of all questions and responses can be found in Appendix B.

Procedures for using ADIT were rated as relatively simple (question 1, Appendix B). Estimates regarding the amount of time needed for practice at the terminal (in order to become proficient in the use of ADIT) ranged from a low of 1 hour to a high of 40 hours (question 2, Appendix B). The system records obtained during the test were rated as more than adequate for use in reviewing research on the topics involved (question 3, Appendix B). Additional comments by participants, however, indicated a strong personal preference for referring to original documents, particularly for the most directly relevant materials. This is less a criticism of the system than a predictable bias of professional researchers in favor of original sources. Participants thought that the records contained information that would be equally useful to planners of service training courses and to those reviewing research (question 4, Appendix B).

All participants indicated that if they had ready access to a terminal, they would use its services. Frequency estimates ranged from one to eight times a month, and time estimates varied from 5 minutes to 3 hours (question 5, Appendix B).

On topics relating to instructional design, ADIT was seen as offering a very appreciable savings in time over both conventional library searches and the DDC (question 6, Appendix B).

Participants felt that when the document coverage is completed, the records would be somewhat useful to personnel involved in administering, planning, and developing instructional systems and devices, but more useful to DOD researchers in instructional technology (questions 7 and 8, Appendix B). Modifying the system to permit querying ADIT for principles relating to instructional design and for specific recommendations on particular problems in that area was thought to be of more value to researchers than to administrators, planners, or developers (questions 9a and 9b, Appendix B). Asked to indicate support for ADIT as a taxpayer rather than a scientist, participants tended to favor rather than object to the project (question 10, Appendix B).

Evaluation of ADIT Guide to Use. Each participant completed an eight-part questionnaire that evaluated the ADIT Guide to Use. Table 3 provides summary scores and means for all questions that used numerical ratings. Scoring was also along a 10-interval scale. A complete listing of all questions and responses can be found in Appendix C. Pages 1-28 contain the fundamental operating procedures for ADIT. Participants spent a mean of 76 minutes reading this portion of the guide (question 1a, Appendix C).

Table 2

Scores and Means for Evaluation of ADIT Questionnaire

Question	Subjects 1	2	3	4	5	6	7	$\bar{X}$	σ
1	6	5	5	3	5	3	8	5.0	1.73
3	5	-	8	5	6	7	1	5.3	2.42
4	4	-	8	7	5	-	1	5.0	2.74
7	6	9	9	6	8	8	3	7.0	2.16
8	6	9	8	4	6	5	3	5.9	2.11
9	4	7	7	8	9	-	-	7.0	1.87
9R	6	9	9	6	8	-	3	6.8	2.32
10	6	8	7	6	7	9	2	6.4	2.22
$\bar{X}$ =	5.4	7.8	7.6	5.6	6.8	6.4	3.0		
σ =	.92	1.6	1.30	1.59	1.49	2.4	2.38		

Table 3

Score and Means for Evaluation of ADIT Guide to Use

Question	Subjects 1	2	3	4	5	6	7	$\bar{X}$	σ
2	5	6	4	3	3	4	2	3.9	1.35
3	5	5	3	4	5	2	5	4.1	1.21
4	3	2	3	4	5	3	5	3.6	1.13
5	5	7	6	5	8	6	7	6.3	1.11
7	3	1	2	4	4	9	3	3.7	2.56
8	3	6	3	4	8	1	7	4.6	2.51
$\bar{X}$ =	4.0	4.5	3.5	4.0	5.5	4.2	4.8		
σ =	1.09	2.43	1.38	.63	2.07	2.93	2.04		

Appendix D of the guide (Checklist for Initial Practice Operation) took a mean of 108 minutes to complete, with a range of 42 to 175 minutes (question 1b, Appendix C).

Although the findings show that participants spent an average of 115 minutes to complete reading the guide (question 1c, Appendix C), this could be an underestimate because it may not reflect all of the time spent looking up information following the initial reading. Participants stated that because this time was spent at irregular intervals, the logs may not document accurately all time spent.

Appendix E of the guide contained 10 practice search problems. Although the guide offered assistance in the form of suggested solutions, the amount of time spent suggests that participants opted to try their own solutions (question 1d, Appendix C). The task that took longest to perform was the operations test; mean time was 382 minutes (question 1e, Appendix C). All participants reported a need to refer to the guide frequently during the course of the test. In many instances, several attempts were made on questions before an answer was deemed satisfactory.

A wide range of topics was selected by participants as areas to work on purely for self-interest. Times for this activity ranged from 5 minutes to more than 1-1/2 hours (question 1f, Appendix C).

The clarity of the guide (for purposes of learning) was rated relative to similar materials. Ratings were closer to the "very confusing" end of the scale than they were to the "very clear" portion (question 2, Appendix C). The length of the guide was seen as somewhat "too short" (question 3, Appendix C), and the information provided was considered "too little" (question 4, Appendix C).

The guide was also seen as being deficient in terms of providing the information necessary to use ADIT at the terminal (question 8, Appendix C). In spite of these shortcomings, however, it was felt that an individual who had mastered the guide would be reasonably competent to operate the ADIT system (question 5, Appendix C). Estimates for how much time should be spent studying the guide by an individual with no computer experience but with some knowledge of training ranged from 2 to 3 hours to as much as 8 hours (question 6, Appendix C).

Questions in Appendix C of the guide were not viewed as being particularly valuable in learning the materials (question 7, Appendix C).

Problems Encountered. Perhaps the most frustrating aspect of the ADIT evaluation was the long delays experienced in gaining access to the data base. Certain problems were apparently due to faulty communication lines, particularly the Autovon lines. Waiting periods of 15 to 30 minutes or more were not uncommon, especially in the mornings and late afternoons. Consequently, the tasks took much longer to complete than originally anticipated. During a considerable portion of the evaluation period, there were many system bugs. For example, answers would

be rejected upon initial entry, only to be accepted upon reentry. The system also would refuse occasionally to accept the 10-digit code number, and at times it would accept a typed-out name for a segment but not the corresponding code number.

There were times when the system responded "missing operator" when, in fact, none was missing. At other times, the system would, in the middle of an operation, return to file without having been instructed to do so. With great regularity, complex search statements would cause the system to respond, "your request is being processed" repeatedly, until the user would hand up in frustration and start over again. Sometimes, a complex request would yield "no entries" or "too much information given" when the very same request entered by way of modification would produce answers. The preceding discussion of problems clearly suggests a need for further debugging and a mechanism for monitoring the system to minimize such problems in the future.

The following summarizes the most frequently occurring comments regarding deficiencies in the User's Guide:

The use of quotation marks is confusing. The guide frequently puts quotation marks around words to be entered as responses, although the quotes are not to be entered. It would be helpful if this were stated clearly in the guide.

Obeying the instructions (p. 32) for entering the name of an author (using the initials for greater precision) in some instances yielded fewer responses than just the author's last name alone. In the worst case, entering an author's name and initials would produce "no response" when there were, indeed, one or more answers when the last name was entered alone. This proved annoying to users who assumed that the guide's directions were the best ones to use.

The guide did not indicate that the six arithmetic operators do not work for file segment 28 (date). Examination of participant protocols reveals that everyone made the same erroneous assumption regarding segment 28. The guide is also not clear on how to proceed when the system responds as if a perfectly legitimate segment name were invalid, nor does it indicate which statements are acceptable after the system responds, "will attempt to continue." This resulted in a frequently fruitless trial-and-error process.

At one point in the guide, users were told that a search request could be modified by entering, "MODIFY" (see p. 22). There is, in addition, a recursive command, "$$MODIFY," which returns the system to the message "ADD NUMBER XXX MODIFICATION." The difference between these commands, if any, should be specified. Moreover, it is not apparent why the system occasionally rejected "MODIFY," following the system response: "How do you want to process them?" which according to the guide is appropriate at this point in the search process.

The guide should specifically state that control must be returned to the system after the end of output for a query and also after each page of printout. It is not at all clear what is required when the system says "Reply." There is also a need to state, more precisely, that if only one sorting is desired, control must be returned. As it is, the initial reaction of all participants in this evaluation was to think there had been an error when the system came back the second time with "ENTER SORT SEGMENT, LENGTH, MODE."

Participants expressed a general feeling that Appendix C (review questions) should have a greater proportion of practical operational questions, and fewer theoretical, system, or nomenclature items. Participants also indicated that the Sample Search Plan on page 57 should be expanded to include the exact search request to be input. Because there is some confusion about appropriate procedures for using connectors in compound requests, there would be considerable merit in providing a complete example in the guide. Indeed, the consensus was that a few complete protocols, at appropriate points, would improve the clarity of instructions greatly. This was especially true for complex search statements.

A universal complaint was that the recursive command "$$WHAT" (which should provide a tutorial message that helps explain what the user is doing wrong) generally failed to clarify the problem and, in some instances, actually contributed to further operator confusion. It was felt that truly useful tutorials should not simply indicate the nature of the error but, more important, should offer specific, detailed guidance on corrective actions.

The suggested solutions for questions in Appendix E were a potential source of confusion primarily because the abbreviated format bore no resemblance to the correct method for inputting. Participants felt that all references to message entry format should appear in the guide exactly as they would be entered on the keyboard.

CONCLUSIONS

There was unanimous agreement that the inclusion of an index would appreciably reduce the amount of time spent looking up information in the guide. Users indicated frequent frustration when explanatory information on a known topic was not able to be located rapidly. This was experienced particularly when participants were working at a terminal.

It was felt that the guide would be improved by having several exercises in which a user is stepped through a problem, e.g., shown what happens as a search is expanded or narrowed, or shown how to truncate and browse sensibly. A section on common errors and how to avoid them would be equally profitable.

Among the system features listed as most desirable were (a) the addition of a break command which would permit users to enter a new request whenever the system was taking an inordinate amount of time processing a request; (b) the ability to use arithmetic operators in segment 28; and (c) the possibility of asking the system to look for certain words in more than one segment without having to repeat the terms or segment numbers.

APPENDIX A

ADIT OPERATION TEST

This is a job-performance test intended for evaluating proficiency in the use of ADIT. It should be completed within about three hours. To take the test you will need (1) this test form, (2) an ADIT Search Plan form, (3) some scratch paper and (4) use of a computer terminal with associated printer and capability of reaching the ADIT computer.

In completing the test, first go through the questions, in sequence, planning the necessary searches and displays. Record these in the spaces provided following the questions (on the Search Plan for Item 10). Then go to the terminal and carry out the necessary activities there. When printouts are requested, print only the first page. Save the complete printout of your activities and displays, but record your answers on this form where requested. If you search or display differently than you had planned, circle the appropriate symbol "S" or "D" to indicate that. Finally, give the test, your search plan, and the complete printout to the person responsible for the test.

Your test will be scored by a point system in which items range from 3 to 6 points in value and the maximum obtainable is 60. Record your times below:

Started planning: Started terminal:

Stopped planning: Stopped terminal:

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1. Get a chronological listing of items authored by Gagne.

S:

D:

2. How many records in ADIT from AC 4000 to AC 6000 inclusive were published in 1950?

S:

D:

Answer:

3. Get the references to some good quality general discussions of transfer of training. List them alphabetically by author.

S:

D:

4. What records involved use of the Army General Classification Test (ACCT)? Are any of the source documents in the Defense Documentation Center collection? If so, include the DDC number with the ADIT AC number.

S:

D:

Answer:

5. What descriptive terms best represent the topics of AC 4170?

S:

D:

Answer:

6. What additional research do authors of articles on feedback after 1973 suggest needs to be done? Make a single listing of only those references which do provide suggestions, and include the suggestions.

S:

D:

7. What did Bourne and Archer conclude in 1956 from their research on distribution of practice? How did the abstractor feel about their article?

A:

D:

Answer:

8. Was the 1973 article by Levin on cue validity government-supported? If so, by what organization?

S:

D:

Answer:

9a. How many records in ADIT have titles suggesting that they concern programmed learning?

S:

D:

Answer:

9b. How many of those are research studies?

S:

D:

Answer:

9c. Prepare a bibliography of those programmed learning studies which are concerned with technical training.

S:

D:

9d. Now prepare a bibliography of <u>any</u> programmed learning research which involved comparisons with computer aided instruction.

S:

D:

10. Make up and carry out a detailed search plan to obtain a bibliography of writings concerned with individualized training. Submit the plan with your test and printout.

APPENDIX B

EVALUATION OF ADIT

Question 1: Rate the procedures for using ADIT, assuming you know them well.

Scale: Very Simple _____ Quite Complex

SUBJECT	RATING
1	6
2	5
3	5
4	3
5	5
6	3
7	8

Σ = 35

$\bar{X}$ = 5

σ = 1.7

Question 2: How much practice at the terminal do you think a person unfamiliar with computer operation but having some knowledge of training needs to become proficient in using ADIT?

SUBJECT	TIME
1	6 hours
2	12-20 hours
3	3 1/2-4 hours
4	40 hours
5	1 hour
6	40 hours
7	10 hours

EVALUATION OF ADIT

Question 3: Rate the adequacy of the record obtained in the test for a person's use in reviewing research on that topic.

Scale: Useless _____better than original

SUBJECT	RATING
1	5
2	-
3	8
4	5
5	6
6	7
7	1

Σ = 32

$\overline{X}$ = 5.3

σ = 2.4

Question 4: Rate the adequacy of the record obtained in the test for a person's use in making a decision involving that topic in planning a service training course.

Scale: Useless _____Very Helpful

SUBJECT	RATING
1	4
2	-
3	8
4	7
5	5
6	-
7	1

Σ = 25

$\overline{X}$ = 5

σ = 2.7

EVALUATION OF ADIT

Question 5: Assuming access readily available, estimate the frequency and total time you would use ADIT in one month.

SUBJECT	FREQUENCY	TIME
1	1	45 minutes
2	2-3	3 hours
3	8	1 1/2 hours
4	2	1 1/2 hours
5	2	4 hours
6	1	1 hour
7	1	5 minutes

EVALUATION OF ADIT

Question 6: Think of a topic relating to the design of instruction with which you have some familiarity. Now estimate how long it would take a person unfamiliar with that topic to do a literature review at your local libraries, with and without prior DDC search, and using ADIT.

Subj 1 - Topic: Training Devices and Simulators

Library Search Time: 30 hours With DDC: 8 hours

ADIT Search Time: 2 hours

Subj 2 - Topic: Compressed Speech

Library Search Time: 40 hours With DDC: 30 hours

ADIT Search Time: 8 hours

Subj 3 - Topic: Long-Term Motor Learning

Library Search Time: 40 hours With DDC: _____

ADIT Search Time: 8 1/2 hours

Subj 4 - Topic: Multi Media

Library Search Time: 40-60 hours With DDC: 8-10 hours

ADIT Search Time: 2-3 hours

Subj 5 - Didn't respond

Subj 6 - Topic: Laboratory vs Lecture Instruction

Library Search Time: 16 hours With DDC: 8 hours

ADIT Search Time: 8 hours

Subj 7 - Topic: Job Aids

Library Search Time: 3 hours With DDC: 20 minutes

ADIT Search Time: 15 minutes

EVALUATION OF ADIT

Question 7: How valuable do you think ADIT will be, when document coverage is complete, to DOD personnel involved in research on instructional technology? Assume convenient individual access.

Scale: Useless_____Very great value

SUBJECT	RATING
1	6
2	9
3	9
4	6
5	8
6	8
7	3
	$\Sigma = 49$
	$\bar{X} = 7$
	$\sigma = 2.2$

Question 8: How valuable do you think ADIT will be, when document coverage is completel, to DOD personnel involved in administering, planning and developing instructional systems and devices? Assume individual access.

Scale: Useless _____Very great value

SUBJECT	RATING
1	6
2	9
3	8
4	4
5	6
6	5
7	3
	$\Sigma = 41$
	$\bar{X} = 5.9$
	$\sigma = 2.1$

EVALUATION OF ADIT

Question 9a: Suppose it were also possible to query ADIT for (a) principles relating to instructional system and equipment design, and (b) specific recommendations on particular problems of that kind. With those capabilities, how valuable do think ADIT would be for researchers?

Scale: Useless_____Very great value

SUBJECT	RATING
1	4
2	7
3	7
4	8
5	9
6	-
7	-
	Σ = 35
	$\bar{X}$ = 7
	σ = 1.9

Question 9b: Suppose it were possible to query ADIT for (a) principles relating to instructional system and equipment design and (b) specific recommendations on particular problems of that kind. With these capabilities, how valuable do you think ADIT would be for administrators, planners and developers?

Scale: Useless_____Very great value

SUBJECT	RATING
1	6
2	9
3	9
4	6
5	8
6	-
7	3
	Σ = 41
	$\bar{X}$ = 6.83
	σ = 2.3

EVALUATION OF ADIT

Question 10: As a tax payer, indicate how you feel about ADIT.

Scale: Strongly object_____ _____Strongly favor

SUBJECT	RATING
1	6
2	8
3	7
4	6
5	7
6	9
7	2

$\Sigma = 45$

$\overline{X} = 6.4$

$\sigma = 2.2$

APPENDIX C

EVALUATION OF GUIDE TO USE

Question 1a: How much time did you spend performing subtask a (reading "ADIT Guide to Use" to page 28)?

SUBJECT	TIME
1	70
2	90
3	67
4	100
5	72
6	60
7	70
	Σ = 529
	$\overline{X}$ = 76
	σ = 14.12

Question 1b: How much time did you spend performing subtask b (complete Appendix D of guide !Checklist for Initial Practice Operation1)?

SUBJECT	TIME
1	55
2	160
3	88
4	175
5	42
6	110
7	125
	Σ = 755
	$\overline{X}$ = 108
	σ = 50.08

EVALUATION OF GUIDE TO USE

Question 1c: How much time did you spend performing subtask b (complete reading of guide)?

SUBJECT	TIME
1	144
2	110
3	99
4	150
5	75
6	95
7	135

Σ = 808

$\overline{X}$ = 115

σ = 28.12

Question 1d: How much time did you spend performing subtask d (complete Appendix E of guide)?

SUBJECT	TIME
1	397
2	237
3	182
4	400
5	116
6	185
7	360

Σ = 1877

$\overline{X}$ = 268

σ = 116.10

EVALUATION OF GUIDE TO USE

Question 1-e: How much time did you spend performing subtask 3 (operations test)?

SUBJECT	TIME
1	483
2	480
3	208
4	510
5	190
6	490
7	315
	Σ = 2676
	$\overline{X}$ = 382
	σ = 141.11

Question 1f: Time to complete subtask f (work on problem of self-interest).

SUBJECT	TIME
1	93
2	25
3	24
4	35
5	20
6	30
7	5
	Σ = 232
	$\overline{X}$ = 33
	σ = 28.02

EVALUATION OF GUIDE TO USE

Question 2: Rate the clarity of the presentation for learning purposes, compared to other such materials.

Scale: Very confusing_____Very clear

SUBJECT	RATING
1	5
2	6
3	4
4	3
5	3
6	4
7	2

$\Sigma = 27$

$\overline{X} = 3.9$

$\sigma = 1.3$

Question 3: Rate the length of the guide for use in learning.

Scale: Much too short _____ ___ Much too long

SUBJECT	RATING
1	5
2	5
3	3
4	4
5	5
6	2
7	5

$\Sigma = 29$

$\overline{X} = 4.1$

$\sigma = 1.2$

EVALUATION OF ADIT GUIDE TO USE

Question 4: Rate the guide as to amount of information given for learning.

Scale: Far too little_____Far too much

SUBJECT	RATING
1	3
2	2
3	3
4	4
5	5
6	3
7	5
	Σ = 25
	$\overline{X}$ = 3.6
	σ = 1.1

Question 5: Indicate how competent to operate ADIT you expect a person who has mastered the guide would be (assuming that person has some knowledge of instruction and instruction research).

Scale: Totally incompetent_____Very competent

SUBJECT	RATING
1	5
2	7
3	6
4	5
5	8
6	6
7	7
	Σ = 44
	$\overline{X}$ = 6.3
	σ = 1.1

EVALUATION OF ADIT GUIDE TO USE

Question 6: How much time would you estimate a person having no computer experience but some knowledge of training should spend studying the guide?

SUBJECT	TIME
1	8 hours
2	5 1/2 hours
3	2-3 hours
4	8 hours
5	4 hours
6	3 hours
7	6 hours

Question 7: Indicate the extent to which the questions in Appendix C helped you in learning the materials?

Scale: Useless_____Very valuable

SUBJECT	RATING
1	3
2	1
3	2
4	4
5	4
6	9
7	3

$\Sigma = 26$

$X = 3.7$

$\sigma = 2.6$

EVALUATION OF ADIT GUIDE TO USE

Question 8: Indicate the extent to which you feel the guide provides the necessary information for using ADIT (at the terminal).

Scale: Much more required_____No more required

SUBJECT	RATING
1	3
2	6
3	3
4	4
5	8
6	1
7	7

$\Sigma = 32$

$\overline{X} = 4.6$

$\sigma = 2.5$

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2 HQDA (DAMI-CSZ)
1 HQDA (DAPE-PBR
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1 HQDA (DAFD-MFA)
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1 HQDA (DAPC-PAS-A)
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1 HQDA (DAMO-RQR)
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1 Ofc Chief of Stf, Studies Ofc
1 DCSPER, ATTN: CPS/OCP
1 The Army Lib, Pentagon, ATTN: RSB Chief
1 The Army Lib, Pentagon, ATTN: ANRAL
1 Ofc, Asst Sect of the Army (R&D)
1 Tech Support Ofc, OJCS
1 USASA, Arlington, ATTN: IARD-T
1 USA Rsch Ofc, Durham, ATTN: Life Sciences Dir
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1 USA Quartermaster Sch, Ft Lee, ATTN: ATSM-TE
1 Intelligence Material Dev Ofc, EWL, Ft Holabird
1 USA SE Signal Sch, Ft Gordon, ATTN: ATSO-EA
1 USA Chaplain Ctr & Sch, Ft Hamilton, ATTN: ATSC-TE-RD
1 USATSCH, Ft Eustis, ATTN: Educ Advisor
1 USA War College, Carlisle Barracks, ATTN: Lib
2 WRAIR, Neuropsychiatry Div
1 DLI, SDA, Monterey
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-WGC
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-MR
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-JF
1 USA Artic Test Ctr, APO Seattle, ATTN: STEAC-MO-ASL
1 USA Artic Test Ctr, APO Seattle, ATTN: AMSTE-PL-TS
1 USA Armament Cmd, Redstone Arsenal, ATTN: ATSK-TEM
1 USA Armament Cmd, Rock Island, ATTN: AMSAR-TDC
1 FAA-NAFEC, Atlantic City, ATTN: Library
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1 FAA Aeronautical Ctr, Oklahoma City, ATTN: AAC-44D
2 USA Fld Arty Sch, Ft Sill, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DI-E
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DT-TP
1 USA Armor Sch, Ft Knox, ATTN: ATSB-CD-AD
2 HQUSACDEC, Ft Ord, ATTN: Library
1 HQUSACDEC, Ft Ord, ATTN: ATEC-EX-E-Hum Factors
2 USAEEC, Ft Benjamin Harrison, ATTN: Library
1 USAPACDC, Ft Benjamin Harrison, ATTN: ATCP-HR
1 USA Comm-Elect Sch, Ft Monmouth, ATTN: ATSN-EA
1 USAEC, Ft Monmouth, ATTN: AMSEL-CT-HDP
1 USAEC, Ft Monmouth, ATTN: AMSEL-PA-P
1 USAEC, Ft Monmouth, ATTN: AMSEL-SI-CB
1 USAEC, Ft Monmouth, ATTN: C, Facl Dev Br
1 USA Materials Sys Anal Agcy, Aberdeen, ATTN: AMXSY-P
1 Edgewood Arsenal, Aberdeen, ATTN: SAREA-BL-H
1 USA Ord Ctr & Sch, Aberdeen, ATTN: ATSL-TEM-C
2 USA Hum Engr Lab, Aberdeen, ATTN: Library/Dir
1 USA Combat Arms Tng Bd, Ft Benning, ATTN: Ad Supervisor
1 USA Infantry Hum Rsch Unit, Ft Benning, ATTN: Chief
1 USA Infantry Bd, Ft Benning, ATTN: STEBC-TE-T
1 USASMA, Ft Bliss, ATTN: ATSS-LRC
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA-CTD-ME
1 USA Air Def Sch, Ft Bliss, ATTN: Tech Lib
1 USA Air Def Bd, Ft Bliss, ATTN: FILES
1 USA Air Def Bd, Ft Bliss, ATTN: STEBD-PO
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Lib
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: ATSW-SE-L
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Ed Advisor
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: DepCdr
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: CCS
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCASA
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACO-E
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACC-CI
1 USAECOM, Night Vision Lab, Ft Belvoir, ATTN: AMSEL-NV-SD
3 USA Computer Sys Cmd, Ft Belvoir, ATTN: Tech Library
1 USAMERDC, Ft Belvoir, ATTN: STSFB-DQ
1 USA Eng Sch, Ft Belvoir, ATTN: Library
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-TD-S
1 USA Topographic Lab, Ft Belvoir, ATTN: STINFO Center
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-GSL
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATS-CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TE
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1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-DT
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-CS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: DAS/SRD
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEM
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: Library
1 CDR, HQ Ft Huachuca, ATTN: Tech Ref Div
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1 CDR, Project MASSTER, ATTN: Tech Info Center
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1 Research Institute, HQ MASSTER, Ft Hood
1 USA Recruiting Cmd, Ft Sherdian, ATTN: USARCPM-P
1 Senior Army Adv., USAFAGOD/TAC, Elgin AF Aux Fld No. 9
1 HQ USARPAC, DCSPER, APO SF 96558, ATTN: GPPE-SE
1 Stimson Lib, Academy of Health Sciences, Ft Sam Houston
1 Marine Corps Inst., ATTN: Dean-MCI
1 HQUSMC, Commandant, ATTN: Code MTMT 51
1 HQUSMC, Commandant, ATTN: Code MPI-20
2 USCG Academy, New London, ATTN: Admission
2 USCG Academy, New London, ATTN: Library
1 USCG Training Ctr, NY, ATTN: CO
1 USCG Training Ctr, NY, ATTN: Educ Svc Ofc
1 USCG, Psychol Res Br, DC, ATTN: GP 1/62
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1 US Marine Corps Liaision Ofc, AMC, Alexandria, ATTN: AMCGS–F
1 USATRADOC, Ft Monroe, ATTN: ATRO–ED
6 USATRADOC, Ft Monroe, ATTN: ATPR–AD
1 USATRADOC, Ft Monroe, ATTN: ATTS–EA
1 USA Forces Cmd, Ft McPherson, ATTN: Library
2 USA Aviation Test Bd, Ft Rucker, ATTN: STEBG–PO
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Library
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Educ Advisor
1 USA Aviation Sch, Ft Rucker, ATTN: PO Drawer O
1 HQUSA Aviation Sys Cmd, St Louis, ATTN: AMSAV–ZDR
2 USA Aviation Sys Test Act., Edwards AFB, ATTN: SAVTE–T
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA TEM
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1 AFHRL (FT) William AFB
1 AFHRL (TT) Lowry AFB
1 AFHRL (AS) WPAFB, OH
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1 AFHRL (DOJN) Lackland AFB
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2 Navy Med Neuropsychiatric Rsch Unit, San Diego
1 Nav Electronic Lab, San Diego, ATTN: Res Lab
1 Nav TrngCen, San Diego, ATTN: Code 9000–Lib
1 NavPostGraSch, Monterey, ATTN: Code 55Aa
1 NavPostGraSch, Monterey, ATTN: Code 2124
1 NavTrngEquipCtr, Orlando, ATTN: Tech Lib
1 US Dept of Labor, DC, ATTN: Manpower Admin
1 US Dept of Justice, DC, ATTN: Drug Enforce Admin
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1 Nat Clearing House for MH–Info, Rockville
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1 Militaerpsykologisk Tjeneste, Copehagen
1 Military Attache, French Embassy, ATTN: Doc Sec
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1 Prin Scientific Off, Appl Hum Engr Rsch Div, Ministry of Defense, New Delhi
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