

project planning and management series

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ACKNOWLEDGEMENT

The Project Planning and Management Series consists of a set of manuals and associated modules presenting practical approaches, tools and techniques for project planning and management. (See list on back cover). A product of the Government of Jamaica/USAID National Planning Project (1976-1980), the series was developed by the Project Development Resource Team (PDRT) of PAMCO for use in "action-training" workshops and reflects extensive experience in training and project development. All present PDRT members are contributing authors and have worked together in writing, revising and publishing the series. Special credits are due to Dr. Merlyn Kettering for design and development of the series; Dr. Bruce Brooks for writing final versions of many modules; Mrs. Marjorie Humphreys for assuming primary editing and production responsibility and for organizing draft papers into more useful materials; Mr. Lascelles Dixon, head of PDRT since 1979, for designing the cover and improving many of the illustrations; and Mrs. Christine Hinds and Miss Linette Johnson for typing the drafts and final manuscripts. Any comments on the series and its usefulness are welcome.

Marcel Knight
Managing Director
PAMCO
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Contributing Authors:

Merlyn Kettering
Bruce Brooks
Conrad Smikle
Lascelles Dixon
Michael Farr
Marjorie Humphreys

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MODULE 41

DESIGN OF A PROJECT MANAGEMENT CONTROL SYSTEM

Merlyn Kettering

- A. PREREQUISITES: None
References: See list on page 41. 10.

B. PURPOSE:

A project management control system enables the project manager to have the flow of information necessary for monitoring project progress, with special attention to:

- 1) identifying deviations from plans;
- 2) analyzing significance and implications of deviations;
- 3) identifying opportunities for project plan modifications; and
- 4) providing an information foundation to devise corrective action.

C. USE:

INTRODUCTION

If the project manager is assigned to a project which does not have a sound information and control system, there are steps which can be followed to establish a desirable system.¹⁾ Many different approaches have been suggested but with general similarities. The following steps reflect the necessary actions for establishing (or reviewing) such a project control system.²⁾

1) SEE STEP FIVE IN PLANNING FOR PROJECT IMPLEMENTATION MANUAL

2) This module is an excerpt from US/AID, *Training Guide for US/AID Project Operating Support System*, US/AID, Washington DC 1979 pp 16-21.

D. STEPS IN DESIGNING A MANAGEMENT CONTROL SYSTEM:

1. Make a Technical Review of the Project (or Program)
2. Identify the Project's Purpose and Outputs
3. Identify the Data Elements
4. Determine Management's Desires
5. Develop Key Indicators
6. Select Key Indicators
7. Structure the System Formats
8. Determine the Reporting Frequency
9. Predetermine Standards
10. Establish Tolerable Ranges for Indicators
11. Arrange for Feedback

E. DISCUSSION OF STEPS TO DESIGN A MANAGEMENT CONTROL SYSTEM:

Step 1. *Make a Technical Review:*

Although you need not be a technical expert, you must become at least superficially familiar with the technical aspects of the project or program which you are going to manage. Therefore, if you have no technical background in the subject matter, locate some introductory materials and get yourself a "Reader's Digest" education on the topic. This will enable you to communicate. Then call in some technical experts and rely on them for technical fine-points.

Step 2. *Identify the Project's Purpose and Outputs:*

What is the project specifically supposed to accomplish? This is an obvious, but often neglected point. People sometimes get so immersed in the immediate day-to-day operations of what they are doing -- the "input" and the "throughput" -- they forget about the "output" and overall purpose that they are supposed to achieve. Remember that without clear objectives, no individual or group can be expected to perform effectively.

Step 3. *Identify the Data Elements:*

Together with your technical experts, "brainstorm" the possible raw elements of data that could be obtained or be useful to the project. Do not worry about their significance, how realistic it would be to obtain them, their source or formatting, and do not become alarmed at the number. Just list them. During this brainstorming session many "intermediate" data elements and indicators (such as rates, ratios, and percentages) will be suggested. Include them, but remember that such data cannot usually be obtained directly. It must be calculated from more basic data, which you should also identify. As a help in this stage, screen the existing files and see what kinds of data have been reported and utilized in the past on this or similar projects.

Step 4. *Determine Management's Desires:*

Sometimes, top management has well established ideas about what it wants, and can be of assistance to you in the formulation stage. Often, however, management does not know precisely what it wants, so asks for "everything". Generally, the less confident they are in their managerial ability, and/or the more technically competent they are in a particular aspect, the more indicators management will feel the need for. Obviously, "Everything" is not a feasible option for an Operating Support System, and you should not limit yourself to (or accept uncritically) the indicators that management requests. In many instances, the manager may not have been totally aware of the project in terms of key indicators. He/She may have merely accepted those that already existed when he/she took over, or those with which he/she is familiar from his/her specialized technical training. For instance, an engineer who becomes a project manager usually requires a lot of engineering type data to manage by; a former budget officer surrounds himself/herself with financial data; and ex-personnel officers tend to look at organization charts, staffing patterns and workloads for guidance. The actual selection of indicators will usually be delegated to the system designer. However, the project manager will have to be persuaded that the project can be effectively monitored with them.

Step 5. *Develop Key Indicators:*

For every key aspect of the project, one or more indicators should be developed. Management's capability to use the

information desired and/or developed is the paramount criterion in establishing key indicators. If a piece of data does not perform a function in the decision-making process, there is no use collecting it.

In general, most managers receive far more information from many sources than they can possibly use. Some is useful, some nice-to-know, and some totally irrelevant. However, before they can make this decision, they have to sort it out and segregate it, which consumes a large portion of their valuable time. Do not add to the manager's burden by further overloading him/her with irrelevant or nice-to-know information. He/She will not thank you for it. Put yourself in the manager's shoes and think the decision-making process through. Ask yourself what kind of decisions the manager could make concerning the project. Then ask yourself "would it make a difference if I did not receive this piece of information?" If not, eliminate it; and if in doubt -- throw it out!

Generally, managers are not (or should not be) interested in the specific details of a situation, but rather what these details can mean in a "big picture". Rates, ratios and percentages are more likely to be useful indicators than actual units of measurement. One of two unit measures may be useful to the manager as well, just so he/she does not lose touch with the substance of the project.

Step 6 *Select Key Indicators:*

If you have more than one indicator for the same process or particular aspect of the project, consider whether any are redundant. Would one be better than the other? Why have two when one might do? One caution to observe in selecting indicators -- make sure that the raw data elements that are required to develop the indicators are obtainable! There are instances where beautiful indicators were developed, but the raw data was impossible to obtain from any source! This, of course, renders the whole thing "inoperable".

Much nonsense is injected into many management information systems by "old line" reports officers and inexperienced designers at this juncture. They typically claim that a lot of data is necessary (and thus cannot be pruned) because it can be used in cross-checking. Here they fail to distinguish between *research* (and/or technical operational) data and *management indicators*. In fact most data reported to management levels is *not* used to cross check, even if it could be. More often, it is merely

recorded and filed. Furthermore if it is compared, there is usually no statistical significance testing done. Without such analysis, raw numbers that do not exactly compare give rise to more questions than answers, confusing rather than clarifying the picture for management. It also dissipates the field staffs productive technical efforts because every element of data required by management takes time and effort to collect.

Therefore, when you are at the stage of reviewing data elements to select key indicators, wield the pruning pencil freely! As you proceed, keep management informed of your progress so that they will understand what you are doing, and hopefully feel they are a party to it. Otherwise, they will say "That's not what I want," and either reject it outright (and you along with it!) or start redesigning the whole thing over again. In either case, much work will have been wasted and time lost.

Step 7. *Structure the System Formats:*

With the key indicators clearly identified, selected and tentatively approved by management, you may proceed to structure the way in which data will be recorded and reported at all levels in the system. Start with Top Management's report. Make a dummy outline of what you want to present, using some hypothetical data. This will guide you in organizing the data required to support it. Anything that does not contribute to the above can be further purged from the system! There are four basic types of formats involved in an MIS: The Basic Worksheets, The Transmission Reports, The MIS Staff Analysis, and The Top Management Summary. The format in which information is presented to management should be different from the manner in which it is received. Management's report should be organized so that everything is in an orderly manner, easy to locate and understand. On the other hand, the basic raw data recorded by the field technician on a worksheet should be designed for convenience in collection. Transmission of data from the technician should be in a summary report designed for ease in transmission.

Failure to do this preliminary design work is the basic weakness in traditional reporting systems. It is an important point for further discussion. From observation of reporting systems that have been structured, the syndrome seems to be a pattern of overemphasis on designing *worksheets*, but neglect of *transmission* and *management summary* reports design. The worksheets usually seem to be

highly structured in a matrix format with many redundant data elements transmitted, unanalyzed, to the next management level. In a good design, the worksheet of the technician is not a miniature picture of that which top management receives. The basic raw data elements recorded on the worksheet are only a part of the data used to establish the key indicators. Top management's information comes from many sources.

Transmitting worksheets is counterproductive in many ways. Since the burden of analysis rests with the recipient (who rarely has the time or the staff capacity to do so), they continue on through the hierarchy largely unanalyzed. At the same time, worksheets foster two illusions: (1) By Management, that with so much data, so well organized on "spread sheets" at the lower levels, "they" know what is going on; and (2) By subordinates, that the higher levels can summarize whatever "they" want from all our data! The sheer bulk of the document when received by top management, however, inhibits more than a cursory glance, and with the pressures of time, usually goes unread. Worksheets do indicate to outsiders that management has a lot of facts at its disposal and thus, presumably knows what is going on, and indeed, such reports are often used by management as "handouts" to questioners. Thus, "worksheet" reports become bureaucratic scriptures -- freely circulated, often alluded to, occasionally glanced at, but seldom read, and rarely interpreted. Unfortunately, they have little impact upon the programs or projects being reported upon. Their production becomes the *end* rather than a *means to action* based on the consolidated information they contain. The time absorbed in their preparation also precludes other productive work by field personnel, upon whom the ultimate burden for data gathering rests. Awesome, but unread, worksheet reports are thus institutionalized, regardless of utility. When they fail to do the job intended, frustrated management imposes additional reporting requirements in ever greater detail on the already overburdened system!

Imposing a new reporting structure on any organization always causes problems. Management's assurances that it is better, more effective, more efficient, etc., usually fall on deaf ears. It means new procedures, additional paper and leg work on the part of the "doers", with little, if any, benefit to *them*. It is always helpful, therefore, if you can eliminate an existing requirement as a *quid pro quo* when installing a new system. Before you finish structuring your formats, also check with the existing system to see

whether any of the required new data elements could be culled from these existing secondary sources.

Step 8. *Determine the Reporting Frequency:*

How often should management be kept informed on a regular basis? Daily, Weekly, Monthly, Quarterly, Annually or when?

There is no standard answer for this. The urgency of the situation, the available communication network and the staff time required and available to process the data are all important factors to take into consideration.

As a general practice, however, management seems to want information much more frequently than it can be gathered and processed, and also more frequently than management's ability to absorb. For example, a report that is submitted by a field agency to the central office on a *weekly* basis because of a statutory requirement serves no constructive purpose if the central office only has the capability of summarizing it monthly!

Step 9. *Predetermine Standards:*

You should determine levels that can reasonably be expected to be attained in each of the indicators at various intervals during the life of the project. Management may already have some overall goals established. Your job is to help management think through the project and indicators in detail. Be patient. Management may not have gone through this exercise before and may consider it a waste of time, impossible to do, or both. However, you must persist, for without a basic plan, you will have nothing with which to compare the actual results, and your information will be reduced to "nice-to-know, but so-what", rather than information upon which to act. Managers generally tend to feel that defining goals or standards is extremely difficult since activities vary from year to year, from one person and one project to another due to a myriad of uncontrollable variables. Despite this, it is important that management state what it would like to happen as a result of the project.

In some situations (particularly where you are comparing a large base of different work units performing similar functions), predetermining standards is not so critical. Instead, the variance between work units for any particular indicator can be monitored and reported, and used as the basis for applying managerial pressure to the extremes.

Standards can then be developed as you go based on "normal" or "average" performance. However, unless the project is open-ended in time, its objectives may not be met in this way.

Step 10. *Establish Tolerable Ranges for Indicators:*

The principle of "management by exception" means that matters should only be brought to top management's attention when things are "exceptional" -- good or bad.

Having established what indicators are significant, management must now determine what is meant by "exceptional". $\pm 5\%$ variation? $\pm 10\%$ variation? Or what? In real life, things hardly ever work out exactly as planned. Sometimes they get a little ahead, sometimes a little behind. Allowance must be made for these variances, otherwise, management will be saturated with detail. Where a number of similar work units are being compared, instead of absolute variation being used as the measure, the number of statistical "standard deviations" from the main can be utilized.

At first-line supervisory levels, the exception principle is not generally applicable. It is the responsibility of these managers to keep their production/accomplishment up to standard wherever possible. They must, therefore, be aware of actual production as the work proceeds so that they can take on-the-spot corrective action as needed. When they pass on summary information to top management, they should be aware of the details when management calls *them* on an exception basis!

Step 11. *Feedback:*

It is important that the comparative analysis (which the management information staff prepares in its continuous monitoring of indicators) be made available to the various subordinate managers and staffs, so that they may see their relative standings and contributions to the overall program. As indicated earlier, although they should know the items which *they* contributed to the report, they may not be aware of some of the data elements (and consequently the indicators) provided from other sources. Also, by seeing their own ranking compared to their peers, they may obtain a better perspective of their own role in overall program accomplishment.

F. SYSTEM DEVELOPMENT VS. ACCURACY:

It is important to recognize that in the development stage, establishing a valid and reliable *system structure* has *priority* over obtaining accurate data. In the early stages of implementation, numerous errors will surface throughout the system. The project manager or staff should not make adjustments to the data received (interpretations of what "they" really meant) merely because it looks wrong. The data should be accepted and recorded at its face value. During the comparative analytical phase, these obvious errors will show up again and be available for corrective follow-up action.

Accuracy can always be improved with closer follow-up and double-checking. However, unless the integrity of the system is stressed, monitored and maintained, basic errors in the system may continue from the source, uncontrolled. Once the system is established, time can be spent by the staff to follow-up before utilization of the reported data. The tendency to "second guess" the reported data must be curbed, however.

G. LIMITATIONS:

The foregoing is a generalized explanation of the procedure for developing a Management System. Any system developed for this purpose should be relatively simple, easy to understand, and not require a great amount of the field staff's time to implement and operate.

Once developed, such a system can provide a high level of information on a project with a minimum amount of effort on the part of the manager. In general, it will simplify life while giving increased effective control over the project.

A good system does not guarantee effective management. However, with a poor system, even the most outstanding project manager can do little more than rush from one crisis to another, hoping that any ad hoc decisions will withstand the penetrating review of hindsight.

H. ASSUMPTIONS:

A management system which provides regular systematic analysis of indicators (technical or otherwise), is not a substitute for judgement. It is only an aid to judgement. Systematic monitoring, control and analysis helps project managers by isolating those areas where judgement must be applied and by indicating the potential significance of the information as revealed by the available data.

Management Support Systems are based on the assumption that most variations from planned occurrences are at least partly susceptible to rational analysis, and try to deal with these in a disciplined way. Regular monitoring of indicators, structured analysis, and presentation to management can eliminate much of the guesswork for the decision makers, leaving them more time to ponder the imponderables and weigh the intangibles -- to set the policies and directions for the project that they think will help attain the desired objectives.

LIST OF REFERENCES:

Project Management Manual:

- MODULE 2 - *Logical Framework*
- 3 - *Work Breakdown Structure*
- 6 - *Linear Responsibility Charts*
- 7 - *Project Scheduling Bar Charts*
- 8 - *Bar Charting for Project Control*
- 10 - *Milestone Status Charts*
- 30 - *Brainstorming*
- 36 - *Project Documents for Planning and Implementation*
- 42 - *Evaluating & Forecasting Project Progress & Performance*
- 46 - *Withdrawal & Accounting for Loan Funds*

Project Planning and Management Series.

MANUAL - I Planning for Project Implementation
MANUAL - P Project Planning
MANUAL - M Project Management
MANUAL - PF Pioneer Farm Implementation Planning

MODULES

1. Defining Project Objectives (Objective Trees)
2. The Logical Framework
3. Work Breakdown Structure
4. Activity Description Sheets
5. Project Organization
6. Linear Responsibility Charts
7. Project Scheduling - Bar Charts
8. Bar Charting for Project Control/Scheduling
9. Project Scheduling - Network Analysis
10. Milestones Description Charts
11. Resource Planning & Budgeting
12. The Role of PAMCO
13. Project Technology Analysis
14. Demand Analysis
15. Market Strategy Analysis
16. Project Area Analysis
17. Project Costs & Benefits
18. Project Profile
19. Financial Analysis
20. Cash Flow Analysis
21. Discounting
22. Net Present Worth Analysis
23. Cost-Benefit Analysis
24. Benefit-Cost Ratio Analysis
25. Internal Rate of Return
26. Social Analysis of a Project
27. Economic Analysis of Projects (including Border Pricing)
28. Financial Statements & Ratios
29. Project Selection & Ratios Analysis
30. Brainstorming
31. Decision-making System for Projects
32. Project Institutional Environmental Analysis
33. Ecological Analysis for Projects
34. Introduction to Contracts, Jamaican Contract Documents & Tendering Procedures
35. Selection & Use of Consultants
36. Project Documents for Planning & Implementation
37. Report Writing for Projects
38. Project Files
39. Formats for Pre-Feasibility & Feasibility Studies
40. Motivation of Employees and Personnel Evaluation
41. Design of a Project Management Control System
42. Evaluating & Forecasting Project Progress & Performance
43. Project Termination
44. Introduction to Lending Agencies
45. Organizing and Conducting Conference Meetings
46. Withdrawal of and Accounting for Loan Funds in the Financing of Projects