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What People Are Writing About

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BOOKS

Budgeting: Key to Planning and Control by REGINALD L. JONES and H. GEORGE TRENTIN, American Management Association, New York, 1966, 253 pages, $12 to AMA members, $18 to nonmembers.

This book by two representatives of a large CPA firm is less routine than its title suggests. The tip-off lies in the subtitle, "Practical Guidelines for Managers." This is not another technical treatise for the financially sophisticated. Rather, it is aimed at operating managers, and its goal is to show them how to use budgeting to improve their own day-to-day performance.

As the authors point out, there are already plenty of books on budgeting, and many of them are excellent. Most of them, however, were written for the guidance of financial executives who are responsible for the installation and administration of budgetary systems. As a result, they are too technical for the nonfinancial executive to understand and too detailed to interest him.

Mr. Jones, a manager in the administrative services division of Arthur Andersen & Co., and Mr. Trentin, who is partner in charge of that division in the firm's New York office, had another objective in mind. They wanted to show operating executives how they can use their budgets to improve their control over their own departments and programs.

The book that resulted is simple in style, broad in scope, and consistently keyed to the interests of operating management. The text is enlivened by the liberal use of brief case histories and clarified by 127 exhibits — financial reports, forms, tables, and diagrams.

Although it is simple, the book is not unsophisticated. The authors advocate responsibility reporting,

flexible budgeting, management by exception, and management by objectives — lumping them all under the broad umbrella of budgeting.

Actually, the subject matter of the book is far broader than that usually included under the heading of budgeting. The volume touches on nearly every aspect of managerial control, from economic order quantities to clerical work measurement. (Many of these topics would be hard to spot in the table of contents, which makes the lack of an index a greater deficiency than it would be otherwise.)

Early chapters take up the role in budgeting of the president, sales manager, and manufacturing manager and the budgeting of capital expenditures, inventories, general and administrative expenses, and specific programs. Research and development and public relations are used as examples of program budgeting. Reproduction of a complete capital expenditures manual for an industrial equipment manufacturer adds weight to the somewhat sketchy discussion of capital budgeting.

Measurement of return on investment and credit policy are covered in a chapter on the balance sheet budget. Special attention is given to the problems of budgeting in service organizations — illustrated by material from an insurance company and an architectural firm — and in retail merchandising.

The financial executive who needs help in "selling" budgeting to his nonfinancial colleagues will find this publication a useful educational tool—provided the system he is promoting meets the standards of usefulness to management set forth in the book.

Management Uses of the Computer by IRVING I. SOLOMON and LAURENCE O. WEINGART, Harper & Row, New York, 1966, 225 pages, $5.95.

Here is another management guide to the computer — but better than most. The technical material is kept to a minimum, and there is heavy emphasis on relative cost considerations.

The authors, consultants with Ernst & Ernst and Computer Usage Company, have aimed this volume at top and middle management executives who need to evaluate what computers can do for their companies.

There are many such books, most of them written by technicians who are not able to communicate with their colleagues, much less with outsiders. This one, in contrast, is simple and readable (although sloppily edited).

The content is traditional — what a computer is; what data processing is; what a system is; how to conduct a feasibility study; and how to design, install, and operate a system. The treatment is brief but reasonably comprehensive; the attention given to the pros and cons of various alternatives, particularly to comparative costs, is noteworthy.

The most novel section of the book is a short overview of the legal problems of computer acquisition, contributed by an attorney, Jerome Gartner. Instead of the hazy questions of legal liability, he concentrates on contract terms (with some helpful hints), control, and records retention. In an appendix he offers a financial analysis of the rent-or-buy decision (he favors purchase), with an eye on the tax considerations.

The book has an index and a 13-page glossary of computer terms.

MAGAZINES

Preparing for a Computer Installation by PATRICK D. BURNS, *Cost and Management*, April, 1966.

This article presents a cogent and practical discussion of one company's approach to the problems encountered in the four phases of computer installation: systems design, the writing of programs, the conversion of records, and program testing.

A vital element in the approach to a computer installation is the development of a strategy or overall plan. Without one the whole effort rests on a shaky foundation. Within the overall plan, which may take several years to complete, each phase of the systems job involves its own specialized problems of personnel selection, education and training, and internal organization for EDP.

The key to effective systems design is the active participation of line managers. Theirs is the responsibility for defining what is required, while the responsibility of the systems analyst is to act as a catalyst, ensuring that the right questions are asked and that answers are not conditioned by existing systems and traditions. The greatest single error in systems design, according to Mr. Burns, is to plunge too quickly into the problems of "how" before the questions of "what" and "why" have been answered. His company's approach encourages "blue-sky dreaming" on the part of line managers, utilizing the systems analyst as a project leader to coordinate the activities of the various line departments.

Job responsibilities

There is no universal answer to the question of where the task of the systems analyst stops and that of the programer begins. A system is considered designed and ready for programing in Mr. Burns' company when its terminal results have been established, when all aspects of the problem definitions and liaison with user departments have been developed, when the clerical routines and forms have been designed, and when a logic diagram has been developed.

The author defines the responsibility of the programer as that of seeing that the machine achieves, in the most effective way possible, the requirements outlined by the systems analyst — a definite change in thinking from the day when the programer was looked on as the key individual in all phases of an installation. However, rather than

reducing him to the status of a coder, this approach leaves the programer a great deal of flexibility within the system, allowing him to contribute to overall system design. Programing is of three distinct types, each with its own special problems: edit programing, or working backward to achieve the final results; file maintenance programing, the heart of the system containing all logical decisions; and preparatory programing, necessary to purify inputs, check them for validity, and arrange them in the best order for processing.

Conversion of records, the easiest task to define and probably the hardest to achieve, must deal with problems of availability of information, its purification, and timing. Depending on the amount of information already available in punched card form and its consistency from department to department, a new computer installation is likely to be faced with a monumental task of converting and purifying records. Decisions must also be made as to the most effective handling of certain "eleventh hour" information, such as account balances, which must be kept up to date from the minute they are set up on the master computer records. Two practical problems from the experience of the author's life insurance company are used to illustrate these problems.

Testing

Program testing, whose importance is nearly always underrated, should properly involve as much time as the programing itself. Mr. Burns outlines his company's production testing operations in detail, clearly demonstrating their importance to the overall installation. Using a test file of some 1,000 policies in the company's system for individual insurance, for example, as many as 600 to 800 transactions, simulating an entire month's operations, are put through in a testing operation. Creation of test cases and the actual check are carried out by specialists in the user departments, rather than by programers, in order to ensure the realism of the tests and to verify the programer's understanding of the program specifications.

Common mistakes in selecting people for EDP jobs are touched on in the article, as are the qualifications necessary for personnel in the categories of systems analyst, programer, department manager, and computer operator.

The author concludes by emphasizing the need for an "agonizing reappraisal" of the system some time after the major problems have been solved in order to ensure that expected savings are being realized. This may involve the elimination of remnants of functions absorbed within the computer system, realignment of job responsibilities, and doing away with some visual or clerical checking considered necessary at the outset.

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The Mathematical Content of the Business School Curriculum by DAVID NOVICK, *California Management Review,* Spring, 1966.

In an effort to outline a program of mathematical studies appropriate for a business school curriculum, Mr. Novick of The RAND Corporation considers both the advantages and disadvantages for managers of familiarity with quantitative methods. The disadvantages cited stem primarily from the present limitations of those methods.

Assuming that the business school student is being prepared for eventual management responsibility, the author reviews the limitations on the use of quantitative methods in today's business world. The principal one is that of information availability. Use of inappropriate data as input typically results in useless or even misleading output information. It is vital, Mr. Novick suggests, "to find ways of improving the quality of data with which we work and of locating new kinds of data." A second factor limiting the applicability of quantitative methods is the multiplicity of the businessman's goals.

However, despite these limitations, mathematical models and quantitative analysis can be useful in group and individual decision making. Managers should understand the analytic methods available – even if they cannot apply them unaided—so that they can recognize the need for a particular quantitative technique in solving a problem and the limitations on the results when known.

The key skill that business school students should acquire, Mr. Novick recommends, is that of problem formulation. He considers the ability to formulate problems to be the basic executive ability. Having formulated the problems, the business executive "can then, through his own staff or through outside consultants, rather easily acquire the current knowledge available for the application of quantitative tools to the solution of the problem he has identified."

Course outline

In an appendix Mr. Novick includes a course outline used by The RAND Corporation for a thirty-five day course designed to "put working-level executives of the armed services in precisely the same position the schools of business should expect to put their graduates with respect to quantitative analysis." The relative importance given to each topic in the course is indicated, but there is no explanation of the reasoning behind the choice of topics.

The basic outline is as follows:

I. Review of Basic Mathematics (10 days)
   A. Algebra and analytic geometry (4½ days)
      1. The idea of signed numbers
      2. Symbolic representation
      3. The concept of an equation
      4. Solution of equations
         a. First degree

b. Second degree
c. Higher order polynominals
d. Other forms
5. Graphing equations
6. Simultaneous equations
a. Mathematical solution
b. Graphical solution
7. Problem solving using algebra (including examples)
8. Concept of a mathematical model (including example)

B. Mathematical notation (1½ days)
1. Subscripts, superscripts, and summations
2. The concept of a matrix
a. Determinants
b. The idea of matrix algebra
c. Application (tie back to solution of a set of simultaneous equations)
3. Dimensions and dimensional analysis
4. Inequalities
5. More about models

C. Logarithms (1 day)
1. Natural logarithms
2. Common logarithms
3. Conversion from one base to another

D. Introduction to the calculus (1 day)
1. The concept of a derivative
2. Applications of derivatives (minimum, maximum)
3. The idea of an integral
4. Partial derivatives

E. Basic probability theory (1½ days)
1. General introduction
2. Mathematics of probability statements
3. Combinations and permutations
4. Probability distributions

F. Models again (½ day)

II. Use of Calculating Devices (3 days)

A. Theory of significant digits and rounding (½ day)

B. Desk calculators

C. Slide rule (1½ days)
1. Placing decimal point using powers of 10
2. Basic arithmetic operations
3. The log-log features of the slide rule

D. Tables (1/3 day)
1. Log
2. Statistical
3. Other

E. Logarithms (1/3 day)
1. Performing basic arithmetic
2. Interpolation

F. Nomograms and other graphic aids (1/3 day)

III. Basic Statistical Methods (20 days)

A. Collection and organization of data (½ day)
1. Principles of data collection
2. Determining what the data represent
3. Organization of preliminary evaluation
4. Final preparation for analysis
a. Use of index numbers to adjust the data
b. Other adjustment techniques

B. Descriptive statistics—single set of data (3 days)
1. Measures of central tendency
a. Various kinds of means
b. The median
c. The mode
2. Measures of dispersion
a. Variance
b. Standard deviation
c. Other measures
3. Computational methods
a. Using deviations around assumed mean
b. Use of coded data
c. Work sheet forms

C. Relationship between two sets of data (7 days)
1. Preparation of scatter diagrams
a. Selection of appropriate scales
b. Interpretation of the results
2. Linear curve fitting
a. Free hand
b. Method of averaging
c. Least squares
3. Nonlinear curve fitting
a. Free hand
b. Method of successive approximations
c. Least squares
d. Use of transformation devices to convert to linear form
(1) Log or semi-log scales
(2) Reciprocal scales
(3) Other nonlinear scales
4. More about curve fitting
a. The idea of the average relationship
b. Goodness of fit
c. Computational methods
d. The concept of degrees of freedom

D. Relationship among more than two sets of data (4 days; illustrated by a case having two explanatory variables)
1. Method of successive approximations
a. Linear case
b. Nonlinear case
2. Method of least squares (linear only)
3. Computational methods

E. Extrapolation and uncertainty (4 days)
1. The concept of a sample
2. Sources of uncertainty
3. Ways of quantifying uncertainty
a. Informal and subjective
b. Formal statistical models (for example, normal linear regression with two variables): (1) Graphic description of the model, (2) Maximum likelihood estimates — intuitive explanation, (3) Significance test on regression coefficients, (4) Prediction intervals — intuitive explanation, (5) Computational methods.

F. Development of index numbers (1½ days)

1. Data selection
2. Selection of base
3. Aggregative index (simple)
4. Weighted aggregates
5. Averages of price relatives

IV. Cost-Quantity Relationships (2 days)
- A. Definitions
  1. Total cost curve
  2. Unit cost curve
  3. Cumulative average cost curve
- B. Linear versus nonlinear forms
- C. Arithmetic operations
  1. Determining the cost of a specific item
  2. Determining the cost of a specific group of items
  3. Use of plot points or other interpolating devices

This article does not provide a manager with a checklist of specific applications or situations in which he would be able to do a more effective job as a result of having studied quantitative analysis techniques. The general pros and cons of studying quantitative methods are not presented in any comprehensive manner. However, the article does give the line manager a general idea of some ways in which a familiarity with quantitative methods would be helpful to him, assuming that he has had little or no exposure to this area.

The chief value of the article is the course outline. By comparing it with his own knowledge, the manager can identify his deficiencies in the understanding of quantitative methods. This evaluation might be extended in a general way to the review of the credentials of subordinate managers and potential trainees.

The proper coverage and depth in a quantitative methods course or curriculum for business school students is a difficult problem. The course outline provided here is at least a useful point of departure for further study.

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A Decision Theory Approach to Portfolio Selection by JAMES C. T. MAO AND ERIK SARNDAL, *Management Science,* April, 1966.

In this article the well known Markowitz portfolio selection model is expanded by incorporating statistical decision theory into the model. Specifically, the investor's initial feelings regarding various possible underlying states of nature are forced explicitly into the selection process in the form of prior and revised probabilities. Estimates are made of the expected returns from each of a set of possible portfolio combinations under each assumed state of nature, yielding for each a set of conditional returns or "payoffs." Using the Bayesian strategy, an optimum portfolio is selected that maximizes the expected weighted average (using the revised probabilities) of these conditional returns.

Basically, the Markowitz-model problem is to select from any given set of securities that combination of risk and return which will maximize expected utility given a certain sum of money to invest. The assumption with respect to utility is that the particular investor would prefer a high expected return with low uncertainty to a low expected return with high uncertainty.

The first step is to select from among the given set of attainable portfolios (each with a particular return and uncertainty) the most "efficient" set. Such a set is defined as that which minimizes, given any particular expected return, the uncertainty of that return.

Once such an "efficient" set is determined, the problem then is to select that "efficient" portfolio which is optimum in accordance with the investor's particular utility function. A geometric interpretation is given in which the "efficient" set is depicted as a locus of points for which, given some particular expected return, the variable of uncertainty (assumed by Markowitz to be the variance associated with the expected return) is at a minimum. The Markowitz quadratic programing problem needed to derive the "efficient" portfolios is also given.

Quantification

The Markowitz model essentially takes the solution to the point of having isolated the most desirable (efficient) portfolios. In order to reach this point, the investor must quantify his feelings with respect to the expected value and variance (uncertainty) of the return from each security and then narrow the resultant portfolio set down to the most desirable set, given this particular money constraint and objectives.

Neither the original model nor any of the extensions considered allows for the possibility of different states of nature. Essentially the selection process is set upon a framework of investor expectations, presumably brought into focus by the estimates made of expected value and variance of investment returns. The dependency reflected by these models, then, extends only as far back as these quantified estimates and thus only touches the surface of a multitude of underlying independent variables upon which the models, in fact, depend. The intended purpose of this article is to reach below this surface and extend or broaden the functional relationships of the models so as to include explicit expression of the underlying factors that the investor heretofore has considered only implicitly in making his estimates of future returns.

Other states

The proposed model basically forces the investor to consider his estimates in the light of more than one possible state of nature. For such states, which may necessarily be broad and general by nature (for example, future business conditions) but which nevertheless may underly the investor's subjective estimates, preliminary probabilities are attached as to their occurrence.

The investor, given the selected

states and these attached to prior probabilities, proceeds to estimate the expected value and variance of the returns of the various securities under *each* assumed state of nature. This gives the investor not one set of attainable portfolios, as in the Markowitz model, but as many different sets (each with a specific expected value and variance) as there are assumed states of nature.

With this information, a table of conditional values is constructed showing for each attainable portfolio the expected or conditional "payoffs" under each state of nature. Of the various portfolios appearing in the table, some are clearly superior—as, for example, those which under each state exhibit the higher payoff. All inferior portfolios may be eliminated from further consideration. The remaining portfolios, analogous to Markowitz's efficient portfolios, constitute the set from which the optimal portfolio will be selected.

Revised probabilities

It now becomes necessary to incorporate revised probabilities into the model. Such revision, carried out by means of Bayes' Theorem (formally stated in the article), is based upon some subsequent information regarding the future states of nature. For example, an economist may issue a forecast concerning the future trend of some economic variable having some bearing on one or more of the assumed states. Given such a forecast or other information, what is the probability that a given state will occur? The answer via Bayes' Theorem is in the form of a revised or conditional probability. These revised probabilities are then applied under Bayesian strategy to the conditional payoffs of the set of superior portfolios to be found in the table of conditional values (or payoffs). The optimum solution is then found in that superior portfolio which maximizes the weighted average (using the revised probabilities) of expected payoffs.

A graphical interpretation of the solution is given, in terms similar to that of the Markowitz model except that the attainable set of portfolios is given as a function of the assumed states of nature rather than the expected value and variance of returns (which have already been incorporated by the revised model via the table of conditional values). Assuming two possible states of nature, the solution is found at the point of tangency between the curve representing the set of superior portfolios and a line with a slope given by the ratio of the revised probabilities. The solution, then, can be seen as ultimately determined by the relationship among the various revised probabilities concerning the assumed underlying states of nature.

Computer solution

The article also includes a formal statement of the revised Markowitz model and a simplified example using two states of nature and three alternative investments. The actual numerical solution was achieved using a computer program based on Markowitz's "critical line method."

The idea behind the reformulation of the Markowitz and subsequent models appears sound. No one could reasonably object to the basic assumption of the model that a decision (or selection) process expressed explicitly is superior to one expressed in implicit terms. Although its validity may not be supportable in any precise way (i.e., little is known of the actual decision making process), this technique forces the investor to calculate the consequences of each act (or estimate) under each possible state of nature.

Reduction of uncertainty

The use of revised probabilities goes one step further in reducing the uncertainty involved by increasing the chances that the expected weighted values are the best possible in the given situation. To this extent, then, the revised model represents an improvement over previous models in which no account was given to the probabilities of various states of nature.

But this is to say nothing about the propriety of the remaining portion of the revised model carried over from the Markowitz model. Is it reasonable to assume, for example, that an investor prefers a high return with low risk to an opposite situation? What is the coefficient of risk aversion, assuming that something of this nature does, in fact, exist? Or, in general, what can be said of the investor's utility function, assuming the investor to be an individual? A corporation? Should such a function turn upon the idea of economic survival, or is maximum return in all situations the proper or actual goal? If the utility function were for the moment known, how would it change given a new set of revised probabilities and what would the effect of change be on attainment of an optimum solution?

The fact that answers to these and other questions concerning the components of the particular model do not exist in any attainable state, however, does not detract from the validity of incorporating into *a* model probabilities and states of nature. It simply suggests that the benefit to be derived from the use of this probability tool in investment decisions depends heavily upon the effectiveness of the model assumed.

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An Application of Heuristic Problem Solving to Accounts Receivable Management by FERDINAND K. LEVY, *Management Science,* February, 1966.

This article applies a heuristic problem solving method to the problem of minimizing the costs associated with the time involved in the collection of a company's accounts receivable.

The problem essentially involves an optimum selection of lockbox

locations out of all possible locations in a situation in which a company has a wide geographic sales distribution and relatively few office locations to which customers remit. This approach also might be used where a company has already established lockbox locations and desires to check them for cost optimality.

Cost determination

The solution begins with determination of the cost factors involved in collecting through lockboxes. Basically, these consist of interest costs (the cost initially giving rise to the problem) and service costs (of which there are two—a variable charge per check collected and a fixed charge per box used). The solution then is to be found in that combination of box locations in which the additional interest earned by earlier collection less the service costs of such collection is maximized.

For such a combination to be achieved, the cost of various possible combinations must be systematically compared with that of all other possible cost combinations. Obviously such comparisons, systematic or not, would be impossible without the aid of the computer. After first presenting the solution in terms of the logic involved, the author presents it in terms of a program written in FORTRAN IV.

Intuitively, the solution can be seen by visualizing a small set of potential lockbox sites. A sample of customer checks is then assumed and a cost of collecting these checks is computed under the possibility that the checks may be collected via any of the potential lockboxes. Thus, for each check there are as many possible costs as there are lockboxes.

Cost assignment

These costs (consisting of the interest cost and the variable cost per check) are then "assigned" to each assumed lockbox site so that for any particular box a total cost may be accumulated which is equivalent (after the fixed costs for the particular box are added) to the total collection costs of the box assuming all checks are collected through it. Of the boxes assumed, the one with the least total collection cost —under the above assumptions—is the starting basis for comparison.

At this point this "least cost box" represents the "least cost combination." The next step is simply to select the box of next least cost and consider it and the previous box selected as a possible alternative combination. If the alternative combination results in a lower cost, it replaces the previous combination as the basis for comparison and the repetitive process is continued. If the alternative combination is not cheaper, then the previous combination (here the first box selected) represents the solution.

In an actual situation, the author applied this method in a company with annual sales in excess of $1 billion, with a stratified sample of 7,620 checks, and 18 possible locations. The computer selected seven of these after two and a half minutes running time. Mr. Levy states that the company, which had previously used only one location (its bank), was able to reduce its accounts receivable float by 64 per cent and realize a saving of $180,000 in interest costs.

Although the evidence cited indicates potential cost savings, there is no guarantee that the heuristic approach will result in a "true optimum" solution such as some more precise method might yield. But considering the simplicity of the method and the ease of its implementation and maintenance with a computer (assuming possible changes in the company's underlying situation — a shift in its sales distribution), it seems reasonable to say that it would yield the most practical results. And it certainly would reduce costs as compared to the use of random selection of box locations or a combination of locations that has evolved out of past growth and distribution of a company's sales.

The success of using such a method in the final analysis seems mainly dependent upon the selection of a proper and representative sample of customer remittances so that all the variables affecting the associated collection costs (such as geographic source of checks, amount per check, number of checks) are adequately accounted for. This is a statistical problem with which the article deals only briefly. The assumption implicitedly made by the author is that an adequate sample is available. And for purposes of evaluating the method such an assumption is proper. But in terms of evaluating the results of the method, the method itself must be held constant while attention is focused upon the problems of sampling. And, of course, the cost of such sampling not only initially but in the future (for purposes of keeping the selected optimum combination up to date) must be considered in evaluating the overall cost savings of the method.

Additional costs

An additional cost associated with the method and one not mentioned by the author is the cost of implementing the change (both initially and in the future) from one set of box locations to some optimum set. This cost would mainly involve notifying the customer of the new location to which he should remit. In any event, these and possible other costs unique to the particular situation must be considered in an overall evaluation. The heuristic approach as stated in the article incorporates only the interest and service costs that are assumed to be general to all situations. Additional costs must therefore be considered on a supplemental basis.

In summary, the article sets forth a relatively simply approach to the common problem of reducing collection time of accounts receivable. The approach appears sound and should yield cost savings if applied to an actual situation.

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Strategies for Allocating Funds by SEYMOUR TILLES, *Harvard Business Review,* January-February, 1966.

The prime objective of a capital budgeting program in any company is to enhance the future performance of the total corporate entity. Many enterprises set a minimum standard for the rate of return on each investment. This practice, which results in a bundle of desirable commitments, may be adequate for evaluation of cost-saving investments, but a more strategically oriented approach to the allocation of funds that permits the company to be considered as a whole, i.e., from the top down rather than from the bottom up, is needed. Mr. Tilles outlines several approaches that can be used to unite high-level corporate strategy with capital budgeting decisions.

There are many elegant procedures for evaluating and selecting alternative investment proposals, but there is no tool for appraising the entire lot of proposed projects from the viewpoint of overall corporate objectives. To use the methods properly, all pertinent factors must be quantified. Some elements cannot be quantified, e.g., investments necessary to maintain a competitive position or the effect on personnel morale of installing a cafeteria to be operated on a nonprofit basis, yet these subjective elements must be given as much weight as the objective return on investment.

Dubious assumptions

Additionally, the rate of return is only as good as the data, or ingredients, of which it is composed. Many dubious assumptions are made regarding technology, competition, prices, costs, profits, the effect of the learning curve, etc. These assumptions are usually made in the department or profit center offering the project as a profitable candidate for investment. As Mr. Tilles points out, in military planning the determination of the basic assumptions is the responsibility of the highest levels of command.

Overall view

Not only do the ranking methods leave something to be desired but also the organizational structure is inefficient in the allocation of funds. Divisions, or profit centers, were created to develop the manager's personal responsibility or accountability. But the objective of capital budgeting must be viewed from the perspective of the entire company, not just what will be profitable for Division A.

The chief executive needs a way of allocating funds that is consistent with his role as chief strategist. He must be able to think about the overall company and convey his conclusions down the line in fairly broad terms.

Product portfolio

One strategic approach he can employ is to determine the fundamental objectives that the organization is trying to achieve. The company can think of itself as managing a "portfolio" of products. Products, per se, do not create success. Success in the competitive world is the result of the company's abilities rather than its products' characteristics. Management must determine which products will comprise the portfolio and then allocate funds to each one. As in investment management, the top executive should consider the goals of the company so as to achieve the desired combination of risk, income, and growth. For example, a workable strategy in a technologically unstable environment may be to maintain a portfolio that includes products having a high degree of technological ferment and those having a relatively stable technology.

Geographic boundaries also represent a major strategic dimension essential for the optimal allocation of funds. As a case in point, in 1964-65, $70 million of Republic Steel's capital spending was invested in the South. Although Republic believed the demand for steel would not grow as rapidly in the South as in Chicago, they were hopeful of doing well in the South because they have had only one real competitor there. The balance of available funds was channeled to the Ohio area, which is now the biggest steel-consuming market in the world.

Distinctive competence

Lastly, a business should develop distinctive competence, i.e., that set of attributes which makes a company both different from and better than its competitors. If the distinctive competence is a reputation for solving technical problems, an investment in research and marketing will make possible its continuation. If it is speed of delivery, the flexibility of production lines and inventory control must be maintained. Or, the distinctive competence may be a remarkable distribution network such as Coca-Cola has developed. Coca-Cola is distributed in 1,600,000 outlets, more than any other product in the world. This extraordinary distribution made it easier for the company to market its new brands. In a rapidly changing environment, competitors may appear from unexpected places, and a distinctive competence may rapidly disappear. Distinctive competence is not something that should be identified and forgotten; it must be continuously analyzed for investment.

Allocation criteria

These recommended strategic approaches provide criteria for the allocation of funds that emphasize the three essential perspectives for strategic choice: (1) They are concerned with the total company; (2) they deal with its competitive position; and (3) they are future-oriented.

The chief executive cannot merely allocate funds to anything that guarantees a given rate of return, nor should he serve merely as arbiter among his subordinates.

His function must be to enhance understanding, to inform his team, and to employ a strategic approach to the enlargement of the organization's resources.

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Branding and the Robinson-Patman Act, by JACKY KNOPP, JR., *The Journal of Business,* January, 1966.

The author summarizes problems facing a manufacturer who sells a product under his own brand and also affixes a "private" or distributor's label to the identical product.

In legislative hearings preceding passage of the Robinson-Patman Act, an attempt was made to add the word "brand" to the requirement of "like grade and quality." This proposal was defeated on the basis that it would defeat the purpose of the bill because large buyers would negotiate for a special brand on top of a price concession from the seller.

The author points out that both the Federal Trade Commission and the courts have had great difficulty applying the "like grade and quality" test since many of the characteristics that make up grade and quality (such as color, flavor, style, etc.) are measurable only subjectively. He suggests, therefore, that some other characteristic be substituted and that the best known acceptable substitute is the "brand."

Brand loyalty

Mr. Knopp presents a logical argument for acceptance of brand as a basis for differential pricing. Manufacturers realize that product differentiation coupled with brand recognition is the most important factor in increasing or maintaining their share of the market; consumers tend to equate consistent quality with certain brands.

A common way in which the branding issue now arises in Robinson-Patman cases is through manufacturers' pricing of private brands that are owned by someone other than the manufacturer. Often the only difference between the private brand and the manufacturer's regular brand is the label. Under the Robinson-Patman Act no price discrimination would be permitted, yet the owner of the private brand does his own job of demand creating through promotion and placing his own reputation for quality behind the product.

Although the FTC basically holds to physical comparisons in cases concerning grade and quality, it has, at times, appeared to favor brand recognition. Mr. Knopp cites a number of cases in which the FTC has actually supported the value of branding as a basis for price differentiation. In essence, the Commission has decided in these cases that public acceptance rather than "grade and quality" is the important competitive factor.

The suggestion is made that the important point is not whether the goods are of like grade and quality but whether the manufacturer and/or distributor has taken unfair advantage which has resulted in a lessening of competition. Possibly this should be the only basis for action by the FTC.

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Impact of Merger Accounting on Post-Merger Financial Reports by A. N. MOSICH, *Management Accounting,* December, 1965.

The use of purchase or pooling accounting to record mergers is carefully analyzed and illustrated, and the potentially dramatic impact of each method upon the future financial condition and earnings of the enterprise is clearly explained.

When a merger is treated as a purchase, acquired assets are recorded at the purchase price and there is no transfer of retained earnings. Under the pooling method the assets and retained earnings are transferred at book value. Since the choice of the proper method between purchase and pooling accounting is not always clear, the accountant should recommend to management the method that will best serve the interests of all concerned.

Using an illustration in which the price paid for the acquired company exceeds the book value of its assets (which is typical in view of the increasing-price-level trend), Mr. Mosich points out the comparative effects of each accounting method on future financial performance. These potential effects include the following:

1. *Effect on Earnings*—Total and per share reported earnings may be much less under the purchase method because of the additional writeoff of the increment in asset values.

2. *Effect on Rate of Return*—Under the purchase method reported earnings are lower, and total assets and equities are higher. This results in substantially lower rates of return on sales, assets, and stockholders' equity. "These factors can have significant meaning to the investor and affect the future market value of the stock."

3. *Effect on Market Value of Stock*—The market value of common stock is often directly related to earnings. A given price/earnings ratio for the post-merger stock would result in substantially different values per share under the two methods (60 per cent difference in the illustration used).

4. *Effect on Raising Additional Funds*—By using pooling, the post-merger company could probably issue more shares of stock at a higher price than if the purchase method had been used. A factor tending to offset this is the higher rate of stockholders' equity that results when purchase accounting is used.

Management must accept the responsibility to disclose fully the pertinent details of a merger to the readers of the financial statements. Because of the increasing trend toward mergers, it is important for management accountants to provide guidance in understanding the

effects of the accounting methods available.

Until reporting on mergers and post-merger results is understandable to readers of financial statements, management accountants will continue to subject their companies to criticism. However, a better understanding of the problems and effects of each method is needed before obtaining more agreement among accountants and more consistency in their reports.

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Officers and Directors — Sitting Ducks by STANLEY L. WALLACE, *Financial Executive,* November, 1965.

There is no sensible alternative to proper insurance when it comes to stockholder action against officers and directors for alleged negligence in the performance of their duties. Negligence, furthermore, is not always avoidable. Are you certain you always know when you are negligent? How about your subordinates?

It is fairly difficult for any of us to guarantee that we will never be negligent, much less take any comfort in the probability that those for whom we are responsible will always act with that degree of care which takes us off the hook as far as negligence is concerned. Every director and officer should have some knowledge of where he stands when it comes to the very strong *possibility* of suit by a stockholder. Can the corporation indemnify the director or officer? Can the corporation foot the defense bill in an action against an officer or director for negligence? What real function would the by-laws have in such an action? If action is brought against a group of directors whose "only sin" was to vote "aye" in favor of a deal in which the corporation incurred a significant loss, and negligence can be established, are the directors jointly and severally liable? Thus, if one director was unable to meet his judgment, would the others be required to meet it? If so, would those who were required to pay more than their share probably have the right of subrogation against those who were deficient? This situation is seen by the author as a "warm feeling which I could do without."

This particularly interesting article explores many of the possible gaps in insurance coverage for officers and directors. It is inconceivable that directors and officers who value their personal fortunes would have no knowledge of this area of possibilities. The point is: Can you trust your personal knowledge of that for which you are liable? It is fully within the realm of possibility that a reading of this article will help you ask more meaningful ques-questions of your insurance agent as well as of your legal staff.

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Information Processing: Fact, Fiction and Future by NORMAN STATLAND, *Data Processing Magazine,* February, 1966.

In a nontechnical fashion, Mr. Statland surveys the history of commercial computer applications. Progress and disappointments of the period from the late 1940's to 1964 and some predictions for the period 1965-1968 are presented.

The author divides the history of commercial applications of digital computers into three phases:

1. The late 1940's and early 1950's, characterized by emphasis on use of computers as high-speed calculators in scientific laboratories. Little attention was paid to input-output devices, programing, or data preparation and conversion. The author describes this period as one of "painful teeth cutting."

2. 1954-1958, characterized by the lack of and need for technical skills and managerial appreciation of the potential of the computer as a profit-making device. The computer was still viewed as a faster and more powerful accounting tool; i.e., the implications of the transition from a wired plugboard to an internally stored program were not realized. Management learned through painful experience that there was little advantage in integrating a computer into existing clerical systems for order processing, payroll preparation, billing, etc.

3. 1958-1964, characterized by exaggerated claims that computers were the panacea for all business problems in spite of frequent costly failures. Although computer capacity and reliability increased, clerical savings were infrequent, and system preparation (installation, programing, etc.) was expensive. However, for the first time analysts designed effective new systems (in contrast to the piecemeal use of the old system adapted for a computer). More attention was paid to programing; new languages (FORTRAN and COBOL) and prestored programs were developed. Management realized "that the future of computers lay in the use of the computer as a management aid rather than solely as a replacement for routine clerical work."

The immediate future will see further use of the computer as a systems analysis tool so that the "true workings of a business. . . . (may be) . . . examined to see how they interact with each other." Centralized data storage for all departments is promising as are feedback loops to show management the results of implemented policies. Computers will become more involved in daily operations such as continuous process control and preparation of daily display reports.

Mr. Statland skillfully avoids controversial issues concerning the future of computers, for example, whether they will ever be able to "think," "create," or replace managers. Also, he does not discuss analog computers or the evolution of digital computers during the century following the pioneering efforts of Charles Babbage who constructed the first computer, (called a "difference engine") in

the 1840's. However, the author's primary objective (to survey commercial application of digital computers to data processing problems during the past two decades) is accomplished concisely in a readable fashion. An excellent supplementary article that deals with future applications is E. Michael Shays' "The Feasibility of Real Time Data Processing," (MANAGEMENT SERVICES, July-August, 1965).

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Modular Production — A New Concept by MARTIN K. STARR, *Harvard Business Review*, November-December, 1965.

The author forecasts a new production technology responsive to changing consumer demands and discusses its significance to management.

With an ever increasing number of new products whose economic lives are shorter, the management of tomorrow will be faced with the task of determining the optimal mix between special- and all-purpose equipment. Mr. Starr offers an excellent solution to meeting the future demands of the market — the next and logically consistent phase in the development of interchangeable parts.

Definition

Modular (or combinatorial) production is the capacity to design and manufacture parts that can be combined in the maximum number of ways. The basic idea is to have an inventory of parts that can be utilized in many appealing product configurations. Each order received can be translated into a unique assembly form, thus permitting the manufacture of a greater variety of products.

With modular production the production manager and his area of responsibility will once again assume high-level importance in top management planning and control. The manufacturing team will be called upon to find operational and economic means for introducing the necessary diversity in productive output, given its potential set of tools, concepts, and facilities. Necessary and real diversity means the capability to produce a sequence of units each of which will differ substantially from preceding units and also from the units produced subsequently.

Technology

The substance of this capability is technological. Existing high-volume, low-cost, automated mass production will eventually give way to adaptive automation capable of producing a sequence of unique outputs at no sacrifice of volume and at no significant increase in cost. This trend is now apparent; e.g., in the auto industry a number of options for new cars are available to customers; a major petroleum company has designed a gasoline pump that permits the consumer to mix his own blend; type faces of typewriters vary; soap comes in many colors, etc. In every case advances in technological capability have been necessary to permit the diversity.

Components of change

The important components of change for the production manager are these: (1) Design must be for interchangeable modules; and (2) the ideal is not a fixed output but rather adaptive automation. The primary significance of adaptive automation will be for assembly operations and only secondarily for the transformation processes. The many different inputs of materials, skills, information, and power (i.e., the transformation process) will be combined in various ways to produce a catalog of parts rather than a single output.

The computer and management sciences will be invaluable tools in coping with the production of variety. When the former is programed with appropriate models developed from the latter, such as sequencing models, line-balancing and queuing models, and heuristic procedures of many kinds, a new and greater level of managerial control of diversity can be accomplished. Complex design constructions and evaluations that formerly required many man-weeks of analysis will be achieved so rapidly that a new sense of creativity will develop.

Fundamental changes

Mr. Starr cautions us that we are dealing with a situation that will involve fundamental changes in the enterprise's environment. Management must develop the ability to cope with and manage a new kind of productivity. The new organizational structure will provide greater responsiveness to the market. Production will have to be in touch with consumers. The company of the future must permit the production manager to respond with sensitive perception to developing technologies. To achieve these results, a much higher level of functional integration is needed—which will be forthcoming as the computer assumes more and more duties which can be programed. Production management and marketing management must participate together in top management decision making.

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