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What People Are Writing About

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what people are writing about

BOOKS

The High Priests of Waste by A. ERNST FITZGERALD, W. W. Norton & Company, Inc., New York, 1972, 416 pages, $8.95.

The industrial engineer who lost his job in the Pentagon for exposing the failure of the Air Force's C-5A cargo plane project tells his story—and presents a blistering indictment of the military-industrial complex.

A. Ernest Fitzgerald, a management consultant with his own industrial engineering firm specializing in cost reduction, was appointed Deputy for Management Systems (reporting to the Assistant Secretary of the Air Force for Financial Management) in 1965. It was a time when Secretary of Defense Robert S. McNamara and his Whiz Kids were promising to eliminate the waste in and make some sense out of the giant military procurement system. Four years and innumerable futile cost reduction attempts later, Mr. Fitzgerald was out of the Pentagon for telling an investigating committee headed by Sen. William Proxmire of Wisconsin that the cost of the C-5A cargo plane was running $2 billion over the original estimate.

Mr. Fitzgerald is, understandably, somewhat bitter over his experience. And he thinks the public should be, too, for it is the public's money that is being wasted in what Mr. Fitzgerald pictures as a giant boondoggle resulting from corruption, ineptitude, and, he thinks, deliberate policy.

There are only a few heroes in Mr. Fitzgerald's book, and of them only Senator Proxmire is less obscure than Mr. Fitzgerald himself. There are many villains—in the defense contracting companies, in the armed services, in the Department of Defense, even in a CPA firm—and nearly all of them are identified by name in this highly explo-

REVIEW EDITORS

In order to assure comprehensive coverage of magazine articles dealing with management subjects, MANAGEMENT ADVISER has arranged with fifteen universities offering the Ph.D. degree in accounting to have leading magazines in the field reviewed on a continuing basis by Ph.D. candidates under the guidance of the educators listed, who serve as the review board for this department of MANAGEMENT ADVISER. Unsigned reviews have been written by members of the magazine's staff.

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sive book. (The only exceptions are the consultants of McKinsey and Co.—referred to throughout as "the McKinseys"—whose Cost Management Improvement Program Mr. Fitzgerald saw as a device for perpetuating the old, unsound assumptions about cost control in a vastly more paper-intensive form.) A few characters in the story, like McNamara himself; Defense Comptroller Robert Anthony; and Dr. Leonard Marks, Jr., Fitzgerald's immediate boss, play more ambiguous—although on the whole negative—roles in the drama.

Mr. Fitzgerald's account of the vicissitudes of such weapons development projects as the C-5A (which ended in the famous Congressional bail-out of Lockheed's civilian and military business), the F-111 fighter plane, and the Minuteman missile is fascinating. So are his criticisms of the Whiz Kids' management gimmicks; he has much that is interesting to say about PERT/Cost, statistical analysis, cost and performance measurement, and fixed price incentive contracting. As an industrial engineer of the pre-management-science school, Mr. Fitzgerald has a bias in favor of more traditional means of cost control. Indeed, his Pentagon troubles began when he opposed the McKinseys' plan to base cost estimating on historical cost, "with the fat built in."

However, the problems in defense procurement, as Mr. Fitzgerald makes clear, are more fundamental than technical. They transcend individuals and parties: "Many of the cost-control advocates in the Pentagon . . . believed that things would change with the advent of the new Administration on January 20 and the departure of the old, sick, and frightened Democratic leadership. Things did change. They got worse."

The basic problem lies in ingrained attitudes. Mr. Fitzgerald hits hard at such attitudes as the "Ape Theory of Engineering" (". . . if enough chimpanzees could be put to work at enough typewriters, one of them would eventually reproduce the works of Shakespeare. . . . One manager of a contractor missile project told me he never worried about engineering problems. 'I just assign a thousand or so guys to the problem . . . One of them is bound to come up with a solution.' "); "cost Calvinism," which holds that ultimate costs of big weapons systems are preordained; the assumption that estimated costs will always be exceeded because of "Inexorable Economic Processes"; and the belief that it is futile to try to predict costs when operating on the "Frontiers of Man's Knowledge."

Not only is cost control in military procurement assumed to be impossible, it is even held to be undesirable. Many in the Pentagon sincerely believe, according to Mr. Fitzgerald, that the national economy depends on the maintenance of defense spending and that waste is unimportant since the money spent goes to maintain jobs and promote the nation's economic welfare.

Many defense contractors have come to believe that their corporate survival is essential to national survival and that they have a right to subsidize their civilian business with the fat from military contracts. These views are widely shared by military contract supervisors who expect to move to jobs in the companies they have negotiated with when they retire.

"Inefficiency is national policy," said Air Force Major General "Zeke" Zoeckler in one of the most famous quotations in the Fitzgerald book. He said in a speech to an Air Force cost study team that inefficiency in the operations of military contractors was necessary to the attainment of "social goals," such as equal employment opportunity programs, seniority clauses in union agreements, programs for employment of the handicapped, apprentice programs, aid to small business, aid to distressed labor areas, and encouragement of improvements in plant layouts and facilities.

The outcome of all this, Mr. Fitzgerald believes, has been not only waste of the taxpayers' money and a weakened defense posture (since many weapons have proved unsatisfactory as well as costly) but a loss of American industrial competitiveness on the world market as indifference to costs has spread from military to civilian business. The solution? Here, like most writers on this subject, Mr. Fitzgerald falls down. The only thing he can suggest is progressive reduction of the defense budget, in the hope that necessity will prove to be the mother of invention in the defense establishment.

Even without panaceas, this is an important book. Perhaps it does contain "considerable innuendo and outright fabrication," as former Deputy Secretary of Defense David Packard charged in a review of the book for *Business Week* (compared by one reader of that magazine to a review of the Crucifixion by Pontius Pilate). But if even a fraction of Mr. Fitzgerald's charges are true, it is time the taxpayers—with the help of the accounting and consulting fraternities—did something about it.

Profile for Profitability: Using Cost Control and Profitability Analysis by Thomas S. Dudick, John Wiley & Sons, Inc., New York, 1972, 263 pages, $12.95.

Less broad than its ambitious title suggests, this book is really a collection of articles and case studies on various applications of cost accounting. Its lack of a unifying idea is more than redeemed by its intensely practical orientation.

This is, its author says, "a book on profitability . . . a broad review of the various aspects of profitability rather than a narrow treatment slanted toward financial management."

Actually, it is not. One might, indeed, question whether it is a book at all, for it has no consistent message, no overall theme, no logical thought progression. It is, rather, a collection of thoughts drawn somewhat randomly from a lifetime

of experience in industrial cost accounting—loosely connected by transitional paragraphs here and there.

What Mr. Dudick has done is to assemble a group of his articles (some of which originally appeared in this magazine), weave in some additional interpretation, and call it a book.

The first section of the volume is the most cohesive. A group of articles on indicators of profitability deal with the general use of financial ratios to compare one company's financial position with that of another, the use of three major indicators of productivity, and the planning of orderly growth through the application of "ten commandments for expansion." A lively case study, in play script form, demonstrates how a group of executives might analyze how their company is doing—and why.

The second section, on assuring profitability, is more diffuse. It contains articles on profit planning, flexible budgeting, job costing, control of the costs of raw materials and direct labor, evaluating the profitability of a new venture, improving the utilization of inventories and facilities, and one way of taking the economic outlook into account in planning.

The third section, titled "Importance of Meaningful Feedback," covers such subjects as improving return on investment, analysis of cost flow and product profitability, formats of financial statements, variance analysis, and direct vs. absorption costing.

Throughout the book the writing is vivid and lively, and there is abundant use of graphs, charts, sample financial reports, and case study and anecdotal material.

Identifying this volume as a glorified anthology should not lead the reader to infer that it is not worth reading. For, just as Mr. Dudick is incapable of generalization in the broadest sense, so is he incapable of generalities. His writing has a concreteness, a specificity, an immediacy that is virtually unique among writers on accounting subjects. Each one of his little case studies is real, alive, and instantly comprehensible.

Equally for the manager who is confused by the jargon of his company's accountants and for the accountant who has yet to learn how to bring his abstractions down to the plant level, this is an invaluable little work. Anyone who has a problem related to any of its topics cannot fail to be helped by it.

The Marketing of Professional Services by AUBREY WILSON, McGraw-Hill Book Company, New York, 1972, 193 pages, $12.50.

Less useful than it might have been if the author had written it out of his head rather than as a treatise on marketing theory, this book is still a valuable aid to the professional in any field.

As every professional knows, services do not sell themselves. Not even the best-known and longest-established accounting, consulting, or other professional service firm can expect the magic of its name to bring in enough business over the transom to support a growing staff or meet the increasing competition of less squeamish rivals.

Yet, as this author points out, little has been written about the marketing of professional services outside the service firms' own manuals.

Expertise in this field is closely guarded and often regarded as a necessary evil whose practice is beneath the dignity of the true professional.

Thus, there is a real need for a practical book on this subject, and the author of this volume, the managing director of a British marketing research firm, might seem to be the ideal choice to supply it. He has the dual credentials of professional practitioner and marketing specialist.

After defining a professional service ("A professional service is one purchased by industry and institutions from individuals and organizations, and is designed to improve the purchasing organization's performance or well-being and to reduce uncertainty by the application of skills derived from a formal and recognized body of knowledge, which may be interdisciplinary, and which provides criteria for the assessment of the results of the application of the service") and analyzing the main differences between its marketing and that of goods and products, the author approaches the subject from the buyer's point of view.

He tells how to outline the important facts about the buying process: who in a company buys professional services, how the buying process is initiated, and why a buyer will decide to purchase a particular service from a particular firm or individual. Then he tells how to use this information to develop a marketing strategy, how to identify and develop sales opportunities, and how to negotiate specific contracts. Mr. Wilson puts much stress on self-analysis, particularly how the professional can identify the special niche he can fill in the customer's planning. All this is told simply and clearly, if somewhat dryly, with little use of anecdotes.

Clearly, there is much in this book that is valuable. Unfortunately Mr. Wilson has chosen to think of it as a contribution to marketing theory rather than a guide to action, and both his basic organization structure and his specific precepts are weakened by being fitted into that framework. Essentially, he has adapted a book about the marketing concept to the marketing of services rather than simply attacking the practical questions involved head-on on the basis of his own experience. This forces the reader to probe harder than he really should have to in order to get answers to his questions—but most of them are there if he tries.

This could have been a better book, but, in the relative absence of competition, it remains a must for the accountant or consultant who wants to build his business.

Breakthrough: Women into Management by ROSALINE LORING and THEODORA WELLS, Van Nostrand Reinhold Company, New York, 1972, 202 pages, $7.95.

Two woman personnel professionals have combined a demand that women be given more opportunity in management with a manual on how to do it.

"Affirmative action programs" with specific goals and timetables for more equal opportunities in management employment for women as well as minorities are now required of all Federal contractors under Executive Order 11246 (Revised Order No. 4). This requirement affects approximately one-third of the work force. Furthermore, a growing number of lawsuits are being filed under the Equal Federal Pay Act of 1963 and Title VII of the Federal Civil Rights Act of 1964 (extended to managers and professionals in 1972), forbidding discrimination by private employers of 25 or more, labor organizations, employment agencies, and union-management apprenticeship programs.

This new legal status for working women is what gives this book its somewhat peremptory tone. Unlike other books on women managers in the past, it is not a plea that women be given more nearly equal opportunities; it is a demand. Although it contains all the old, familiar arguments and answers to male objections, they are presented in an almost offhand way—for now there is a legal whip behind them.

Able for the first time to be practical rather than propagandistic, the authors explain what an "affirmative action program" is and how to develop one. Their presentation is weakened by the absence of case study material, but that is hardly their fault; it is part of the burden of pioneering. Illustrative examples will become more readily available as the Federal enforcement process moves ahead.

Meanwhile, present and prospective Federal contractors had better get busy. This book is not the perfect solution to their problem—for example, its information on recruiting and sources of supply of women executives is skimpy—but it is the only one available so far, and it will have to do.

Where Have All the Robots Gone? Worker Dissatisfaction in the '70's by HAROLD L. SHEPPARD and NEAL Q. HERRICK, The Free Press, a Division of The Macmillan Company, New York, 1972, 222 pages, $7.95.

These authors claim, on the basis of rather slim statistical evidence, that worker dissatisfaction is widespread in American industry.

More and more workers, those authors declare, "are becoming disenchanted with the boring, repetitive tasks set by a merciless assembly line or by bureaucracy. They feel they have been herded into economic and social cul-de-sacs." This is, the authors feel, a serious problem for American industry, particularly with the growing number of workers under 30, who are "more dissatisfied, more oriented toward change, and have higher expectations of work than their older counterparts."

To back up these assertions, the authors quote in great detail the results of three surveys. One, a national survey of a national probability sample of 1,533 employed workers conducted by the Survey Research Center of the University of Michigan for the U. S. Department of Labor in 1969, found that 13 per cent were dissatisfied with their jobs and only 63 per cent considered their jobs to be like the kinds they had originally wanted.

The other two surveys were conducted by the authors themselves on behalf of the W. E. Upjohn Institute for Employment Research, where they both work. One covered 101 members of the auto and steel workers' unions in Kalamazoo, Mich., in 1971; the other, 270 undescribed blue-collar workers in Pennsylvania in 1970. In these two surveys 22 per cent of the workers were found to be dissatisfied with their jobs and only 37 per cent said the jobs they held were like the ones they had originally aimed at.

(Incidentally, although the answers to each survey question are discussed intensively, with piles of percentages and footnotes, nowhere are the surveys themselves described. Their salient characteristics have to be pieced together from scattered references.)

On this rather slight evidence the authors have constructed a book-length analysis of what may well be a major problem: Workers are less happy with their jobs than they have ever been (although there is no real comparative evidence about how happy they used to be). The discontent is rooted in the nature of the work rather than in such side issues as pay and working conditions. This discontent is leading workers into all sorts of undesirable behavior, i.e., absenteeism, and inattention to quality.

Actually, whatever one may think of the authors' work as a serious contribution to sociology, they may well be right. They are not the first to say it, after all. The problem is one that deserves further study—and more effort on management's part than is indicated by the rather cursory round-up of a few job enlargement plans that the book presents. Oversensationalized though it is, this book probably contains a nugget of truth—and a signal to more research.

Segment Reporting for Managers and Investors by ALFRED RAPPAPORT and EUGENE M. LERNER, National Association of Accountants, New York, 1972, 99 pages, $10 ($6 to NAA members).

Assuming that public reporting by line of business will become more widespread in the coming years, these authors attempt to develop a model that will permit use of the same data base to serve the needs of both public disclosure

and management reporting, despite differences in the information requirements of the two audiences.

Segment reporting is desired by many investors and lenders as a guide to sound decisions about companies whose component activities differ in terms of growth, profitability, and risk. In 1969, in a previous NAA study, these authors concluded that such reporting was desirable. In this report they explore its implementation.

First they explain how to divide the corporate entity into basic activities, offering guidelines for the choice of activities on which to report. Then they propose models for segregated activity earnings and funds statements that meet the investor's basic needs and indicate how these models can serve as the framework of a management planning and control system.

A chapter on specific accounting problems in segment reporting uses Tenneco Inc. as a prototype for analysis. The final chapter, based on a critical examination of 1969 and 1970 annual reports of 147 diversified companies, deals with voluntary disclosure practices.

Although somewhat academic in approach and concise in style to the point where it is sometimes difficult to read, this is a useful book for financial executives and auditors faced with the decision about or the reality of segment reporting.

Briefly listed

Social Measurement: Points of View of Sociologists, Businessmen, Political Scientists, Government Officials, Economists, and CPAs, American Institute of Certified Public Accountants, New York, 1972, 123 pages, $5 to nonmembers, $4 to members, and $3 to educators (paperbound).

This booklet is the transcript of a symposium conducted by the AICPA on the subject of the application of accounting measurement techniques to the social sector. Kinds of social measurement being done or considered by the other professional groups represented at the meeting were also considered.

MAGAZINES

The Do's and Don'ts of Management Advisory Services by John R. Mitchell, *The CPA Journal,* October, 1972.

A comprehensive and workmanlike guide to the organization and staffing of an MAS department within a CPA firm, Mr. Mitchell's article will be particularly valuable to the accounting firm that is getting into a formal, autonomous MAS operation for the first time.

The author, who has organized his article into 14 points or guidelines, each of which he discusses briefly, has covered a broad field surprisingly well. Starting out with the basic *raison d'etre* of an MAS department and selection of the necessary personnel, he arrives very quickly at such mundane but important subjects as frequency of billing and implementation of the consultants' recommendations.

Mr. Mitchell points out that the CPA firms that have been most successful in satisfying both their clients and themselves in the consulting area have organized their MAS activities and structure into an autonomous organization closely resembling a nonaccounting consulting firm. This is no accident, he asserts; rather it stems from the actual economic and professional requirements of consulting practice.

The author's 14 exhortations, around which the article is built, are:

- Be honest about your capabilities, with your client and yourself.
- Start your MAS operation with experienced consultants.
- Develop and use competent outside resources to supplement your own capabilities.
- Concentrate on engagements which are economically viable.
- Establish specific responsibility for each engagement.
- Don't try to solve the client's problem in your first conversation.
- Be specific about the objectives, approach, and costs of each engagement.
- Clearly designate the responsibility for implementation of recommendations.
- Plan and schedule each engagement.
- Emphasize specific recommendations and fundamental improvements.
- Let the client know when the engagement is completed.
- Bill your services specifically and promptly.
- Keep all professional personnel alert for MAS opportunities.
- Organize your MAS activities as a profit center.

Mr. Mitchell's well-organized and developed presentation betrays his own background as a management consultant (he is now director of the Management Advisory Services Division of the AICPA). It is logical; it is clear; and it sticks to its point: the organization and mechanics of establishing an MAS department.

As a map, a sort of table of organization for creation of such a department, it is excellent. The only qualities the reader must supply are the talent, the background, and the instinct to make MAS work.

A Linear Risk Constraint in Capital Budgeting by C. Whitmore and S. Darkazanli, *Management Science* (Application Series), December, 1971.

Since many companies now employ mathematical programing in capital budgeting, it is implied that some recognition of uncertainty or risk is desirable in undertaking the capital budgeting decision process. Two methods for constructing linear restrictions to approximate risk constraints in capital budgeting are presented.

One of these models is discussed. The uncertainty associated with

each project being considered is represented by its mean present value, the variance of its present value, and, either its covariance with the firm's current operations or its responsiveness to an index of general economic activity. That is, cash flows are regarded as random variables. Where realistic estimates of future cash flows have been made, and present values have been computed, without considering the problem of uncertainty, it does not seem unreasonable to accept resulting present values as the mean present values. The variance of the present value of each project can be built up from the variance of each cash flow and making use of the following –

$$\text{Variance}(\sum_{i=1}^{n} K_i X_i) = \sum_{i=1}^{n} K_i^2 \text{ variance } X_i + 2 \sum_{i<j}^{n} \sum^{n} K_i K_j \text{ covariance } (X_i X_j)$$

where the K_i are real constants and the X_i random variables. In determining the variance of the present value of a project $K_i = (1 + r)^{-n}$ where r is the discount rate and n is the number of periods over which the particular cash flow X_i is being discounted.

The capital budgeting problem

The investment decision is viewed as a task of selecting a portfolio of capital projects. The problem is stated as,

$$\max (\mu)$$

subject to, (1)

$$\sigma^2 \leq V$$

where

$$\mu = \sum_{j=1}^{n} \mu_j X_j \text{ and}$$

$$\sigma^2 = \sum_{i=1}^{n} \sum_{j=1}^{n} \text{covariance } (p_i p_j) X_i X_j$$

$$= \sum_{i=1}^{n} X^2_i \text{ variance } p_i + 2 \sum_{i<j}^{n} \sum^{n} X_i X_j \text{ covariance } (p_i p_j)$$

where μj is the mean present value of project j,
p_j is the present value of project j, a random variable
Xj is the extent of acceptance of project j
$Xj \in [0,1]$

That is, the mean value of the portfolio is maximized, subject to a constraint on its uncertainty.

The problem selects optimal Xj. If fractional solutions for Xj are not meaningful, that is, a project is either to be accepted or rejected, then the problem becomes more difficult to solve. More importantly, to the authors, the variance constraint introduces nonlinearity in the X's. Their contribution is in suggesting a linearization of this constraint.

Their argument proceeds as follows (emphasis added):

> It is well known, although rarely stated explicitly that the present value of cash flows from *current* operations of the firm should be included. . . . Most firms have a large number of ongoing programs and operations which are not considered in the capital budgeting decision. Although theory suggests that each current project should be revaluated in each budget period, this is not done in practice. Usually only new investment opportunities and a few current projects earmarked for reconsideration are subjected to the analysis. . . . Given this, it seems reasonable to designate one project . . . say project #1, to represent *all* current operations of the firm, that is, all investments implemented sometime in the past but not presently being re-evaluated. Since current operations will be continued $X_1 = 1$ in the capital budgeting problem.

The variance constraint is rewritten as follows,

$$\text{variance } p_i + 2\sum_{j=2}^{n} X_j \text{ covariance } (p_i, p_j) + \sum_{i=2}^{n} \sum_{j=2}^{n} X_i X_j \text{ covariance } (p_i p_j) \leq V$$

The authors go on to claim that for many firms the capital budget in any year represents a small fraction of the value of the firm's total assets. Further, they claim that many of the new investment projects under consideration have present values which are highly positively correlated with the present value of current operations. That is, the new projects will tend to perform well when existing investments do well and perform badly when the existing portfolio of projects performs adversely. The authors argue that it is this fact that affects the uncertainty of new portfolios most significantly; in their words:

> This covariance of project present values with the present value of current operations usually contributes significantly more to the total risk of the firm than the risk of any combination of the capital investments projects being considered.

They therefore drop the last term from the rewritten variance constraint above leaving a linear constraint in the X's. The authors claim that the analysis required to determine the covariance of a project with the firm's current operations "is not unlike the reasoning business managers use every day in relating one aspect of their business to another."

Evaluation

The practitioner advising his client on capital expenditure decisions and using linear programing techniques will have to evaluate the tradeoff involved between a linear constraint and a more complete nonlinear uncertainty statement.

The authors point out that the number of parameters to be estimated is of order n (the number of projects being considered) in the simplified model and of or-

der n^2 in the complete model. Specifically, there are $(n^2 \div n)/2$ statistical parameters to be estimated in the complete variance constraint, and n in the simpler model. If the number of projects being considered is not so large as to make the difference significant then one advantage of the suggested approach is minimized. The advantage of linearity remains and is difficult to evaluate since the real advantage depends on the ability of the practitioner to use nonlinear programing techniques. The term ($\sum Xi^2$ variance pi) could be added – this still leaves out the covariances between the projects—and the constraint remains convex even though nonlinear.

Highlight uncertainty in budgeting

Perhaps the main contribution of the authors is that they bring attention to the uncertainty involved in capital budgeting decisions. Whereas this is not novel, it cannot be overemphasized. The authors make use of earlier developments in portfolio theory.

J. K. Winsen
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The Relationship Between Benefit-Cost Analysis and Planning-Programming - Budgeting - Systems by N. W. Fisher, *The Australian Accountant*, April, 1972.

Although benefit-cost analysis and planning-programing-budgeting systems are usually treated as separate approaches to the government decision-making process, Fisher points out their similarities and the possibility of applying benefit-cost analysis as a part of the PPBS approach.

Benefit-cost analysis may be defined as the application of quantitative economic analysis to public investment decisions. Basically, the approach involves the valuation of the benefits to be derived from an investment over an extended time period, the use of compound interest techniques to discount these values, and the comparison of the projects being considered. The implied objective of economic efficiency leads to selection criteria which favor projects with the greatest excess of discounted benefits over costs. Its corollary in private industry is the general area of capital budgeting.

Key characteristics of PPBS

Mr. Fisher defines and analyzes planning - programing - budgeting systems in terms of their key characteristics which are: 1) specification of program objectives; 2) program output analysis; 3) a multiperiod approach to program costs and benefits; 4) development of alternatives; and 5) evaluation of program performance in terms of the specified objectives.

While economic efficiency is the implicit goal of benefit-cost analysis, PPBS can embrace social, economic, political, or other goals. Although basic goals may be qualitative in nature, they must be clearly and precisely defined so that input costs such as salaries may be classified by objectives in the accounting-budgeting system. After the careful specification of goals, each proposed program is analyzed. Fisher points out that benefit-cost analysis can fit into the PPBS framework at this point if the program output can be quantified and valued. Otherwise, analytical techniques such as cost-effectiveness (minimizing the cost of achieving an effect or maximizing an effect for a given cost) or qualitative rating procedures may be used. Concurrently, alternative methods of achieving goals are formulated and analyzed.

Mathematical programing techniques are then used for project selection and funding. The use of mathematical programing requires that outputs or goal achievements be quantified in terms of measurable units. In addition, these units must be valued with respect to each other (i.e., one unit of Project A output is worth two units of Project B output) to allow trading-off between competing objectives. Once such an objective function and related constraints are agreed upon, mathematical programing processes of maximizing or minimizing an objective function subject to constraints may be used to determine resource allocations to projects. Fisher points out that PPBS allows legislators to establish a program structure as a basis for project selection and funding instead of considering each project separately. Furthermore, the long run nature of the process forces legislators to consider the objectives of projects in their entirety as opposed to one-year, input-oriented budgets which allow "foot-in-the-door" project approval.

Meaningful recording rare

The specification of units and measurement methods which are closely related to the basic objectives of projects also facilitates follow-up evaluations of programs. As Fisher points out, meaningful quantitative recording and reporting on program achievements is rare. It is all too easy to revert to measuring effectiveness in terms of expenditure. Such circular reasoning could lead to greater expenditures to increase measured effectiveness even though the program is not achieving its intended goals. Measuring the output in the units used in the mathematical programing enables legislators to revise the relationships in the program structure based on past performance.

The planning-programing-budgeting system is a very comprehensive approach to government decision making. Because of its long-run nature and required quantification of benefits, it can encompass the more narrow techniques of benefit-cost analysis. Hopefully, the two approaches together will lead to improved government decision making.

William T. Harris, Jr.
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