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What People Are Writing About

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what people are writing about

BOOKS

Accounting Information in Managerial Decision-Making for Small and Medium Manufacturers (Research Monograph 2) by GARY A. LUOMA, National Association of Accountants, New York 10022, 1967, 88 pages, \$2 (paperback).

Smaller companies, this study finds, could improve their decision making simply by making better use of the information that is already known or readily available to them.

This little monograph compares the "proper and sophisticated" use of accounting in decision making and the extent to which it is practiced by managements of small and medium-size firms. Not surprisingly, the research indicates "a wide gulf" between them.

The author picked six specific decision areas in which to analyze management use of cost data and information: capital equipment analysis, cost-volume-profit analysis, financial budgeting, inventory control, make or buy analysis for products or components, and product pricing. He conducted in-depth studies of six companies, all Southern or Midwestern manufacturers

with annual sales volumes of \$12 million or less. This research was supplemented by a mail survey from which 62 usable replies were received.

In general, the author concludes, managerial decision making in small and medium-size manufacturing firms is not highly structured, and accounting data are not being used in a sophisticated manner. Some major operating decisions are made without the use of proper accounting information, even though that information is known or is readily available to management.

The sophistication with which accounting data are used in deci-

REVIEW EDITORS

In order to assure comprehensive coverage of magazine articles dealing with management subjects, MANAGEMENT SERVICES 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 SERVICES. Unsigned reviews have been written by members of the magazine's staff.

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sion making varies of course among companies and among the specific decision areas studied. Orderly procedures are more common in the areas of capital equipment analysis, financial budgeting, and product pricing than in the areas of cost-volume-profit analysis, inventory control, and make or buy analysis.

Among the major deficiencies: There is a general lack of precise definition and separation of fixed and variable costs with a consequent lack of incremental or differential analysis. Full manufacturing costs are used in many situations where other cost structures would be more meaningful.

Decisions are based on oversimplified analyses. Many of them are made in response to developments in operating environment without adequate attention to the effect on costs and profits. Generally, executives are aware that accounting information can be useful in decision making but do not understand exactly how to go about using it. The author's recommendation: more accounting education for management, particularly top management.

Although the conclusions of this study are far from unexpected, they do point up specific opportunities for accountants to be of service to smaller companies. For the small company executive, the description of model accounting-based decision making that the author presents for contrast with his research findings might serve as a simple introduction.

A Manager's Guide to Computer Processing and The Management of Data Processing by ROGER L. SISSON and RICHARD G. CANNING, John Wiley & Sons, Inc., New York, 1967, each 124 pages, each \$6.95.

These companion volumes are basic guides to the use of computers for the executive and the data processing administrator, respectively.

The first of these books, the manager's guide, is another introduction to the computer for the businessman. Its purposes, according to the authors, are to show the manager how to view the management information system analytically, to teach him enough of the language of the systems designers to facilitate communication with them, and to teach him enough about computers for him to be able to determine whether his information system needs modernizing.

It defines the characteristics of management control systems, relates these characteristics to the various functions of the business, and discusses how information can be categorized for management purposes, how systems functions should be organized, and what costs are involved. There are, of course, a myriad of such books; this one is shorter and less technical than most.

The book for data processing managers has less competition. Its emphasis is on the future. The authors identify the major trends in computer applications, equipment, organization, and staffing, differentiating the advances they think will be made almost immediately—such as the adoption of visual display units and fast response systems—from those that are more remote—such as the corporate data file and the information utility. Then they suggest how the EDP manager should prepare for these changes.

The language is simple, but the approach is sophisticated. These authors know a lot about data processing problems; any manager of an EDP system should be interested in what they have to say.

Management Systems: A Book of Readings by PETER P. SCHODERBEK (editor), John Wiley & Sons, Inc., New York, 1967, \$10.95.

Although this volume was compiled primarily for use as a supplementary college textbook, it would also be valuable background

reading for anyone involved in systems work.

This carefully chosen collection of articles on various aspects of management systems combines a number of subjects not often taken up in a single volume. The principal topics are the systems concept, information technology and its effect on the organization structure, design of management systems, total systems, human problems of systems, management control systems, cybernetics, computers, simulation, measurement, PERT and PERT/Cost, real time systems, and information retrieval.

All the articles are readable (clarity was one of the editor's principal criteria for inclusion in the volume); most are valuable; and some are genuinely outstanding. The material is reprinted from books, seminar proceedings, and nineteen periodicals; five of the articles originally appeared in MANAGEMENT SERVICES.

An Evaluation of Finance Leasing by JAMES F. JACKSON, JR., Bureau of Business Research, Graduate School of Business, The University of Texas, Austin, 1967, 139 pages, \$2.50 (paperback).

This summary of the basic considerations in deciding between leasing and purchase would be helpful background material for anyone who must make such an analysis.

The objective of this study was to determine what conditions favor the use of finance leases over alternative methods of financing an asset.

The author examines various methods of determining the relative cost of the alternatives, including relative total cost and annual cost of assets; analyzes the effect of cash-flow differences; reviews the basic tax considerations; and summarizes the significant qualitative factors to be considered.

Assuming that the finance lease qualifies for a tax deduction, it generally has an economic advantage over purchase of the asset if the nondepreciable portion of the asset is high, if the useful life is long, and if the cost of capital is high, he concludes. However, non-quantifiable considerations such as flexibility also may be important, and in the end each decision must be made on its individual merits.

The Structure of Human Decisions by DAVID W. MILLER and MARTIN K. STARR, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1967, 179 pages, \$2.95 (paperback).

Two Columbia University professors offer a remarkably clear and nonmathematical explanation of modern decision theory.

Both the advocates of traditional scientific management and the human relations theorists have been looking for a unified theory of management for a long time—without much success. More recently the mathematically minded management scientists have come up with their own candidate—decision theory.

Decision making, these authors claim, is a universal process whose basic elements apply to any problem, whatever its detail. This book seeks to explain what decision theory is and how the manager can apply it to any sort of problem. The application rests on the proper classification of a problem; once the problem has been classified, problem solving techniques appropriate to that classification can be used. The techniques themselves, which are the tools of operations research, are not elaborated upon in this book, whose stress is on basic concepts.

The authors start by explaining model building and by defining the organization as a communications network, characterized by input, output, and feedback. They explain utility and maximization as

decision criteria, and discuss the problems of suboptimization.

Then they outline decision theory, stressing probability theory and payoff matrixes. They divide decision problems into five classifications: decision making under conditions of certainty, uncertainty, risk, partial information, and conflict, and suggest decision criteria for each classification. Finally, they indicate briefly how applied decision theory (operations research) can be used in problem solving.

All this is done in the simplest possible language and with minimal use of mathematics. Anyone who wants to know what management science is all about without actually becoming an operations research man himself will find this little book genuinely helpful.

Critical Path Networks by R. L. MARTINO, MDI Publications, Management Development Institute, Inc., 130 West Lancaster Avenue, Wayne, Pennsylvania 19087, 1967, 158 pages, \$17.50.

A pioneer in the field of critical path networking has produced a primer for the complete beginner.

The various networking techniques (PERT—Program Evaluation and Review Technique; CPM—Critical Path Method; and MAP—Multiple-resource Allocation Procedure) are probably the most widely used tools of operations research. They have, indeed, become so common that Dr. Martino sees—probably accurately—a need for a primer that can be understood even at the high school level.

This is what he has attempted to supply in this volume. It is designed to explain the nature, scope, and application of critical path networks to all who might need to apply this approach to project work or to direct others in its application.

Topics covered include project planning, scheduling, and controlling; modeling a project; preparation of master networks; ranges of

starting times; job boundaries and float; the critical path; event-oriented networks; and implementation.

The book treats networking as a universal technique independent of any particular profession, discipline, or computer configuration. The presentation requires no specialized knowledge of any field, of computers, or even of mathematics. (The reader needs only a minimum of high school algebra, and even that can be omitted.)

The style is simple, and the presentation is graphic, with more than 200 diagrams in a handsomely produced volume. Although the high price may limit its use in training programs, there is no question that this manual fills a real need.

Briefly Listed

Financial Information for Executive Management by N. THORNTON, Gee & Co. Ltd., 151 Strand, London WC2, England, 1967, 180 pages, 42 shillings (\$5.04).

This little summary of the essentials of management accounting examines management information as a tool of business control, identifies the assumptions and limitations that govern the providing of financial information, outlines pertinent accounting terminology and classifications, and specifies some of the detailed information that should appear on financial reports. More than half the book consists of appendixes, containing sample accounting reports and information on report preparation, reproduction, the use of charts, and the committee system.

The Financial Executive and the New Accounting by MAURICE E. PELOUBET, CPA, The Ronald Press Company, New York, 1967, 227 pages, \$6.

This review, for the corporate executive, of the services accounting firms offer their clients in-

cludes a chapter outlining current approaches to management advisory services. It lists the six basic steps in a consulting engagement and tells 18 brief case histories illustrating typical assignments.

Teach Yourself Operational Research by M. S. MAKOVER and E. WILLIAMSON, The English Universities Press Limited, St. Paul's House, Warwick Lane, London EC4, England, 1967, 264 pages, 10 shillings sixpence (\$1.26).

Operational (operations) research is not really what the reader of this self-instructional text will learn from it. Rather, the subject is some of the basic mathematical techniques that are the standard tools of operations research: probability, replacement, forecasting, stock control, queues, linear programming, theory of games, network analysis, and dynamic programming. The treatment is simple, clear, and concise, but it demands some grounding in mathematics.

MAGAZINES

HP—A New Tool for Uncovering Decision Processes by CHARLES G. MOORE, *Pittsburgh Business Review*, September, 1967.

This article summarizes some recent research on human decision making processes that shows promise of developing a means of automating some middle management decisions.

The predicted automation of decision making at the middle management level has not yet occurred. Yet, this author indicates, recent progress in the use of a new tool known as heuristic programming suggests that the day may be drawing nearer.

Heuristic programming (HP) is the development of a computer decision program by rule of thumb experimentation. Academic researchers have been using this

technique to teach computers to simulate human decision processes. The purpose was to learn something about how human beings actually make decisions. But the success of these experiments indicates that it may soon be possible to automate some management decision making—and perhaps even to forecast the decision making of customers and competitors.

The decision processes that have been simulated include the determination of prices (regular, promotional, and markdown) in a retail store; the investment decisions of a bank trust officer; the purchasing patterns of a department store appliance buyer; and a motorist's choice of gasoline service stations. In some cases the computer has been programmed to duplicate almost exactly the decisions actually made by the human being.

From all this the researchers have reached some conclusions about the way people's minds work in decision making; for example, that the mind considers relevant factors in sequential fashion rather than simultaneously (just like a computer) and that the rules of thumb used in reaching the decisions are relatively simple. They also have succeeded in identifying the functions actually performed in decision making: choice, categorization, and computation.

The decision rules developed in these studies for the most part represent the thinking of single individuals and hence are not necessarily valid as generalizations. But larger samples can be studied. Then it would be possible to capture the decision criteria and data bases in the form of flow diagrams and put them into computers.

The decisions that would thus be automated, although relatively important and typically made at a managerial level of the organization, differ only in degree, not in kind, from those already being made by computers (payroll calculations, inventory control systems, etc.). These higher-level decisions differ from the others in that the rules of thumb used have been

learned by the individuals who use them largely through experience, often without formalization, and that they may require the use of subjective, unquantifiable information. But, to be suitable for automation, they still must be routine (i.e., fitting a more or less consistent pattern) and repetitive (to justify the cost of programming).

Even more exciting is the more distant prospect of programming the behavior of persons outside the organization—a development that would give the manager much more control over his environment. The day of electronic decision making may not be so remote after all.

Systems and Government by JAME D. GRANT, *Budgeting*, September-October, 1967.

In this article the administrative vice-president of the National Institute of Public Affairs stresses the importance of the systems approach for allocation of government resources. He discusses the new integrated planning-programing-budgeting system in the Executive Branch and the applicability of the systems approach to government non-defense projects.

This article discusses two areas where the systems approach is being newly applied to government: the planning-programing-budgeting system and industrial-type systems studies for public programs. The integrated planning-programing-budgeting system was initiated by the Bureau of the Budget in October, 1965, and the systems studies were conducted by aerospace companies for the State of California.

The integrated planning-programing-budgeting system (PPBS) is intended to alter the federal planning and budgeting process to effect more systematic analysis and, thus, to provide a better allocation of federally controlled resources. The author describes the three con-

cepts on which the new PPBS system is based: 1. the delineation of agency objectives and alternative programs which can attain the objectives, 2. the existence of long-term planning, and 3. a budgeting process that can translate a broad program decision into a budgetary framework for executive action.

The author states that the new "objective-oriented" federal system has many desirable characteristics for a federal budget structure such as cost benefit analysis and the comparison of various management units administering the same program. Objectives in our society, he says, are influenced by differing social responsibilities, and the formulation of objectives should be multi-disciplinary to attain the "optimal set of concurrent objectives." Thus, social justice, not simply economic rationality, may be the limit on executive action. Mr. Grant also believes that in certain cases the handling of uncertainty can be as effectively managed in the political area as in the analytical area.

The second area discussed is the applicability of the systems approach, so successful in defense areas, to government non-defense projects. This area is currently of particular interest because of the probability of a defense cutback at the conclusion of the war. He breaks down the systems approach to its three phases: analysis, engineering, and management. Systems analysis supports decisions of design, selection, or operation. Systems engineering, more detailed than analysis, deals with design and development. Systems management represents the ability of an organization to design, develop, and operate an intricate system. The State of California sponsored a study a few years ago on the feasibility of adapting industrial systems capabilities to non-defense problems such as transportation, pollution, and crime. The results indicate that the systems approach can be adapted to public programs and the "pattern of action" necessary to attain the social objectives of these programs. The use of contracts

Vertical: What People Are Writing About
between government and business offers a means of utilizing industrial capacity for public programs.

The National Institute of Public Affairs evaluated the California studies and concluded that they substantiated the feasibility of the application of the systems approach to public affairs fields. The institute also called for more exploration, stressed the need for cooperation among "Balkanized" jurisdictions, pointed to more specialized personnel requirements, and, finally, mentioned that government and business must work toward each other's goals if the partnership is to be successful.

The article is valuable reading for those interested in the adaptability of the systems approach to non-defense problems at all levels of government and the related activities in the federal program planning and budgeting system.

RICHARD J. VARGO
University of Washington

Canons for Line of Business Reporting by OSWALD NIELSEN, *Management Accounting*, August, 1967.

This author suggests that reports resembling analyses and reporting for internal management use might better serve the public than the line of business reporting of current controversy.

Current interest among accountants in line of business reporting (reporting sales and profits by division or product lines) was, the author points out, spurred by the Senate Anti-Trust Hearings in 1965 and the statement made by Manuel Cohen, Chairman of the Securities and Exchange Commission in Denver in July, 1966, and re-emphasized at the annual meeting of the American Institute of Certified Public Accountants in October, 1966. Furthermore, some financial analysts support more extensive reporting because they feel seg-

mented information will help them to give better service to the investors who depend on them.

The author discusses some of the practical difficulties in presenting a meaningful expression of net income by individual lines of business—the risk of disclosing classified information, the shifting significance of lines of business, the diversity of accounting practice among divisions, and the integration of a business activity which is not always clearly identified as entirely horizontal or vertical.

He also discusses the conceptual problems. First, sales figures may not be good indicators of the revenue capabilities of various business segments. This is true in the case of vertically integrated lines and in any situation where intra-company transfer pricing is involved. Secondly, there are problems related to general overhead and its allocation. No basis for joint cost allocation has been developed up to now.

In spite of these institutional and conceptual problems, management finds segmented information useful for internal purposes, and the author feels it can be of value to outsiders. Professor Nielsen has applied the accounting techniques for making analyses for internal planning and control to external reporting to provide more adequate information for general readers and outside users. This information may be important to a sound analysis of the company's worth and future prospects. The author uses as examples analyses of such data as sales figures, joint and by-product cost, general overhead financing charges, and loss allocations.

Examples

One illustration used by the author concerns sales. If the integration is vertical, sales that occur internally between divisions might arise from a make-or-buy analysis. This may be used to determine the value of internally used production. This analysis "will be in terms of cost savings, arrived at

by comparing contemplated purchase price with those costs incurred incrementally to achieve internal production."

Another illustration deals with the difficult problems of "concurrent absorption." In this case managerial analyses should be conducted on the basis of both long-run and short-run considerations. In the long run all overhead can be traced to a particular product line on an incremental cost basis, thus reporting on a full cost basis. In the short run reporting would be of sales and contribution margins by lines of business.

The author raises the question of stability of segmentation. He recommends the disclosure of the important shifts in lines of business; to achieve this the various lines must be identified clearly enough to permit the study of such changes.

Finally, the author concludes that certain business segments, especially those that do not lend themselves readily to quantitative analyses, may be more adequately reported by combined than by segregated reporting.

What is now needed is further study by management, accountants, and regulatory agencies to assess the relative advantages of these analytical considerations and to decide what disclosures should be required in financial reporting.

FAWZY DEMIAN
University of Washington

Financial Implications of Lot-size Inventory Models by WILLIAM BERANEK, *Management Science*, April, 1967.

Many inventory models, including the lot-size or classical model, imply financial conditions that should be considered by the user. If the assumptions of the model do not correspond to those in a firm's environment, the result will be financial infeasibility or a non-optimal inventory or both. Most users of the lot-size model would not recognize financial infeasibility

because they are modeling for a sub-unit within the firm, which thus would be, in effect, subsidized by other sub-units in this situation. The nonoptimal inventory is also likely to go unnoticed; it is probably an unnecessary cost when an improved model is available.

In illustrating the restrictive conditions of the lot-size model, the author examines its assumptions concerning inventory carrying costs. These carrying costs, c , are defined to include the interest cost per unit of inventory over the planning horizon, T . If demand for inventory is uniform over the horizon and if q denotes beginning inventory, the average inventory becomes $q/2$, and it is conventional to define total carrying costs over T as $cq/2$. The implied assumption in this definition is that both interest cost and the average amount of the loan outstanding are proportional to $q/2$. In addition, each of the several loan repayment schedules that would agree with this proportionality are associated with a cash inflow assumption. Consideration of this necessary cash inflow is complicated by the fact that dollar resources tied up in inventory must flow through accounts receivable before resulting in a cash flow.

As a remedy, the author proposes incorporation of the actual financial conditions of each subject firm or sub-unit of a firm in the model utilized. His suggested method involves the computation of actual financial carrying costs, quantities which then may be inserted into expressions of total inventory costs in the model. The procedure for computing the financial carrying costs consists of first assessing the loan repayment arrangement in order to determine the average amount of the loan outstanding. Then the interest cost per cycle is computed by multiplying the interest rate by the average amount borrowed. This amount plus any fixed borrowing fees is added to the non-financial carrying

costs to obtain total carrying costs for a cycle which is used in the model. In four examples, it is shown that some ordinary financial situations result in considerable differences between the usual assumptions and the model using the firm's actual financial conditions.

Most users of this type of inventory model should consider the implications of this article on their model. It does not seem likely that the assumptions of the classical model will exist in very many firms, and the resulting errors may be costly.

WILLIAM L. FELIX
The Ohio State University

The Lawyer, the Statistician and the Internal Auditor by L. B. SAWYER, *The Internal Auditor*, Summer, 1967.

Statistical sampling has gained wide acceptance in business, but variable sampling has been held inadmissible in court cases. In this article the problem is discussed from the viewpoint of rules of evidence, and some possible approaches to gaining admissibility for variable sampling are suggested.

The author, an attorney, utilizes the case of *Sears, Roebuck and Co. v. The City of Inglewood* to illustrate and highlight his discussion of the relationship of statistical sampling (especially for variables) and rules of evidence. The case involved overpayments of city sales taxes. Sears had paid taxes on sales to out-of-city customers and sought a refund. A professor of statistics conducted a sample examination of the sales tickets for the period and found the overpayment to be \$28,250 plus or minus \$4,200 at the 95 per cent confidence level.

Inadmissible evidence

The case was thrown out of court when the defense attorney asked

the professor one question: "On the basis of your sample, can you state that sales to people outside the Inglewood area were exactly . . . ?" and the professor replied, "Of course not." His testimony was ruled inadmissible, and the reasons why constitute the gist of the article.

Rules of evidence are rules of exclusion, since any relevant evidence should be brought into testimony. The relevant rules in this case are these: the hearsay rule, the opinion rule, and the best evidence rule. The hearsay rule prevents admission of testimony by persons who did not witness the occurrence about which they are testifying. Business records are technically hearsay but have evolved into admissible testimony as an exception to the rule. Witnesses are not permitted to give opinions unless they are experts in some field, profession, or science and then only if the experts' opinions are the only way in which the facts could be presented in an intelligible manner to the average court and jury. The best evidence rule would require all documents pertaining to the issue to be presented. An exception to the rule has developed as a practical necessity. If the documents are so numerous that it would be virtually impossible to present them all, a summary prepared by a competent witness may be admitted.

Problems of variable sampling

Thus, business records are admissible, expert witnesses may offer opinions, and summaries of documents may be presented. Still, the court forced Sears to examine all 950,000 sales tickets for the period before its claim was allowed. The author feels that since attribute sampling has been held admissible, the problem lies in variable sampling for three reasons: Variable sampling is incomprehensible to the average court and jury; it is conjecture, not good solid fact; and its results are not precise but must be expressed as ranges, mak-

ing the court hesitate to set a numerical value.

These objections he finds to be invalid. Internal auditors should carry their expertise in "translating" technical problems to non-technical managers into the area of interpreting sample results for lay juries and courts. Similarly, variable sampling is not conjecture but is mathematically sound and widely accepted in many business situations such as determinations of the shares of airline fares when several lines carry the same passenger who pays one airline for the entire trip. Finally, the range of estimate may be narrowed through adjustments in sample size, and the saving in examination costs may offset the possible loss in accepting the low point of the range estimate (\$24,050 in the Sears case).

The author concludes with some prescriptions for the internal auditor to adopt for the purpose of gaining acceptance by courts of variable sampling results—chiefly becoming proficient in the area and informing management of his ability. Certified public accountants as well as internal auditors should find the article interesting and informative, particularly since the legal aspects of the question are dealt with clearly and fairly completely.

JOSEPH G. LOUDERBACK III
University of Florida

Marketing and the Controversy over Conglomerate Mergers

JOHN C. NARVER, *Journal of Marketing*, July, 1967.

The controversy between anti-trust agencies of the federal government and business management about conglomerate mergers would be clarified if everyone could agree on a definition of a "conglomerate."

Many businessmen have concluded that the Federal Trade Commission opposes marketing efficiency, because of the Commission's opinion in the Procter &

Gamble-Clorox merger case. The central issue in the proposed Procter & Gamble-Clorox merger is the antitrust implications of the alleged marketing efficiencies claimed by the principals in the merger. The Commission questions whether free competition will not be hampered by such mergers; management, on the other hand, feels that competition will be enhanced by heightened competitive opportunities, absorption of idle capacity, and marketing efficiencies in the allocation of resources.

Some seventy per cent of all mergers are conglomerate mergers. This alone is sufficient to justify the increased intensity of interest in this type of merger. Another factor is the lack of a fully developed theoretical foundation for understanding firms with interests and activities in several markets simultaneously. Economic theory is inadequate since its constructions deal largely with the single-product firm operating in one market.

The philosophical differences may have their bases in what have become diverse interpretations of the House report's description (in the bill to amend Section 7 of the Clayton Act) of a conglomerate merger. It was there stated to be an acquisition in which there is "...no discernible relationship in the nature of business between the acquiring and acquired firms." Just what constitutes "no discernible relationship"? Two possible relationships have been suggested: an *activity* relationship and a *product* relationship. In Dr. Narver's judgment, a proper definition is that a conglomerate merger is one in which the acquired and acquiring firms have no discernible *product* relationship, that is, a merger in which the products of the two companies are noncompetitive and are not related vertically. A merger of the conglomerate type, as opposed to the familiar vertical and horizontal types, is one in which the acquiring firm gains a new external market, either a new product market or a new geographical market. A new market is one where

customers Management Services: The Magazine of Planning, Systems, and Controls, Vol. 5 (1968), No. 2, p. 8. require the firm product as a substitute for the firm? Are people motivated to achieve these goals? despite product identity, a regional firm acquiring a firm in another region, neither of whose products cross the regional market lines, is said to have a new geographical market. Moreover, a new product market emerges and substitution is impossible when the acquired and acquiring firms' products lack the mutual ability to satisfy the same consumer want.

In conglomerate mergers "bigness" as such, is irrelevant, and an activity relationship is relevant only incidentally. A solution to the controversy over the social desirability of conglomerate mergers may be found if conglomerate is accepted as meaning any and all market diversifications. Market diversification does not necessarily restrict competition but even may enhance it.

THOMAS D. WOOD
University of Florida

Motivation and Coordination in Management Control Systems by CHARLES T. HORNGREN, *Management Accounting*, May, 1967.

Most attempts to judge the effectiveness of management control systems focus on the physical and technical aspects of the systems, not on the "total" control systems employed. The purpose of a control system should be to aid management in attaining "harmony of goals (effectiveness) and the optimum acquisition and utilization of resources (efficiency)." This demands coordination, which in its turn involves the motivation of management.

The author focuses on three areas of management, using illustrative examples to show the relationship of the concepts to the business environment:

1. *Goal setting*—Is there a global perspective in the control system incorporating and interrelating the

2. *Structure of organization*—Is the control system complementary with the organizational structure to help improve the level of motivation?

3. *Acquiring and using resources*—Is the information generated by the control system accurate and relevant enough to be useful in the management's utilization of resources?

Goal setting

In goal setting, the firm must balance its set of interdependent goals, guarding against placing too much emphasis on any particular goal. The establishing and pursuing of goals should not be on a day-to-day basis but requires coordination over longer periods of time. For example, an incentive system should be based upon the performance of the entire firm, not some individual segment. It is possible that efforts by a division to maximize its profits will largely result in efforts to shift costs to other divisions.

The structure of organization and the management control system are inseparable. A change in one is not a panacea for problems in the other. The division and subdivision of the activities of the business enterprise are an attempt to maximize "effectiveness and efficiency," and they require some responsible hierarchy of management. This process is reflected in control systems based upon responsibility costing.

Control systems

Control systems must facilitate the striking of a reasonable balance between cooperation and competition among responsibility centers, keeping in mind the problems of motivation in each center. The accounting system is a direct part of a control system, recording and reporting the performance of each responsibility center. Prob-

to exercise care when establishing these responsibility centers, allowing sufficient freedom of choice to prevent the centers from becoming mere cost accumulation points. It is therefore necessary to consider the motivational aspects involved in the accounting control system

Information systems

Acquiring and using resources must be based on information that is timely, accurate, and relevant. The information from the accounting system should aid management in choosing the correct alternative from among competing courses of action. For example, the goals of the organization and its structure can influence the manner in which foremen allocate the time of their crews to the types of work performed. In the author's example, time spent on maintenance and repair was closely controlled while time spent on construction was loosely controlled. The result was that foremen were encouraging workers to understate the time spent on maintenance and repair work.

Every system possesses problem areas, such as conflicting goals and faulty information. The aim of a control system is to "reduce the lack of coordination and to increase the proper motivation." Because motivation should be a prime consideration in the design of a management control system, specific measures should be undertaken to facilitate an appraisal of the motivational influences of that system. Many times the weaknesses are not technical system problems but lie in the companion area of administration. A successful system requires strength in both.

Limited objective

The author's primary, and limited, objective is to "underscore and make explicit the probable impact of a system on managers' behavior" without analyzing any cause and effect relationships

among the various factors jointly affecting behavior. Within this framework the article illustrates through the specific examples that the control system *does* influence management behavior. It should be noted, however, that accounting has had very little experience with the problem of evaluating levels of motivation.

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Toward a Theory of Group-Decision Behavior by GEOFFREY CLARKSON and FRANCIS TUGGLE, *Behavioral Science*, January, 1966.

In explaining group decision behavior by developing a theory based on the individual's decision processes, an experiment is reported that had some success, according to its authors, in predicting the behavior of several two-person groups in bidding market prices based upon individual decision rules.

The theory outlined in this article is based on the assumption that certain structural invariances (fixed patterns) exist in the decision processes of individuals, that is, individuals have some prior knowledge, some information processes, and some decision rules. The authors extend this notion to groups and suggest that the behavior of groups is determined by individual decision processes plus some means of resolving conflict.

The experiment consists of an experimental task, a program for establishing decision rules, and a program for predicting group decision behavior.

Experimental task

The experimental task is administered first to each subject and later to two-person groups of subjects. Subjects bid prices on two objects in different markets; then an alternative set of prices is selected randomly. If the subject's bid is less

than the corresponding price in the alternative set, the subject wins. In all other cases, he loses. Following this choice situation, the subject is allowed to revise one of his bids, by increasing it or decreasing it before the next alternative set of prices is announced.

Following this initial bidding the authors establish decision rules for each subject by utilizing a computer program to approximate the subject's behavior after he has experienced two wins, a win and a loss, or two losses.

Prediction

From the individual decision rules two-person group decision behavior is predicted. This prediction is made on the following bases:

1. If in a specific situation the decision rules of both subjects in a two-person group agree, then the group decision is the same as each of the individual's decisions.

2. If in a specific situation the decision rules do not agree, then conflict-resolving rules are employed: (a) If both of the group prices on the previous trial were winning prices, then each of the prices is predicted to be raised in the next trial. (b) If one of the group prices in the previous trial was a losing price, then that price is predicted to be lowered in the next trial. (c) If both of the group prices in the preceding trial were losing prices, then the prices are predicted to be lowered on the next two trials.

Comparison with behavior

Following the development of these predictions, the subjects are combined into two-person groups which are given the task, and the actual behavior of the groups is compared with the predicted behavior.

In this experiment the authors report success in correctly guessing the response of the groups at the .01 level of significance. A correct response was defined as one which determined which market price

would be changed and in which direction that change would occur (increase or decrease).

Conclusion

The authors conclude that although the experiment was limited to the two-person groups, they have isolated an aspect of group decision behavior. They say that they are in the process of developing a three-person group experiment and that in the future they intend to determine what effect group decision behavior will have on individual decisions.

The authors' approach may become relevant to the study of decision processes in specific business areas. For instance, in the accounting field, researchers have been concerned primarily with the impact of accounting data on individual decision makers. Possibly this theory of decision behavior will be extended to consider the relationship between accounting data and group decision theory.

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