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What People Are Writing About

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what people are writing about

BOOKS

Cybernetics for the Modern Mind
by WALTER R. FUCHS, The Macmillan Company, New York, 1971, 357 pages, \$6.95.

This simplified explanation of the underlying theory behind the electronic computer, by a well known scientific popularizer, will add little to a businessman's understanding of what computers can do for his own operations but much to his grasp of the mathematical and logical theories that explain how they actually work.

The publisher's blurb describes this book as an explanation "for the general reader of the 'electric brains'; the mathematics involved; how they work; what they can do," making it seem as if this were just another popularization of computers. That description hardly does the author justice.

Such books are a dime a dozen—but this one is quite different from the others. Its author aims much higher, and his subject matter is much broader. He is seeking to elucidate not computers alone but rather the whole mathematical theory on which their conception is based.

Indeed it takes him more than

200 pages even to get to the computer. The first four chapters deal with thinking and language; they lead to the conclusion that the atom of information cannot be found in language. Then comes the bit, or unit of information, defined by a yes-no decision. That leads the author to the binary digit—but not yet to the computer.

First he discusses probability theory; its youngest branch, information theory; and Boolean algebra, or classical statement logic. All this prepares the reader for a relatively brief discussion of parity bits, flip-flop circuits, machine storage, programing, and eventually cybernetics as the science of con-

REVIEW EDITORS

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

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trol. He takes up computers as players of chess and other games, self-reproducing machines, and such popular questions as whether the machines really think and whether they will eventually dominate mankind but has little to say about their applications in business.

This is essentially the material that early computer programmers were required to master before they could program, and it shows why they had to be mathematicians. For this is mathematical theory—albeit for the most part translated into English rather than reproduced in mathematical symbolism—and it is not simple material, despite the author's skill in popularization. (He is also the author of *Physics for the Modern Mind* and *Mathematics for the Modern Mind*.) Its readability is not enhanced by what seems to be a rather stiff translation from the original German.

The book is, nevertheless, fascinating. It is a handsome volume, lavishly illustrated with diagrams, sketches, photographs, and cartoons, many of them four-color, in bright, primary colors. While this is probably not a very "practical" book, it is intellectually stimulating and highly valuable for anyone who wants to really understand computers.

The First Henry Ford: A Study in Personality and Business Leadership by ANNE JARDIM, The MIT Press, Cambridge, Massachusetts, 1970, 278 pages, \$6.95.

Henry Ford built a great industrial empire and then came close to destroying it by a series of seemingly irrational actions which conventional historians have been at a loss to explain. For a Freudian, however, the explanation is simple: He was always acting out his conflict with his father.

Here is another in the series of biographies by "psychohistorians"

that Massachusetts Institute of Technology is publishing. Henry Ford was a very different man from Frederick W. Taylor (see M/S January-February '71, p. 58), but his problem was essentially the same, in the view of his psychiatrically oriented biographer: his relationship with his father.

Like many others of his day Henry Ford tinkered around with engines and built a horseless carriage. Unlike the others he succeeded in building a car ideally suited to the needs of the day, set up a production system capable of making it at a price the ordinary man could afford even though his workers were paid the then startling wage of \$5 a day, and established a great and enduring industrial enterprise.

Irrationalities

These successful and eminently rational achievements were followed by a series of seemingly irrational actions. He clung to the Model T long after it had outlived its usefulness. While General Motors was evolving as a veritable model of rational organization structure and effective management control, Ford turned his company into a satrapy, ruled by whim, pervaded by fear, and staffed by sycophants, hatchet men, and semi-thugs. He embarked on a series of irrelevant and eccentric projects—a "peace ship" to end World War I, a newspaper characterized by strident anti-Semitism, a nostalgic reconstruction of a rural village.

These facts of Ford's life are reasonably well known—although perhaps not as well known as the author of this book seems to assume—and this author seeks not to retell but to explain them.

Freudian line

Her explanation could be predicted by anyone familiar with the Freudian line of thought: Ford's hostility to his father produced in him a style of "aggression toward, rejection of, and the drive

to dominate the men around him." Ford unconsciously held to two recurrent issues. "At the risk of oversimplification they may be described as the need to retaliate against the 'bad' father and the need to deny through restitutive action (although I left the farm I am still a 'good' son) the sense of loss and abandonment."

Ford, says the author, moved from conflict through adaptation to restitution. "The Ford method—the production process which was to become so intimately associated with Henry Ford that even in Russia it was called Fordizatsia and assumed the stature of an industrial philosophy—represents initially a highly adaptive attempt at coping with the conflicts that lay at the base of his obsession."

Ford's great burst of creative inspiration followed his father's death in 1905, the author notes. "At a conscious level he had repudiated his father's help, denying that it had ever been given him. . . . A pattern of guilt emerges in which the element of restitution predominates. Ford's fixation on the car, a fixation beyond the reach of the pressures of reality, can mean only that it had come to symbolize for him a way back, a means of expiation."

It is hard for the lay reader to certify the author's case as proven. The facts cited about Ford's relationship to his father are not such as to suggest so deep a conflict. For the Freudians, however, the existence of a behavior pattern implies the existence of the standard cause.

Small matter. This is an entertaining book, although at times it is somewhat confused; interweaving her analysis with her chronological account, the author often finds herself analyzing events that have not yet been reported in the book—a disadvantage for anyone not already well acquainted with Ford's life history. Those who disagree with the analysis—or object to the whole idea of trying to psychoanalyze people who are no longer living—will still find the pic-

ture of Ford's personality interesting.

Briefly Listed

Manage More by Doing Less by RAYMOND O. LOEN, McGraw-Hill Book Company, New York, 1971, 254 pages, \$10.95.

This book, by a management consultant, emphasizes the importance to a manager of making the distinction between managing and doing. The managerial functions stressed are planning (including goal setting, programing, scheduling, budgeting, forecasting, organization planning, and developing policies, procedures, and standards), directing (including staffing, training, supervising, delegating, motivating, counseling, and coordinating), controlling (including measuring, evaluating, and correcting), deciding, communicating, and improving.

The Arts of Top Management: A McKinsey Anthology by ROLAND MANN (Editor), McGraw-Hill Book Company, New York, 1971, 402 pages, \$12.50.

This collection includes articles by McKinsey & Company, Inc., consultants in the general areas of corporate planning, organization, profit structure, management development and compensation, marketing and distribution, management of technology, management sciences, and EDP.

The Manager's Project Control Handbook by TRINA M. MCGOVERN, A&M Publishing Company, 400 Veteran Avenue, Los Angeles, California 90024, 1970, 40 pages plus index, \$5 (paperbound).

This little manual, a sort of extended checklist, covers the functions of a task force, its organization, procedures in carrying out the project, techniques for charting work flow, forms design, and preparation of a manual of standard operating procedures.

Software for Computer Systems by EDWARD O. JOSLIN (Editor), College Readings, Incorporated, P. O. Box 2323, Arlington, Virginia 22202, 1970, 373 pages, \$6.95 (paperbound).

In addition to 18 articles first published in 1968 or later, this book contains two original primers on FORTRAN and COBOL prepared by Richard C. McAdams as vendor-independent versions based on the ANSI Standard Specifications. The articles deal with supervisory and monitor systems, incremental compilers, report program generators, application programing, assembly language programing, and specific computer languages as well as such problem areas as software maintenance, conversion, and documentation.

Managing with People: A Manager's Handbook of Organization Development Methods by JACK K. FORDYCE and RAYMOND WELLS, Addison-Wesley Publishing Company, Reading, Massachusetts 01867, 1971, 192 pages, \$5.95 (paperbound).

These authors emphasize two aspects of organization development, as a way of managing change and as a way of focusing human energy toward desired specific outcomes. Basic subjects are methods of bringing about change, finding out what is going on, holding better meetings, and changing the quality of relationships. Four case studies deal with reorganization of a retail chain, customer relations in an aerospace firm, development of a teacher education program, and revitalizing a division of an engineering company.

Federal Information Processing Standards Index, NATIONAL BUREAU OF STANDARDS FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION (FIPS Pub. 12), Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402, 1971, 143 pages, \$1.50 (paperbound).

This index seeks to make available in a single document information on standards activities in the field of information processing at various levels—Federal, national, and international. Also included are related policy and procedural guideline documents and a listing of Federal agency representatives serving on information processing standards committees.

Corporate Planning Through Simulation by LYBRAND, ROSS BROS. & MONTGOMERY, New York, 1971, 12 pages, paperbound, available to clients and friends on request.

This little booklet offers an overview of the use of modeling and simulation techniques in corporate planning. Some of the mathematical techniques involved are explained and some of the available models are described.

Retailing: Concepts, Institutions and Management by ROM J. MARKIN, JR., The Macmillan Company, New York, 1971, 398 pages, \$5.95 (paperbound).

This anthology contains 45 articles on such considerations in retailing as customer attitudes, institutional trends, spatial considerations, pricing, promotion, management control, and prospects for the future.

The Dictionary of Administration and Supervision by IVAN S. BANKI, Systems Research, Box 74524, Los Angeles, California 90004, 131 pages, \$5.92.

This little reference book seeks to define terms used in traditional management areas (planning, organizing, staffing, directing, coordinating, reporting, and budgeting) and in such newer branches as operations research, organizational sociology, group dynamics, administrative law, and the like. It also contains a bibliography of selected encyclopedias, dictionaries, and texts.

MAGAZINES

Danger Ahead for Pension Funds

by CHARLES D. ELLIS, *Harvard Business Review*, May-June, 1971.

Corporate pension funds are heading for a crisis, this author warns. Obligations are growing faster than funding. Mr. Ellis urges more high-level attention to strategic planning.

Pension funding contributions and benefit payments have been rising at a rate of nearly 15 per cent compounded annually, according to a survey of large corporations cited by Mr. Ellis in the introductory part of this article. Most of the executives surveyed expect this growth to continue or perhaps even increase. Yet these same executives do not expect their own companies' contributions or benefits to rise as much as 5 per cent over the next five years.

This is quite a discrepancy. The only way to make both sets of figures accurate is to assume a higher actuarial rate of return. And that, says Mr. Ellis, "is what companies have been doing. The assumed rate of return on pension portfolio investment has gone from 3.5 per cent to 5 per cent, on the average."

Obviously, however, that can't continue forever. "When the slack provided by the formerly low actuarial assumption gets used up, the growth in pension obligations will have to be met by real money, not by accounting adjustments."

The basic problem, in Mr. Ellis's view, is poor management, and the solution is better management. The survey showed that by a substantial majority the senior executives responsible for pension funds spend only a small part of their time on pension policy and strategy; they do not make long-term forecasts of future benefits or future contributions.

Right now, Mr. Ellis says, most companies are funding their pensions to provide for no more than

the present schedule of benefits—and that after adjusting current liability downward because of such actuarial factors as turnover, mortality, and investment income. As a result, he charges, the size of the pension liabilities being incurred now is being understated, and management some day will be forced to "play catch-up ball" with pension funding.

Mr. Ellis recommends more attention to pension fund planning at a high corporate level and better cooperation among investment managers, wage and salary administrators, and actuaries. He lists the data each of these departments should supply to enable senior management to calculate the "pension fund equation (PFE), or model" and from that to project for some years into the future annual levels of benefit payments, annual funding obligations, and the degree of liquidity required to meet current and intermediate obligations. He also suggests other calculations that would prove helpful in pension management.

New Accounting and Acquisition Planning by RICHARD H. HILLMAN, *Business Horizons*, October, 1970.

The article is concerned with the implications of the accounting changes brought about by the new Accounting Principles Board Opinions 16 and 17 and the effect such changes may have on future strategies of acquisition-minded corporations. The author indicates four trends likely to result from the new opinions and discusses ways in which to deal with such trends.

APB Opinions 16 and 17 contain two major changes regarding accounting for business combinations. The changes are as follows:

1. The opinions restrict those business combinations that can be accounted for as a pooling of interests.

2. The opinions require, in purchase acquisitions, the amortization of the excess of cost over book value.

The key requirements, which lead to the major changes, of both the pooling and purchase treatment are discussed, together with their potential impact on the acquisition movement in the United States.

To assess the impact of the new opinions, a study was conducted involving a random sample of 28 major business combinations which took place in 1969 (prior to the new opinions of 1970) and applied the pooling concept of accounting in recording the combinations. The conclusions of the study indicated:

1. Of the 28 combinations, 24 would no longer qualify for the pooling concept of accounting.
2. If these 24 combinations had utilized the purchase method of accounting, their 1969 reported earnings would have been reduced by an average of 7 per cent.

In addition, the acquisition of Hooker Chemical by Occidental Petroleum in July, 1968, was analyzed. The pooling concept was used in this acquisition. The author concludes, "The implication here is that Occidental might not have found the acquisition financially feasible had the new rules been in effect."

The author attempts to generalize from the results of his research by claiming that four trends are likely to emerge as a direct result of the new opinions. The accuracy of his generalizations must be judged by the reader since the empirical evidence contained in the article is limited in its scope and the relation between the empirical data and the generalized trends is questionable. The four trends stated are as follows:

1. The level of future merger activity may be reduced as

companies turn more toward internal growth.

2. Companies with low market value/book value ratios are likely to become more attractive as acquisition candidates.
3. Discounted cash flow analysis will be relied upon more heavily in acquisition evaluation.
4. Dividend policy analysis of acquisition candidates will be more important in acquisition evaluation.

After a discussion of the reasons why these trends are likely, the author gives his readers a formula intended to be used as an indicator of the magnitude of the negative financial impact of the new requirement of annual amortization charges against future income:

Approximate annual impact on earnings per share = $[(\text{Purchase price} - \text{Book value}) \div \text{Average life of goodwill}] \div \text{Total combined shares outstanding}$.

Four specific steps are then suggested which can be taken to minimize the negative EPS impact determined by the formula.

1. Offer lower premiums on acquisitions.
2. Acquire only firms with low market value/book value ratios.
3. Evaluate firms on the goodwill factor and write-off period.
4. Increase conversion features in purchase acquisitions.

This article is valuable for executives involved in the decision making processes of acquisition-minded firms. If they recognize the implications of these changes in accounting for business combinations, executives will be more knowledgeable in their acquisition strategies. Thus, while the empirical data and the exact conclusions drawn from such data may be questioned, the underlying thesis is sound, and the article is certainly a contribution to our knowledge and understand-

ing of the accounting opinions and their importance to business planning.

BART A. BASI
Indiana University

Ten Ways to Avoid the Detours in Physical Distribution Management by ALLEN HARVEY, *Business Management*, November, 1970.

Mr. Harvey demonstrates the materiality of physical distribution costs and advocates a company-wide approach to this problem.

Many executives are shocked to learn that 25 to 35 per cent of every sales dollar is absorbed by physical distribution costs if the physical distribution system is defined to include inventory management, materials handling, warehousing, transportation, packaging, and customer services. Many distribution costs are buried in accounting reports under such classifications as interest, rent, and wages even though debt in fact could be reduced by inventory reduction; rent may include extensive storage areas; and production personnel may spend substantial time moving material within their departments. Even if functional classifications are used, physical distribution costs occur in so many physical locations and in so many forms that the total is difficult to obtain.

Because of this diversity in location, there may not be anyone responsible for controlling these costs. In many cases, lower-level employees at various plants spend considerable time performing distribution activities without coordination with similar activities in other plants or departments. Mr. Harvey compares this to the chaos of an army without anyone in command. A manager with sufficient authority and responsibility to cut across normal department lines is needed to bring the small pieces together as an integrated whole

which can better serve the company and customers.

Can help profits

In addition to the cost-cutting attraction, a well organized distribution system can improve profits by shortening customer-order-processing time. A shorter time lag between the order and the receipt of the product could provide a valuable marketing advantage. Many customers who must wait for back-order processing seek other suppliers, causing an immeasurable loss of future sales and profits. Sound inventory management can alleviate this problem as well as cut costs.

A significant advantage of reducing order time is the potential for inventory reduction. Mr. Harvey says that in his experience inventory carrying costs are approximately 25 to 40 per cent of inventory and that large inventories may discourage the development of new products and approaches. By development of appropriate reorder points, these costs may be reduced without loss of customer good will. Further reduction may be obtained by shortening replenishment time. A reduction of the time needed to replenish items by two weeks eliminates the need for two weeks' worth of inventory. In the case of short-lived or seasonal merchandise, a reduction of replenishment time can help sales as well as ensuring that merchandise is ready for sale when the customer wants it.

Product pruning urged

Another source of inventory reduction is the reduction of the number of products and package sizes carried. Mr. Harvey states that when product lines expand arithmetically, total costs increase geometrically at an alarming rate. The additional inventory requirements imposed by a multitude of products and sizes and the related order processing problems created are a strong in-

centive for holding proliferation in check. A wide array of products and sizes may also inhibit the automation of distribution activities. The related increase in production costs provides yet another reason for eliminating marginal products.

Because physical distribution costs are related to so many areas of business activity, companies need high-level distribution planning to minimize this significant cost. Physical distribution costs must be considered when making decisions ranging from choosing a supplier to finished goods delivery. Therefore a company-wide plan administered by one key manager is needed. By properly planning the operation of the physical distribution system on the basis of relevant information and cost reports, a business has an opportunity to increase profits dramatically.

TOMMY HARRIS
*Louisiana State University
at Baton Rouge*

Choosing Between In-House and Service Bureau by JOHN D. MACLEAN, *Management Controls*, September, 1970.

The choice between service bureau computer use or in-house installation is primarily an economic decision based on comparison of the costs and benefits of the two alternatives. As the author notes, this analysis should be supplemented by judgment as to the adequacy of service and the inconvenience that may be involved.

There are three basic types of computer service bureau options. In a batch processing operation, the user gathers the applicable documents, codes them, prepares a control tape, and then forwards this to the service bureau. The service bureau converts the information into machine-readable form and then processes the information through the computer for balanc-

ing and report preparation. According to the author, batch processing is easily comprehended and convenient.

The second type of service bureau option is time sharing. Time sharing permits access to a large computer that has the capability to process information for many companies simultaneously. Usually access is through a console located on the user's premises, and output is received through the same console or a printing device. An advantage of time sharing is that a small user has access to a more powerful computer than could be justified for his own firm alone. The limitations of time sharing are the speed and capacity limitations of the remote input and output devices.

The final classification of service bureaus discussed by the author is remote batching. Remote batching follows the same principles as time sharing, but with more powerful input and output devices. The user transforms the information into machine-readable form and then transmits it to the large computer by use of a remote input device. A smaller computer may be used as the input/output device.

In-house computer

As the author points out, an in-house computer installation requires the organization to acquire the equipment and personnel to operate a system that meets its data requirements.

An in-house installation is most likely to be necessary when the organization has unique, time-consuming applications. There may also be small-volume applications that justify in-house installations. The primary criterion for in-house installation is service to the organization. The advantage of in-house installation is full accessibility of all programming and operating staff for coordinating the data processing effort. Other factors that must be considered when evaluating the in-house approach include these:

1. The organization must equip itself with a system that is powerful enough to meet data processing requirements.
2. The organization must staff the installation with supervising and operating personnel.
3. The organization must operate the system in terms of job scheduling and communications with other departments.
4. The organization may lease unused computer time to outside organizations.
5. Dependency on the computer may cause serious trouble if the system breaks down.
6. Personnel responsible for the operations of the installation of the system are readily available for special projects.

Service bureau

The primary advantage of using a service bureau is that it gives limited access to a computer for a minimum investment in time and money. Service bureaus try to serve the user and will do certain amounts of systems and programming work. The only responsibilities of the user are to provide accurate input to the system and to notify the service bureau of any modifications.

Service bureaus often offer standard systems and programs to many users. These "package" applications enable the bureau to perform a service for the user at significantly lower cost since development costs are spread over a number of users. Other factors that must be considered when evaluating the service bureau approach include the following:

1. The responsibility for running the computer installation rests outside the organization. As a result, the costs are lower.
2. The user can devote more effort to ensuring the accuracy of input and control at both the user's location and the service bureau.
3. Personnel that use time shar-

ing or real time communications must be adequately proficient in using the required equipment.

4. Staffing the computer installation with qualified personnel is the responsibility of the service bureau.
5. If the user does not meet his input schedule, the delays involved may be considerable and costly.

The author correctly notes that before undertaking either a service bureau contract or an in-house installation the company must expend considerable effort in planning the change in operations. This planning process should consider the needs of the organization and the resources available. In addition, to ensure the success of either an in-house installation or use of a service bureau, adequately trained and experienced personnel are of utmost importance. Finally, in areas where data processing is to be applied, senior management should take part in the "evolution" and approval of specific systems to ensure that requirements for success are understood and met.

CHARLES L. McDONALD, CPA
Michigan State University

Measuring the Effectiveness of Nondefense Programs by HARRY P. HATRY, *Operations Research*, September-October, 1970.

This article discusses the criteria for and the deficiencies of the currently most popular approaches to evaluating public programs and policies and proposes an improved program for such evaluations.

In the first part of this article the author briefly describes the three approaches most commonly used for public program selection. Very briefly, they are:

1. The assumption that effectiveness either is not measurable or need not be measured, resulting in

the use of program cost estimates to reflect the effectiveness of the program.

2. The use of "immediately observable products" to measure effectiveness. (These are of two types: (a) work-load measures and (b) physical standards.)

3. The translation of each program effect into a common measurement unit. (There are two forms: (a) "cost-benefit" analysis, which translates program effects into monetary terms, and (b) "weighting" techniques, which combine measures expressed in various units into a single "index of worth.")

Improvements proposed

The bulk of the article deals with the author's proposals for improvement, particularly in selecting and using evaluation criteria. Six steps are presented. The first step is for the governmental body to specifically determine its basic objectives so that the programs can be related to these objectives. Second, the agency must realize that there are many evaluation criteria which can be applied to any problem. If only one criterion is considered, at least four deficiencies can arise; these are discussed by the author in considerable detail. Third, the subgroups of the population which a particular program will affect must be considered since a program affects different subgroups to different degrees.

The fourth step deals with proxy criteria. These may be needed where it is difficult to evaluate program alternatives against their fundamental objectives, but their use should not be overdone. Where it is necessary, all deficiencies of the proxy should be explicitly identified and allowed for so that it is compatible with the fundamental criteria.

Fifth, there is a time dimension to be considered. Each program alternative must be evaluated against each relevant criterion for each year of the planning horizon since programs generally have effects several years into the future. Finally,

to be useful, the criteria used must be measurable in some fashion, but they need not be absolutely quantifiable.

Recommendations summarized

After presenting a brief illustration of the use of these criteria, the author presents his general recommendations as to the procedure to be followed by any governmental agency in measuring how effective its public service programs are. These recommendations embody the above criteria:

- "1. All major program proposals should be required to identify explicitly the basic objectives toward which the programs are aimed.

- "2. Criteria should be selected that permit direct evaluation of programs against the identified objectives. . . .

- "3. Program proposals that contribute to the same basic objectives should be evaluated together, regardless of organizational lines.

- "4. The impacts of programs beyond the budget year . . . should be explicitly considered to see that future needs are not unduly penalized at the expense of current needs.

- "5. . . . Programs should be evaluated against all relevant criteria."

Although these recommendations have been proposed for governmental agencies, they are also applicable to private enterprises that have to look at alternative project proposals and evaluate them to find the best ones in the light of their overall objectives.

The author makes one additional point, which is equally applicable to governmental agencies and private enterprises: "In measuring the output, or effectiveness, of nondefense public programs, it is important to determine what we should want to measure without being restricted by our current ability to measure things—we should avoid prejudging, based on current practice, what may be measurable and what may not be." Such an idea should govern all individuals or groups involved in evaluating pro-

grams or decisions, since any pre-conceived conceptions may blind them to better ways of doing their task.

ROSALIE HALLBAUER
University of Florida

Computer Displays for Management by BRUCE JOPLIN and JAMES W. PATTILLO, *Management Controls*, July, 1970.

The continued growth of the use of electronic computers in business has necessitated a search for more efficient and economical methods of retrieving information from the computer. Three computer reporting techniques that appear to have great potential for solving the output bottleneck are cathode ray tubes, computer-linked microfilm, and computer-connected graphic display.

Three methods for retrieving and displaying electronically processed data are discussed in this article.

Cathode ray tubes

The cathode ray tube (CRT) can be used to display information stored in the computer on a television screen. The keyboard attached to the CRT is used to issue instructions to the computer. The CRT is linked directly or via communications lines to the computer. It can receive data from or transmit data to the computer. Most displays are in tabular form although some units possess graphic capability. Operators may be trained to use the CRT in a few hours. However, absolute control must be maintained over data input and access to data output.

The two principal uses of CRT units are file scanning and management reporting systems. File scanning is most useful where the current status of individual records is necessary for operating decisions. Common examples would be customer balances in financial in-

stitutions, airline reservations, and production and inventory control. Most file scanning systems serve special purposes and are not total information systems.

Higher-level management typically needs summaries and analyses of file conditions and activities reported on a periodic basis. CRT management reporting systems provide up-to-date information instantaneously. Subsystems of reporting are established for various categories of interest. The pyramid approach is used to build successive report summaries at each level. Reports are automatically updated by the computer. A series of previous reports may be available in the computer along with the updated reports.

Microfilm reporting

The use of microfilm for reporting to management should not be confused with the storage and retrieval of large, inactive files. The latter use is often characterized by slow manual operating procedures. The former refers to microfilm operations connected directly to the computer.

The number of possible integrated microfilm-computer systems is large indeed. A substantial variety of new equipment and techniques is being marketed by more than 100 manufacturers. This situation makes it difficult to generalize about the potentials and limitations of microfilm systems. However, it is possible to point out some important features which apply, particularly to the more advanced systems. The first three features pertain particularly to a system called Micromation, developed by Stromberg-Carlson:

- 1) *Direct photography from special cathode ray tube display:* One no longer needs to produce a paper copy to be photographed.
- 2) *Automatic process:* The photographic process advances the data and the film and

photographs each page of the data.

- 3) *Three types of film:* The most popular is 16mm film stored in cartridges or magazines; there is also 35mm film, cut into individual frames and stored on aperture cards; finally, there is microfiche, capable of storing up to 72 pages on one microfiche sheet.

Additional features of film systems include these:

- 4) *Graphics on film:* Some systems can present data in graphic form directly from the computer.
- 5) *Processing speeds:* An eight-hour shift can produce between 20,000 and 70,000 pages of data depending on the equipment used.
- 6) *Duplicate and "hard" copies:* It is easy and inexpensive to make duplicate or paper copies of data when necessary.
- 7) *Paper reports:* Paper reports probably will disappear in the long run. All report users will have access to a viewing device when information is desired.
- 8) *Updating and retrieval:* Periodically the management reports are updated and the new information is microfilmed. Updating is faster and cheaper using microfilm than with paper printers.

Where instant access is essential CRT units may be necessary. However, CRT costs may be prohibitive for some companies. Microfilm reporting is a less expensive alternative to CRT units where instant access is not necessary.

Computer graphic displays

Most business data stored in a computer are retrieved in some numerical tabulation form. Often these data are then converted to

one or more graphic forms by hand before they are used by management. This process is no longer necessary. Devices are now available which allow the computer to print out data in various graphic forms.

Two basic devices are available for graphic display of computer-stored data. The digital plotter is the most widely used device; it may operate on line or off line. Specially equipped computer printers are not as widely used, in part because of the large cost of programming such a system. But the use of both types of devices is increasing.

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How to Manage More by Doing Less by RAYMOND O. LOEN, *Business Management*, November, 1970.

Mr. Loen provides a timely reminder of the importance of proper planning and describes the basic methods used to develop a successful management program.

The recent rise in the number of managers facing possible unemployment highlights the need to plan a management strategy. Mr. Loen provides an example of a controller who was replaced because of his failure to develop a program to meet the new needs of his company. He lost the continuing war between managers both within and outside businesses by not planning his strategy accordingly. He may not even have realized he was "in a war." By proper planning, the manager can compete effectively with other managers on the constructive basis of performance.

Beach trip used as example

A simple example of a family's planning a trip to a beach is used by Mr. Loen to illustrate how a "strategist" sets his objectives, eval-

uates his resources and potential problems, and devises a plan of action most likely to attain his objectives. Other short examples, such as a personnel manager's reducing employee turnover by encouraging his staff to hire experienced college graduates instead of new graduates, are used to illustrate how managers obtain results by planning the activities of people to reach an objective.

Define objectives

The first step in devising a sound strategy is to define objectives in terms of what is to be accomplished and to assign priorities to these objectives. Optimization requires maximum utilization of strengths. Thus, the manager should identify his resources. Mr. Loen provides a checklist for identification of marketing resources and obstacles, indicating areas of potential strength and weakness in men, machines, materials, money, methods, management, and facilities.

On the basis of resources, obstacles, and areas of functional responsibility, the manager then develops his basic strategy. For example, a marketing manager may concentrate on what product is sold, to whom it is sold, when it is sold, how it is sold, or a combination of these factors. Quick-service food outlets stress convenience to customers in a hurry and sell primarily to young, above-average-income families. Other forms of business have other marketing characteristics. Mr. Loen provides a checklist of product characteristics to illustrate how to analyze parts of a basic strategy.

A high-level manager may plan a basic strategy of assisting other managers in devising their strategies and coordinating them to meet overall company objectives. When a basic strategy, such as improvement of product dependability, has been successful, the manager should consider development of a new strategy, such as im-

proving product reputation or brand name identification. By logical changes in basic strategy, the manager continuously works for further improvement instead of concentrating on deficiencies already overcome.

A more specific set of actions for implementation of the strategy is based on the previously derived management plan. These actions should center on what will be accomplished through people. The major actions should be planned with consideration of the possible outcomes, ranging from the best to the worst that can happen. Mr. Loen suggests that these major action plans be limited to twelve to keep from bogging down in too many details.

The manager must continuously plan his future strategy on the basis of his company's needs. He should periodically review objectives, resources, obstacles, and methods of achieving goals to ensure that he is accomplishing the maximum possible with his time and resources. Maximizing his return enables the manager to compete effectively on the basis of performance.

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