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What People Are Writing About

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what people are writing about

BOOKS

The Executive Strategist: An Armchair Guide to Scientific Decision-Making by ROBERT C. WEISSELBERG and JOSEPH C. COWLEY, McGraw-Hill Book Company, New York, 1969, 249 pages, \$6.95.

This guide to the techniques and applications of operations research for the non-mathematically-minded manager—one of what are beginning to seem like hundreds of books on this subject—is far superior to most of its genre, both in content and in style.

The aim of this book, its authors say, is to help bridge the communications gap between the executive and the management scientists he is increasingly likely to employ these days. It seeks to introduce the nontechnical executive to some of the basic decision making techniques being used to solve operational problems—what they are and how and when they can be applied—and to give him a familiarity with the terminology of operations research.

This may sound familiar. It should. There are already dozens of books with the same aim on the market. Most of them are written by operations research technicians

or professors. Their style tends to be both dull and difficult to follow. More important, their content often reflects the interest of the writer rather than the reader. If the author's underlying purpose is to "sell" OR, there is usually too much emphasis on applications with inadequate explanation of the methods. Or, conversely, the methods are explained in too much detail, as if the reader were the specialist expected to try to use them.

This book, written by a consultant and a professional writer on management subjects, avoids these pitfalls. The style is lively and readable—if not always as

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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simple as it seems—and the reader is not told so much about the techniques that he risks getting bogged down in pencil pushing.

The basic techniques discussed are mathematical programming, queueing theory, statistical analysis, probability theory, simulation (or Monte Carlo), and replacement, failure, or reliability theory. Two chapters on statistics and probability follow the introductory discussions of decision theory and decision situations, but otherwise the book is organized not by techniques but by problems: Inventory, queueing or waiting line, sequencing or control, routing, search, information, replacement, and competitive problems, with technique chapters interspersed.

A useful action checklist specifies, for each problem category, how to spot it, typical specific business problems within the category, facets of the problem, basic strategy for dealing with it, complications, and OR techniques available for attacking it. An interesting chapter applies OR principles to the management of an executive's time and suggests when and how to use consultants.

A chapter from this book, on search, information, and replacement problems, appeared in *MANAGEMENT SERVICES* ("Strategies for Decision Making," January-February '70, p. 41).

Management Guides to Mergers and Acquisitions, edited by JOHN L. HARVEY and ALBERT NEWGARDEN, John Wiley & Sons, Inc., New York, 1969, 319 pages, \$14.95.

This compilation of articles on various aspects of merger planning combines the viewpoints of accountants, lawyers, appraisers, bankers, and other specialists along with buyers and sellers of companies.

This book, assembled by a partner and a principal of Arthur Young & Company, offers examples

of the kinds of information management must have to make a merger decision and suggestions on how to develop such information.

It consists of 27 articles on planning and fact finding in mergers; the legal, accounting, financial, tax, and personnel considerations; problems of post-merger integration; and foreign mergers, concluding with a section on how not to buy and sell a company.

Most of the chapters are reprints, chiefly from publications of the American Management Association and the Harvard Business School and from the magazine *Mergers & Acquisitions*. Other material was prepared specifically for the book, for the most part by personnel of Arthur Young & Company.

The book is unusual, among volumes on this subject, in the variety of viewpoints represented. It is also unusual, among books published for businessmen, for the care with which it was prepared. For example, most of the reprinted articles were updated before republication.

Unfortunately, in a field as complex and dynamic as this one, there are few eternal verities, and the most valuable chapters of this book are also those that are likely to have the shortest useful lives. While it lasts, however, this is a convenient guide for the executive who is not yet very sophisticated about mergers.

Decision Analysis: Introductory Lectures on Choices Under Uncertainty by HOWARD RAIFFA, Addison-Wesley Publishing Company, Reading, Massachusetts, 1968, 309 pages, \$4.95 (paperbound).

This relatively "elementary" introduction to business-related statistical theory, with emphasis on the Bayesian school of probability analysis, is within the grasp of the average college graduate, if he is willing to work a little.

Statistical techniques, especially sampling and probability analysis, are among the most widely used tools of operations research in industry. Applications range from such old standbys as quality control and actuarial science to such newer fields as sales forecasting and risk analysis in capital budgeting.

Any consultant, any businessman, or particularly any accountant who lacks formal training in statistics is likely to find himself somewhat at a loss in the modern management world. He may find some help in this book, a composite of several series of lectures given by the author on the use of statistics in decision making under conditions of uncertainty.

The word "may" is required, for this is not an easy book (although the author claims it can be understood without training in mathematics beyond the level of high school algebra.) Says Dr. Raiffa, "Most of the basic ideas of decision analysis can be understood with a mathematical background of high school algebra or less; and furthermore, in complicated applied problems the mathematical part of the analysis is not necessarily the most intellectually challenging or important part. I have therefore taken considerable pains to keep down the mathematical demands upon the reader, and most of the book is free from algebraic and symbolic manipulations." He concedes, however, that "some sophistication in logical analysis is undoubtedly required throughout."

One feature that makes the book interesting—and controversial—to both mathematically sophisticated and unsophisticated readers is its emphasis on the so-called Bayesian approach to problem solving. Dr. Raiffa, along with his colleague, Robert O. Schlaiffer, is among the country's leading exponents of this method, which uses both utility values to scale preferences and subjective probabilities to forecast. To the horror of more conservative statisticians, these men advocate the use of composites of "informed opinions" to predict the future

when the standard laws of probability are not applicable. The validity of this method, now being tested in business decision making in a few large companies, has not yet been established. It is, however, something with which everyone in any way involved in OR should be familiar.

One deficiency of Dr. Raiffa's book from the business reader's point of view is that it is not applications oriented. The reader is pretty much left to figure out for himself how the techniques described could be used in business. Indeed, the preface specifies that the subject matter of the book is how "an individual who is faced with a problem of choice under uncertainty should go about choosing a course of action that is consistent with his personal basic judgments and preferences." The example used is that of predicting the color of balls drawn from an urn, an activity that is likely to be actually engaged in only by the administrator of a lottery.

The viewpoint throughout is that of a mathematician who is attempting to explain (rather than sell) his world to an outsider. But this mathematician is a clear thinker and a rather skillful writer; those who can keep up with him will find the effort worthwhile.

The Systems Approach by C. WEST CHURCHMAN, Dell Publishing Co., Inc., New York, 1968, 243 pages, \$2.25.

This book, aimed at the thinking citizen rather than the businessman, discusses the systems approach as a branch of philosophy rather than as a bag of problem solving tools.

The publisher's blurb describes this book as "the first nontechnical study" of the systems approach. Nontechnical it is—in the sense that it is addressed to the layman and written in simple, straightforward language without the use of

technical terms. But it is far from being a popularization in the usual sense.

Professor Churchman, who is associate director of the Space Sciences Laboratory at the University of California, is interested in global problems rather than the dull tasks involved in managing a business, and he is deeply interested in the philosophy of science.

This book is therefore, a philosophical treatise. The basic question it raises is whether the systems approach can be used to solve mankind's fundamental social problems. The question is not definitively answered, of course—like any work of philosophy, the book focuses on questions rather than answers—but the author does conclude, "The systems approach is not a bad idea."

The organization of the book is that of a debate (a la Socrates and Plato, but without dialogue) among the enthusiasts for various types of systems approaches and between them and their critics, "sometimes a doubting Thomas . . . sometimes an infuriated humanist."

Four approaches identified

Professor Churchman identifies four different ideas as to what constitutes *the* systems approach. The advocates of efficiency claim that the best approach is to identify the trouble spots, especially the spots where there is waste, and eliminate them. The problem with efficiency, of course, is that it may lead to optimization at too low a level of the system.

The advocates of the use of science in approaching a system (the model builders) are the ones who have created some novel ideas and techniques, and the author tends to treat them as the true spokesmen for the systems approach. The other two groups, the humanists and the anti-planners, he presents as critics, with criticisms that cannot always be answered.

Professor Churchman explains the basics of systems analysis and model building, using as an exam-

ple a study of cargo handling at the port of San Francisco. He describes specific systems approaches—program budgeting and management information systems—using as an example an attempt to develop a management information system for the government of California. He discusses scheduling and planning.

Then he gets down to the heart of the debate—systems and people—with chapters on values, behavior, and anti-planning.

The systems approach, he concludes, really consists of a continuing debate between various attitudes of mind with respect to society. "What is in the nature of systems is a continuing perception and deception, a continuing reviewing of the world, of the whole system, and of its components. The essence of the systems approach, therefore, is confusion as well as enlightenment."

As should be evident, this is not a simple book, despite the seeming simplicity of its style. It is no how-to-do-it manual, and the businessman who is looking for "practical" help in solving his problems will not find it here. It is, however, a stimulating and provocative book for those who occasionally like to sit back and examine just exactly what it is they are doing.

Cost Effectiveness: Economic Evaluation of Engineered Systems by J. MORLEY ENGLISH, John Wiley & Sons, Inc., New York, 1968, 301 pages, \$14.95.

Although it was put together for engineers, this summary of techniques for evaluating the benefits of systems in terms of their costs is less mathematical and more readable than many books addressed to management people.

Cost effectiveness or cost benefit analysis, as introduced to the Pentagon in the McNamara era and spread to other government departments and to contractors by the

Johnson Administration, has become another catchword in industry.

Actually, however, as the editor of this book points out, although the terminology is new, the idea is not (except perhaps to government). Cost effectiveness is basically nothing more than engineering economics. Engineers have always sought to balance costs against benefits, in quantified form if possible.

This does not mean that the technique is not a useful one for management analysts to master. Quite the contrary. And as an introduction to the field this book is surprisingly good even though it was envisioned as an engineering work and it consists of contributions by a number of authors.

The book is better integrated than most anthologies, perhaps because its sections were prepared as part of a short course given at the University of California at Los Angeles in 1967. Some important aspects of cost effectiveness analysis receive little attention, particularly cost accounting, but for the most part the subject is treated comprehensively.

Topics covered include systems engineering, probability analysis, decision theory, value theory, system resource requirements, system worth, and quantification of benefits. A case study illustrates the use of the technique in evaluating a hypothetical supersonic transport.

Considering that the course was put together for engineers, there is surprisingly little mathematics in the book. It is appropriate for a wider readership than its editor had in mind.

Briefly listed

Simulation and Gaming in Business and Economics in the 1960's: A Bibliography by EDWARD R. JOHNSON, Bureau of Business and Economic Research, College of Business Administration, Phillips Hall, The University of

Management Services: A Magazine of Planning, Systems, and Controls, Vol. 7 [1970], No. 3, Art. 9
Iowa, Iowa City, Iowa 52240, 1969, 48 pages, \$1 (paperbound), single copy gratis to interested faculty members.

This bibliography of books and articles on simulation and gaming and their use in business and economics lists material in a dozen specific fields, including accounting, industrial applications, and small business, as well as general works in the field and related research (operations research, behavioral research, Monte Carlo methods, mathematics, and statistics).

Directory of Planning, Budgeting and Control Information by ARTHUR L. MILEY, Planning Executives Institute, 16 Park Place, Oxford, Ohio 45056, 1969, 141 pages, \$3 (paperbound).

This compilation of references on planning, budgeting, and control subjects lists more than 1,500 articles and reports and 250 books published during the period 1950-69.

Critical Factors in Data Management, edited by FRED GRUENBERGER, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1969, 146 pages, \$7.50.

The emphasis in this collection of papers presented at a West Coast symposium is on the management of large data bases and their role in time sharing. Most of the papers are technical, but not all are obscure.

Mastering Executive Arts and Skills by CRAWLEY A. PARRIS, Parker Publishing Company, Inc., West Nyack, New York, 1969, 205 pages, \$8.95.

Written in a strongly promotional style, by a trade association executive, this self-help book outlines a ten-point program for success: Design a self-development course to suit you, put on the right executive look, speak up with confidence,

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give your writing sales appeal, take the fear out of decision making, develop the knack of effective supervision, use positive discipline for better results, get more from your subordinates through counseling, learn how to thrive in any organizational climate, and turn your liabilities into assets.

MAGAZINES

A Systems Approach to Total Compensation by GORDON WOLF and MARIO LEO, *Business Management*, February, 1970.

Simulation models can be used to analyze executive compensation plans just as effectively as for other economic analyses, these authors suggest.

Too many executive compensation programs, the authors point out, are evaluated solely on the basis of direct salary figures. Often other compensation elements, as well as tax considerations, are lost in the evaluation process.

Through simulation, a company can analyze the cost implications of various compensation programs. Projected results rather than rough estimates can then be used in determining the economic impact of the various programs on both the executive and the company. The authors, although they recognize that qualitative as well as quantitative factors are involved, restrict their analysis to quantitative, dollars-and-cents, factors.

Effective analysis of compensation requires that two critical measures be developed. These are (1) the cost to the company and (2) the value to the employee. These measures must be analyzed on both a before-tax and an after-tax basis because of the impact of taxes on the executive's disposable personal income and on the net cost of the plan to the company. Other variables include the form of the compensation, the time that elapses between the date when the com-

pensation is earned and when it is received, and the cost of capital.

Among the compensation items that should be included in the model are the base salary, cash and stock bonuses, various stock plans, pensions, profit sharing, medical benefits, etc. Other factors such as social security, awards, loans, holidays, and various other fringe benefits are normally excluded, however, because they are insignificant, already included elsewhere, or outside the control of management. Various items of information about the individual and the company are also needed for use in the model.

The model estimates the value of the various compensation items at the time they will actually be received and discounts them back to the present. An efficiency index is also developed that indicates the economic benefit of each item in relation to the dollar outlay required. An index of 1 indicates that a particular compensation item is equivalent to a direct cash payment. Index numbers above and below 1 are more efficient and less efficient, respectively, than cash. Since each item is stated in terms of current dollar cost, the components of a compensation package can be rearranged to fit a particular executive's needs without disturbing the package's total cost to the company. Since the returns from different plans of the same dollar cost vary, this simulation would allow the choice for each executive of the plan which would maximize his return. This ability to individualize the compensation program may, among other things, aid in executive recruitment. Company officials are often surprised at how much the costs of providing plans of equivalent dollar amounts vary among different compensation packages, the authors report.

Like all simulation models, this one is only as accurate as the information provided by management. The proper use of the model—with accurate input data—can result in well planned compensation

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plans that are more effective than haphazardly determined plans. Less accurate information will yield something less.

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Operations Auditing by ROY A. LINDBERG, *Management Review*, December, 1969.

This brief overview of operations auditing (subtitled "what it is, what it is not") is aimed at the operations auditor's management client rather than the auditor himself.

Mr. Lindberg, manager of the management services department of J. H. Cohn & Co., defines operations auditing as "a technique for routinely and systematically appraising unit or function effectiveness against corporate and industry standards, utilizing nonspecialist (in the area of study) personnel, with the objective of assuring a given management that its aims are being carried out, or identifying conditions capable of being improved through more intensive and specialized attention."

It is needed, he says, to help managers check on areas that are beyond their direct observation. In large companies face-to-face communication is impossible, ordinary performance reports are too historical, and controls are too specific to fulfill this purpose.

In many companies, Mr. Lindberg notes, operations auditing has not been a success. Most often, he thinks, this is because the operations auditor is being given the wrong tasks, especially that of suggesting solutions to the problems he finds. Suggesting solutions, he warns, is a task for consultants and specialists; adding that to the operations auditor's responsibilities destroys his independence and forces him to assume an expertise he lacks.

Preparation of standards against which to appraise a given unit's

performance is one of the most difficult yet most important jobs of the operations auditor, according to Mr. Lindberg. Unless the auditing is "consciously and systematically carried out against acceptable standards," it is really no different from the manager's own "pulse taking."

Mr. Lindberg recommends the use of questionnaires—to lend uniformity to the performance of the audit, act as a checklist to ensure that all subjects are covered, depersonalize the audit to emphasize equality of treatment, and provide a basis for developing audit time standards.

Mr. Lindberg also discusses, very briefly, the staffing of the function and ways of establishing friendly relations with auditees.

This article, although it says nothing that an accountant involved in operations auditing does not already know, could be useful to the accountant in the indoctrination of management and nonfinancial personnel.

How to Face Being Taken Over by JOHN L. HANDY, *Harvard Business Review*, November-December, 1969.

A well known executive recruiter sounds a warning for executives whose companies are about to be involved in mergers.

Only about ten per cent of the executives surveyed in a recent study of merging companies were psychologically prepared for the aftermath of the mergers, especially for the resulting changes in organizational structure and managerial status.

That is one of the conclusions Mr. Handy reached from a "12-month survey of 960 executives [in top and middle management] whose companies had recently been acquired or were being acquired." Nearly 70 per cent of the group, he says, were complacent, feeling that the consummation of

the merger would have little or no effect on their positions and careers. About 20 per cent "panicked." Because they felt their careers were threatened, they began looking for new jobs.

Oddly enough, Mr. Handy says, he has found both from the survey and from firsthand experience that the more successful an executive is the less likely he is to be prepared for the possible personal ill effects of a merger. That, according to the author, is because the successful executive is not accustomed to failure; it never occurs to him that it could happen to him.

The executive most vulnerable to job loss as a result of a merger is, of course, the chief executive officer. As a rule of thumb, Mr. Handy suggests, the higher you are the riskier your job. The second most vulnerable executive is the highest-priced staff officer in administration, legal services, personnel, finance, or accounting—functions likely to be duplicated in the acquiring company.

Checklist offered

As for other executives, Mr. Handy offers a handy eleven-point checklist they can use to weigh their chances. In general, executives are vulnerable if their salaries are high relative to the market, and particularly to the scale of the acquiring company; if their jobs are duplicated in the acquiring company (likely to be true of most staff jobs); if they publicly opposed the merger; and if their chief asset is knowledge of their companies rather than of some professional or specialized field.

Mr. Handy does not explain how his "survey" was conducted, what questions were asked, or how each executive's degree of preparation for merger was determined (by the executive himself or by some sort of objective criteria). But, whatever the merits of his study, the points he makes sound like common sense and may serve as a timely note of caution to those on the verge of merger.

Evaluating an Information System by CHARLES MACVEAGH, *The Price Waterhouse Review*, Winter, 1969.

An elaborate information system in itself is no assurance that enlightened decisions will result. Only when the output of an appropriately designed information system is effectively employed in decision making may some measure of operational success be attributed to the presence of the data collection processes. Referring to a client system, the author describes in general terms how one company combined good management with a good information system and achieved striking success.

Better business decisions are dependent on two factors—a good management information system and good management. Mr. MacVeagh cites various combinations of good/poor management and good/poor information systems he has encountered in his experience. A clear distinction is made between the salient features of management and those of the information system. The author believes that only when the two are brought together should the process be labeled a *management information system*.

The client company he describes has the following management characteristics: (1) a well defined organizational structure including clear-cut responsibilities and communications channels, (2) a fearless and knowledgeable leadership, (3) a sense of organizational pride, discipline, and commonality of purpose, (4) a competent staff at all levels, and (5) a perceptive financial vice president with both human relations and decision making expertise.

In describing the desirable features of the company's information system, the author is quick to point out that an appropriately designed system does not blossom overnight. Only after years of hard work and several modifications was the system such that the client was able to effect the results it sought.

Basically, the client's information system features four essentials:

First, an elaborate system for codifying accounts was designed. The chart was conceived in such a pattern as to be useful for maintaining a common corporate general ledger (for a multi-division, multi-plant, widely dispersed, and vertically integrated producer of food products) while at the same time serving the needs of the divisions and the various responsibility centers therein.

Basic systems integrated

Second, other basic systems relating to order entry, procurement, payrolls, redistribution and accruals of costs, and basic statements were considered for each component of the organization and were integrated into the system.

Third, a standard cost system has been applied to the functional areas of sales, manufacturing, and administration. Inherent in the establishment of any standard cost system, the author notes, is the need to reflect immediately the significant changes in the processes and prices related to the functions. This is accomplished in the client's operations.

Reports well designed

The fourth essential in a successful information system is a well designed hierarchy of reports for management. Each summary report is supported fully by schedules detailing the activities that comprise the corporate whole—all the way down to the individual salesman's efforts. The contribution approach is emphasized to assess the efforts of individuals as well as divisions.

The client system described appears to rely heavily on direct-standard costing for internal reporting, with modification of the reports where necessary to keep management informed of the cumulative progress that will eventually be reflected in the published financial reports. This "dual" system precludes any "surprises" at year

end when the auditors arrive and begin discussing adjustments.

Because of the success of this client's system, managers have made more and more demands for additional information relating to their respective activities. Expressing more confidence in the figures being generated, management has increased its utilization of the system. Currently, considerably more attention is being given to forecasting—for the purpose of modifying plans relative to events. Whether the client's system is programed to generate corrective action plans or whether management merely uses the system's routine output to assist in decision making is not spelled out for the reader, however.

Benefits cited

The client has benefited in other ways, too. Cash, receivables, and payables are better controlled, and significant improvements have been made in the area of inventory management. The result, of course, is increased profits, a manifestation of better decisions resulting from increased accuracy and more timely reporting.

The author might have enhanced his presentation by including some exhibits outlining the configuration of the system as well as some illustrative report formats. Additionally, it would have been interesting to learn something about the orientation program that assisted in effecting the marriage of management and the information system. The reader also is left wondering how information external to the formal system is introduced into the decision making processes. It must be assumed that such a provision has been made, however, as the client is considered successful in its industry.

In conclusion, the author emphasizes some points that may assist businesses considering relatively sophisticated information-intelligence systems. First of all, the existence of an expensive and technologically up-to-date information system will not in itself guarantee better busi-

ness decisions. Good management, fully attuned to the system's potentialities and limitations, still remains the dominant factor in a firm's future. The most effective information systems are tailored to meet the individual business' needs. Even the most perceptive of managers can benefit from the output of an *appropriate* system.

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How They're Planning OR at the Top by EFRAIM TURBAN, *Journal of Industrial Engineering*, December, 1969.

This report of a survey indicates growing acceptance by large companies of the operations research function and of the results of OR studies.

Nearly half (44 per cent) of the "107 of the largest corporations in the United States" surveyed by this author have corporate-level operations research departments, this article reports. The majority of the others say that they either are conducting OR studies via other headquarters departments or are delegating such activities to the divisional level. The companies that do have corporate OR departments are, on the average, 50 per cent larger than the ones that do not and have a substantially higher percentage of products that were introduced within the past five years.

Most of the corporate OR departments report to a vice president (of systems, services, planning and development, or finance); 12 per cent report to the president. In some cases the OR department director is a vice president himself.

OR departments are small (five professionals, on the average) and young (the average age for the staff is 33; for the manager, 40). Their educational backgrounds vary widely; the most common majors are engineering and mathe-

matics (at the undergraduate level), business (at the master's level), and OR or management science (at the doctoral level).

The survey uncovered about 500 OR projects ranging from simple inventory problems to complex simulations of entire industries or social systems. There seemed to be a clear trend to more sophisticated projects.

The average corporate OR department budget is about 0.25 per cent of total sales. Salaries account for about half the budget. The average starting salary is \$9,930 for the holder of a bachelor's degree, \$11,820 for the master's degree, and \$15,000 for the doctorate.

Only about a third of the departments charge "client" departments within the company for their services; in the other companies the department's expenditures are regarded as part of corporate overhead. Only about half the companies attempt to compute the savings achieved by the OR department, and most of those do so only on the basis of individual projects.

On the whole, though, most of the companies seem to be satisfied with the results of their OR work. Only two companies reported having abolished their OR departments because they considered them unsuccessful experiments, and about two-thirds of all the recent OR projects reported were classified as having been mostly or completely implemented.

The Proper Place of Computers by PETER P. SCHODERBEK and JAMES D. BABCOCK, *Business Horizons*, October, 1969.

A survey was made of the current literature on the proper placement of the EDP function, and a mail questionnaire was sent to the EDP managers of 200 industrial firms. The replies to the mail questionnaire indicate that the computer function is moving away from the accounting department and becoming more independent. At the

same time it is progressing upward in the managerial hierarchy. The more independent EDP departments located at higher corporate levels appear to be the more successful.

The EDP managers of 109 of *Fortune* magazine's top 500 industrial firms for 1967 answered a questionnaire developed by the authors. The results of the study are summarized in six tables, each of which leads to a conclusion. The six conclusions are:

Separate departments increasing

1. The EDP function is moving out of the accounting department into a separate independent department. The data processing or systems department is now responsible for EDP in 28 more firms than it was originally while the accounting department is responsible in 27 fewer companies than it was originally.

2. The primary reason for the change is the increased need for an independent EDP function. More than 95 per cent of the respondents indicated that the function should be independent of all operating departments.

Fewer problems result

3. The number of problems is fewer in an independent department than in the accounting department. Of the 49 firms which have the EDP function within the accounting department, only 10 reported no significant problems. Seventeen reported an accounting bias in the department as the major problem. At the same time, of the 54 firms granting autonomy to the EDP function, 35 reported no significant problems.

4. The level of the EDP function in the managerial hierarchy is moving upward. Originally 41.8 per cent of the EDP managers were in middle management or below. At the present time only 30.6 per cent are in middle management or lower. The number of presidents

and vice presidents as EDP managers has increased from 9 to 17.

5. More vice presidents and fewer controllers are responsible for the EDP function. Previously, the controller was responsible for three-fourths of the computer installations; he now directs only one-half of them. The number of installations directed by a vice president has increased from 7.9 per cent to 28.4 per cent.

6. The number of problems is fewer the higher the position is of the executive responsible for the EDP activity. In the 31 firms in which the computer activity reports to a vice president, 25 reported no significant problems. In the 55 firms in which it reports to the controller, only 10 reported no significant problems. This led the authors to conclude that computer systems operate more efficiently at a high corporate level.

Survey lends support

In their survey of the literature the authors found many articles whose conclusions tended to agree with the results of the mail questionnaire.

There are, of course, advantages and disadvantages in establishing the EDP function in the accounting department. Two of the advantages are the controller's experience in operating a management information system and the ease of transition to a fully integrated computer system. The accountant's tendency to put a higher priority on his own work than on that of other departments and his limited knowledge of new methods and techniques for handling information are two of the disadvantages.

The authors also cite the advantages and disadvantages of creating an independent EDP function. The main advantage is the neutrality and independence of the department. Other advantages are that the staff already has a detailed knowledge of EDP equipment and techniques and that the computer department tends to take a broad view of systems problems. Two of

the possible shortcomings are: (1) Operating managers may view the actions of the EDP department as an intrusion into their area, and (2) the EDP staff may have a limited knowledge of the operating departments.

The factors that affect the success of computer systems also play a significant role in determining the location of responsibility. Four such factors, as developed in an article by Philip H. Thurston, are used as examples by these authors. The principal argument for locating the EDP function high in the managerial hierarchy seems to be that the EDP executive needs to be able to cut across organizational lines without undue interference.

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