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Battelle
Columbus Laboratories

Report

IMPROVEMENT PROCESS

to

DIRECTORATE OF LOGISTICS MANAGEMENT
SYSTEMS REQUIREMENTS (XRB)
DCS/PLANS AND PROGRAMS
AIR FORCE LOGISTICS COMMAND
WRIGHT-PATTERSON AFB, OHIO 45433

Contract No. F33600-81-C-0613

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June 2, 1982

by

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FINAL REPORT

on

IMPROVEMENT PROCESS

to

Directorate of Logistics Management
Systems Requirements (XRB)
DCS/Plans and Programs
Air Force Logistics Command
Wright-Patterson AFB, Ohio 45433

from

BATTELLE
Columbus Laboratories

June 2, 1982

INTRODUCTION

Under Contract No. F33600-81-C-0613, Battelle's Columbus Laboratories has been supporting AFLC/XRB in the application of the long-range LMS planning system, developed under Contract No. F33600-80-C-0414. The Planning Model provided a guide for the planning activities conducted under Contract 0613. The Battelle responsibility was to monitor planning activities and to make recommendations for improvement of the planning model.

It is the purpose of this document to comment on the success of the planning model as it was applied to the Improvement Process.

This report, a Lessons Learned document, is presented in two parts. The first covers support activities to Level II Improvement planning from its initiation in September 1981 through the initial planning meeting held at San Antonio ALC on November 3-5, 1981.

The second part addresses the support provided to planning sessions held via Teleteach in December 1981 and January 1982.

PART I: INITIAL SUPPORT ACTIVITIESPreparation Procedures

The initial activity involved preparation of a plan for accomplishing the first two planning steps. These planning steps were specifically directed toward identifying

- (a) What Exists Today, and
- (b) Needed Capabilities

for long-range LMS development in support of the Improvement Process. The required activities were identified and tentative schedules prepared independently by both Battelle and XRB and then reconciled, with responsibilities for preparation of planning materials mutually determined.

The three major activities involved (a) developing a strawman description of the Improvement Process, its LAGs and functions as they exist today and how they might look in the future, (b) making preparations for the first planning meeting, and (c) conducting the first planning meeting.

Under activity (a), Battelle developed a background package for mission planners at Headquarters AFLC to use in preparing the strawman. This included a brief introduction to long-range LMS planning and a description of the steps to be followed in developing the strawman. Several attachments were contained in the package including descriptions of the Improvement Process related to the extract chart and the Mission Support Document (MSD); descriptions of LAGs 29, 30, 31, and 32; Command shortfalls related to the Improvement Process; and extracts from AFLC Command Level Guidance for LMS Planning. Also included were sample work sheets for developing descriptions of each function including decisions, responsible organizations, input information and its sources, and output information and its destinations.

Development of the strawman functional descriptions for both the current and future systems as well as definition of current and future shortfalls was performed by mission personnel from LOL and LOE. Meetings were held with each group to review the background materials and to begin development of the strawman. Both XRB and Battelle personnel participated in these meetings. The mission planners then proceeded to develop the strawman under the schedule laid out by M. Rhone/XRB and under her guidance when questions arose. Final format-

ting of the strawman materials, typing, and preparation of vugraphs was performed by XRB and reviewed by Battelle.

Arrangements for the meeting at San Antonio ALC on November 3-5, 1981 with representatives from both Oklahoma City and San Antonio ALCs were made by XRB and coordinated through LOM at Headquarters. Attendees were jointly agreed to by the ALCs, XRB, and LO.

The meeting schedule, presentation format, and selection of facilitators and recorders were decided jointly by XRB and Battelle.

Planning Content

Input

The basic planning materials prepared for the San Antonio meeting consisted of a drawing representing each function as it exists today and a drawing as it should look in the future. On each drawing was shown the function block giving the function name, the organizations responsible for performing the function and the major decisions made in performing the function. Also shown were the major information inputs to the function and their sources, and the major information outputs and their destinations. Associated with each current function drawing was a list of current shortfalls, and with each future function drawing, a list of future shortfalls.

Only one LAG, LAG 32 Tech Order Management, had more than one function. For this LAG a second type of drawing was provided showing information flows among the three functions involved. Separate drawings were provided for both the current and future versions of the LAG.

Finally, drawings were provided for both the current and future versions of the entire Improvement Process showing major information flows between the LAGs that constitute the process.

All planning materials were developed by appropriate functional experts in LO who followed the formats provided by XRB and Battelle. Final preparation and reproduction of the planning materials was performed by XRB.

Facilities

The San Antonio planning meeting was held in the XR conference room at San Antonio ALC. The room was equipped with a screen and dual vugraph projectors, and a central table.

Process

The meeting was introduced by Mel Lammers/XRB who reviewed the intent of long-range LMS planning based on institutionalizing the planning process and addressing LMS renewal on a modular basis to make the planning manageable, to reduce the overall risk, and to spread the planning investment.

This introduction was followed by a brief introduction to the LMS planning process given by Doug Hill of Battelle.

The balance of the meeting basically followed the schedule shown in Figure 1. The planning sessions were facilitated for the most part by M. Rhone/XRB. HQ AFLC/LO staff acted as resource persons to clarify how the planning materials were developed and the underlying rationale. The remainder of the attendees shown in Figure 2 performed the actual planning.

Output

The planning was conducted by reviewing and discussing the planning materials and modifying or augmenting them as required. Changes and additions were noted on vugraphs of the planning materials during the discussions. These materials were then "cleaned up" and distributed to the meeting attendees.

During the final afternoon of the planning meeting, the discussions centered on the development of alternative approaches to overcoming the identified shortfalls, both current and future. This session was intended to introduce the concept of alternative approaches to the planning participants. The next step was for them to generate, prior to the next planning meeting, alternative approaches to the identified shortfalls contained in the "cleaned up" planning materials that were distributed to them. These alternative approaches were then to be screened against standard Air Force policies and good business practices.

Finally, those approaches that passed the screen were to be evaluated against a variety of criteria such as cost, timeliness, consistency with other projects, and benefit to the Air Force.

Finally, those approaches that passed the screen were to be evaluated against a variety of criteria such as cost, timeliness, consistency with other projects, and benefit to the Air Force.

TIME	TUESDAY 3 NOVEMBER 1981	WEDNESDAY 4 NOVEMBER 1981	THURSDAY 5 NOVEMBER 1981
0830	Introduction, Remarks, and Announcements - OVERVIEW TO PLANNING - Battelle Columbus Laboratories	LAG 32 - T. O. MANAGEMENT & DISTRIBUTION (Current) - XRB/LOL - Introduce LAG Chart - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review LAG Chart (Interconnections between functions) - Review Current Shortfalls -- Peacetime -- Wartime - Review Current Improvement Process Chart -- Info Flows Between LAGs	LAG 32 - T. O. MANAGEMENT & DISTRIBUTION (Future) - XRB/LOL - Introduce LAG Chart - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review LAG Chart (Interconnections between functions) - Review Future Shortfalls -- Peacetime -- Wartime - Review Future Improvement Process Chart -- Info Flows Between LAGs
0915	LAG 59 - IMPROVE PRODUCT PERFORMANCE (Current) - XRB/LOE - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Current Shortfalls -- Peacetime -- Wartime	LAG 59 - IMPROVE PRODUCT PERFORMANCE (Future) - XRB/LOE - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Future Shortfalls -- Peacetime -- Wartime LAG 31 - MATERIEL DEFICIENCY REPORTING & TECHNICAL ANALYSIS (Future) - XRB/LOL - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Future Shortfalls -- Peacetime -- Wartime	LAG 31 - MATERIEL DEFICIENCY REPORTING & TECHNICAL ANALYSIS (Future) - XRB/LOL - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Future Shortfalls -- Peacetime -- Wartime - Overview of Next Step in Planning Procedure
1200	LUNCH	LUNCH	LUNCH
1300	LAG 31 - MATERIEL DEFICIENCY REPORTING & TECHNICAL ANALYSIS (Current) - XRB/LOL - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Current Shortfalls -- Peacetime -- Wartime	LAG 31 - MATERIEL DEFICIENCY REPORTING & TECHNICAL ANALYSIS (Future) - XRB/LOL - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Future Shortfalls -- Peacetime -- Wartime	LAG 31 - MATERIEL DEFICIENCY REPORTING & TECHNICAL ANALYSIS (Future) - XRB/LOL - Review Individual Function Chart -- Decisions -- Info Flows -- Org -- Sources & Sinks - Review Future Shortfalls -- Peacetime -- Wartime
1600			

LMS LONG RANGE PLANNING
IMPROVEMENT PROCESS MEETING

3-5 Nov 81

Dave Shade	HQ AFLC/XRBT	787-4714
George Kawanishi	HQ AFLC/LOLM	787-7004
Craig Gridley	HQ AFLC/LOEP	787-2257
Barbara McGuire	SA-ALC/XRXA	945-4664
Anna Strickland	HQ AFLC/LOMCP	787-6910
Carl Coffinan	OC-ALC/MHEDUD	735-7684
Vernon Magill	OC-ALC/MHED	735-2989
Jerry Ozeretny	OC-ALC/MHMMB	735-5173
Capt F.B. "Rick" Atkinson	OC-ALC/MHOM	735-3373
Henry W. Diehm	OC-ALC/MHOM	735-3373
Kenneth Ward	SA-ALC/MHIR	945-8525
Cal Adams	SA-ALC/MMSR	945-6304
Vern McAlpin	HQ AFLC/LOEP	787-2257
Richard Baker	SA-ALC/MMSMP	945-7071
Frank Pena	SA-ALC/MMSMP	945-7071
Sherria Dunlap	SA-ALC/MMSM	945-5273
Doug Hill	Battelle-Columbus	(614) 424-7001
Kamie R. Rhone	HQ AFLC/XRBT	787-4714
Mel Lammers	HQ AFLC/XRBT	787-4714
Ernest H. Rodriguez	SA-ALC/MHEDB	945-7324
LTC Henry L. Howe	HQ AFLC/LOEP	787-2257
Linda Thomas	SA-ALC/XRSS	945-4757
L. Fred Smith	SA-ALC/MHEA	945-3936

FIGURE 2

Recommended Changes

As a result of the preparation for and conduct of the first two steps of the planning process, a number of observations have been made that relate to improving the effectiveness and efficiency of carrying out those steps for other processes and perspectives. In the following sections the observations have been grouped and explicit recommendations made for improving the planning process.

Planning Materials and Meeting Preparations

1. The principles expressed by M. Lammers/XRB, namely:
 - Logistics requirements must drive hardware acquisitions, and
 - Flexibility is paramount because of uncertainty of the futureare important and need to be given high visibility in the package of introductory materials provided to both HQ and ALC planners.
2. There was some redundancy between the introductory presentations by M. Lammers/XRB and D. Hill/Battelle. These presentations should be compared prior to presentation to avoid such redundancy in the future.
3. The rationale behind the development of the Process charts and LAG charts was not a part of the planning materials. The rationale should be clearly described and included in the package of planning materials.
4. The information flows to and from functions were not labeled as to whether their origin or destination was outside the LAG and/or Process. Such labeling should be included on the strawman function charts to facilitate the development of LAG charts, and the process chart.

5. In some cases, an information output from a function that flowed to another function in the same LAG, or to another function in a different LAG in the Improvement Process, was labeled differently than the corresponding information input. Such inconsistency makes the formation of LAG charts and Process charts difficult. It is recommended that the inconsistencies be resolved prior to the planning meeting. This would probably require that the functional planners develop the LAG and process charts.
6. The overall complexity of interconnecting information flows across all processes and perspectives overwhelm the people that recognize the complexity. An explanation of how these interconnections are to be handled through the configuration control procedure should be developed and made available to functional area planners.
7. The futurity document was misinterpreted as a constraining set of factors that had to be addressed. This material has to be presented as a thought stimulator to get planners to consider future requirements - not as a set of constraining requirements that have to be addressed.
8. The ALC planners, and to some extent the HQ functional area planners tend to think about "how they go about solving a problem". Their orientation should be toward "what information is needed to make the decisions associated with a function". The solution to this problem would seem to be working closely with the functional area planners during consideration of the first couple of functions and a tutorial "walk-through" session with ALC planners on at least one function.
9. Some shortfalls were not sufficiently explicit - at least for the ALC planners. They should be defined relative to a

performance standard (i.e., what is satisfactory) that has a meaningful measure associated with it.

10. "Shortfall" was considered to be a poor term for use with the future version of functions. "Future requirement" is the preferred term.

Selection of Planning Personnel

The following observations are made without comment but lead to a major recommendation at the end of this section.

1. The ALC people had difficulty relating to the function diagrams, decisions, and shortfalls. These factors are at a considerably higher level of abstraction than these people normally consider.
2. The ALC people were not adequately familiar with the planning materials forwarded to them prior to the meeting. Many had simply not studied the material enough to thoroughly understand it.
3. The presence of HQ AFLC planners at San Antonio was necessary to explain the strawman. Nevertheless, their presence was intimidating to some of the ALC people as exhibited at times by their deference to the HQ position.
4. It was particularly difficult to get the ALC planners to divorce themselves from consideration of the existing DSDs and focus on the functions.
5. The ALC people seemed to have particular difficulty in putting themselves in a frame of mind to consider future requirements.
6. The ALC people knew their systems and detailed functions extremely well.

7. The "strawman" was changed relatively little as a result of the San Antonio meeting. It is likely that similar or even improved results might have been obtained through application of the same effort by HQ functional area planners.

As a result of the above observations, it appears that Level II planning should be carried out only by HQ functional area planners. ALC planners could carry the primary responsibility for Level III planning for those functions for which they are responsible. Functions that are a HQ responsibility could be the responsibility of HQ personnel insofar as Level III planning is concerned.

PART II: SUPPORT TO TELETEACH SESSIONSPreparation Procedures

During November and early December 1981, there were a series of meetings between XRB, LO, and Battelle to decide on the next steps in light of the San Antonio experience and in view of extremely limited travel funds.

A part of the preparations centered on developing an understanding of the LMS modernization program within LO at HQ AFLC and within MM at the ALCs. In this regard a series of tutorial briefings were developed describing the LMS modernization program and the planning methods to be used. These briefings were presented on December 11 and 14 at HQ AFLC.

LO felt that all ALCs should be involved with Improvement LMS planning. With this guidance and the travel limitations it was decided to use the TeleTeach facilities at AFIT and at each of the ALCs to conduct the next planning sessions. This had the advantage of allowing participation of all ALCs and the involvement of more people at each ALC although the introduction of new people implied the need for tutorial material being presented.

The TeleTeach sessions were scheduled beginning December 15 with subsequent sessions scheduled on December 16-18 and January 5-8 and January 11.

In preparation for the December 15 meeting, Battelle and XRB developed agendas for the meetings as well as tutorial material. Packages of planning outputs that resulted from the San Antonio meeting for each of the three LAGs were also prepared and distributed to all five ALCs.

Planning ContentInput

The planning materials provided to planners at each ALC included introductory briefing materials on LMS Requirements Determination, on the three-level planning process for identifying LMS requirements, and on the output of the San Antonio meeting.

A background package consisting of the following 14 items was provided to each participant :

1. Extract Chart
2. Long-Range LMS Planning: Improvement Process: Level II, Block 1.
3. Long-Range LMS Planning Paper
4. Improvement Process (Extract Chart Description)
5. Improvement Process (MSD)
6. LAG 29 - Monitor Field Performance
7. LAG 30 - Materiel Performance Analysis
8. LAG 59 - Monitor Product Performance
9. LAG 31 - Materiel Deficiency Report Control
10. LAG 32 - T.O. Management
11. Blank Worksheets
12. Improvement Process Shortfall Extraction
13. "Futurity" Document
14. Improvement Strawman (Revised).

In addition, a guidance document on the preparation of alternative approaches was provided.

Facilities

The December 15 and 16, 1981 TeleTeach Sessions were held at the AFIT TeleTeach room at WPAFB at the TeleTeach Facilities at each of the ALCs.

The AFIT facility was equipped with individual "push-to-talk" desk microphones as well as the electronic blackboards, audio mixing equipment, and speakers.

Process

The first Improvement Planning Session conducted through TeleTeach began on December 15, 1981 with HQ AFLC/LO and XR, and representatives from MM and XR at all ALCs participating. While necessary planning materials had been

hand carried to the ALCs on December 11, 1981, they had not been adequately reproduced at the ALCs and distributed to participants. This necessitated some adjustment in the presentation approach and schedule as described below.

The first activity was a "sign-in" process by all ALC participants to find out who was present and verify current operation of the electronic blackboard and audio links. The system operated satisfactorily apart from some occasional lack of clarity with the audio link.

After initial remarks by M. Lammers (XRBT), Dr. Hill of Battelle presented the "Briefing on LMS Requirements Planning" that had been presented to the DMMs and LO on December 11 and to PM on December 14 by K. Miller of Battelle. Because hard copy of the VuGraphs was not available to the ALC participants, they had to be copied on the electronic blackboard. Consequently the twenty minute briefing lasted more than one and one-half hours. This may not have been all bad however since the material was totally new to most ALC participants. What was originally a briefing became much more of a tutorial session.

After a short lunch break, LO personnel took some time to confirm the organization of planning groups to address each LAG. M. Lammers then presented the revised schedule for the balance of December 15 and for December 16.

D. Hill then presented the LMS Requirements Planning backup VuGraphs that provide further explanation of the eight planning steps and provide sample outputs taken from the Level III Maintenance LAG 50 planning output. This presentation moved fairly quickly since by this time that set of VuGraphs had been reproduced and distributed to all participants.

On December 16, 1981 Mel Lammers opened the planning session with a brief review of processes and LAGs for the benefit of some new participants at the ALCs. Dr. Hill then reviewed the contents of the planning package that had been used by LO to develop the strawman LAGs and by the participants at the San Antonio meeting in November. This was followed by a review of LAG 31 led by George Kawanishi (LOLM).

After the LAG 31 discussion, LAG 32 was briefly discussed. Then D. Hill discussed the concept of developing and structuring change objectives as a step leading to the definition of alternative approaches. LAG 32 current shortfalls were used in an example.

After the discussion on change objectives C. Gridley (LOEP) led a discussion of LAG 36. This again resulted in a good discussion. Finally G. Kawanishi gave the planners their assignments and reconfirmed the TeleTeach Sessions on January 5, 1982 for LAG 32, on January 6, 1982 for LAG 31 and on January 7 and January 8, 1982 for LAG 76.

Subsequent to the December 16 Session, Battelle did not participate in the TeleTeach Sessions. Battelle did provide guidance to XRB analysts in preparing for TeleTeach Sessions, particularly in the area of defining shortfalls, change objectives, and alternative approaches.

Battelle also assisted in two meetings held on February 10, 1982 designed to introduce and demonstrate the application of evaluation criteria to the prioritization of alternative approaches to attaining change objectives. The first meeting addressed change objectives and alternative approaches developed for Lag 31: Material Deficiency Reporting (MDR). Some time was spent discussing the evaluation criteria that the MDR group had developed and it was decided to use an evaluation scale of 5 (actually from -- to ++ to avoid numbers). Alternative approaches were evaluated for two of the five MDR change objectives. The procedure worked quite well and the group decided that they would be able to proceed with the evaluations on their own.

In the second meeting XRB and Battelle analysts met with the Lag 32: Tech Order Management group. Some time was spent discussing the change objectives and alternative approaches that had been developed for this Lag by Oklahoma City ALC personnel. Some inconsistencies were identified and G. Kawanishi decided that his HQ people should review the material in detail before going through the evaluation procedure. Some time was spent discussing the evaluation criteria and results of the morning session. Kawanishi seemed to think the procedure was acceptable.

These meetings on February 10, 1982 were the last substantive support that Battelle provided to Level II Improvement Planning.

Output

The first time that the ALC participants had an opportunity to make additions and changes to the previously generated planning results was after

G. Kawanishi's review of LAG 31 on December 16. As a result of the LAG 31 discussion some new information outputs and destinations were added and an error in the symbology was identified.

Similarly, good discussion and some relatively minor improvements to the planning results were made during the TeleTeach session.

Subsequent to the TeleTeach sessions on December 15 and 16, Headquarters AFLC and ALC staff significantly reworked the planning outputs with an emphasis on identifying current and future shortfalls and the approaches needed to overcome these shortfalls.

Recommendations

This set of recommendations reflects a somewhat limited role by Battelle in the TeleTeach and subsequent LMS planning meetings for the Improvement Process. There are three areas addressed. The first involves some observations on use of the TeleTeach technology. The second involves the preparation of materials to bring new people into the planning process. Finally, there are a few comments on developing evaluations of alternative approaches.

TeleTeach

The TeleTeach technology is effective when it is working properly and when appropriate planning materials have been prepared and delivered to participants. In our experience, there were technical difficulties in keeping both the audio and graphics capabilities operational at all five ALCs and at HQ AFLC. It is disruptive to everyone on the network when one terminal loses audio and/or graphics capability. Everyone has to wait while technicians attempt to get the network patches back together.

On a more positive note, it was found that TeleTeach allowed for wide participation in the LMS planning, and for bringing in specialists in a particular functional area on an "as needed" basis.

The TeleTeach tends to focus the group on whomever is speaking or writing. Corner discussions seem to be much less of a problem than they would otherwise be in a meeting with the number of participants involved in the

Improvement planning sessions. This large number of people does make it important to establish and enforce a speaker protocol at the beginning of each session. It is simply a matter of having each speaker giving his name and affiliation/location each time he speaks on the network. But it is important that the speaker's identify be established each time the person speaks so that everyone can keep track of the discussion.

Using TeleTeach, it was found that changes to previously prepared planning materials could be generated. Some difficulty was experienced in capturing and documenting shortfalls as they were identified. It is difficult to judge the relative effectiveness of this approach when compared to a face-to-face meeting with a large group and all of its attendant problems, but the general feeling is that TeleTeach provided an adequate medium of communications when it was working properly.

Preparation of Materials

As indicated previously, the preparation of tutorial materials becomes particularly important in the TeleTeach environment. TeleTeach promotes considerable flexibility in involving many different people in the planning process who may be totally unfamiliar with the LMS Modernization Program and with the methodology for LMS Requirements Determination. The materials prepared to help communicate the essence of the Modernization program and Requirements Determination Process were simply not available in time for people to read them before the first meetings in December. But even if they had been available, it is not clear that they would have been understood by the participants. Attaining understanding takes time. Even with the availability of improved materials such as contained in the three-volume "Handbook for Logistics Management Systems (LMS) Requirements Determination Planning Process" it will require the commitment of significant amounts of staff time for the participants to develop the understanding necessary to facilitate their effective participation as LMS planners. This requirement must be recognized and satisfied as well as the requirement for direct involvement in planning activities.

Evaluation of Alternative Approaches

Finally, the area of evaluation of alternative approaches deserves comment. The structure originally proposed by Battelle involved the identification of shortfalls, grouping the shortfalls under change objectives, and then developing and evaluating alternative approaches to satisfy the change objectives.

XRB analysts directed the three groups (one for each LAG) to generate shortfall definitions that are all problem oriented (i.e., what is wrong). XRB also asked them to generate "fixes" for each shortfall. This would be followed by having them develop alternative approaches from these "fixes", and change objectives from the shortfalls. The change objectives and alternative approaches would then be matched/modified as required. XRB felt that the deviation from the original process of identifying shortfalls, change objectives, and alternative approaches, in that order, was necessary to get effective ALC participation. It was found that the ALC planners would address shortfalls and fixes but had some difficulty with defining change objectives and alternative approaches. To expedite the planning the ALC proposals were directed to identify fixes corresponding to each shortfall.

This deviation from the original direction does not appear to be serious from the point of view of identifying current shortfalls. However, this would tend to focus the planners' attention on existing shortfalls and not on shortfalls that might exist in the future. Whether or not this was a contributing factor, the resulting shortfalls and "fixes" have tended to be dominated by existing problems rather than potential future problems. Many other factors could have contributed to this result but there remains a problem in how to elicit future-oriented ideas. One possible solution is to assure the participation of at least a few senior management persons in each planning session to provide a long-term view of management system needs.

The actual evaluation of alternative approaches can be performed through a variety of techniques. The techniques described earlier appeared to work well and the participants seemed to be comfortable with the procedure.

In fact, they were apparently able to continue on their own with the evaluation of other alternative approaches after some instruction in going through the evaluation of two approaches.

The main point to be made here is that there is no one "correct" or "best" evaluation technique. It is probably best to stay away from numerical scoring to prevent people from doing mental arithmetic and attach undue meaning to what are in fact subjective judgements. The purpose of the evaluation procedure is to help structure the evaluation process, to assure that the major decision factors are considered, and to arrive at a relative ranking of the alternative approaches.

Conclusions

The LMS Requirements Determination Planning methodology developed under Contract No. F33600-80-C-0414 has been applied and adapted to LMS planning for the Improvement Process. This brief report covers only the lessons observed from those activities that Battelle's Columbus Laboratories supported.

Basically the planning methodology was applied much as planned with adaptations being made to accommodate the TeleTeach sessions. The lessons learned that are generally applicable have been reflected in the latest version of the planning methodology. This methodology is to be documented in a three-volume "Handbook for Logistics Management Systems (LMS) Requirements Determination Planning Process", scheduled for June 30, 1982.

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