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David Novick

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LONG-RANGE PLANNING THROUGH PROGRAM BUDGETING

David Novick^{*}

The RAND Corporation, Santa Monica, California

A plan for an organization, whether a government agency or a business firm, prescribes actions to be taken and activities to be carried on in the future to advance the organization's perceived objectives. Plans vary widely in substance and form according to the nature of the organization, the scope of the plan, and the time-frame to which it applies. However, one element is universal in the planning of any organization that produces goods or services: At some point the plan must deal with the question, "How shall the organization make use of its available resources?" This--the resource allocation question--is fundamental, because in every sphere of the organization's activity the amount of resources sets limits to what can be accomplished.

The strategic and most comprehensive form of planning is long-range planning of the organization's total program. In business, such planning may comprehend the full set of product lines and productive functions of a diversified corporation. In government, it may encompass the programs of an entire Department or Ministry or, perhaps, the development of a "Five-Year Plan" for an entire jurisdiction. My talk today deals with a system for organizing the long-range planning function and for assisting managers in reaching the key resource allocation decisions that confront them in this long-range planning context.

For more than twenty-five years I have been developing a management tool--Program Budgeting--which is designed to strengthen an organization's capability to do long-range planning and to provide a systematic

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method for resolving major resource allocation issues.* Program Budgeting--or the Planning-Programming-Budgeting Systems abbreviated as PPB--focuses on the basic function of management, which is to use the organization's available resources in the way that will be most effective in meeting its goals. Basically, the PPB system contributes to the planning process in two ways.

First, it establishes and makes explicit the relationships, or linkages, among the organization's objectives, its programs and activities, the resource implications of those activities, and their financial expression in a budget. In so doing, it provides much of the information needed for rational planning in an easily usable form.

Second, PPB contributes directly to management decisionmaking by providing analyses of the consequences, in terms of estimated costs and expected benefits, of possible program decisions.

While this may sound like a very broad charter, it should be borne in mind that there are a number of important things that PPB does not do: One is that PPB, as it is discussed here, is an instrument for overall planning which utilizes existing systems for directing and controlling operations and therefore does not necessitate change in either existing organization or methods of administration. Second, PPB is specifically designed for long-range planning and budgeting; it is not primarily a tool for conducting the annual budgeting-accounting cycle, although next year's budget must be included in its purview and accounting supplies part of the reports. Third, although PPB stresses the use of quantitative analytical methods, and in some cases a rather extensive use of modern computer technology, it does not attempt to quantify every part of the problem or to computerize the decisionmaking process.**

Today, PPB has been in operation for seven years in the U.S. Department of Defense. Since 1965, efforts have been under way to extend the

* Program Budgeting: Program Analysis and the Federal Budget, 2d ed., "Introduction," D. Novick (ed.), Harvard University Press, Cambridge, Mass., 1967.

** D. Novick, The Role of Quantitative Analysis and the Computer in Program Budgeting, The RAND Corporation, P-3716, October 1967.

system to other departments and agencies of the U.S Federal Government. Many state and local governments in the U.S. have taken action to apply PPB methods to their own planning problems and similar methods are in use in major business firms. Nevertheless, in some organizations the advent of PPB has caused much apprehension and insecurity. This is largely the result of misunderstanding of what PPB is and what it does. When understood and in operation, the Planning-Programming-Budgeting System turns out to be just common sense and simple. Perhaps because people assume it to be revolutionary and complex, it is usual that only in doing program budgeting does the real content come through--it is revolutionary but simple.

THE PROGRAM BUDGET CONCEPT

A few basic concepts provide the main elements of which the PPB system is constructed:

OBJECTIVES are the organization's aims or purposes, which, collectively, define its *raison d'être*. They may be stated initially in broad and relatively abstract terms, as for example, when we say that the objective of a defense program is to provide national security or the objectives of education are to provide good citizens and productive participants in the economy. However, objectives at this level are too remote from the organization's specific activities to be useful for formulating or evaluating programs. They must be translated into lower-level objectives that can be stated in sufficiently concrete terms to be operational.

PROGRAMS are the sets of activities or program packages undertaken to accomplish objectives.* A program generally has an identifiable end-product. (Some programs may be undertaken in support of others; if so, they have identifiable intermediate products.) Several programs may be associated with an objective, in which case they may be identified with distinct sub-objectives or with complementary, but separable, means for accomplishing the objective.

*Wartime Production Controls, D. Novick, M. Anshen, and W. C. Truppner, Columbia University Press, New York, 1949, pp. 109-111.

RESOURCES are the goods and services consumed by program activities. They may be thought of as the inputs required to produce each program's end-product. Program COST is the monetary value of resources identified with a program.

EFFECTIVENESS is a measure of the degree to which programs accomplish their objectives. It is related to BENEFIT, which is a measure of the utility to be derived from each program.

Program budgeting for an organization begins with an effort to identify and define objectives, and group the organization's activities into programs that can be related to each objective. This is the revolution, since it requires grouping by end-product rather than by administrative organization or by function. This is done so that we can look at WHAT we produce--output--in addition to HOW we produce or what inputs we consume. The program budget itself presents resources and costs categorized according to the program, or end-product, to which they apply. This is in contrast to the traditional budgets found in most organizations that assemble costs by type of resource input (line item) and by organizational or functional categories. The point of this restructuring of budget information is that it aids planning by focusing attention on competition for resources among programs and on the effectiveness of resource use within programs. The entire process by which objectives are identified, programs are defined and quantitatively described, and the budget is recast into a program budget format, is called the structural phase of Planning-Programming-Budgeting.

Often, both in government and in business, responsibility for the work required to accomplish a coherent set of objectives is divided among a number of organizations. In the U.S. Government, for example, programs with objectives for health and education are each fragmented among a dozen bureaus and independent agencies. The activities of each one are sometimes complementary, sometimes contradictory or conflicting with those of the others. But in any case, under traditional budgeting systems, planning for these programs tends to reflect their fragmented organization. There is no overall coordination of the resource allocation decisions relevant to program objectives. One of the strengths of program budgeting is that it is capable of cutting across

organizational boundaries, drawing together the information needed by decisionmakers without regard to divisions in operating authority among jurisdictions. The advantage for planning is obvious: A program can be examined as a whole, contradictions are more likely to be recognized, and there is a context--otherwise lacking--for consideration of changes that would alter or cut across existing agency lines.

One product of the structural phase is a conversion matrix or "crosswalk" from the budget in program terms to the traditional or functional budget which treats of organizations like departments and sections in categories such as wages and salaries, supplies, equipment, etc. Through the crosswalk we are able to translate on-going methods of record keeping and reporting into data for program planning. Through it we are also able to translate program decisions into existing methods for directing, authorizing, controlling, recording, and reporting operations. If existing management methods in any of these areas are inadequate or unsatisfactory, they should be upgraded and improved whether or not the organization has a PPB system. In any case, the Program Budget must derive information and relationships from existing management records and practices and must rely on them for the implementation of the programs that are to be put into operation.

The long-range planner encounters problems of choice at several levels. At the highest level, the different programs and objectives compete for their shares of the organization's total resources or total budget. For example, in a government Transportation Ministry, there is competition among programs for international transportation, domestic intercity transportation and local transportation. In a business firm, there may be competition for investment funds among different product lines, different research and development projects, and so forth. At a lower level, the problem of choice focuses on decisions among alternative ways of carrying out a program. For instance, in connection with the Transportation Ministry's program of domestic intercity transportation, choices have to be made among alternative transport modes--railway, automobile, and air transport--or among alternative combinations of modes.

In program budgeting, the approach to this problem is to apply analysis wherever it is possible, so that decisionmakers will be able to

make the final judgments with as much objective information as can be assembled. Thus, a Planning-Programming-Budgeting system subsumes a systems analysis capability, with which the resource and cost implications of program alternatives and their expected "outputs" or accomplishments may be estimated, examined, and compared. (When a systems analysis capability is not in being or inadequate, it should be created or upgraded since analysis is perhaps the most important part of PPB.) A wide range of techniques is employed in these program analyses, including statistical analysis, modeling, gaming, and simulation, operations analysis, econometric techniques, etc. Systems analysis examines both the resource/cost side and the benefit/effectiveness side of program consequences.

An important aspect of systems analysis in connection with program planning is that it often goes far beyond the decision problem as initially given. Program analysis is not confined to examination of predetermined alternatives. Development of new and better alternatives is part of the process. It is likely that analysis of possibilities A, B, and C will lead to the invention of new alternatives D and E, which may be preferable (more cost/effective) to the original candidates. Therefore, the analytical aspect of PPB cannot be viewed merely as the application of a collection of well-defined analytical techniques to a problem. The process is a much more flexible and subtle one, which calls for creativity by the analyst and interaction between the analyst and the decisionmaker during the decision process.

OTHER IMPORTANT FEATURES

I will briefly mention some other features of the PPB system in order to convey a fuller impression of the context in which these principles are applied:

Extended Time Horizon. Since program decisions that we make today often have implications that extend far into the future, and since program costs may be incurred and benefits received many years after a decision is made, meaningful planning requires a long time horizon. Generally, the program budget itself and the associated program analyses cover at least a five-year period and, where appropriate, they should

be extended ten or fifteen or more years into the future.

Planning, not forecasting, is the purpose of the PPB system. Our aim is to examine the cost and benefit implications of relevant alternative courses of action for the future. The program budget, which conveys a projection of existing programs and a display of decisions already made, provides a baseline and serves as a frame of reference for specification and analysis of alternatives. It should not be thought of as a static extrapolation of a program.

Comparability rather than accuracy is the main consideration in our analysis of program cost and benefits. Because of intrinsic uncertainties in long-range planning, absolute accuracy is, in any case, not attainable. The relevant criterion for analyses is consistency in treatment of different alternatives. This must be accompanied by explicit treatment of uncertainties, including tests of the sensitivity of analytical results to variations in circumstances. Excessive concentration on absolute accuracy is likely to be self-defeating since it would tend to overwhelm the work with detail and make this kind of planning impracticable. A corollary is that aggregate, not detailed, data must generally be used in cost and benefit estimation. Excessive detail makes examination of many alternatives costly or impossible, so we abstract from detail where we can and focus on variables that have important impacts on program consequences.

Several points may be made about the cost concepts that enter into program analysis:

Full costing of programs and program alternatives is required if we are to achieve the needed consistency in our estimates. Programs often have indirect cost implications that are difficult to trace. There may be important interdependencies between "direct" and "support" programs or among direct programs themselves (e.g., joint cost situations). In order to sort out the full cost implications of alternatives it is often necessary to have a cost model or its equivalent that is capable of translating the total program of the organization into resource and cost implications. The cost figures that will actually be compared with benefit estimates are incremental costs associated with specific program decisions, but these must be derived by comparing the full costs of either another program alternative or a base case.

Resources and costs are generally divided into three categories, corresponding to differences in the time pattern by which they are incurred and in the duration of their contribution to benefits. Research and Development costs are the one-time outlays to create new capability, e.g., studies of new products, services, or technologies, or of new methods for accomplishing programs. Investment costs are the nonrecurring outlays required to install new capability, e.g., construction of plants or facilities, purchase of equipment, training of personnel for participation in new programs, etc. Annual operating costs are the recurring costs required to operate either new capability to be installed or existing capability to be kept in use. Each of these elements of cost enters into the full cost of a program. All three elements are projected on a year-by-year basis and summed for each program and for the total program of the organization. Capital and operating cost implications of programs are looked at together, not separately as is the traditional practice in the budgeting of many governmental agencies and business organizations.

A planning-programming-budgeting system provides for communication between analysts and decisionmakers and between analysts, operating organizations and decisionmakers at different organizational levels. Some of the specific documentary forms that have been developed to facilitate this exchange of information are the following:

Program Memoranda provide the communication between the analysts within a program area and the analytical staff which services the decisionmaking group. In these paper studies the program group lays out the issues it identifies in the program area, the alternatives it recommends, and the pros and cons for its recommendations, as well as the data, analysis, and arguments for the possibilities it has rejected.

The top-side analytical group re-analyzes the program memorandum and writes its program memorandum in response. The reply may accept the recommendations for the same, different, or modified reasons. It may determine issues that have not been raised. It may suggest alternative program packages that have not been considered. It may modify alternatives that were examined. After as much study, analysis, and re-analysis as time permits, the top staff, with concurrence or objection

from the program manager, drafts the final program memorandum covering all issues and all alternatives for consideration by the decisionmaker.

Special Studies require more time and/or study resources than are available during the program memorandum period as scheduled. These areas are assigned for completion in the near future as the importance of subject indicates and will frequently (not always) cut across areas handled by two or more program managers. For reasons of time or specialized knowledge, parts or all of these studies may be contracted out.

Program Change action is another administrative step calling for analysis and study. Program Budgeting aims at a continuing, fluid management process. This means setting up a "base case" or set of decisions taken now which are revised and up-dated as required. When change is or appears to be in order, the program change process considers the proposed change and does so in a total resource, overall time context just as though it was a program memorandum in the original deliberations.

Ideally, this would mean only one overall Program Budget exercise. Changes would be made as required and the revised total program plan that resulted would now become the new base case which would be used for the "crosswalk" from the Program Budget into the immediate changes in the budget as well as next year's organizational and functional operating budgets.

INTRODUCING PPB

Two possible courses of action are open for the introduction of Program Budgeting. One is to set up a study group which would examine the government's or company's objectives, develop a program structure tailored to those objectives, recommend alternative organization and administration schemes, examine the organization's analytical capabilities and recommend education, training, and hiring policies to be followed in developing the analysis capacity required for Program Budgeting. (Re-assignment, up-grading, etc. would obviously be included.) This approach would aim at an operation to start 18 months to 2 years in the future.

The other way to proceed would start with the assumption that

Program Budgeting is the thing to do and get on with it. This would mean taking some "great leaps" to put it in use in a current planning and budget cycle, and learning in the doing the answers the study group would otherwise have provided.

To do this, one would start by:

- A. Setting up a program structure that uses major activities or lines of business as Final Product Programs, taking major government agency-wide or company-wide activities like electronic data processing (EDP) and calling them Major Support Programs and putting everything else, like research, planning, executives, etc. into a General Support Program category. This may or may not be the right program basis. It probably is not. However, it will fit existing practice and is a satisfactory starting point from which improvements can be developed over time.
- B. Have several Final Product Programs and Major Support Programs made the subject of Program Memoranda to be completed in 6 to 8 weeks. In developing the final product programs or major support programs, use is made of the existing analytic capability. The development of program memoranda and the other communication materials of the program budget places high reliance on analysis. Therefore, if the analytic organization is either understaffed or inadequate, immediate steps should be taken to expand and upgrade.
- C. Designate an individual(s) to complete the program structure so as to accommodate all of the government unit's or business unit's activities to the three major areas identified in A above. These studies should be completed in 8 to 10 weeks.
- D. Designate an individual(s) to develop a first-cut study on alternatives available for organization and administration of Program Budgeting in the government unit or the business organization.
- E. Agree on:
 1. Program identification;
 2. Possible program manager;

3. Organization and administration;
 4. Schedule of steps to be taken and dates;
- F. Get executive approval and move on.

One of the major advantages of this approach is that from the outset we get the required interaction between the operating, analytical, and decisionmaking parts of the organization which is essential to the development of an effective program budgeting system. By this device time is saved and more intimate knowledge of the content of the administrative procedure is developed by both analytical and operating personnel.

CONCLUDING REMARKS

Let me conclude with a few words about the use of the word budget in "Program Budgeting." Earlier I said "PPB is specifically designed for long-range planning and budgeting; it is not primarily a tool for conducting the annual budgeting-accounting cycle, although next year's budget must be included in its purview and accounting supplies part of the reports." The relationship between program and budget, and planning, programming and budgeting merits more complete description.

It is rather commonplace in the literature on budgeting for business to say, "The budget is the financial expression of a plan." Many people apply the same definition for government. Nonetheless, we are all familiar with the budget that was developed without a plan (particularly a long-range plan). In fact, it is probably fair to say that in most budgets such planning as there is, is a projection of the status quo with increments added on the basis of the most current experience. Turning to the other side of the coin, we all know of plans that never get translated into budgets. A statement made by Roswell Gilpatric when he was Deputy Secretary of Defense in 1961 typifies one of these situations: "In the past, the Defense Department has often developed its force structure by starting with a budget and sending it off in search of a program."* The other side is the elaborate plans made

* Roswell L. Gilpatric, "Defense--How Much Will it Cost?" California Management Review, Vol. V, No. 2, p. 53.

by either government or business which never get beyond the "top level" approval; that is, are never budgeted.

In summary, let me define Planning as the production of a range of meaningful potentials for selection of courses of action through a systematic consideration of alternatives. In the short range it deals with a limited number of alternatives because past actions have already locked in the available paths of action. However, for the long range (the major emphasis of Program Budgeting) the planning activity attempts to examine as many alternative courses of action as appear to be feasible and to project the future course of the organization against these in cost-benefit terms. Since the objective is not to make specific decisions but rather to turn up likely possibilities, the work is done in a general and highly aggregative form for both resources required and benefits to be gained.

Programming is the more detailed determination of the manpower, equipment and facilities necessary for accomplishing a program--feasibility testing in terms of specific resources and time. In Programming, the program and program elements used in the planning process in highly aggregative terms are moved down the scale to more detailed terms (as detailed as appropriate to the issue) required for determining the feasibility of the possibilities that are given serious study. Even here, for most cost elements, we are at a level of aggregation above that required for the detailed determinations that are involved in next year's budget. That budget is the translation of program cost elements into the specific funding and time requirements identified in traditional terms such as object class, function and organization.

Let me devote my last few minutes to a further effort to distinguish the program budget from the traditional next-year's budget. PPB is the development and preparation of a budget in a planning context; that is, done with information about what is in store for the future. The planning context puts it in contrast to the short-range fiscal management and expenditure control objectives which categorize the traditional approach. This new method allows the design of major shifts among purposes for which resources are to be used, ranging from changes in funding levels to the introduction of completely new activities.

Under the program budget, annual allotments of funds to administrative organizations allow them to take the next step along a path the general direction of which has been thoughtfully set by policy makers at all levels. Probably more important, the direction of the path and the distance to be covered in the next year will have been established after considering a number of possible futures for the entire company or business organization.