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BOOKS

The Impact of Computers on Organizations by THOMAS L. WHISLER, Praeger Publishers, New York, 1969, 188 pages, $11.

In what appears to be the most thorough study so far of the effect of electronic data processing on corporate organization structure and job content, Professor Whisler analyzes the changes brought about by the computer in a group of large life insurance companies. He finds that some interesting trends are developing.

The electronic computer's progress as a tool of management has been accompanied by sweeping forecasts of the impact it would have on workers and management. Among the most frequently predicted effects: complete routinization of lower-level jobs, increased centralization of authority, and the virtual elimination of middle management.

None of these things has happened yet, nor has any previous study succeeded in establishing that they are about to happen. Professor Whisler, however, has come up with some concrete evidence, based on the experience of the life insurance industry, that these forecasts, while not necessarily completely accurate, are more than idle headline hunting.

Earlier studies of the effect of the computer on organizations followed one of three patterns: in-depth case studies of one or two companies, in-depth analyses of specific departments in several companies, or broad surveys of a large number of companies. In Professor Whisler's study the research followed the in-depth case-study pattern but was company-wide in a sizable group of companies (19, with occasional additions for purposes of comparison). The aim was to obtain both breadth and depth.

The research was actually conducted by executives of the companies themselves, all of which were large life insurance companies. Limiting the sample to a single industry ensured comparability of the results; whether the findings are truly relevant for other industries is an issue, the author concedes, on which "the reader will have to make up his own mind." The companies were not in any way a cross-section of the life insurance industry; they were picked because of their experience with computers, in some cases going back to the early 1950's. Thus, they represent the probable trend of the future rather than the pattern of the present.

Preconceptions supported

The future trend, of course, was precisely what Professor Whisler was trying to establish. His conclusions for the most part agree with his own preconceptions—but most of them do seem to have a solid basis in present fact.

So far, Professor Whisler reports, employment effects have been concentrated at the clerical level, where employment has declined; this trend, he forecasts, will continue. There have been employment changes at the supervisory level, but they are mixed; some companies have fewer supervisors; some have more. The number of managers has not yet been affected. Ultimately, Professor Whisler thinks, as companies complete their information systems, fewer supervisors will be needed and possibly fewer managers (at least line managers) as well.

Clerical jobs routinized

In terms of job content, the author says, clerical jobs have become more routine and supervisory jobs more complex. Managerial jobs, not yet greatly affected, will develop a higher and higher "research" content, Professor Whisler thinks.

The issue of centralization versus decentralization remains open, according to the author. The effects so far have been mixed, and the computer itself has the potential for use either way. Professor Whisler feels, however, that management's natural bent is toward centralization, that companies have decentralized because they had to, not because top managers really wanted to share power, and therefore that in most cases the locus of decision making will move upward in the organization.

The nature of business decision making, however, is changing with the computer, and standard organizational thinking and terminology may cease to apply. As more specialists (especially computer men, operations researchers, and financial people) intervene in decisions, the old distinctions between line and staff are blurring. Many of the insurance companies are abandoning profit-center management to return to the old functional organizational structure, which requires fewer line executives and often tends to increase the influence of staff executives.

Pyramid may go

In the future, Professor Whisler predicts, the "traditional line-and-staff corporate structure will lose much of its rigidity and may evolve into a much more free-wheeling form." The pyramid structure may be replaced by a sort of project management, in which responsibilities are fixed only at the top of the organization.

This is a provocative and important book. Although some of the author's specific predictions may be open to challenge, it is impossible to quarrel with Professor Whisler's ultimate conclusion:

". . . top-level management faces an imminent and critical problem in dealing with adaptation to the organizational changes that information technology is generating . . . managers [must] take seriously the probability that they themselves will be caught up in the process of change."

Urban Dynamics by JAY W. FORRESTER, The M. I. T. Press, Massachusetts Institute of Technology, Cambridge, Massachusetts, and London, England, 1969, 285 pages, $12.50.

Construction of low-cost housing, job training programs, and state and federal subsidies will not solve the problems of American cities; in fact, over the long run they may do more harm than good. Professor Forrester reached these controversial conclusions by simulating the dynamics of urban development on a computer-based model of a hypothetical city. The model and the simulation are described in this book.

In this book Professor Forrester applies the technique he used to call industrial dynamics to the analysis of urban problems. The results are startling—and highly controversial. However, as the author emphasizes, the significance of the work lies not in the details and findings of the model (which may or may not be valid) but in the methodology.

An electrical engineer who helped to design early computers and the SAGE air defense system, Professor Forrester developed his theory of industrial dynamics as an outgrowth of computer feedback theory. (Industrial dynamics was discussed in detail in an early issue of MANAGEMENT SERVICES; see "Industrial Dynamics" by Bruce Carlson, May-June '64, p. 32.)

Feedback systems

In industrial dynamics, says Professor Forrester, "systems are seen as feedback processes having a specific and orderly structure. From the structure of the particular system arises its dynamic behavior. The industrial dynamics approach to a social system organizes the growth and goal-seeking processes of the system into a computer model. A digital computer is then used to simulate the behavior of

the system . . . By changing the guiding policies within the system, one can see how the behavior of the actual system might be modified."

From industrial organizations Professor Forrester has moved on to cities, and in this book he describes just such a simulation of an urban area from birth to decay —a period of some 250 years.

Urban model

In the model the key influences that determine growth and stagnation were assumed to be changes in population, housing, and industry. These variables were divided into three kinds of workers: managerial-professional people, laborers, and underemployed; three types of industry: new enterprise, mature business, and declining industry; and three types of housing: premium housing, worker housing, and underemployed housing. The interactions among these variables in a closed-loop feedback system were examined over the life cycle of the city. Then various governmental policies were tested to see whether problems of maturity and stagnation could be corrected.

Conventional solutions failed

Some of the fiindings were surprising. Construction of low-rent housing, for example, did not solve the city's problems but instead compounded them (in the model) by increasing the inward flow of the poor and thus making slum congestion even worse. Training programs to upgrade the skills of the underemployed produced similar results over the long run (after ten years or so). Job creation (through a WPA-like program) and subsidies from the state and Federal governments worked out the same way; they attracted more low-skilled workers to the area and thus eventually depressed the city even more.

The only policy that helped the city to revive in the model was the gradual demolition of slum housing combined with incentives to encourage development of new industry.

Reportedly, Minneapolis and Dallas are planning to apply Professor Forrester's recommendations. Their action may, indeed, be premature. The validity of this book's conclusions rests directly on the validity of the model, which in turn depends on the validity of the assumptions built into it, both as to which are the relevant factors in urban development and as to how they actually interact.

Source of assumptions

Professor Forrester himself is no expert on cities although he is accomplished in operations research techniques. His assumptions about the way industry, housing, and employment behave in cities come from "the insights of those who know the urban scene firsthand, from my own reading in the public and business press, and from . . . literature on the dynamics of social systems."

It would obviously be rash in the extreme to throw out everything we have been doing to relieve poverty just because of the findings of the first attempt to apply simulation to the urban scene. This model is important because it is a pioneering effort, but that very fact makes the model almost certain to be imperfect.

Method not policy

Professor Forrester himself warns against taking his results and acting on them "without further examination of the underlying assumptions . . . the pertinence of the model . . . [should first be] evaluated against the requirements of the particular situation . . . this book is presented as a method of analysis rather than as policy recommendations."

The method is well worth further development, and this is a book that should be read by everyone interested in urban affairs, urban industry, or operations research. (Fortunately it is relatively easy to read; the mathematical analysis is relegated to the appendix, which, incidentally, takes up nearly half the volume.) This work may point the way toward a much more rational approach to the problems of poverty and urban blight.

Business Decisions and Technological Change by JOHN DIEBOLD, Praeger Publishers, New York, 1970, 268 pages, $10.

This collection of speeches and articles by one of the best-known publicists of the electronic computer concentrates on reviews and forecasts of EDP's impact on specific industries.

Here is yet another compilation of selections from the writings of John Diebold, a prolific "prophet" of the computer industry. It hangs together somewhat better than most of them, perhaps because the thesis of the book is so broad it could encompass almost anything.

That thesis, briefly summarized, is as follows: Technological change affects business in three ways. It changes how business operates. It changes what business does (products). And it changes society, thus creating new business opportunities. To adapt to new technology (computers, in this case) business needs new methodologies for applying information systems and for judging their real cost-effectiveness.

To measure computer cost-effectiveness, Mr. Diebold suggests, business should not start with the costs of processing data but with measures of data's value, the gains derived from the use of the information. "The need is to evaluate not only cost-displacement savings within data processing itself or even operations gains, such as from reduced inventory and faster production, but the until-now 'intangible' benefits residing in improved customer service, corporate planning, and forecasting."

The idea of stressing value rather than cost in computer evaluation is a provocative one. Unfortunately, Mr. Diebold has very little to say about how it could be done.

Actually, however, the heart of this book is the so-called case studies of the use of the computer in particular industries. Few of them are *actually* case studies in the sense of an examination of past experience with a particular problem. The closest approach to a genuine case study is probably the chapter on the petroleum industry, a leader in EDP. The machine tool industry chapter is critical of past practices, but Mr. Diebold finds this industry remiss in applying all technology, not just computers. The other "case studies," on railroads, banking, newspapers, foreign affairs, and urban government, concentrate more on what should happen in the future than on what has already happened.

Apart from the industry analyses, there is little in this book that has not been said many times before, by Mr. Diebold himself as well as by others. Those interested in the industries he discusses may find the book worthwhile.

The Behavioral Aspects of Accounting Data for Performance Evaluation, edited by THOMAS J. BURNS, Monograph Number AA4, College of Administrative Science, The Ohio State University, Columbus, Ohio 43210, 1970, 347 pages, $8.50 (paperbound).

This report of a symposium is interesting even though it is as inconclusive as symposia always are.

This monograph is the proceedings of an accounting symposium held at Ohio State University in the fall of 1968. It consists of case-study-type papers presented by executives of six companies, critiques of these papers by six professors of accounting or behavioral science, and general discussion by participants of varied background.

The results are worthwhile for several reasons. The case studies are inherently interesting, as case studies always are, no matter what the subject. The critiques are sharp and pointed, partly because they were prepared in advance and the authors had copies of the papers on which they were commenting. The discussion is tightly edited and to the point.

Case studies

In the case studies the emphasis is more on how performance is evaluated than on the behavioral aspects of the process—but that is interesting in itself. Two exceptions were the paper presented by executives of the R. G. Barry Corporation, which is working on a novel system of "human resource accounting," and the conclusions of Carl C. Schwan, Jr., director of financial planning of Industrial Nucleonics Corporation, who found, for example, that "In cases where the organizational structure corresponds identically with the financial reporting structure, managers tend to be profit-conscious. In cases where the organizational structure varies from the financial reporting structure, profit reports are generally ignored and managers become almost completely budget-oriented."

Nothing proved

As the critics were not slow to point out, the case studies prove nothing in particular. Said Prof. Andrew C. Stedry of the University of Texas, ". . . the problems presented by the authors have been well known to researchers for some time. The solutions proposed are neither unique nor new. It is not shown that the fact that the companies involved have achieved more than average success is in any way related to the techniques used. The papers thus stand as an enumeration of techniques which are being tried without obvious deleterious effects."

Prof. Norton M. Bedford of the University of Illinois summed it all up, "Overall, we are led by the discussion at the symposium to believe the use of accounting data in performance evaluation is effective, but we do not know exactly what behavior the accounting data influence or precisely how that behavior is induced by accounting data."

Both comments are valid but too harsh. So little is known about this subject that every scrap of information has some value, and this book is full of ideas, at least, even though it lacks any definitive conclusions.

Briefly listed

Information for Decision Making: Quantitative and Behavioral Dimensions edited by ALFRED RAPPAPORT, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1970, 447 pages, $7.95.

This anthology of more than thirty articles by nearly fifty authors on various aspects of management science, accounting, and behavioral science has as its objective to relate "advances in the management sciences, including the behavioral sciences, to the task of effectively designing and using decision-oriented information systems." Four of the articles originally appeared in MANAGEMENT SERVICES.

A Management Guide to PERT/CPM by JEROME D. WIEST and FERDINAND K. LEVY, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1969, 170 pages, $4.95 (paperbound).

This is an attempt to provide a small guide to PERT/CPM scheduling and control methods that is compact but complete in its coverage. The emphasis is on the basic ideas; more advanced methods are discussed in appendixes. Exercises are included for practice.

Emerging Concepts in Management: Process, Behavioral, Quantitative, and Systems by MAX S.

WORTMAN and FRED LUTHANS, The Macmillan Company, New York, 1969, 462 pages, $5.95 (paperbound).

This anthology consists of 46 articles on management theory, management's social and ethical responsibilities, and four major approaches to management: the process approach (planning, organizing, directing, and controlling), the behavioral approach, the quantitative approach, and the systems approach.

Business and Government Long Range Planning: Impacts, Problems, Opportunities (Proceedings of the Eleventh Annual Symposium on Planning of The Institute of Management Sciences) edited by HASAN OZBEKHAN and GENE E. TALBERT, The Institute of Management Sciences, P. O. Box 6112, Providence, Rhode Island 02904, 265 pages, $5 (paperbound).

Topics include national planning, corporate planning, planning in underdeveloped countries, industry-government relationships, and the global implications of it all. A verbatim transcript, this book lacks focus and specificity, but some interesting ideas are expressed along the way.

Profile of Data Processing in the Federal Government—1970, AIDS Division, Deland Associated Industries, 328 Pennsylvania Avenue S.E., Washington, D.C. 20003, 1970, 600 pages, $35.

This reference book identifies the 2,433 ADP units operating within the Federal Government by agency, organization, and activity. For each unit it gives a current and projected equipment inventory and 1968, 1969, and projected 1970 budget information, including equipment, supply, and service costs.

How to Buy Proprietary Software Products edited by L. WELKE, International Computer Programs, Inc., 2511 East 46 Street, Q-4, Indianapolis, Indiana 46205, 1970, 65 pages, $4.50 (paperbound), bulk rates available.

This booklet, based on the transcript of a customer seminar conducted by a software company, covers the present status of the software industry, guidelines for evaluating a software package, and the accounting, tax, and legal implications. There is a four-page checklist for software purchasing.

MAGAZINES

Management Information Systems: A Status Report on the Concept and its Implementation by ARTHUR B. TOAN, JR., *The Price Waterhouse Review,* Spring, 1970.

The term "Management Information System" appeared on the American scene in the late 1950's. It has since become a part of the language of all who are concerned with the development and use of information for managing business and nonprofit entities. As the author points out, however, coining a term and fully implementing a concept are two entirely different things.

A "Management Information System" (MIS) is an advanced electronic computer system designed for producing and delivering information that will support management in the process of planning, directing, and controlling an entity. The MIS systems discussed in the article can be said to be computer-based, integrated, accessible, and timely and/or interactive as well as important to the essential functions of management.

Computer generations

MIS may be viewed in terms of the three generations of computer equipment. In the days of first generation computers, the equipment was so limited that virtually all of its capabilities were required merely to record and process data, to produce documents, and to make elementary summaries of results. The situation changed somewhat, however, when second generation equipment came on the scene. Systems designers decided that the greatest promise lay with greater integration; therefore, they developed systems that incorporated both horizontal and vertical integration concepts. Although MIS systems of the second generation were only partially successful, they did result in more sophisticated systems for planning and control.

The arrival of third generation computer equipment caused many companies to view their MIS not just or even primarily as consisting of the integration of systems but in broader terms—as concerned with the production, delivery, and content of information. Answers derived from evaluating their systems from the standpoint of information for management were often different from answers obtained when judging these same systems in terms of data processing, document preparation, and lower-level reporting.

Although third generation MIS has tremendous possibilities, most experts believe that MIS should be handled with care and used selectively. Not every business nor all of any business's needs can benefit from a full-fledged MIS any more than all could profit from any prior form of mechanization or any prior systems concept. The greatest benefits from MIS may well be those that result from better decisions, more effective resource utilization, more effective manufacturing, etc.

MIS options

According to the author, there are four major options available for plotting a future in computer systems. The first option clearly is to do nothing at all—either because other systems work or because other uses of corporate funds can claim a higher priority. The second

option is to use the new computer technology, the new software, and the new ideas selectively, only for facilitating data processing or for accomplishing other legitimate purposes without changing the system into one that could properly be called an MIS.

Simplest MIS

The third option, which is the first of the true MIS options, can be described as the "remote/batch" or "access only" system. It is the simplest, surest, least costly way of getting people used to MIS that one can find. It is all of these things primarily because it deals with entry and/or delivery only—with the on line acceptance of new data, with the off line or batch processing of that data, and then with the on line delivery of information, stored in accessible data banks brought up to date periodically to reflect the results of information produced by the off line systems. Much of the information required by the middle management of a corporation, and undoubtedly much of the information required by its top management, fall within an operational time span that coincides with what an "access only" system can easily provide.

Full-fledged system

The fourth option would extend MIS to a full-fledged system in which the fast entry and delivery of information are coupled with its on line production. It would use third generation concepts, techniques, and equipment to improve the speed and accuracy with which data are recorded, transmitted, and processed so as to provide a marked difference in the timeliness of the information the system contains. Although this option can obviously be much more complicated, risky, and costly than the one that deals only with accessibility, there is much evidence that this concept can be and is being usefully applied. The best known on line systems include the airline and hotel reservation systems, the stock quotation systems, the freight car systems, and some of the military/space systems.

Management via MIS

As the author sees it, there is little point in designing systems to produce and deliver information unless one can and does properly specify its contents. Although specifying and then creating information that will fully meet the needs of management is an amazingly complex job, much progress has been made over a long period of time in helping to move information from low-level summarization to measurement and control to forecasting and planning and to the plane of simulation. The MIS specialists should proceed jointly and in parallel, therefore, to improve both the systems and their information content.

In conclusion, the author states that the successful MIS will not count solely on user interaction with the predigested, preselected material which we now strive so diligently to put into useful management reports but also on user interaction with files of electronic data to which the executive will have access. Thus, the most exciting thing about MIS is the freedom provided executives to extract, to rearrange, to analyze, to compare relevant and accessible data—to search for significant trends that will provide a basis for understanding things past and forecasting, planning, and simulating things future.

GROVER L. PORTER
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National Income Accounting and Distributive Trade Cost by LOUIS P. BUCKLIN, *Journal of Marketing*, April, 1970.

Surprising change within the marketing system is shown by the use of national income accounting to measure the costs of distributive trade (wholesaling and retailing).

There has been an unfortunate absence of research on marketing costs since World War II. Regularly published national income accounting data are suggested by the author as a source of estimates of marketing costs.

Value added

National income accounting statistics reflect the value added by each sector of the economy. Value added by the trade sector is regarded as equivalent to distributive trade cost. The distributive trade cost ratio expresses the relationship between the value of work performed by that sector and the total value added to goods that pass through the trade sector. The author uses the factor cost of the trade sector, derived either by adding capital consumption to the national income for this sector or by subtracting indirect taxes from gross national product for this sector, as the numerator of the distributive trade cost ratio. The denominator of this ratio is the factor cost of the total economy less service and finance sector factor cost, less government salaries and military purchases, plus the difference between net and total exports. The trade sector data of national income accounting exclude manufacturers' sales offices and branches.

Distributive cost ratios are shown to have increased steadily from the Depression to the peak of World War II. Immediately after the war there was a sharp drop to a level approximating that of the years immediately preceding World War II—still above the 1929-33 period.

Growth of wholesale sector

Changes in the gross margin percentage of the trade industries result in parallel shifts in the distributive trade cost ratio. The list of factors affecting trade margins includes competition, product mix, and changes in productivity, all of which are discussed by the author. The distributive trade cost ratio is

also changed by a shift in the relative importance of wholesaling and retailing. The wholesale sector has enjoyed increased margins as well as an increased role in the distribution of goods, and the result is a magnified wholesale component of trade.

Close approximation

Dr. Bucklin's formulation of the ratio of distributive to total cost results in as close an approximation to distributive trade cost as it may be possible to obtain using the regularly published national income accounting data of the Department of Commerce. His results reflect observable trends over the past four decades. He has set forth a valuable tool for keeping abreast of current trends, although his formulation is open to changes to overcome bias due to the exclusions in the denominator.

Three insights are reached in Dr. Bucklin's study of the relationships among changes in trade cost and associated measures. The data clearly show the importance of competition in maintaining reasonable marketing costs. The data suggest that much of the slightly higher costs observed in the distributive trade cost sector is due to the change in role rather than to excessive charges or greater profits. Finally, there is surprising evidence of the increasing importance of the wholesale sector relative to the retail sector.

STEVEN S. RUBINSTEIN
University of Florida

Management Service by JAMES E. QUACKENBUSH, *Massachusetts CPA Review,* March-April, 1970.

Mr. Quackenbush takes the position that the "small" and "medium-size" CPA firms have long provided management services on a professionally qualified basis and will continue to do so in the future. He also describes the basic requirements necessary for any management services program and cites some typical management services that he himself rendered during a recent month.

The term "management services" is defined by Mr. Quackenbush as the carrying out of any management function that management, despite its abilities in many vital areas, finds impractical to carry out itself. Thus the "small" and "medium-size" CPA firms, by the very nature of their unusually close relationships with their clients, have rendered management services for their clients on a daily, routine basis for a long time. The author points out that these firms are composed of competent, intelligent, dedicated, and talented practitioners who are aware of change and the need for responsiveness to the business community and its increasingly complex problems.

According to Mr. Quackenbush, even though the "smaller" practitioner has been providing management services for many years and such services are nothing new to him, they are a relatively recent specialty of the "larger" CPA firms, whose practices consisted largely of auditing and taxes until fairly recently. Even so, the approach of the professional technical training programs has been to have the "larger" firm tell the "local practitioner" how to render management services. Mr. Quackenbush readily admits that the "larger" firms are more sophisticated in merchandising their management services programs, but he feels that they are not necessarily more knowledgeable.

Common sense needed

To Mr. Quackenbush, the basic requirement for any management services program is simple common sense. He quotes scholars from several disciplines to emphasize his points in his discussion of the characteristics of common sense. One of these characteristics is an awareness of relativity. Another characteristic of common sense is not to be afraid of making mistakes; nothing is accomplished that is not attempted.

Communication still sought

Mr. Quackenbush states that communication is one of the most essential needs of the business and professional community; he thinks it has been and is the most sought-after talent of the decade. He points out that it is necessary to communicate with other people, particularly with clients and in working with people, hiring them, training them, and managing them. He also takes a slap at college and university professors for being slow in recognizing the communication problem in their counseling of students in the selection of courses.

Mr. Quackenbush says, "The basic requirements, then, for any management services function are, rather than the scientific tangibles, the human intangibles, including common sense, confidence, motivation and selection, and communication and the ability to plan." Thus the "local practitioner" is at least on equal footing with the "larger" CPA firms in his attempt to provide management services and may even be in a more favorable position because of his close relationship with his clients.

Typical services

The next section of the article is devoted to specific examples of typical management services performed by the author during a recent month. These examples range from the solution of a communication problem by the installation of a two-way radio to intricate tax problems and fringe benefit programs for key employees. As Mr. Quackenbush points out, many of the cited examples are related to taxes, but he emphasizes that tax planning is as much a management function as planning of product mix or salaries.

Mr. Quackenbush concludes by quoting a remark of John Lawler in his report, "The Divided House

of Accounting," presented at a recent AICPA Council meeting: "The true task is to design a society capable of continuous change, renewal and responsiveness. I submit that the flexible 'small' and 'medium-size' CPA firm, because of its very smallness, is most ideally situated to meet this task; that it is best suited to meet the new, strange and perplexing situations that will continually occur."

EDWARD E. MILAM
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The Direct-Cost Approach to Setting Optimum Sales Prices by SAM M. WOOLSEY, *Industrial Marketing*, January, 1970.

This article discusses the concept of direct costing and how it can be used in unit price determination to generate greater marginal income. The author stresses the importance of optimally relating sales prices and sales volume and gives a few guides for using direct costing to set prices.

Full absorption cost has been the most widely used method of determining the cost of a manufactured product. In costs it includes direct material, direct factory labor, direct factory overhead, and fixed factory overhead. Professor Woolsey suggests instead the use of direct costing, which includes in costs only direct material, direct labor, and direct factory overhead.

The missing element in costs under the latter method, and the heart of the difference between the two, is fixed factory overhead. The direct cost method classifies fixed factory overhead (like insurance on a factory building, the superintendent's salary, property taxes) as sunk, "fixed, and the same in total within the relative range of activity" and excludes it from immediate consideration in unit price structure.

On the other hand, direct costs like raw material, direct labor, and variable components of other costs are considered basic determinants of unit cost and price in direct costing because they vary in total with the volume of production. The exclusion of fixed factory overhead cost from consideration gives a lower per-unit cost. According to the author this method of costing has three major advantages:

Major advantages

Maximization of Marginal Income: Marginal income is the difference between sales revenue and direct cost for the product being sold. This difference is treated in direct costing as a contribution to fixed overhead, which, as noted earlier, tends to remain the same during the relevant range of activity, and to profits. The concept of maximizing marginal income is the key to profitable pricing, in this author's view.

Optimal Relation Between Sales Price and Sales Volume: If the demand for a product is flexible, the sales volume will be inversely proportional to the sales price. A high sales price will yield a high marginal income per unit, but the volume of sales will be low. A low sales price will result in a large sales volume, but, Mr. Woolsey warns, a high sales volume does not necessarily produce the greatest income for the company. In both cases, total marginal income will be small. Mr. Woolsey suggests that greater marginal income will be achieved only when the sales price is somewhere between these two extremes and optimally related to the sales volume. To achieve this optimal relationship between sales price and sales volume, management must plan and budget with available forecasts and estimates of marginal income resulting from projected sales volume in relation to various price levels, competition, economic conditions, and other relevant factors.

Below Cost—To Sell Or Not To Sell: Often sales prices are not enough to cover the entire cost but just enough to cover direct costs only. The manager is faced with the problem "of whether or not to accept an order at a sales price below cost of production." His response should not necessarily be negative. Instead, he should examine whether the order will produce marginal income without an increase in fixed costs. Even though there is a temporary increase in fixed costs, the order might still be accepted if the marginal income generated will be more than the additional fixed cost. Thus, the guiding concept, as outlined by this author, is that the company may accept a special order for a product at a price below cost if (a) the transaction will produce marginal income, (b) the company is not prevented from manufacturing other articles on which a greater marginal income is produced, and (c) acceptance of the order does not significantly change the numbers of units that can be sold at the regular price.

Application of this recommended method, Mr. Woolsey asserts, should yield better profits for an enterprise.

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The Executive Image: Your Changing Role in Industrial Communications by MARTIN WRIGHT, *Business Management*, April, 1970; **The Executive Image: The Over-the-Hill Executive** by ERNEST A. MCKAY, *Business Management*, April, 1970; and **The Executive Image: Materials Manager, The New Corporate Function** (no author cited), *Business Management*, April, 1970.

This is a group of three articles showing specific executive roles in the present-day corporation.

In the first article of this group the author states that this nation now faces five major problems. He describes how industry can play a vital role in solving these problems through effective communication.

According to the author, the five greatest problems, not necessarily in order of severity, in this country today are race and poverty, student unrest, pollution and conservation, crime and crime prevention, and productivity. The major theme of this article is that industry must now become more involved in trying to solve these pressing problems. We must rely on industry because government has failed to solve them, the universities have lost touch with reality, and labor has lost its zeal. The author relates some specific examples of how communication can help industry to solve these problems.

To combat poverty

To combat race and poverty, which he says are closely related, the author suggests that businesses hire those considered unemployable and make them employable, productive, and useful. He cites an example of a company that set new records of productivity by doing this.

The author does not consider student unrest to be a major problem. Only a small minority of students are actually involved in rioting. Yet he acknowledges that almost all students do challenge the concept that material progress is a valid measure of society's well-being. To help win students over, the author recommends that corporations communicate to students industry's concern for social problems and show how it is helping to solve them.

Pollution problem

The author believes that pollution may become the No. 1 problem in the next ten years. He finds the interest and help that industry has provided in combating this problem to be reassuring.

The author cites crime statistics as evidence that this is an ever-increasing problem. To combat it, he feels, there must be a change in public attitude toward law enforcement. He recommends that responsible citizens become involved in law enforcement by serving on committees, working with local governments to change methods, and utilizing the knowledge of professional social scientists and others.

The author elaborates more on the fifth problem, "productivity," than on any of the others. He recognizes that this is the problem with which men of industry are most familiar.

Communications tips

After discussing the problems of productivity, the author offers six suggestions for developing effective communications in solving these problems. These suggestions are as follows:

1. Listen to your employees.
2. Open up to employees about company problems.
3. Consider employees just as you consider yourself.
4. Tell them what is going on in simple language.
5. Try something different.
6. Check up to see if you are getting through.

The author concludes that industry and business now have the opportunity to make a significant contribution toward solving many of our serious problems. He urges businessmen to accept this challenge.

Second chance

The second article in this group on the executive image discusses the middle-aged executive whom top management has labeled as "unpromotable." The author recommends that companies look a second time at these men because many still have dedication and potential, if given a chance.

The author's discussion centers around those corporate middle management executives in their forties and fifties who see no future advancement within their company. These men have been passed over for promotion, sometimes unfairly, sometimes because of a mistake they made years ago that should have been long forgotten.

The author points out that many times these men are still loyal to the company and harbor no bitterness. But since they have been discarded, they are merely marking time waiting for retirement.

Shift of creativity

Having lost the challenge of their jobs, many such executives take on creative, profitable activities in their spare time. They are often involved in selling real estate, writing books, and actively investing in the stock market.

The author suggests that much of this creative energy could be put to use profitably for the company. He recommends that top management re-evaluate these individuals to determine what potential still exists. Irrelevant mistakes of years ago should be forgotten. Some companies have found a bonanza of talent and experience in some of these previously "washed-up" executives. The author concludes that any company making a reappraisal may be pleasantly surprised at what it finds.

Materials manager

The third article apparently was based on an interview with Stephen B. Oresman, vice president, Booz, Allen, & Hamilton, Inc., a management consulting firm. The article discusses the necessity for companies to utilize a materials manager for control and coordination of their entire materials systems.

This article reports that many companies have computerized their inventory control and production scheduling, believing that this would solve many problems. However, frequently they find that their problems multiply. According to Mr. Oresman, this happens because inventory and production control systems are closely related to other functions scattered throughout a company and controlled by many departments. To be effective, all functions should be coordinated and integrated into one smooth-

flowing system. This system should be built and managed by a materials manager.

Job structure

The article says that the materials manager should have both factory and computer experience. All departments involved in materials should report to him. He should be responsible for systems development and operating results, reporting directly to top management.

Mr. Oresman states that despite all the advantages in an integrated materials system, many companies have been unsuccessful in establishing and operating one. He believes that there are eight major reasons for this situation:

Causes of failure

1. *Lack of communication*: Data processing personnel and operations men don't speak the same language.
2. *Fuzzy objectives*: Company goals are poorly defined.
3. *Weak foundations*: Many systems were built on manual card systems that never worked well. Now errors are multiplied.
4. *Undisciplined clerks*: Clerks don't appreciate the necessity for accuracy in entering data.
5. *Great expectations*: Many top managers expect the computer to save on personnel when sometimes more people are needed.
6. *Sexy hardware*: Data processing people frequently urge newer, more sophisticated equipment before the old system has been thoroughly developed and tested.
7. *Underestimating complexity*: Many executives don't realize the complexity of such a system and consequently do not develop sufficient controls.
8. *Computer-shy management*: Many top managers do not understand computers and do not become sufficiently involved in systems development.

Mr. Oresman concludes that many of these problems can be solved with a materials manager who has responsibility for integrating inventory and production control. But he cautions that top management must appoint him, give him freedom and authority, and listen to him.

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Accountants and Sales Forecasters —Partners for Profit by R. W. BECKMAN, *The Australian Accountant,* March, 1970.

Coordination of all of the resources available to management is essential if the goals selected are to be attained. Recent years have witnessed a marked increase in the attention devoted to marketing activities—and specifically to sales forecasting. The accountant's involvement in sales forecasting is of the utmost importance in the planning and control that lead to goal achievement.

Sales forecasting entails much more than statistical trend analysis. In fact, management need not be controlled by past performance but instead can deliberately plan to improve performance and determine the course(s) of action that will bring about such improvement.

The first step in the process is for management to evaluate its policies, set general marketing policies, and establish sales objectives. The next stage should involve all of those individuals who are responsible for making the forecast work, i.e., salesmen, supervisors, sales managers, etc. Since these individuals are deeply involved, they will be setting currently attainable standards, and thus the forecast can be accepted with confidence. Lastly, the efforts of the individual representatives must be coordinated into a composite forecast and responsibility assigned at all levels. Of course, the forecast must be in line with company policy.

Although some types of selling do not readily lend themselves to this approach, a carefully-thought-out forecast involving key individuals is invaluable.

The accountant's role in the formulation of the sales forecast has left something to be desired. All too often forecasts of sales volume and sales expenses have been treated separately. It is essential for the success of the sales forecast that cost-volume-profit analysis be conducted in relation to market segments, key customers, and key products. This approach inevitably brings in the accountant. The accountant will be required to provide sales people with intelligible and meaningful expense and profit information that can be used to review alternative courses of action. Accountants must be made to understand what marketing people are trying to accomplish. Then the information can be tailor made to fit.

Direct costing is an effective tool for managerial planning, particularly sales planning. The whole process is geared toward profit analysis. The author suggests that this approach lends itself to the control and planning requirements of sales contribution planning.

Information requirements for both planning and control of sales include (a) cost-volume-profit analysis with respect to markets, market segments, key products, and territories; (b) nonfinancial data such as market share, sales coverage, sales performance, selling expense ratios, advertising ratios, complaints, stockouts, and overdue deliveries.

In addition to the basic product and geographical analyses that have usually been supplied in the past, an analysis of market segmentation must also be performed if forecasting is to be effective. The author diagrammatically illustrates the type of detailed segmentation of information that one might utilize. Once again the author postulates that responsibilities must be fixed, and, furthermore, he suggests that they be fixed on the basis of segments illustrated. Accountants

will be called upon for financial and non-financial data and for interpretation of the data.

The future will see utilization of new highly sophisticated analytical techniques as business becomes more competitive. Marketing models will come alive through the use of EDP with the aid of the adequately trained accountant. The lines of demarcation that have shaped the roles of the accountant and the marketing man in the past will be expunged, and the resulting interaction will bring about greater profits than ever before.

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Your CPA—Con Man or Fall Guy? by J. H. Hennessy, Jr., *Business Management,* January, 1970.

This article discusses the current controversy over the reporting of corporate performance as it relates to the CPA and generally accepted accounting principles. Although the author is critical of many public accounting practices, his basic viewpoint is sympathetic to the CPA, and his warnings are offered in the best interests of the profession.

Mr. Hennessy suggests that a credibility gap exists in the business world and that investors no longer believe what they read in published financial statements. Corporations have upgraded these presentations by using better paper, flossy graphics, multicolor illustrations, and considerable verbiage, but the question still persists as to whether or not they really say anything. Do they actually tell what happened?

The numerous law suits of the last few years would indicate that many people feel they do not. Management has been sued and along with it the certifying accountant, resulting in considerable embarrassment for both. This article asks how a rational man could envision a role in which one would ring the bell on his own employer and ponders the position of the accountant as being in the middle caught by the crossfire of investors and the businesses they own. Thus the title, "Your CPA—Con Man or Fall Guy?"

Problem self-inflicted

The article says that the image of the CPA is at an all-time low; a cursory review of the events of the 1960's bears this out. The author further indicates that this problem is, to a degree, self-inflicted. The accounting profession, he says, has devised such complex rules rooted in abstract theory that the investors are confused and the business man is denied a portion of the flexibility he desires. The result is that the CPA pleases neither and is held in mild contempt by both.

A further complication is added by the fact that "over all" sits the Securities and Exchange Commission as the final authority. This august body has (in the past) left the controls mainly in the hands of the AICPA, which enlists voluntary compliance from its members. As a result, the AICPA has tended to issue opinions on items of current controversy important to the SEC, and its findings have generally been compatible with the views of that body. It is possible, the author suggests, that more important items are sometimes overlooked under these circumstances.

Manipulation possible

The author goes on to discuss various inconsistencies in accounting principles and how these permit changes in reporting methods from time to time even without any change in the nature of the business. He further challenges the CPA's competence to judge materiality under certain circumstances. In short, he demonstrates how management (if so inclined) can manipulate earnings per share in a number of ways while staying within the bounds of generally accepted accounting principles.

New audience

These problems have become more acute in recent years because the CPA of today is confronted with a new and more knowledgeable audience in the form of mutual fund managers and professional security analysts. In an attempt to satisfy their needs, the allowed flexibility of reporting has been reduced somewhat—not enough to bring them real satisfaction but enough to incur the wrath of management. What should be classed as an equivalent common share for earnings per share purposes is one area in which inconsistencies still exist; others include the timing of expenses, inventory valuation methods, and changes in accounting period. Mr. Hennessy believes that a "piecemeal" patch-up of these inconsistencies is not the answer; he suggests that more far-reaching reforms are needed.

Financial statements, in his opinion, are a form of technical shorthand and cannot stand as management's major testimony of stewardship. They need to be accompanied by 1. greater detail on competitive results, 2. better-defined outlooks, and 3. a more extensive and creditable explanation of performance. He further suggests that a single income figure for investors as well as for tax purposes would be desirable and that these two areas of reporting should be drawn closer together where practical.

Narrowing of principles urged

In short, he recommends, the ambiguity and inconsistencies should be removed from financial statements. One route to this end could be the narrowing of generally accepted accounting principles. The result would be an income statement that would serve as an index to performance rather than as a quantitive measure of

profit in the strictly theoretical sense. This is an intriguing idea that deserves consideration.

The entire article, in fact, deserves careful consideration. There is a great deal of talk about the future of accounting—and some of it paints a rather dark picture—but there is reason to believe that a day of progress lies ahead. When an entire profession is capable of an in-depth examination (yes, and even criticism) from within its own ranks such as accounting has recently experienced, all is not lost. After all, the author of this article is himself a CPA. It is this spirit of self-examination that will enable accounting to hold its place as a leading profession.

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Capital Budgeting Analysis With The Timing of Events Uncertain by WILLIS R. GREER, JR., *The Accounting Review,* January, 1970.

For the most reliable measure of a project's worth where timing is uncertain, subjective time estimates should be used to derive a probability distribution. The beta distribution is suggested as an effective distribution for use in such situations.

This article discusses three approaches to project capital budgeting where the timing of cash flows for a project is uncertain. In the first approach, the decision maker's subjective estimate of the most likely time for the flow to take place is treated as though it were certain. The second approach is to compute the mean or expected time of the flow in question. This "average" is then treated as certain. The third approach is to compute the expected present value of the flows by breaking the entire time over which the events could occur into intervals. These intervals are assigned subjective probabilities, which are weighted using present values for each interval. The resulting series of present values are totaled to arrive at the net expected present value for the project.

Relative merits

The first method selects the time at which the event is most likely to take place but ignores the fact that the time might be before or after that most likely time. The error, the author points out, is that this approach tries to maximize the likelihood of making a correct estimate instead of the likelihood of making a correct decision. The second and third methods correct for this error by using the expected value concept.

In the second method, or the expected time method, subjective probabilities of occurrence are assigned to each time that a cash flow might be expected to occur. This produces an average time of occurrence, which is then used in the present value analysis. But this does not give the expected net present value of the cash flow because the analyst uses the "average" expected time as certain instead of applying the probabilities more closely to the timing of each cash flow. The author shows, through use of a simplified project situation, that the third method would result in maximizing average return. If the expected value decision rule were used for all decisions of this type, the average return from all the decisions should be maximized.

For complex projects

In complex situations, the establishment of the subjective probabilities required for the expected value approach becomes cumbersome. To simplify the procedure, the author suggests that a process similar to the use of the beta distribution in a PERT analysis can be followed. Three estimates are needed: an "earliest possible time," a "latest possible time," and a "most likely time." These estimates can be used as parameters of the beta. With the standard deviation assumed to be one-sixth of the range, a standardized beta distribution can be computed. To convert this distribution to probabilities which can be used in the capital budgeting analysis, the author has constructed a beta curve area chart. The chart allows the user to avoid the calculus that would otherwise be required. Where greater accuracy than the chart will provide is desired, a digital computer or printed tables could be used to produce the probabilities for the beta. A number of references are given that should be of value in understanding and implementing the author's ideas.

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Managerial Decision Models: Report of the American Accounting Association Committee by CHARLES T. HORNGREN, chairman, *The Accounting Review,* Supplement to Vol. XLIV, Committee Reports, 1969.

The increasing use of managerial decision models has created a demand for routine collection and analysis of data beyond the current bounds of accounting systems. The AAA committee on managerial decision models suggests that accountants assume responsibility for these data—but a fundamental reorientation of the accounting system is required.

Mathematical models are receiving increased use in the managerial decision making process. Inventory planning and control and capital budgeting are two areas in which mathematical decision models are commonly used. What impact will the increased demand for data for these models have upon accountants and the accounting system? What types of data should be collected and who should collect them? In this tentative statement, the AAA committee headed by

Charles T. Horngren advocates an expanded role for accountants in responding to the broad needs for management information.

Data requirements

Current accounting systems typically collect only those data that are 1) generated internally within the company, 2) based upon historical costs or exchange values, 3) aggregated into company totals, 4) quantifiable in dollar terms, and 5) the result of an actual transaction or event which has occurred. By contrast, a quite different set of data is required for most managerial decision models. Frequent use must be made of externally generated data such as competitors' selling prices and industry growth rates. For decision making purposes, expected future costs, rather than historical costs, are the relevant variables. Usually, incremental data such as the marginal cost of the last unit produced are more important than average or aggregate data. Many short-run decisions may be based upon purely quantifiable data, but qualitative data are frequently more critical for long-run decision making. And, finally, the models require much information that does not arise from actual transactions, such as estimated returns for alternative uses of resources.

The accounting system should provide these data required for managerial decision models to the greatest extent possible. A fundamental reorientation of the accounting system is necessary if accountants are to continue as major suppliers of information for planning and controlling.

Accountants' role

The objective of internal accountants has always been to generate useful information for management. This objective, coupled with their skill and experience in systematic data gathering, dictates that accountants should supply the data required for the managerial decision models. But the accountant must be more than just a data collector. He must understand how his data are used in the model, and he must aid the model builder in assuring that data for input to the model are relevant. The economic feasibility of data acquisition must be traded off against the need to be responsive to the requirements of the decision-model users.

The accountant must be particularly sensitive to the manner in which management will use the models. Almost all decision models assume use by an "economic man." But the actual implementation of decision models is strongly affected by behavioral implications which must be considered by the accountant before he can make practical plans to link the accounting system with decision models.

Planning vs. control

It is a major challenge for the accountant to ensure that the control systems against which performance is measured are consistent with the decision models used in planning. This will require modifying the traditional full cost accrual statements based upon historical transactions. If a capital budgeting decision is based upon discounted cash flow projections, it is inconsistent to measure and control performance of the selected action with a short-run income statement. A similar inconsistency arises if inventory policy is based upon a model that is strongly influenced by the imputed cost of the investment in inventory but if performance reports ignore this imputed cost. To ensure consistency between the managerial decision model and performance control reporting, the accounting system should be oriented more to the needs of internal management than to those of persons outside the company who measure performance by the traditional accounting statements.

Thus, the increasing use of managerial decision models will necessitate a basic reorientation of the accounting system. New kinds of data must be collected to provide relevant inputs to the models. New reporting systems must be devised to ensure that consistent criteria are used to make decisions and control performance. If the objective of providing useful information to management is to be fulfilled by accountants in the future, they must accept the challenge to adapt their output to the needs of managerial decision models.

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