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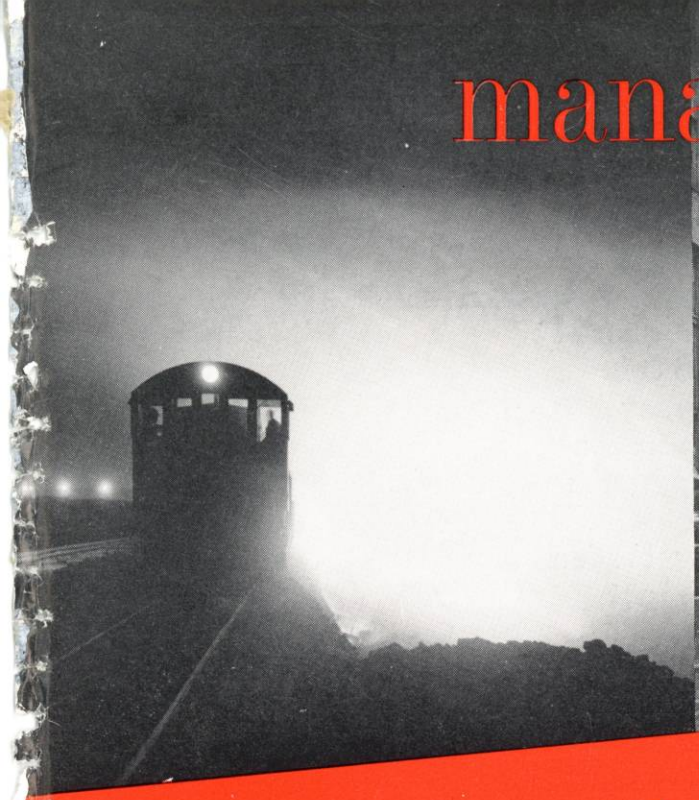

Is Accounting Geared to Today's Needs?

Arthur B. Toan, Jr.

A Publication of the American Institute of Certified Public Accountants

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management adviser

(formerly *Management Services*)

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Pollution control:

A corporate responsibilty

Pollution and pollution abatement have become important aspects of every business. They affect budgets, profit and loss, position in the community, corporate image, even the price of stock in some cases.

Pollution is a now problem that is receiving now attention from astute businessmen. Water treatment plants, fume scrubbers and filtration systems, land reclamation, plant beautification, litter prevention, employee education programs, are all types of things industry is doing to help in the pollution fight.

But regardless what a businessman is doing today he must be considering pollution control efforts for tomorrow.

One thing he can do is write for a free booklet entitled "71 Things You Can Do To Stop Pollution." It doesn't have all the answers on pollution. But it might give a businessman a few ideas for both today and tomorrow.

People start pollution. People can stop it.

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AICPA Draft Statement on MAS, CPAs' Aid to Detroit In Improving Operations Discussed at Annual Meeting

The American Institute of Certified Public Accountants evidenced its commitment to a strong professional involvement in the area of management advisory services at its annual meeting, held in Detroit October 10-13.

At the meeting's management advisory services session, AICPA Executive Vice President Leonard M. Savoie read a draft of a statement developed by the Management Advisory Services Executive Committee. The draft demonstrated why the co-existence of auditing and consulting services in public accounting firms is of widespread benefit not only to clients but also to the public in general.

"I heartily approve the statement," Mr. Savoie said. "I am convinced that management advisory services will continue to grow and will continue to be an integral part of the practice of public accounting."

The AICPA official referred back to a speech presented to the annual meeting by SEC Commissioner James Needham, who, he said, urged accountants "to look for ways by which clients can improve their productivity and profitability, and thus contribute to the achievement of increasing employment and stemming inflation."

"Thus, a high officer of Government has urged the profession to provide advisory services which will aid managements to do a better job and thereby foster economic health to the benefit of the entire nation," Mr. Savoie said.

Responding to a speech presented earlier by Ralph Nader, director of the Center for Responsive Law, Mr. Savoie told the MAS session, "Mr. Nader said the profession must be free of client pressure and cited management advisory services as a possible weakness in resistance to this pressure." Mr. Savoie cited the draft statement as proof that Mr. Nader was mistaken.

Questioned further on this point, Mr. Savoie added, 'The statement of the Management Advisory Services Executive Committee develops in a positive way that management advisory service improves the competence of the firm and increased competence provides the basis for further independence in performing professional work."

At the same session Philip G. Tannian, project director and executive assistant to the mayor of Detroit, told how that city has benefited from the management advisory services of various CPA firms.

When the city of Detroit faced

a loss of its credit rating and the possibility of payless paydays for its employees, Mayor Roman S. Gribbs sent out a call for help to Detroit's CPA firms, the mayor's assistant said.

Initially six CPA firms responded to the city's SOS and contributed their services free of charge, Mr. Tannian said. The firms were Ernst & Ernst; Touche Ross & Co.; Lybrand, Ross Bros. & Montgomery; Arthur Andersen & Co.; Peat Marwick, Mitchell & Co.; and Arthur Young and Company.

The firms looked at the city's operations and recommended improvements that would result in cash savings without impairing service quality, Mr. Tannian explained.

Their goals were to improve accountability, expedite decisions, and improve employee morale. A job freeze was instituted, and by redistributing duties it was found that within eight months the city government was getting along well despite 2,000 job vacancies. When more cuts were needed, an additional 500 employees were laid off "without materially affecting the quality or quantity of services rendered," Mr. Tannian reported. He said the dismissed employees were later called back as job vacancies developed.

Another area the firms investigated was the disposal of solid wastes. A saving of hundreds of thousands of dollars was made possible by quadrupling the tonnage of solid waste processed in one compacting facility, Mr. Tannian said. Compaction costs much less per ton than incineration does, and increasing the use of the compacting facility allowed the city to save the money that would have been needed to repair one of its old broken incinerators. Another real improvement made through the increased use of the facility was a reduction in Detroit's air pollution, the mayor's assistant pointed out.

Detroit now has funding available for its management advisory services projects and has 13 projects underway with an aggregate contract value of approximately $3,000,000. Smaller CPA firms have joined the initial six in providing their services.

Some of the projects the Detroit city government is funding are: analyzing the business and management systems of Detroit General Hospital; developing a housing model to evaluate current programs; centralization of the city's data processing facilities; converting the operations of traffic court to EDP; auditing all operating agencies not subject to the city's Auditor General.

Under a $1,980,000 contract Detroit's law enforcement agencies are being analyzed. Mr. Tannian says this project has already shown some measure of success: Street crime has been decreasing in Detroit since the beginning of the year.

Mr. Tannian said that he hopes that by next year Mayor Gribbs will be able to say that Detroit is operating at the lowest possible cost consistent with urban needs; that city employees have become more satisfied, committed, and competent; and that the organizational structure of the city has changed in the interests of better government. Mr. Tannian said that both he and the mayor were "very pleased that the accounting profession is having a hand" in making the city "a wonderful place to live in again."

MAS Education

Preparing accounting students for the management advisory services specialty was discussed by Dr. Thomas H. Williams, professor of accounting at the University of Texas, Austin.

Dr. Williams told the meeting that the basic characteristics of management advisory services require an emphasis on quantitative analysis of management problems and a knowledge of data processing systems. At the University of Texas the M.B.A. in management sciences includes courses in quantitative methods, computer sciences, and behavioral sciences in the context of the problems that are likely to arise.

Educators, Dr. Williams said, are still uncertain about the right blend of courses for the management services specialty. They also question whether an M.B.A. is sufficient for the management services specialist; perhaps a doctorate is necessary.

Dr. Williams maintains that, while today the management advisory services departments of CPA firms have "conglomerate-like sets of capabilities," in the long run the management services staff will consist entirely of CPAs, occasionally augmented by outside specialists.

Mr. Savoie commented that there are more specialties involved in the management advisory services area than a CPA can possibly have and that is why it is so important for the accounting profession to recognize the necessary specialists.

In response, Dr. Williams pointed out that to remain a profession there is a need for a commonality of knowledge. He observed that specialization in both auditing and taxes springs out of a common body of knowledge and he believes the same can be true of management advisory services.

At a ceremony held during the annual business session William C. Ramsgard, of Crouse-Hinds Co., Syracuse, N.Y., received the Lester Witte Foundation Award for the best article in MANAGEMENT ADVISER (formerly MANAGEMENT SERVICES) "promoting or exemplifying the practice of management services in a small or medium size firm." The award, a plaque and $100, was presented for his article, "Evaluate Your Computer Installation," which appeared in the January-February, 1971, issue of the magazine. The board of consulting editors selected the article as the best to appear in the period July-August, 1970, through May-June, 1971. The award was presented by the AICPA's then-President Marshall S. Armstrong.

Executive Pay Rises Last Year Foreshadowed Wage Freeze, McKinsey Says

"In effect, industry beat President Nixon to the punch in curbing inflation with its own wage freeze at the executive level," reports George H. Foote, McKinsey & Company partner who directed the firm's latest Executive Compensation Survey, covering 1970. He reports that the rise in top executive compensation was only about one-tenth of the nation's cost-of-living increment last year.

Top executive compensation (including salary, bonus, and other contractual amounts of cash and stock) in 577 of the largest U.S. corporations in 31 industries were covered in the McKinsey study.

According to McKinsey, total compensation for chief executives rose an average of only 0.6 per cent in 1970 over the previous year, compared with a 4.6 per cent gain in 1969 and 9.8 per cent in 1968. In 1970, sales for these companies rose an average of only 3.9 per cent, the smallest gain since 1961, and profits fell an average of 13.1 per cent, the largest drop since the survey began in 1954.

The study found that the second-, third-, and fourth-highest-paid company executives received increases parallel to the top man's. Last year their compensation stood at 71, 58, and 51 per cent of the chief executive's, compared with 73, 58, and 51 per cent in the previous year.

Many cut salaries

Thirteen of the 31 industries showed overall chief executive pay cuts. Seventeen industries showed chief executive pay increases. McKinsey reports that the correlation between changes in executive pay and corporate profits was stronger in 1970 than in previous years.

In 12 of the 18 industries in which profits declined, there was either no change or a reported decrease in executive compensation. One notable exception was the air transportation industry. Although 1969 was profitable, the picture changed so abruptly that there was an earnings deficit last year in the air transportation industry. Still its top executives received the largest overall increase in chief executive pay among all industries, 12.5 per cent, McKinsey reports.

Half the companies surveyed gave pay increases to their top executives, with the average gain being 10.0 per cent. Thirty-two per cent lowered chief executive compensation in 1970, and 18 per cent reported no change, McKinsey says.

In the air transportation, chemical, nonferrous metals, paper, rubber, and textile industries, at least one of every three companies reported profit declines but gave raises to their chief executives, the management consulting firm reports.

The largest one-year stock option gain for an individual executive was $1.4 million and the largest five-year option gain for another was $3.6 million.

Twenty per cent of the companies with stock option programs instituted entirely new ones or significantly revamped their old ones. "This accelerating move to adopting new stock programs is a direct result of the Tax Reform Act of 1969 and the growing disenchantment with qualified stock options," McKinsey Partner Foote explains. "Companies are now taking a more performance-oriented approach to capital accumulation programs where benefits are not tied solely to the vagaries of the stock market."

Westinghouse Offers Computer Production Program Package

A package of computer programs designed to increase production knowledge and reduce operating costs has been developed by the Westinghouse Tele-Computer Systems Corporation, Pittsburgh.

Westinghouse's new Bill of Material Processor, the program package, improves the organization, maintenance, and flow of information in the engineering and manufacturing information departments, Westinghouse claims.

The Bill of Material Processor provides the user with a centralized data base of engineering and manufacturing product information; information retrieval capability on demand; a where-used retrieval on component parts; detail part explosions; and a framework for further mechanization.

Westinghouse's program package is written in COBOL. More information on the Bill of Material Processor is available from the Westinghouse Electric Corporation, Westinghouse Building, Pittsburgh, Pa. 15222.

Cost Analysis Can Ease Staff Cutbacks, Says Machine Supplier

Cost analysis techniques can minimize staff cutbacks caused by the recession, says Arthur L. Hanrahan, president of Philips Business Systems Inc., a New York office equipment supplier.

Mr. Hanrahan points out that the current economy has been described as a "white collar recession" and that many jobs important to company efficiency have been eliminated because of it.

"The situation points up the growing need for a systems approach in administration procedures," Mr. Hanrahan says. "Companies which properly control office costs and staff levels in normal times obviously will need to do less trimming during hard times, and will be able to maintain vital services."

Careful analysis of company communications can produce startling

savings, Mr. Hanrahan maintains. To take the analytical approach, company communications should be looked on as the "word processing system," he says.

"Put simply, this means matching properly trained people with the best machines for carrying out a planned communications program."

All communications should be designed for a specific and needed purpose, Mr. Hanrahan points out, not as a goal in themselves. Also, office facilities and equipment should be regularly reappraised for adequacy, he recommends.

The latest office equipment can free executives and secretaries from more routine tasks and allow them to spend their time on administrative duties, Mr. Hanrahan says.

Survey of Communications Facilities Offered by Philadelphia Firm

A survey of communications facilities available today has been compiled by the Datapro Research Corporation, Philadelphia, and is being offered to data processing executives free of charge.

All About Data Communications Facilities is a description of the facilities and the services they offer and the associated rates. It includes public networks, leased lines, WATS, TWX, Telex, Telpak, and other facilities.

The survey was originally published as part of the August supplement to DATAPRO 70, a management-oriented information service on computer equipment and software. The report is being offered free of charge to allow data processing executives to sample the information included in the DATAPRO service.

In looking ahead to the microwave communications facilities dedicated to the transmission of data (see M/A July-Aug. '71, pp. 8-9), the report says, "All in all, it looks like a bonanza for some data processing users, with several types of improved services and lower prices over the next three to four years. Datran, AT&T, and Western Union have all announced switched microwave networks to begin operation in 1973 or 1974. MCI [Microwave Communications, Inc.] plans to begin operation of dedicated lines in 1971."

The Datapro 13-page report is a summary of what is available now. *All About Data Communications Facilities* may be obtained from the Datapro Research Corporation, 2204 Walnut Street, Philadelphia, Pa. 19103.

Optical reader survey

Another DATAPRO 70 feature report, *All About Optical Readers,* is being sold for $10.00 a copy.

The 28-page report covers character, mark, and bar-code readers from 32 different manufacturers.

Included in the report are comparison charts describing the recognition capabilities, document specifications, output media, error control features, performance, pricing, availability status, and applications of 64 readers priced from $1,235 to $1,500,000.

The general characteristics, capabilities, and limitations of current optical readers are also explained in the report.

RCA Abandons Computers to Focus On 'Special' Systems

One year and two days after RCA set out to do battle with IBM for a share of its computer business, the challenger raised the white flag of defeat. (See M/S Nov.-Dec. '70, p. 16.)

On September 10, 1971, RCA Corporation Chairman Robert W. Sarnoff announced his corporation would go out of the main-frame computer manufacturing business. Instead, it will devote its computer efforts to the development and marketing of specialized data communications and specially designed business systems, he said.

Just about a year earlier Mr. Sarnoff had said, "We are determined to attain an industry rank second only to IBM in this country. . . . In order to accomplish this goal RCA is prepared to commit whatever resources are necessary."

However, since that time RCA has made intensive studies of the industry's changing conditions. The studies indicated that over the next five years RCA would have to invest more than $500 million to finally make a profit. "With the concurrence of my associates in management," Chairman Sarnoff said, "I determined that the price was simply too high for RCA. . . ."

RCA now joins GE in the ranks of those who tried but failed. (See M/S July-Aug. '70, p. 12.) However, while GE was able to merge its computer operations with Honeywell's, RCA at the time of its announcement had not yet found a buyer for its facilities. Approximately 10,000 people are employed in RCA's computer operations, and one analyst predicted 70 per cent of them will be laid off.

Industry analysts now fear that customers will lose faith in the smaller computer manufacturers and buy only from IBM. Customers do not want to be left with equipment from manufacturers that are no longer around, it is observed.

RCA does intend to fulfill its contractual commitments, Mr. Sarnoff said. It will continue to provide maintenance work through its subsidiary, the RCA Service Company.

Mr. Sarnoff said that RCA expects to take a resulting write-off in 1971 "that could reach $250 million after tax" and will produce a "substantial loss" for the year. This anticipated net loss exceeds the largest net profit in RCA history, $160.7 million in 1968. It is even possible the charge will exceed RCA's combined net income for 1970 and 1971.

Where did RCA go wrong? Two

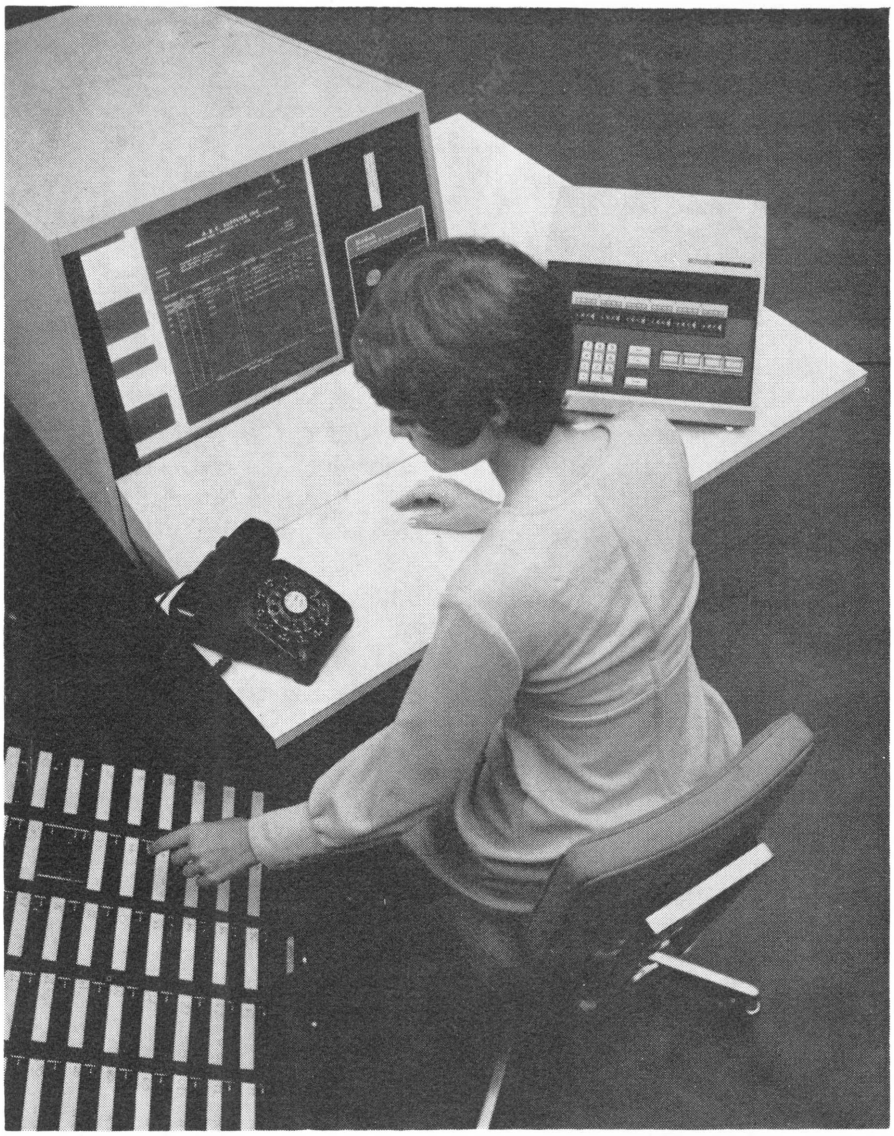
contributing factors may have been that it made no overseas marketing attempt until this past July and it was never well established as a business machine supplier.

Robert Colton, vice president of the Quantum Science Corporation, said that he thought RCA suffered from the general economic conditions, the company's own bad moves, and the customers' disenchantment with the "oversold" computer. He feels that RCA's decision signals the end of "me-too-ism in the computer industry."

While the main-frame computer business makes up the bulk of the computer industry, RCA, belatedly, found out that this segment would "continue to grow but at lower levels than previously projected," Mr. Sarnoff said.

Ironically, it seems IBM will gain the most by RCA's pulling out of the field. RCA had designed its computers to be directly competitive—and thus compatible—with IBM machines, so RCA customers will find IBM programing and service support the most easily available, it is supposed. Also, customer apprehension of dealing with smaller firms that might go out of the computer business may give IBM added sales.

Richard Brandon of Brandon Applied Systems concluded, "IBM is just too good and too tough to attempt to take head-on."



MIRACODE II, a new electronic system for coding, filing, and retrieving microfilmed information, was introduced this fall by Eastman Kodak Company. Using a 12-digit code system for identification of randomly filed documents, the retrieval terminal can scan 16mm roll microfilm at rates up to 350 documents per second to retrieve the document or documents sought, then make paper copies as desired. MIRACODE II is essentially an improved version of a system introduced by Kodak in 1963; it is, says Kodak, more reliable, more versatile, faster (the new encoder, for example, is twice as fast as the old one), and cheaper ($25,000 to $35,000 for camera, encoder, controller, retrieval terminal, and copier). MIRACODE I was originally designed for technical library systems but has found applications in business, in hospitals, and in police departments. Kodak is now stressing the business market—for storage and retrieval of customer orders, inventory data, payables, and receivables.

League of Urban School Areas Forming Common Data Base

The Council of the Great City Schools, a coalition of 22 of the nation's largest urban school districts, is developing a planning and management information system, it was recently announced.

The system will be used to assist in measuring the progress and effectiveness of school programs, for short- and long-range planning, and for budget preparation and administration.

System 2000, a general purpose data base management system developed and marketed by MRI Systems Corporation, Austin, Texas, is being used for the Council's project.

The Council's system will be developed in the Dallas Independent School District and then be made available to the other 21 members of the Council of Great City Schools.

Three separate but highly interrelated data bases will compose the system. One data base will contain information on students, a second, on teachers and school personnel, and the third will describe facilities and equipment. The information will be used to support strategic planning and top management functions.

London Airport Installs First Real Time Cargo Handling System

London's Heathrow Airport recently put into operation the world's first real-time automated cargo handling system.

The system, called LACES (London Airport Cargo Electronic Data Processing Scheme), is designed to clear incoming air freight through customs in one-third of the usual time by reducing the paperwork involved.

Heathrow Airport handles over 400,000 tons of cargo a year and this figure is expected to increase by more than one-third by 1975. The LACES system provides continual information on the progress of each incoming consignment through the clearance process and reduces the amount of necessary storage space.

The LACES system cost $12,000,000 and took approximately 500 man-years over a two-year period to complete.

Computer Sciences International, Computer Sciences Corporation's European organization, designed the system's software.

KLM Royal Dutch Airlines cargo facilities and several customs stations were the first organizations to be connected to LACES. Additional airlines are being added this fall.

LACES is being operated by the National Data Processing Service, the service bureau sponsored by the British Post Office.

Direct Mailing Service For Europe Established In Ireland by U.S. Firm

Dart Industries Inc. has established a subsidiary in the Republic of Ireland to provide a new computerized direct mail service for marketing in Europe. Companies in the United States and Europe are being offered the new service.

Dart Ireland's first direct mail list will contain more than 500,000 names of European university students for a major international magazine publisher.

System adapts to tape

"Our new operation in Ireland produces direct mail lists that combine broad selectivity with a high degree of accuracy," said Lewis Rashmir, president of Dart Direct Marketing. "Our system also is tailored to the conversion of business data from a printed form to computer magnetic tape for such functions as customer invoices and billings, registration lists, and general record keeping."

Dart Ireland is located in Tuam, County Galway. Dart Direct Marketing, Los Angeles, established the Irish subsidiary in cooperation with the Industrial Development Authority of Ireland. Dart Ireland will employ over 200 people when it goes into full production.

Atlanta College Added To List Giving Credit For Computer Courses

Over the past year more and more colleges have awarded academic credits for courses completed in computer institutes. Such a cooperative program has recently been worked out in the Southeast between the Honeywell Institute of Information Sciences and Atlanta Baptist College.

Credit is automatic

Students who completed computer institute courses in the past were able in some cases to take examinations to qualify them for college credits. However, this new arrangement gives the student college credit, when he applies to a cooperating university, just on the basis of successful course completion.

The college's curriculum committee reviews the course content, applicability to the academic degree, and the computer institute's faculty before the decision to accredit the commercial course is made.

Two of the computer schools that have had these cooperative programs are Control Data's and Honeywell's institutes.

Affiliations

Control Data is affiliated with The University of Minnesota, The New York Institute of Technology, and Augsburg College and Golden Valley Lutheran College, both in Minnesota.

Honeywell is affiliated with Atlanta Baptist College and Pepperdine University, Los Angeles.

New York Stock Exchange Authorizes Pilot Computer Order System

The Board of Governors of the New York Stock Exchange has authorized $300,000 for the immediate pilot testing of a new program that would enable member firms to execute 100-share orders by computer.

If the pilot program proves successful, the Board of Governors indicated, it is prepared to spend an estimated additional $7.4 million to put the system into full operation. The complete system could be fully implemented by late 1973, the Board said.

In a special bulletin to NYSE members, Chairman of the Board Ralph DeNunzio and President Robert Haack explained that members of the Exchange staff had developed three alternative automation plans. The Automated Trading System was selected because it seemed the best approach to automating the Floor, it would be less

than one quarter the cost of the other alternatives, and it would take less than half the time to implement, the NYSE officials reported.

This is how the Automated Trading System will work: Specialist firms (those that buy or sell for their own account to stabilize price fluctuations) will provide ATS quotes and quantities for each of their stocks. Brokerage houses will transmit their 100-share market orders to the Exchange's computer, either directly or with the assistance of a clerk on the Floor.

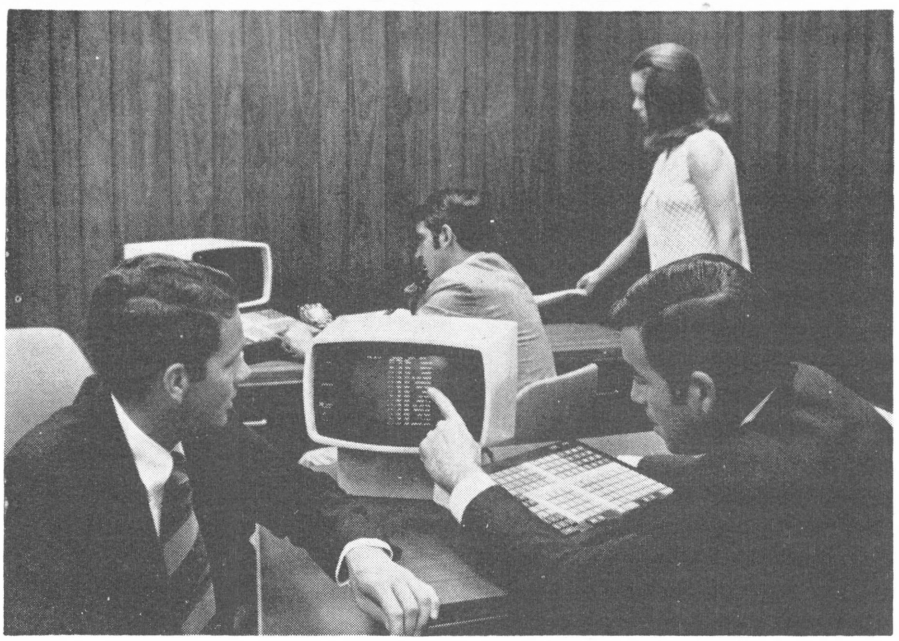
As each incoming order is received the ATS computer will automatically execute it against the specialist's quote, providing no stop is requested. Once the execution is made the computer will update the quantity connected with the quotes, report the trade on the ticker, notify the brokerage firm that its order has been executed, and tell the specialist of his part in the trade.

This system will make it possible for a customer to telephone his registered representative to place an order and to receive a report on its execution all in the same call, NYSE officials say.

Chairman DeNunzio and President Haack conclude, "Automated execution of 100-share market orders under the ATS system retains all the benefits of the central auction market, including the depth and fair and orderly trading made possible by the unique strength of the Exchange's specialist system. At the same time, ATS brings the speed and efficiency of the computer into the trading process."

The American Stock Exchange is developing its own system for automated execution, but spokesmen at both exchanges say the two systems will be compatible, an important feature because of the overlap of membership on the two exchanges.

A system for the computerized execution of orders for less than 100 shares is already being implemented by the New York Stock Exchange.



New IBM terminal can show broker and customer account status.

Merrill Lynch, Pierce, Fenner & Smith Orders Nearly 4,000 New IBM Terminals

The same day IBM announced a new communications system for the brokerage industry, Merrill Lynch, Pierce, Fenner & Smith, Inc., said it had ordered 3,896 of the new IBM desk-top terminals. The investment firm indicated that this was the largest order that had ever been placed for electronic stock-market quotation devices.

The IBM 3670 brokerage communications system can include thousands of TV-like display terminals. It can link brokers across the nation to their firm's central IBM System/370 or System/360, IBM says. The terminal output cannot be used with other computers.

Can send orders, too

On the terminal's keyboard there are 178 color-coded keys. By depressing the keys, orders can be transmitted via the central computer to the floor of the proper exchange.

Information that can be displayed on the terminal screen by pressing the appropriate keys includes a customer's portfolio; statistical data on a security; analysts' opinions on stock-issuing companies; exchange tickers; market indices; and financial news wires.

It is possible to display information in a split-screen arrangement. Current price of a stock, for example, could be displayed on the top of the screen and an analyst's opinion of the security on the bottom half.

Shipments will start next fall

Monthly rental for a terminal is $62 with a purchase price of $2,130. The required control unit, which handles up to 24 displays and 8 printers, rents for $1,845 with a purchase price of $63,780. First customer shipments will begin next fall.

Merrill Lynch, Pierce, Fenner & Smith, Inc., said it will take 18 months to phase in the IBM terminals. This could mean it will phase out the 3,896 terminals it has bought from Ultronic Systems, Scantlin Electronics, and Bunker-Ramo.

Marketers Must Tighten Quality Control Standards; More Stringent Federal Consumer Protection Laws Proposed, Speakers Tell Jersey Meeting

Manufacturers must be responsible for marketing products which are safe under conditions of normal use and even in cases of foreseeable abuse, Samuel M. Hart, deputy director of the Bureau of Product Safety, told the second annual Product Liability Prevention Conference.

The manufacturer "must do the necessary testing, evaluating, and appraising of his product to assure himself that there is no potential or actual hazard which can be minimized or eliminated, and that the consumer will not suffer injury or illness when using his product," Mr. Hart said.

More than 250 industrialists, retailers, engineers, attorneys, and insurance men attended the Product Liability Prevention Conference. The three-day conference was held August 25-27 at the Newark College of Engineering, in New Jersey. The conference was sponsored by ten national professional and trade organizations and financed by Associated Testing Laboratories, Inc., of Wayne, N. J.

Congressman Benjamin S. Rosenthal (D-L, N.Y.) told the conference that federal consumer protection is at a "ten-year low" and that he is introducing legislation to prevent repetition of the Bon Vivant and Campbell soup botulism incidents.

Congressman Rosenthal's legislation would strip the Food and Drug Administration and the U. S. Department of Agriculture of all responsibility for inspection of food products. A new Food Safety Agency would be given the inspection responsibility.

The proposed legislation would also require brand-name food manufacturers who produce under private labels for others to affix their own names on all such products.

Another conference speaker, William D. Dixon, assistant director for industry guidance in the FTC's Bureau of Consumer Protection, said the time is coming when the manufacturer of a "lemon" will have a duty to replace it voluntarily, "no matter what the cost."

Pending legislation would keep the seller from giving an express warranty under which he would "assume a lesser burden than that which would say that his products are at least fit and useable for the ordinary purposes for which they are sold," Mr. Dixon warned.

Even if no new product safety standards and safety legislation are enacted by Congress, the FTC might enforce existing safety standards or create such standards where none now exist, Mr. Dixon explained.

Legal perils cited

There is anticompetitive potential in safety standards, and consequently Mr. Dixon urges that provisions be made "to insure that such standards not be used as a guise for collusion by manufacturers to engage in activities which adversely affect competition."

Richard M. Marcus, immediate past president of the American Trial Lawyers Association, pointed out to the conference audience that statements made—or not made—in advertising and on labels can be used against a manufacturer in a successful product liability lawsuit. Mr. Marcus cited the case of three illiterate farm workers who died from exposure to an insecticide. The court held that the manufacturer should have realized the printed warning on the label was not enough. "College graduates are not the only consumers," Mr. Marcus said.

Manufacturers should make quality control programs and liability control programs an integrated coordinated total program, Donald S. Feigenbaum, executive vice-president of General Systems Company, of Pittsfield, Mass., told the conference.

Quality control characteristics

Mr. Feigenbaum outlined 11 characteristics a quality control program must have if it is to reduce liability risks. The quality control program:

"1. Controls quality on an integrated, organization-wide basis;

"2. Has primary decision making ties with upper management;

"3. Provides a budgetary base and technical competence to permit preventive effort;

"4. Establishes quality control as a set of disciplines applied throughout the business;

"5. Establishes quality control's coupling with customers on a positive, feed-forward basis;

"6. Structures and reports quality costs;

"7. Makes quality motivation a continuous process;

"8. Continuously measures and monitors actual customer quality satisfaction;

"9. Provides good product service on a rapid and economic basis;

"10. Integrates product liability control considerations;

"11. Adds a major, organizationally 'horizontal' workscope to the quality function."

Foresees systems role

Mr. Feigenbaum predicted, "This new and long overdue partnership between the quality field and the product liability field may well see systems engineering becoming the fundamental design technology of the quality engineer in his work of creating integrated quality systems in his company which build liability prevention within themselves."

Albert F. Erdman, president of

Associated Testing Laboratories, Inc., Wayne, N. J., the company financing the conference, recently stated that 300,000 product liability suits reach the courts anually. By 1975 it is predicted that 750,000 such suits will come into the courts.

"There is an increasingly urgent social and economic need to minimize the potential for damage inherent in every product on the market," Mr. Erdman said. "This applies not only to design and manufacture but even to labeling instructions and advertising. If the size of court awards—in some cases running into millions of dollars—is evidence of this, judges and juries think so too."

Associated Testing has started a new hazard evaluation and liability prevention division to serve manufacturers, retailers, trade associations, attorneys, and insurers. The company is an independent test laboratory and a custom manufacturer of environmental simulators used in product testing.

Photocopies of Printed Matter for Last 100 Years Offered

Photocopies of material published within about the last hundred years can be obtained from the Berliner Research Center, Danbury, Connecticut, 06810.

A computer research system has been added to the manual system used by the literature researchers. Some of the sources covered are newspapers, periodicals, trademarks, government publications, corporation reports, labor union publications, patents, catalogs, and advertisements.

Berliner offers a search service as well as a photocopying service where no search is required, the client supplying the details of sources.

The company is making available a brochure, T-2, giving more details about Berliner's services.

Texas City Developing Central Computer Data File for All Agencies

Wichita Falls, Texas, is developing a computer system that will serve as a central and single information file for all its city agencies and city-owned utilities.

The system is being developed with the aid of a three-million-dollar Federal grant. At the center of the management information system is an IBM System/370 Model 145.

1,500 city activities

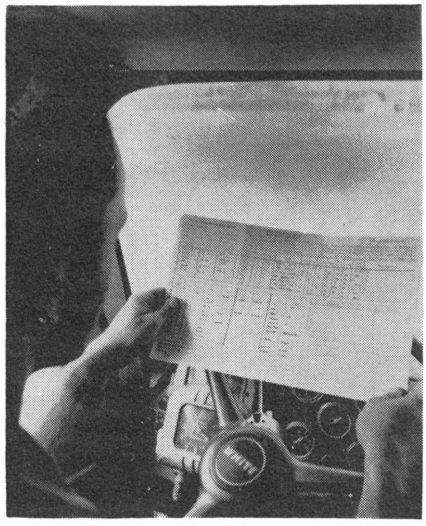
Wichita Falls started the project in March, 1970, and expects to have it completed by March, 1973. The first step in the project was to reexamine the functions of city government. About 1,500 separate activities were identified, including issuing of parking tickets and selling water to residents.

Jerry Dunn, assistant city manager in charge of the project, gave one example of how the city will use its new system. "Our building, tax, fire, and engineering departments all need information on land use throughout the city," he said. "Traditionally, each department independently gathers the specific information it needs. With the new system, we are developing a single land-use data file that can serve all these city agencies, as well as the county and school district."

Vehicle information

The system will be used by the police department to keep track of stolen vehicles and other property and to process complaints. It will also develop maintenance schedules for all city-owned vehicles.

In 1966 Wichita Falls became one of the first cities in the nation to install a computer to regulate traffic signals on city streets. The city hopes that its management information system will serve as a model for other cities.



A computer is producing route maps for drivers at the Fox Grocery Company in Pittsburgh. Computer considers traffic patterns, driving time in working out most efficient routes for each of company's 40 trucks.

Burroughs Shows Three New Calculators; One Is Miniature Model

An electronic display calculator that requires 42 per cent less desk space than the smallest previous model developed by Burroughs has been introduced by that company along with two other new models.

New small calculator

The C 3160 electronic calculator is 4.8 inches wide, 3.1 inches high, and 9.5 inches deep and it weighs 3.1 pounds. The calculator can be operated with the power furnished by a car cigarette lighter outlet. It sells for $389 or can be leased for $12 a month on a three-year plan.

Other models

The second new calculator introduced by Burroughs is the C 3260, which is slightly larger than the C 3160. It has an independent storage memory which enables it to accumulate results or be used for

constant factor calculations. The C 3260 sells for $449 and may be leased for $14 per month on a three-year plan.

Burrough's third new calculator is the C 3225. It uses medium-scale integrated circuitry and can completely solve many problems which previously would have required an independent storage memory, Burroughs claims.

The C 3225 can compute gross, discount, sales tax, and net for single-line invoices by using only the computing unit, Burroughs says. The C 3225 can be purchased for $695 and leased for $21 per month on a three-year plan.

Honeywell Announces Information System For Distributors

A new information system for wholesale distributors has been developed by Honeywell Information Systems.

Called Management Information for DIStributors (MI.DIS), the system incorporates ten subsystems to provide solutions to functional problems in the areas of marketing, financial management, operations control, and product acquisition and control.

Subsystems of MI.DIS can be implemented and intermixed on a schedule that best meets the needs of the distribution firm, Honeywell states. Because the subsystems interconnect, a report-by-exception system allows the elimination of duplicate stored information.

All functions covered

The ten subsystems cover the functional areas of order processing, financial management, inventory management, purchasing, transportation, facilities and equipment maintenance, merchandising, warehouse control, customer services, and management planning.

Conference Board Survey Shows Business Feels More Social Involvement Essential

Traditional public relations tactics are not by themselves sufficient to counteract the image of private enterprise being created by its critics, a group of recently surveyed business leaders feel.

The Conference Board conducted a survey of 196 top-level executives from 65 countries. Many of the executives believe business must develop new initiatives to expand its social role and open up its communication lines with the public.

"It is most dangerous to think of the problems in image and public relations terms," a U.S. executive told The Conference Board. "One cannot 'implant an image' if it is not so; overemphasis on, or overconfidence in, communication techniques should not supplant facing the substance of the matter."

A Norwegian executive said, "We must make a systematic effort to sell the argument that business is not a homogeneous group in a sinister alliance against the rest of society."

The Conference Board reports the vast majority of those interviewed believe business will have to play a greater social role. Some believe failure to act will result in harsh penalties.

A U. S. company president said, "It is not only possible for business to fulfill both the social and economic roles expected of it today, it is *necessary* if private enterprise wishes to survive in its present form and to continue to pursue its business goals in a just and prosperous society."

"Why should youth have a monopoly in declaring itself for human values?" a Canadian executive said. "Surely on the issues affecting our environment—racial equality, equal opportunity, clean air and water, housing, slum clearance, the elimination of hunger at home and abroad—the leaders of private enterprise and idealistic youth are on common ground. We provide the money and material that are being used to correct these ills, but without our open involvement in this activity our material contribution is anonymous or assumed to have been grudgingly extracted."

The executives believe companies in industrialized countries should push for better business practices (including improved customer relations, responsible financial management, and equitable treatment of employees); give more priority to research and development of new products; and maintain continuous training of management.

In less developed countries companies should develop effective quality controls; eliminate racial and national discrimination in hiring and promoting; provide job security for workers; and support management training centers and vocational schools, the executives said.

They believe that private enterprise is held in the highest esteem in the industrially developed countries and that it is in the less developed countries that the more severe image problems exist.

Xerox Gives Staff Paid Time for Social Welfare Work

Selected employees of the Xerox Corporation are being given time off at full pay to participate in social welfare projects.

"In an effort to put something back into society, we are giving the most important asset we have —the time of our people," said Xerox President and Chief Executive Officer C. Peter McColough.

The Xerox Social Service Leave

Program will grant company employees in the United States up to a year's leave at full pay to pursue a self-selected project that will aid society. Anyone who has worked at Xerox for at least three years is eligible for this program.

When the employee returns to Xerox he will be given a job with pay, responsibility, status, and opportunity for advancement equal to the one he left.

Xerox will give a total of 240 man-months a year to the social service program. A seven-member employee evaluation committee will select those to be granted leaves.

The social service projects engaged in need have no connection with the employee's job or the skills he uses at Xerox, the company said. Any kind of social service that is sponsored by a public or private, nonprofit, legitimate, existing organization that will accept the offered participation can be proposed.

"We are now giving Xerox people a chance to pursue these kinds of activities full time during the prime of their working careers and when they are best able to do it," Mr. McColough said. "They are not going to have to wait until they retire."

The employee evaluation committee is a cross-section of Xerox people which includes former members of the Peace Corps and the Office of Economic Opportunity in Washington and a corporate vice president who once left Xerox for three years to teach and write plays.

Three New Publications Are Available

Two new publications from the American Federation of Information Processing Societies, Inc., are now available.

The Proceedings of the 1971 Spring Joint Computer Conference, Volume 38 of AFIPS Conference Proceedings, contains 67 papers presented May 18-20 in Atlantic City.

The fully indexed 631-page volume may be obtained from AFIPS Press, 210 Summit Avenue, Montvale, N. J. 07465. The price is $26.00.

A reduced price of $13.00 is available for prepaid orders from members of constituent societies. The AICPA is such a constituent society.

Also the AFIPS Conference Proceedings Index, indexing Conference Proceedings Volumes 1-37, may be ordered from AFIPS Press. The price is $20, but it is offered at a reduced rate of $10 for prepaid orders from members of constituent societies.

When ordering at the reduced prices, members of AFIPS constituent societies should state their affiliation and membership number.

Gratis booklet

The TBI Guide to Computer Sub-Leases—A Self Teaching Study is being offered free to interested computer users by Time Brokers, Inc., 500 Executive Blvd., Elmsford, N. Y. 10523.

The 12-page booklet is in the form of self-teaching questions. It is designed to help those considering subleasing of their installed equipment develop a realistic subleasing marketing plan.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of August 12, 1970: Section 3685. Title 39, United States Code)

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8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities (If there are none, so state): None.

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The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes have not changed during preceding 12 months.

11. Extent and nature of circulation:

A. Total no. copies printed (Net Press Run): Average no. copies each issue during preceding 12 months: 22,221. Actual number of copies of single issue published nearest to filing date: 19,152.

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1. Sales through dealers and carriers, street vendors and counter sales. Average no. copies each issue during preceding 12 months: 11. Actual number of copies of single issue published nearest to filing date: 1.

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D. Free distribution by mail, carrier or other means

1. Samples, complimentary, and other free copies. Average no. copies each issue during preceding 12 months: 1,495. Actual number of copies of single issue published nearest to filing date: 1,642.

2. Copies distributed to news agents, but not sold. Average no. copies each issue during preceding 12 months: None. Actual number of copies of single issue published nearest to filing date: None.

E. Total distribution (Sum of C and D). Average no. copies each issue during preceding 12 months: 19,628. Actual number of copies of single issue published nearest to filing date: 18,843.

F. Office use, left-over, unaccounted, spoiled after printing. Average no. copies each issue during preceding 12 months: 2,593. Actual number of copies of single issue published nearest to filing date: 309.

G. Total (Sum of E & F—should equal net press run shown in A). Average no. copies each issue during preceding 12 months: 22,221. Actual number of copies of single issue published nearest to filing date: 19,152.

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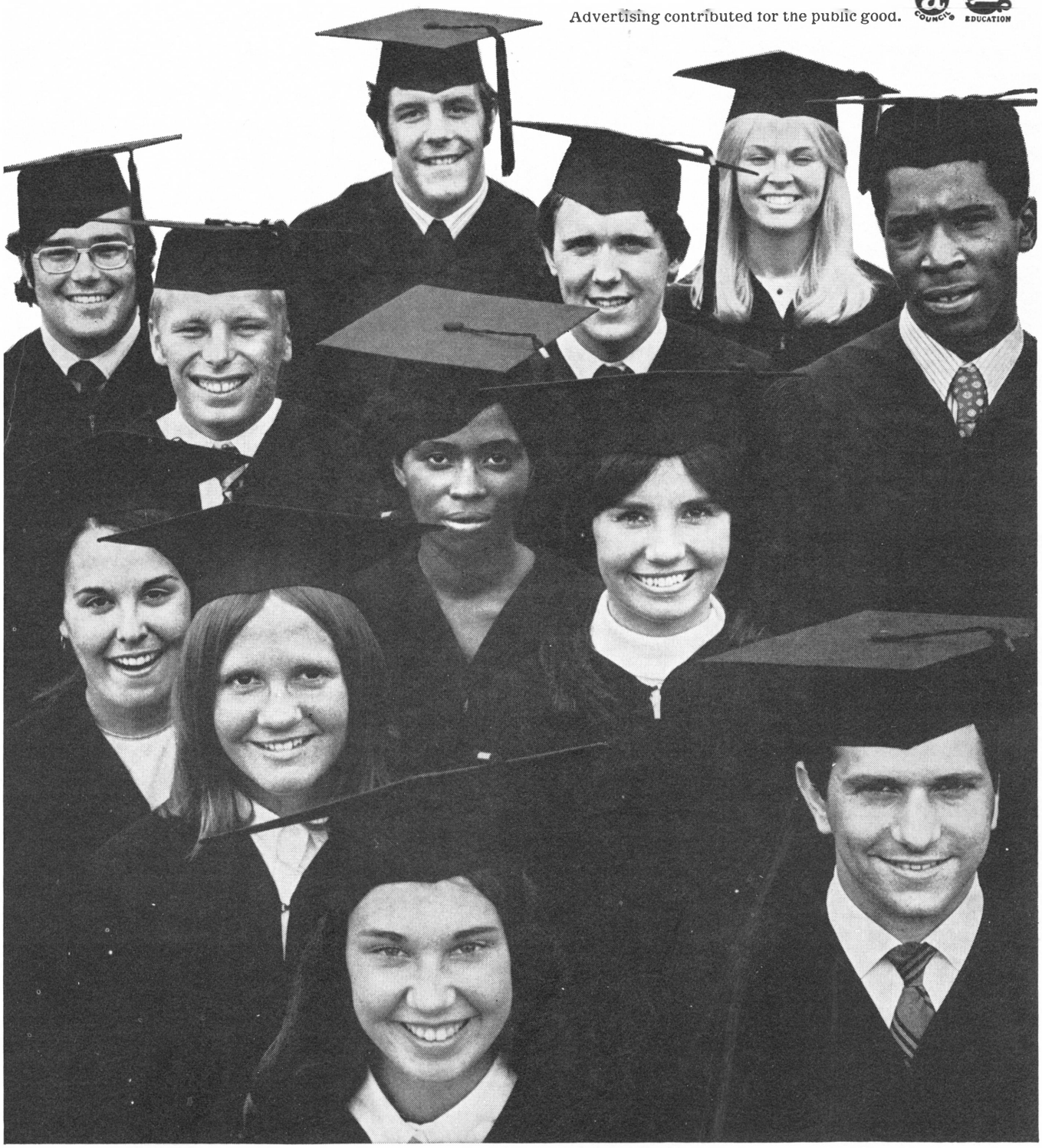


Accounting developed first to serve the owner. When it later became closely allied to working with all levels of management, it adopted the authoritarian ideas of the early part of the century. But is this enough today?

IS ACCOUNTING GEARED TO TODAY'S NEEDS?

by Arthur B. Toan, Jr.
Price Waterhouse & Co.

Most of us who have made our careers in accounting have been aware that accountants neither live nor act in a vacuum and that what we are doing has, in some way, an impact on those for whom we account. Most of us, however, also are normally so tied up in problems of technique and in the recording and manipulating of numbers and the preparation of reports, or are so remote from the individuals who are affected, that we do not know, think of, or perhaps even care about what those surrogates of ourselves—our policies, systems, principles of accounting, budgets, and reports—are doing in the "outside world."

That is what this article is about: the fact that accounting has an impact on human behavior, that it may or may not be the kind of impact we imagine or would choose, and that it is important to individual accountants and to accounting in general to know more about what we actually are doing so that we may, if need be, bring about a more productive result.

Accounting existed for many centuries without much direct impact on behavior, except perhaps on those at the very top of business and governmental organizations. For most of that period, its function was heavily oriented toward providing a private scorekeeping on behalf of the owner, manager, or tax collector. It was so far removed from most of the people involved in the actual operation of the business that its characteristics and personality were of little moment.

But, within the last century, a new trend began to develop. Accountants were asked—or, on their

Accounting existed for centuries without much impact on behavior except on those at the very top; within the last century it has dealt with individuals throughout the organization.

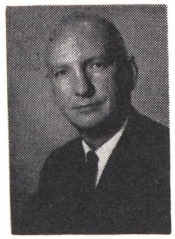
own, decided—to participate in the managerial process by continuously supplying data to many individuals throughout the organizations they served in order to aid them in planning, budgeting, communicating, directing, and controlling their activities. As a result, the characteristics of accounting, accounting systems, financial planning and control systems, and reports have assumed significance from a behavioral point of view.

As accountants moved into the managerial process, they proceeded to adopt or reflect a philosophy of management. They did so of necessity, for no accounting system or set of reports or group of financial planning and control techniques is or can ever be completely devoid of a point of view. Decisions as to what information to record, what information to report, how and in what context to report it, etc. must reflect some set of criteria and thus, unavoidably, some type of philosophy, some bias, or some point of view.

When accountants moved fairly extensively into the managerial process in the earlier years of this century, they quite logically adopted the managerial philosophy which was strongest during that period. It was one which they did not create so much as take from the ideas of industrial engineering, organization theory, and economic theory then in existence.

These were strong, powerful ideas. They are, in fact, the dominant ideas prevailing today. It is generally acknowledged that the behavioral philosophy of modern-day corporate accounting can be traced, for the most part, to the period from 1905 to 1920 and that —no matter how great the changes in society or our understanding of the behavior of groups and of individuals, or even of the development and application of different theories of management—there have been relatively few changes in the underlying beliefs of accounting since then. These ideas were strong enough so that, with appropriate modifications, the same can be said about accounting in government.

Accountants continue to use, without essential change, an economic theory which was developed in response to the need for a philosophy which would explain, motivate, coordinate, and control the kinds of enterprises which emerged from the industrial revolution. Its emphasis was on economic gain for the enterprise, economic incentive for the individual, and an economically oriented decision making process. We continue, with minor modifications, to use an organization theory which reflects the engineer's point of view—treating man as an adjunct to or as an inferior substitute for a machine and as something to be taught and economically motivated to maximize productivity. Finally, we use the ideas of the "principles of management" school, which advocated a departmental approach, grouping activities according to their specialty for their more efficient per-



ARTHUR B. TOAN, Jr., CPA, is the national director of management advisory services for Price Waterhouse & Co. He has been a consulting editor for this magazine and currently serves as an adviser on its "Management Advisory Services Forum." Mr. Toan is active in AICPA, AMA, and NAA committee work. He has published one book, **Using Information to Manage**, and about 50 articles on management-oriented subjects.

formance, placing strong emphasis on span of control, precise delegation of authority, accountability, and clearly fixed responsibility.

In a chapter of a recent book,* Professor Edwin H. Caplan describes the accounting model which was built on this theory of management.

He does so in terms of a series of behavioral assumptions—as to organizational goals, as to the behavior of employees, as to the behavior of management, and as to the role of management accounting. I have listed them below, in a somewhat modified form, as they might apply to a combination of business and governmental institutions. These assumptions are:

Respecting organizational goals

1. The principal objective of organizational activity is profit maximization or, in its absence, efficiency—the efficient delivery of goods and services (economic theory).
2. This principal objective can be segmented into subgoals to be distributed throughout the organization (principles of management).
3. Goals are additive; what is good for the parts of the organization is also good for the whole (principles of management).

Respecting participant behavior

1. Managers and employees are motivated primarily by economic forces (economic theory).
2. Work is an unpleasant task which people will avoid whenever possible (economic theory).
3. Human beings are ordinarily uninterested, inefficient, and wasteful (scientific management). If money is available to be spent, they will find a way to spend it.

Respecting management behavior

1. The role of management is to maximize the profits of the firm (economic theory) or the efficiency with which governmental services are provided.
2. In order to perform this role, management must control the tendencies of employees to be lazy, wasteful, and inefficient (scientific management).
3. The essence of management control is authority. The ultimate authority of management stems from its ability to affect the economic reward structure (scientific management).
4. There must be a balance between the authority a person has and his responsibility for performance (principles of management).

Respecting management accounting

1. The primary function of management accounting is to aid management in the process of profit maximization or the achievement of efficiency (scientific management).
2. The accounting system is a goal-allocation device which permits management to select its operating objectives and to divide and distribute them throughout the firm, assigning responsibilities for performance. This is commonly referred to as "planning" (principles of management).
3. The accounting system is a control device which permits management to identify and correct undesirable performance (scientific management).
4. There is sufficient certainty, rationality, and knowledge within the system to permit an accurate comparison of responsibility for performance and the ultimate benefits and costs of that performance (principles of management).
5. The accounting system is "neutral" in its evaluations—personal bias is eliminated by the objectivity of the system (principles of management).

This sounds like a pretty good description of most business accounting systems. If one eliminates the element of profit, it bears a strong relationship to those which are prevalent in government circles, too. Except for the encouragement

Accountants continue to use, without essential change, an economic theory which was developed in response to the need for a philosophy which would explain, motivate, coordinate, and control the kinds of enterprises which emerged from the industrial revolution.

* Edwin H. Caplan, "Behavioral Assumptions of Management Accounting," *Accounting and Its Behavioral Implications* by William J. Bruns, Jr., and Don T. DeCoster, McGraw-Hill Book Company, New York, 1969, pp. 113-130.

Will those with different and more radical philosophies someday storm the conventions and conferences of the accountants—even as they today do those of other professions?

of participation in the budgeting process, and even then within fairly restrictive limits, the *accounting* systems of most organizations will not be all that different from those created in response to the assumptions which Professor Caplan has set forth.

Should this be the case? Let's say, for the sake of argument, that we really don't know and that maybe some questions need to be asked and answered to find out. What would a few of these questions be?

The following are indicative:

- Should the fact that serious doubt exists as to whether the economic and organizational theories underlying our accounting systems properly or fully describe the forces which motivate both managers and employees lead us to change present accounting systems?
- Do you think that the accountant's philosophy contributed to what Douglas McGregor had in mind when he wrote in *The Human Side of Enterprise* that a realistic picture of man is that he is basically an active, potentially creative, autonomous, growing organism and that much of his unsatisfactory behavior in organizational settings is a result of the environment's rules, rewards, and management styles, rather than his basic character?
- Consider Maslow's increasingly accepted theory that man has a five-step hierarchy of needs which, in ascending order of importance, are: 1. the satisfaction of physiological needs, 2. safety, 3. social affection, 4. esteem, and 5. self-fulfillment. Since accounting continues to look at man as essentially an economic creature, do you think that accounting has failed in its job?
- When Erikson, Lewin, Argyris, etc. have set forth essentially similar ideas broadly reinforcing Maslow's theory, have accountants been listening?
- In short, are the economic and organizational theories on which accounting and financial planning and control systems have been built still relevant and valid—if, in fact, they ever were? Or, if valid, should they be partially modified? Is man in the 1970's the same animal he was 50 years ago?

Let us now shift our focus somewhat and consider these questions:

- Is there something about the kind of person who becomes an accountant, or is it the nature of his techniques, or is it some acquired desire to deal only with transactions in which a third party sets values in monetary terms, which leads him to a value system in which economics is very, very much the king and to a form of scorekeeping from which noneconomic costs and values are eliminated?
- Stated in a more extreme form, does the accountant by the way he keeps score help to shape and reinforce a particular style of management which perhaps would have evolved differently under a different accounting philosophy and perhaps would change in the future if accounting were to change?
- Stated at its most extreme, will those with different and more radical philosophies someday storm the conventions and conferences of the accountants—even as they today do those of doctors, historians, teachers, and political scientists—contending that the bias of accountants supports a pattern of behavior by the managerial establishment which they would like to see changed?
- In short, does the present style of accounting exist because it supports a style of management, or is it rather that this style of accounting, because it does exist, serves as a constraint on a management's ability to change if, in fact, it wants to?

Or, to shift the point of view once again:

- Is it possible that some or much of accounting—either because of or in spite of its value for economic decision making and for economic scorekeeping—is counterproductive as a motivational tool? Should it be altered, superseded, or supplemented if it is to achieve a

primary purpose of motivation in a positive sense?

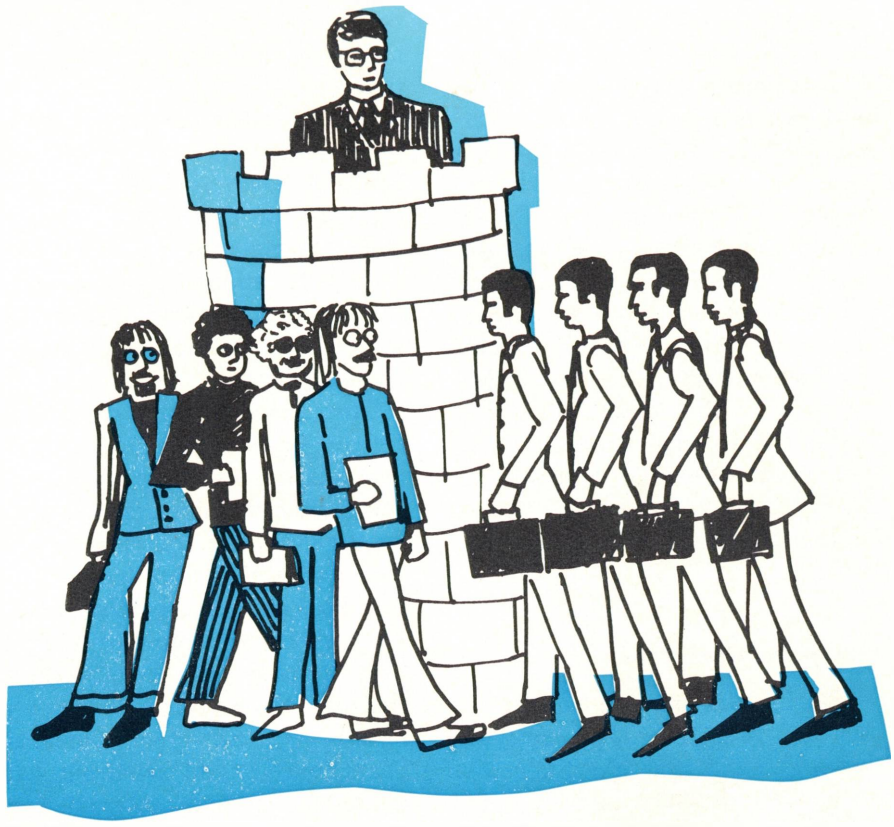
- Or should accounting concentrate on economic and efficiency measurements alone and encourage the development of other systems, presumably devised and operated by nonaccountants, to provide an appropriate balance with accounting-oriented results?
- Or is it even true, as some people seriously contend, that the long-range results of accounting-based planning and control include degrees of tension, hostility, distrust, self-preservation, and a concentration on personal and small-group goals which emerge in negative attitudes toward the company or business or the government as a whole?
- Under present or future systems, should this then mean that the present tendency to make a widespread distribution of accounting data should be reversed if it is to continue in its present form?

Or, to ask a few questions in more concrete form:

- What type of participation in goal setting and in the budgetary process is actually most productive in setting budgetary goals?
- What happens when budgets are loose or tight, when options are limited, when opportunities to change are small?
- What happens when the size of the group being measured is increased or decreased?
- What happens when both economic and noneconomic measurements are employed?
- What happens when the orientation of the accountant changes from control to support?
- What happens when the orientation of the auditor undergoes a similar kind of change?
- And, in a somewhat different field, what happens to management decisions when the accounting principles used are changed or the form and content of accounting reports are altered?

Finally, we might ask:

- Should we consciously try to reduce the role of accounting as a behavior-causing instrument?



Should accounting strive to be cold, aloof, economic, and as neutral and uninvolved as it can be, accepting the possibility that it may not fit in with newer concepts of the behavior of man or the changing desires of society?

- Should accounting strive to be cold, aloof, economic, and as neutral and uninvolved as it can be, accepting the possibility that it may not fit in with newer concepts of the behavior of man or the changing desires of society, deliberately doing so in order not to be swept up in internal attitudes and motivations?
- Should it strive just to present its view of long-term truths and its view of reality as it would be seen by an unsympathetic investor or a critical citizen of society?
- Should accounting, in short, try to leave the cheering to others and concentrate on performing just an umpire/scorekeeper role to the best of its ability?

The questions one could ask are obviously numerous; the purpose of this enumeration has been only to suggest. No—that is not really true. Its purpose has been to *state*: 1. that accounting and accountants are extremely important mechanisms and people in the organizations where they are at work; 2. that they have great impact on the attitudes and behavior of people in ways about which relatively little is known; and 3. that there are many reasons to believe that the behavioral assumptions underlying much of accounting may be inconsistent with what experts in human or organizational behavior are saying is and/or should be the case.

Its purpose also has been to point out that there exist the beginnings of a lot of research in this field. Much of it is exploratory, with results which are somewhat tentative, as one might expect at this stage of events. However, the topics are interesting and indicative of what is being done. The following list is broadly indicative:

"Budgeting and Employee Behavior," "Budget-Induced Pressure and Its Relationship to Supervisory Behavior," "The Effects of Participation," "Studies in Group Decision-Making," "An Experimental Study of Group Cohesiveness and Productivity," "Aspiration Levels, Attitudes, and Performance in a

Goal-Oriented Situation," "Interrelationships Among Levels of Aspiration, Performance, and Estimates of Past Performance," "The Behavioral Properties of Variance Controls," "The Behavioral Implications of Accounting Measurements," "Dysfunctional Consequences of Performance Measurements," "The Effect of Frequency of Feedback on Attitudes of Performance," "Some Effects of Communication Patterns on Group Performance," "The Behavioral Implications of Internal Control," "The Behavioral Effects of Audits," and "Approaches to Auditing Which Will Maximize Organizational Value."

Possible future role

Finally, the purpose of this article has been to provide the basis for suggesting that much remains to be done in which business, government, the professions, and academia can and should play a part. The "how," the "where," and the "why" could be discussed for each of these groups individually; they will differ and be the same. Perhaps, however, the more useful would be to repeat what I suggested to a group of Federal Government accountants several months ago, for it indicates in some detail some of the answers one group might find and the kind of role it might play. In my talk to them, I said:

"What has this got to do with you? First, and most obvious, as representatives of a large and important group of accountants, you are interested in anything which has or can have a significant impact on your field of endeavor. Second, you collectively influence the behavior of a very large number of people. Third, you provide a simply enormous laboratory in which to study some aspects of this subject effectively.

"Why should I make the last point? One reason is that since the profit motive is lacking in government, the opportunity exists to study the impact of accounting on expenditures alone. In a laboratory sense, therefore, the results are more certain because they are more pure.

"On the other hand, because the profit motive is not present, you can and have tried to find other measures of the benefits derived from expenditures and thus have acquired considerable experience in the noneconomic field. You can use or test this knowledge in the accounting field.

"Also, since you are large, widespread, and organizationally decentralized, you can experiment simultaneously in essentially similar organizations and thus be able to compare the results more readily. You can change the nature, frequency, and content of information; the size and composition of the unit; the tightness or looseness of control; and other significant characteristics and see what happens. You can make interunit comparisons which smaller organizations can make only with difficulty.

"Another reason is that, since you often are altering in some way what you as accountants are trying to do, you have a chance to observe 'the before and after' and even 'the during.' In fact, you have at this moment a chance to analyze the behavioral assumptions, the predicted behavioral effects, and the actual consequences of one of the really large-scale accounting changes made in recent years—the introduction of Planning-Programming-Budgeting Systems. If you wish, in fact, you can chase the secondary consequences down through other levels of government and even into nongovernmental organizations in those instances where such Federal grants have been made.

"And, the final reason I would like to mention is that, because you have people who are capable of thinking about matters such as I have described, you can produce useful results."

The opportunities resting in the hands of government accountants, important as they may be, do not preempt the field. The worlds of business and of the accounting profession and of government reflect elements in common, but they are by no means identical, even in those areas in which they overlap to some degree. The role of profit in the world of business is itself enough to differentiate the techniques and role of accounting in business organizations. When one adds such factors as the nature and flexibility of demand and its consequences, the characteristics of blue- and white-collar business employees and their organizations, corporate compensation and personnel practices, and the presence of lenders and investors with heightened economic interests, the opportunities to look meaningfully at the interrelationship of accounting and behavior in this arena become ever so clear.

Accounting's "Hawthorne"

In conclusion, I would like to mention an incident which is now a commonplace point of reference in the behavioral field. When a couple of people, studying the impact of differences in physical working conditions on employee productivity in a plant in a town called Hawthorne, finished their work about 40 years ago, they found out a fair amount about what they set out to discover. They found out even more about the behavior of groups and of individuals and about the attitudes and behavior of individuals as members of groups in that setting. As a consequence, they set in motion ideas which have greatly influenced much of the subsequent thinking about the motivation and behavior of industrial workers—and, in fact, of all employees.

One just has to believe there is the Hawthorne equivalent waiting to be realized in the field of accounting-induced behavior or behavior-induced accounting and that, in their own way, the forces set in motion by this knowledge will be of great significance—both for accountants and for those for whose performances they account.

The previous article posed some questions about the relevancy of the accounting function in today's world. This suggests a new role for accountants, which they are better qualified to fill than anyone else —

SOCIO-ECONOMIC ACCOUNTING: ITS ORIGINS, ITS FUTURE—

An Interview With David F. Linowes

by Louise H. Dratler
Assistant Editor

TRADITIONALLY the world of the businessman and the world of the social scientist have been poles apart. Today, however, the severity of the nation's social problems makes it imperative there be a rapprochement, one man believes.

David F. Linowes appealed for the "socio-economic management" of public institutions in the *New York Times* business section March 14, 1971, perhaps his most widely read appeal to date. (See M/A May-June '71, p. 15.)

Mr. Linowes is a partner in the accounting firm of Laventhol Krekstein Horwath & Horwath. His primary professional interest is evaluating and integrating mergers, a field he has written on frequently in this publication and in others.

We saw his *Times* article and wondered how his professional role related to his interest in development of a plan for improving the public sector.

"Running through mergers and socio-economic management there is a common thread," Mr. Linowes explained. "When you are evaluating mergers you are examining the resources each company has and trying to see how to get the most effective combination, how to apply those resources in the best way. And you do the same thing when you are looking at an antipoverty program: How do you apply these dollars to make people self-sufficient and self-respecting? Or, how do you teach children reading, writing, and arithmetic, given these resources. . .? It is really all management advisory services, all part of the accounting discipline."

Mr. Linowes believes in a broad definition of accounting that has served him on missions all over the world. "I never looked at accounting as narrowly as 'the language of business.' Perhaps my 20 years in Washington, just being that close to the seat of government, had some effect," he said.

After serving in the Army Signal Corps during World War II, Mr. Linowes started his own firm in a small office in the District of Columbia. When he decided to take on a junior there was only room for one desk in the office. So whenever Mr. Linowes came into the office the junior would have to continue his paperwork using the top of a file cabinet as his writing table. Today, 25 years later, that junior is still with that firm as a partner of Leopold & Linowes.

In 1953, while working with the Community Chest for the D.C. Institute of CPAs, Mr. Linowes was asked to head a citizens' committee to combat charity rackets then operating in Washington. Legislation was needed, but the legitimate charities could not initiate any action themselves for fear of losing their tax exempt status. The situ-

ation required an independent observer to take action.

"I realized how valuable being an accountant was in this spot," Mr. Linowes said. "My so-called 'expertise' was really the cornerstone of all we were doing. I evaluated all these organizations, as an accountant, and many of them were rackets. I questioned this 'administrative expense' and that 'salary.' The legislation we finally got through was complete disclosure legislation and it was modeled after that of the S.E.C. It forced the charities to make complete disclosure so the public could evaluate them."

The chairmanship of the Citizens Committee for Regulating Charitable Solicitations was David Linowes' "first thrust into an uncharted area." He continued to be active politically and civically, as well as professionally, and in 1967 was asked by the State Department to head a mission to assist Turkey in its efforts to improve management standards and to establish an accounting profession.

In 1968 he was requested to travel to Pakistan, Iran, and Turkey on behalf of the United Nations Industrial Development Organization to assist in those countries' industrialization and economic development programs. Then in 1970 he went on another mission for the State Department, to India; he has just returned from a similar mission to Greece.

"I was present in these countries as a consultant. We deal on a professional level, not a political one," Mr. Linowes explained. "You are only effective if you are received by the foreign government as its guest, so that you can be constructively helpful to them.

"The missions were to assist the developing nations in identifying their resources and to help them in guiding their application of these resources to accomplish their desired end result. This included, therefore, in Turkey establishing an accounting profession. They realized that without an accounting profession, a profession of measurement, they could not effectively evaluate and control what they were doing with their resources. Of course, in these developing nations accounting is viewed in a much broader perspective than the way in which we view it here. They don't look at it as merely an adjunct of business. For instance, I recall very clearly asking Suleyman Demirel, then prime minister of Turkey, why they wanted to establish an accounting profession. 'To help us govern our country,' was his answer."

These foreign missions helped mold Mr. Linowes' theory of socio-economic management for this country's social institutions. "Developing nations really practice socio-economic management without recognizing it as such. For example, when they want to develop a particular area, where, let's say, there are 100,000 people starving, they will plan on a five-year basis for the area to make its people self-sufficient in terms of being able to work, being able to raise enough food in order to sustain themselves. They lay out a program requiring so many dams for irrigation, so many fertilizer factories to make the soil fertile, and setting up educational institutions to teach the farmers how to use modern agricultural techniques. They never consider the plan finished until all the elements are finished; that means 100,000 people are working and producing their own food—therefore they are self-sufficient. The government doesn't stop and say, well now, we've built two dams or three fertilizer factories: This is 'counting by numbers.' It feels the complete job must be done. It is really addressing itself to the social needs. It is a matter of identifying as objectives 'the people needs.'

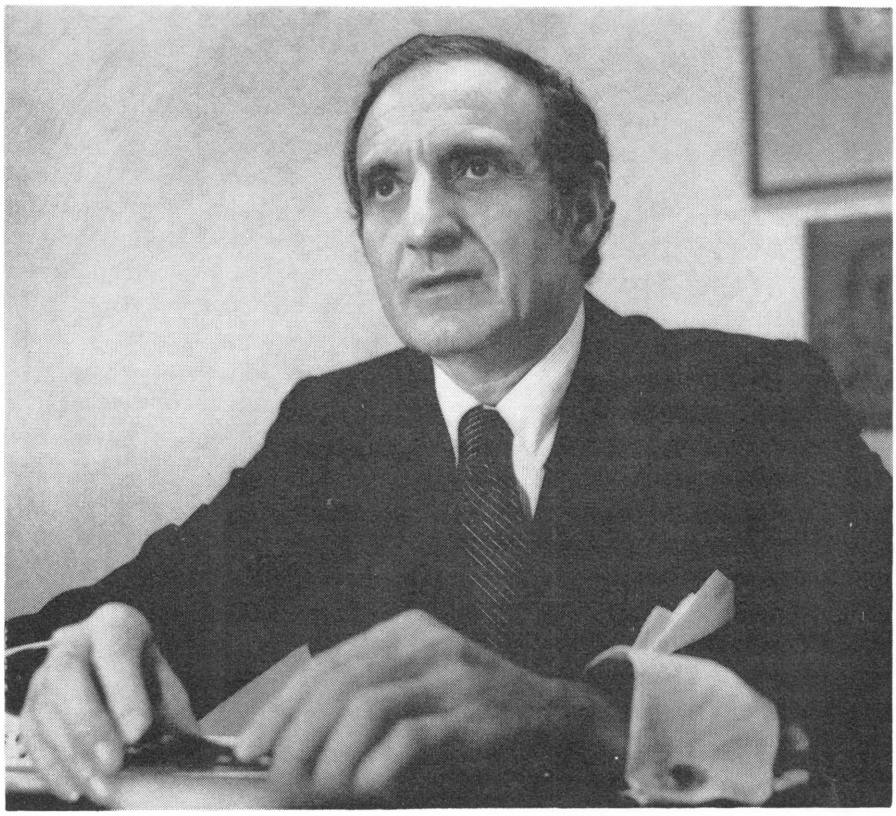
"This is what socio-economic management is basically: It is applying business management techniques to the social area by combining them with some social science techniques."

This is what socio-economic management is basically: It is applying business management techniques to the social area by combining them with some social science techniques.

David Linowes believes many social program administrators forget their long-range objectives and instead just concern themselves with how many people they can feed, clothe, and house with the money they have been given. He compares this to business: "If business wants to open a new market area, for example, it will start television advertising in the area, take newspaper space, give out free samples, perhaps start a door-to-door campaign. When all of that is over it will say that for these applications of resources, for these inputs, for the dollars we spent, we opened a market for $10,000,000 of sales that will produce $1,000,000 of profits annually.

"If this were run by a poverty program administrator, he would say that for these dollars we spent we got 20 television programs, 50 newspaper ad pages, and so many samples were given away. In other words, he just tallies the pieces. He says for this amount of money we fed 50,000 people, clothed 20,000 people, and housed 10,000 people. He forgets that the objective is supposed to be to make these people self-sufficient, make them employable and employed, just as in business the objective is to make profits."

Another lesson social institutions should learn from business, according to Mr. Linowes, is the necessity of frequently changing the way resources are applied until the most desirable combination is found. He points out that if a company is not marketing its products successfully it will change packaging, content, advertising, etc., until it achieves the volume and profits it wants. But "in social institutions they never change what they do, how they spend their money. They keep doing things in the same old way just hoping for results. If the administrators do not feel they are getting enough done they ask for more money, and then they use it to increase their activities in the same ineffective way. They should not become locked into doing the same things but should keep changing until they achieve the kind of objective they are after."



Part of the problem, Mr. Linowes believes, is that there are no adequate standards against which to measure the true accomplishments of the administrators. The poorest administrators get the most money because it is felt that the administrator who is achieving his goals doesn't need more money. "*In our social structure in the public sector ineffectiveness and inefficiency are rewarded,*" he observes.

Mr. Linowes has proposed that socio-economic management councils, composed of social scientists, business management executives, and accountants, be established at every level of government to determine to what extent existing social programs are meeting their objectives. Those areas that are solving their problems effectively would be given more aid to continue and expand their programs. Those areas that are not meeting their objectives would be given only their basic funds; however, they would be shown which other communities had effectively handled their public programs, in the hope that the inefficient areas would copy the successful ones' programs. The councils would also create programs to solve major urban problems.

"At the same time that our business sector built the greatest industrial complex in all world history, our social institutions grew into the biggest confusion of all world history," Mr. Linowes observes. "And I maintain the reason for that is that business and industry have evolved sophisticated management principles and have applied them effectively. And they were able to do this because they had a measuring standard, profit. Social institutions never had measuring standards, and to this day don't have them, in most cases aren't even seeking them, and therefore haven't been forced to improve their operations through the development of sophisticated management techniques. Today they don't have to create their own: They can borrow from business."

Mr. Linowes' ideas are being put into practice by several organizations. The American Accounting Association and the National Association of Accountants have com-

mittees on socio-economic accounting. The D.C. Institute of CPAs is considering establishing a socio-economic management council. New York University is giving a course on it this fall. Mr. Linowes' *Times* article has been read into the Congressional Record and he has been asked to testify before a Congressional committee on ways of applying his management theory.

"I would like to see accounting defined as the measurement and communication of social and economic data. That is the way I feel our profession will be defined in the next 20 years; we're moving in that direction," Mr. Linowes said. He believes that a social commitment is necessary for the profession of accountancy to maintain the kind of standing in society it deserves.

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He also points out, for those more materialistically minded, "There is so much being wasted. If we come in and show these institutions how to redimension the way they apply their resources, the rewards in terms of fees are bound to be commensurate with the results achieved."

Active for U.N.

One of David Linowes' many charitable activities is his chairmanship of the National Council of U.S. People for the U.N. The organization is geared to humanitarian activities but even this group had a practical basis for formation. As Mr. Linowes explains it, before the formation of this group a person who gave money to the United Nations could not deduct it for tax purposes because the U.N. is not an American organization and the I.R.S. did not permit a tax exemption. Instead, when U.S. citizens contributed, the United States would total such contributions and then reduce its contribution to the international organization's cost by that total.

In effect, individuals were really giving money to the U.S. Government rather than the U.N. The U.S. People for the U.N., an American agency, enables individuals to give added funds to the U.N. and have their contributions tax exempt as well.

Serves two universities

Besides being involved in Laventhol Krekstein Horwath & Horwath's practice development department, both nationally and internationally, Mr. Linowes is an adjunct professor of management at New York University, giving five lectures a year on merger accounting and management. He also serves on the professional advisory board of the University of Illinois' department of accounting. Mr. Linowes has held several offices in the AICPA, including a vice presidency in 1962-63. Currently he is vice chairman of the Institute's trial board. He is a member of many civic organizations and in 1970 he was awarded the American Jewish Committee's Human Relations Award.

In his scarce free time David Linowes enjoys golf and tennis. He plays the piano if one of his four children doesn't beat him to the keyboard. Mr. Linowes collects antiques and ivories, particularly ivories from Italy, Germany, and Austria. He admits, however, that since he has been working in New York City he has had little time for art auctions.

During his travels Mr. Linowes has rummaged through many stores to find very old accounting literature. He has even encountered a stone tablet which contained hieroglyphics on the subject of measurement. A painting he found during his missions hangs in his office. Done by an Indian artist, the painting once hung in the dining room of the American Embassy in India.

However, perhaps the most interesting adornment of David Linowes' office is the bronze plaque that hangs above his desk. It bears a profile of President Theodore Roosevelt and his words, "Fighting for the right is the noblest sport the world affords." Mr. Linowes has entered the fight by use of the accounting discipline.

The 'total information system' serving every possible need of all the departments of a company is a goal eagerly pursued by many businesses. Are they moving too fast and too optimistically? The authors say they are —

INTEGRATED INFORMATION SYSTEMS— SHADOW OR SUBSTANCE?

by Peter P. Schoderbek
The University of Iowa

and Stephen E. Schoderbek
United States Air Force Academy

RECENTLY there has arisen a cult of high priests devoted to the mission of propagating the concept of completely integrated information systems. With their arsenal of newly furbished equipment they have gone forth proliferating phrases such as "unified information systems" and "total integrated systems."

If one were to take these prophets seriously, he would soon find himself entangled inextricably in endless controversies and pointless debates. Since it is a fact that such a concept is popular and seemingly desirable, its proponents have acquired ardent followers who have been quick to echo the credits of integrated systems without a knowledge of their limitations. It is the purpose of this article to examine the idea of a total integrated system and problems encountered in pursuing such a goal.

During the past two decades the computer certainly has been heralded as *the* vehicle for the Second Industrial Revolution. Linked almost inexorably to this is the idea that advances in computer and information technology necessarily lead to an all-embracing, all-purpose system best suited for managing industrial corporations. In some quarters there is still the misconception that the primary objective of a computer system is managing information rather than providing information for management. In the former instance (and, incidentally, many of today's systems are still designed with this objective in mind) the information system is concerned with the rapid collection, processing, and display of data which often have little to do with decision making. In the latter instance, information not only is collected but also is restructured to reduce the uncertainty inherent in decision making.

It is not too difficult to see why the notion of a total system received so much attention . . . and so much abuse. The notion of integrated information systems no

doubt had its origins in integrated data processing systems. Since raw data gathered from separate information centers could be used for more than one decision making function, many felt that further technological advancements would lead to totally integrated systems. Efforts have been made in many companies to design a total data base and then to use that base to generate the necessary information. To be sure, there has been some integration of data in many organizations, but, for the most part, this has been true only for those systems utilizing the same *kinds* of related data. This similarity of inputs is one of the requirements of an integrated system; if compatibility of data does not exist, the system is not integrated. But before information systems can be integrated, the models which accept, process, and analyze such information must first be integrated; only then can one even commence to discuss integrated systems.

The fact that compatibility may not exist in all the subsystems does not negate the entire concept of integration but rather coerces one to define initially the boundaries of the system. Thus, one does not have an integrated system in the true sense of the word, i.e., "to form into a whole," but rather a limited integrated system; the system simply is not a total (or holistic) one. Thus, it may be said then that the degree of integration is somewhat dependent upon the design of the system.

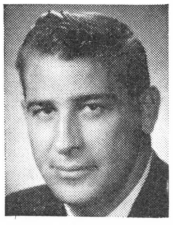
In the initial stages of designing a management information system, the designers typically ask managers what information is required for their decisions. Such a question implies that the managers can identify the important variables involved in the process, assuming at the same time that the availability of this information will lead to better decisions.

There is much weighty evidence to the contrary. There is also evidence that many managers cannot reduce the decision making process to quantifiable expressions. This may not be an unwillingness on the part of the managers to cooperate, but rather a genuine inability to comply, since in order to identify the information that one needs, one must first have a model of how he makes decisions. Until a model of this process exists one cannot specify the information required, and, too often, mathematical concepts cannot capture the expressions of human values which often dictate decisions. Thus, neither simply the abundance of information nor mathematical expressions generally reflect human decisons. The lack of useful models in general obviously limits the integration of them in attempting to develop information systems.

For the most part, the interactions of the major functions of the organization have not been duly noted in the design stage of information systems. Typically what occurs is that the organization is wrenched apart and divided into its principal functions and subfunctions. This is what has accounted for the superabundance of systems—production information systems, marketing information systems, and so on. To further compound the situation the above functions are further splintered into inventory systems, scheduling systems, market research systems, forecasting systems, and a host of others specialized for each duly important function. When one attempts to integrate these many systems, all designed for varying and specific purposes, each possibly using a different mode of information, the result is inevitable. The multiplicity of subsystems which may use separate data bases suggests that different kinds of information are required, and while some information centers may be created for external reporting, others will surely be utilized for operating decisions, and still others for planning or forecasting purposes. There is nothing inherently incorrect in developing subsystems independently of each other as long as they retain their capability for interfacing.

In discussing a problem where each system was designed by the systems group residing within the individual organizations, Clinton Williams of Chrysler Corporation recently stated:

> Each organization took a parochial view of their own requirements without regard to the impact of these systems on the total business. This is not a unique example. I could cite many others. This problem was eventually resolved by a central staff with total corporate planning responsibility. Such a staff is necessary to build an M.I.S. in a big company. Some companies have at-



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> tempted to solve this problem by centralizing systems design. This satisfies the requirement of looking at the corporate view but creates a more serious problem; that of not being responsive to the needs of the individual organizations. Central planning combined with decentralized systems design offers the best combination for big business organizations.[1]

Even the task of delineating an MIS for a large organization is a formidable one, much less integrating it. Says Williams:

> The job of defining an information system for a large company is an enormous undertaking. We have 160 computers installed in our company, world-wide, supporting such diverse products as cars, trucks, boats, air conditioners, chemicals, tanks and missiles, and subsidiary companies engaged in commercial credit, land development, and car leasing. The thought of putting this into an overall M.I.S. scheme staggers the imagination.[2]

A common area of disagreement is what does and what does not constitute an integrated system. It would not be difficult to point out obvious dissimilarities from authors and practitioners alike. Some would define an integrated system as including both on line and real time considerations (OLRT). In William Crowley's view, if a system is integrated, it will:

> 1. Supply historical data and analysis of that data.
> 2. Supply "on line" data, that is, factual material picked right out of the system as fast as it is generated.
> 3. Supply data in "real time," fast enough so that management can exercise necessary management control instantly.[3]

Others appraise the merits of real time information systems as producers of instant and relevant information. Pattillo states:

> On line real time information systems are upon us. The benefits to be derived focus mainly around the "instant information" aspect. At any time we are able to query the computer and receive up-to-date information on any desired phase of the business. The information system may be limited or *total*. It may deal with financial information only, or the system may include data on all functions of the business. . . .[4]

If integrated systems were to embrace the elements suggestive of a more sophisticated computer system, the task would be no more formidable since an on line real time system of itself does not imply an integrated system. Many firms with real time capability do not thereby claim to have an integrated system. Indeed, most of the applications of real time systems were born of critical but very specialized problems.

Some authorities rather than demanding the presence of a real time requirement for an integrated system even question the legitimacy of the entire concept. In a provocative article, Dearden, after relegating the functions of management to six categories, concludes that real time is of value only for controlling certain logistic systems.[5] While Dearden has been accused of fabricating a straw man (and to some extent this is certainly true), nevertheless, he does address himself to some penetrating questions for the systems man. The salient point he rightly makes is that the concept of an integrated system does not depend upon the use of real time hardware for producing instantaneous information. He unmistakably scores the point that many organizations do not need real time systems and at the present time cannot justify extensive use of them; moreover, the attempt to achieve an integrated system does not cut down on the problems at all. Williams also makes the same point:

> Our major batch systems have daily update. This gives us a lot of flexibility for producing needed information with high response timing. Not very many information requirements have been established that require higher response than this.[6]

One of the more formidable ob-

[1] Clinton C. Williams, "Practical Problems of M.I.S. in a Business Environment," paper presented at the First Annual Meeting of the American Institute for Decision Sciences. New Orleans, La., Oct. 30-31, 1969, pp. 3-4.
[2] *op. cit.* p. 4.
[3] William J. Crowley, "Can We Integrate Systems Without Integrating Management?" *Journal of Data Processing*, August, 1966, reprinted in *The Computer Sampler*, McGraw-Hill Book Company, New York, 1968, p. 272.
[4] James W. Pattillo, "A Study in Instant Information," *Management Accounting*, May, 1969, p. 17. (Emphasis by the authors.)
[5] John Dearden, "The Myth of Real-Time Management Information," *Harvard Business Review*, May-June, 1966. Also see John Dearden and F. Warren McFarland, *Management Information Systems*, Richard D. Irwin, Inc., Homewood, Ill., 1966.
[6] Williams, *op. cit.*, p. 5.

stacles to an integrated management system is the unproductiveness of insight into the nonrepetitive decision making process of the data generated by systems reports. Since some hold that information is imperfect whenever it is unavailable, or too costly, or unproductive of knowledge, the reason why many systems do not generate insightful information may be that much of the information actually utilized in the decision making process is information *external* to the firm. In many cases this external information dictates decisions irrespective of internal conditions. Robert Anthony succinctly states this:

> It is because of the varied and unpredictable nature of data required for strategic planning that an attempt to design an all-purpose internal information system is probably hopeless. For the same reason, the dream of some computer specialists of a gigantic bank, from which planners can obtain all the information they wish by pressing some buttons, is probably no more than a dream.[7]

It is noteworthy that typically the higher the decision making in the organization, the more judgmental the factors involved. Decisions made at the levels of middle management and above are more in response to external pressures upon the firm than to indigenous factors. Those systems which purport to employ a central data base, for the most part, do so for decisions made either at the lower management level or those which are repetitive.

Daniel, in his oft-quoted article, "Management Information Crises,"[8] states that a dynamic management information system requires information of three types: environmental information, competitive information, and internal information. Even if management were able to successfully integrate the internal information, it would be impractical for a firm to attempt to synthesize a system with input data based upon continually changing political, economic, and environmental factors as well as data relating to the past, present, and probably future activities of direct and indirect competition. Anthony makes the same point when he writes:

> Strategic planning relies heavily on *external information,* that is, on data collected more from outside the company, such as market analyses, estimates of costs and other factors involved in building a plant in a new locality, technological developments and so on. . . . Strategic planning and management control activities tend to conflict with one another in some respects.[9]

Recent studies show an increasing awareness of the importance of this external information. Aguilar in his recent book, *Scanning the Business Environment,* examined the kinds, sources, and modes of external information that executives use for strategic decision making.[10] He found that for large companies 51 per cent of the information utilized for strategic decisions came from sources external to the organization, while 49 per cent of the information came from internal sources.[11] Keegan examined the sources and the manner in which executives at headquarters level learn about the significant opportunities and threats to their companies.[12] He found that documents were the source of only 27 per cent of the important external information received by executives. He also states:

> The bulk (60%) of these documents are publications and information service reports from *outside* the company. Letters and reports from inside sources account for the remaining 40%.[13]

Those enamored with the integrated systems concept are often unaware of the heavy financial commitment required. Many managers have been sold on the notion that with a totally integrated system they would be able to query the computer and receive answers to virtually any question they desire. Even if such a system were possible, and it is not, this would require a monumental data base and a special computer access language. Such a course of action could hardly be justified in regard to the time-cost expenditure relative to the benefits received. Several years of developmental time is

[7] Robert N. Anthony, *Planning and Control Systems: A Framework for Analysis,* Graduate School of Business Administration, Harvard University, Cambridge, Mass., 1965, p. 45.

[8] D. Roman Daniel, "Management Information Crises," *Harvard Business Review,* September-October, 1961, p. 55.

[9] Robert N. Anthony, "Framework for Analysis," *Management Services,* March-April, 1964, p. 21.

[10] Francis J. Aguilar, *Scanning the Business Environment,* Macmillan Company, New York, 1967.

[11] *Ibid.,* p. 80.

[12] Warren J. Keegan, "Acquisition of Global Business Information," *Columbia Journal of World Business,* March-April, 1968, pp. 35-41. See also Warren J. Keegan, "The Scanning of International Business Environment: A Study of the Information Acquisition Process," unpublished Ph.D. dissertation, Graduate School of Business Administration, Harvard University, June, 1967.

[13] *Ibid.,* p. 37.

common just with modular systems, let alone a system purporting to include all relevant data.

Characteristically, the cost of an installation and its payoff will dictate the degree of integration that is feasible, and in many instances the computer may be cost-justified for only one or two functional areas. For these firms, then, the optimal degree of integration has been achieved at that particular point in time. On the other hand, the attempt to tie together the entire information flow would be economically unwise. The great effort expended, regardless of the hardware sophistication, would be enormously disproportionate to the benefits produced.

This splintering-up approach to information systems is one which often has been derided as ignoring future requirements of the firm. On the contrary, it can be said that management seldom fully ignores future benefits but rather that it discounts the value of these benefits and hence seems to rely upon the more verifiable short-run values.[14] The number of firms that have attempted complete integration of information (often with the computer manufacturer's warranties and vows of assistance) only to experience absolute failure is not insignificant. These firms, understandably, do not draw the wide attention to their misadventures they deserve.

It is suggested that the acquisition and operation of an integrated management information system be viewed in the same light as the purchase and operation of an additional amount of capital equipment. Both actions can and often do involve large amounts of financial resources. If the purchase of capital must be verified as cost-effective, an information system should also contribute its share to profit. Obviously, the verification of benefits from any integrated management information system is difficult, but certainly it is not impossible. Systematic analysis of the almost unlimited volume of output will not only expand the initial list of probable benefits but will help to ensure that the system is earning its keep.

The literature is replete with articles dealing with resistance to change, psychology for the systems analyst, and the like. And yet, in spite of this overabundance of advice, engineering acceptance of change is a major factor in the reception given information systems. While this is especially true for advanced installations, which necessarily employ operations research personnel for model building and simulation, the same problems exist for initial installations. It could be expected that firms "learn" to deal with these "human" problems before advanced applications, but this is not the case. Churchman, in regard to why recommendations by O.R. personnel are not accepted by management, notes:

> These reflections imply that the missing ingredient in the process of implementation is the understanding of the manager. Any research team that fails to study the manager and his personality may well fail to bring about a recommended change.[15]

There is much evidence to support the fact that many information systems now in existence remain on the shelf unused. Chambers states concerning a producton information system:

> We developed a very sophisticated model for the finishing operations at that plant (finishing is a semicontinuous operation there). The model takes into account not only the speed of the production lines, inventories at various stages, order quantities, and labor smoothing, but also how the kilns are loaded. There are about six or seven control variables, and the model very closely approximates reality. It has optimizing features, where possible, and involves some simulation. However, the plant is not using it because they don't understand what is in the model and how it works. We have found that unless we get people to understand what we have done, and unless we develop the model or system slowly, it isn't going to be used.[16]

He makes the point that if a system is developed sequentially and the managers are allowed to absorb it on a piecemeal basis, then there is a higher probability of success. This is especially true where the decision making function is highly complex. It is also common knowledge that when change is understood, resistance to it is less formidable.

[14] A firm in the farm implement industry just announced "that they were abandoning their efforts to integrate their international operations because of both problems encountered in the endeavor and the tremendous high cost relative to benefits expected."

[15] C. West Churchman, "Managerial Acceptance of Scientific Recommendations," *California Management Review*, Fall, 1964, p. 35.

[16] John C. Chambers, "Total Versus Modular Information Systems: Empirical Experience in Finance and Personnel," *Management Information Systems for the 1970's*, Robert D. Smith (ed.), Center for Business and Economic Research, Kent State University, Kent, Ohio, 1970, pp. 52-53.

The quest for a total integrated system is sheer folly as well as misleading. The quantum jump from modular subsystems to one "holistic" system is neither financially nor technically feasible at this time.

At a recent symposium on simulation it was stated in regard to a sophisticated corporate model:

> . . . We would like to cite this evidence, but we cannot. The reason that we can't is that we do not have a data bank of interactive estimates, because no analyst is currently using this system. This is despite the fact that the model has been in a finished form for almost nine months, and has been introduced to approximately one hundred security analysts and four different organizations, including the Security Analysts of ———————— Bank. Obviously, something has gone very wrong: a large amount of money has been spent to develop a product which is sitting on the shelf unused.
>
> The model was not, however, "human engineered" by someone familiar with the thought processes of a non-computer-oriented user. . . . Furthermore, the user was provided with very little assistance as to how he was to derive the imputs to this model: how is an analyst to be expected to make probabilistic forecasts, when this represents to him an entirely new mode of thought?[17]

Traditional managers, who have had neither the exposure nor the training to adequately cope with computer technology, are overwhelmed by this new vehicle, which they rightly or wrongly perceive as a threat to their decision making prerogatives. Even when training has narrowed the gap slightly, it has by no means bridged the chasm. Besides, many of the training programs are of little benefit to the participants since they are one-shot operations which do not provide in-depth knowledge of the system. It is not enough simply to know what information to ask for and how to read computer printouts. If a manager is to evaluate a system, he must know some of the inner workings of the system.[18]

A major division exists both in theory and practice concerning integrated management information systems. The authors suggest that this is so because of a failure to describe precisely not only the scope of the system itself but also the types of decisions toward which the system must be designed. At the one extreme is the all-embracing integrated system with inputs of objective data based upon continually changing political, economic, and environmental factors, as well as data relating to past, present, and probably future activities of the firm and its competitors. At the other extreme lies a system with a capability to provide an analysis of only segmented internal data. The degree of systems sophistication even at this end will be difficult to achieve since true integration will require the formidable meshing of many modular subsystems. Notwithstanding the often-cited examples of several major firms that have had some measure of success with integrated logistic systems, progress has been modest.

In any event, the quest for a total integrated system is sheer folly as well as misleading. The quantum jump from modular subsystems to one "holistic" system is neither financially nor technically feasible at this time. It is hoped that the steady flow of literature on "total" systems will be slowed and the hypnotic attraction will dissipate as the slow integration of modular subsystems proceeds in industry. As this occurs, the concept of integrated systems will become a substantive one instead of mere shadows.

[17] Wayne H. Wagner *et al.*, "Telecommunications Earnings Estimation Model (TEEM): An Evaluation," paper presented at Symposium on Corporate Simulation Models, Seattle, Wash., March 23-25, 1970.

[18] This point is succinctly made in Russell L. Ackoff's article, "Management Misinformation System," *Management Science*, December, 1967.

Part Two—

Playscript dramatizing perils of auditing computer records without sufficient data processing knowledge enlivens second day of Boston—

SEVENTH ANNUAL COMPUTER CONFERENCE

A Management Adviser Staff Report

THE second morning of the AICPA Seventh Annual Computer Conference, Tuesday, May 25, opened with a departure from previous AICPA meeting formats. Using the playscript technique, several members and staff personnel dramatized the perils facing a CPA firm doing an audit for a company that has gone in heavily for automated record keeping when the CPAs don't understand enough about computers. Entitled "The Best Defense Is a Good Audit," the story opened in the office of a mythical accounting firm considering a new account, an automobile repair parts company that reported it was having inventory turnover and accounts receivable problems.

The real accountants portraying the fictional accountants were, respectively, Robert B. Nadel, Hertz, Herson & Co., playing Tom, the partner of the supposed accounting firm; Harry Brown, Ernst & Ernst, playing Dick, the supervisor; and Jack Martin, Seymour Schneidman & Associates, playing Harry, the in-charge accountant. The script was written by Harry Brown.

On to the play:

(We are in the accountants' office with Partner Tom, Supervisor Dick, and In-Charge Accountant Harry. They are quite pleased over the acquisition of a fairly large client. Partner Tom is seated behind the desk and the oter two men are entering the office.)

Tom: Come on in, Dick, you too, Harry. I've got some good news.

Dick: Is it about AIC? (turning to Harry) That's Automatic Industries Corporation. I heard that we were being considered as auditors.

Tom: Yes, that's right! I just came from a meeting with the finance committee of the Board of Directors and we have been selected as auditors for this year. I am really impressed with the officers and board members that I met today. As you know, AIC has its headquarters operation here in town but at the present time it has a dozen automotive parts warehouses throughout the Midwest.

Dick: How old is the company and what are their net sales?

Tom: The company was started about 10 years ago by three of the present officers. It is distributor for several lines of fast-moving automobile repair parts. They also have a small retail operation at each warehouse which sells some of the fancier specialty items for hot-

rods and drag racers. Sales have been increasing about 10 per cent a year and last year the company had sales of about $20,000,000.

Harry: Sounds interesting. That should make it about our largest client.

Tom: That's right. A quick review of last year's financial statements, which were not audited, by the way, showed that they had some inventory turnover problems and possibly some accounts receivable collection problems. My quick estimate is that the audit will require about 1,600 hours this first year and a little less than that in the future.

Dick: How does their accounting look? Did you get a chance to talk to anyone?

Tom: Yes, I did. I talked with the Treasurer and he indicated that they were doing some great things with the computer. They hired their data processing manager away from a much larger wholesale automotive parts company and they seem to be getting some excellent reports out of the system. Just about everything, I understand, is automated. Their gross profit margin is very slim and they have to have good inventory turnover and very quick response to customers' requests to maintain any kind of competitive edge over other parts wholesalers. They have their own salesmen at each warehouse location and they also have a delivery service to the larger local garages and repair shops.

Dick: When can we get started? What's the year-end?

Tom: It's a December closing and we should start almost immediately. I've already discussed inventory observation with the Treasurer and he indicated that they would take their physical inventory at the end of November. Perpetual inventory records are on the computer for all 12 warehouses. He indicated that eight of the warehouses were quite large but that four of them were relatively new and these have much smaller inventories. Just about everything is centralized at the main office. Maybe we will only observe the inventories at the eight largest warehouses this year. I want you, Dick, to supervise the job and I think you will need about three staff accountants. I already chose Harry for you because I noted from his personnel record that he had a course in computer programing in college. Is that right, Harry?

Harry: Yes, sir. At State, the Engineering School offered a programing language course to any student. I took the course and wrote a few programs in Fortran. We ran the programs on a terminal located in one of the engineering building classrooms. I was certainly impressed with the calculating speed of the computer.

Dick: I'm glad you are working with me again, Harry, but I don't think that the computer should give us much trouble. I already worked on one job where the client has a computer and we found it no different from any other job. In fact, the reports were so good that we were able to complete the audit without going near the computer room. We commented in the management letter on the high quality of computer output, although we did mention that they were spending a pretty good chunk of money for data processing.

Tom: Good. I think, Dick, that you had better call the Treasurer tomorrow and make arrangements to start the review of internal control and the preliminary work. From everything I've heard, internal control is really good. I think you two should handle the initial review. Write up some fairly general procedure memorandums on the basic accounting system. Maybe, while you are doing that, you could also do some of the preliminary work. Dick, I want you to prepare a job budget within a week or two, and try to come somewhere near the 1,500 or 1,600 hours that I estimated. I am really pleased to get this job and it should give us some contacts in several other cities. Thank you both, and don't forget to keep me informed on progress. (Partner Tom leaves the room and Dick turns to Harry.)

Dick: You know, Harry, I hope that computer doesn't give us any trouble but I read somewhere that most computers are nothing more than big bookkeeping machines and we can probably do our audit around it.

Harry: No, it shouldn't give us any trouble. At one of the association meetings, one of the speakers kept saying that the computer was fast, but awfully stupid. He also commented that it was extremely accurate and that it never made a footing error or any mathematical error. (Lights out)

The lights dimmed and a panel of four appeared on the right side of the stage. They were Richard C. Bluestine, Touche Ross & Co.; Everett Johnson, Haskins & Sells; Fred L. Lilly, Jr., Ernst & Ernst; and John F. Mullarkey, AICPA. Discussing the scene that had just taken place, they commented that obviously none of the accountants portrayed was too familiar with computers; their naive self-confidence about a situation they didn't know sufficiently well proved that. Would they be competent to talk knowledgeably enough with the client's EDP personnel to learn what was really going on? Would they be able to check on the controls established within the EDP system? One of the panelists com-

mented sadly that no accountant doing an audit which he knew would have to be done manually would take so cavalier an approach to his assignment.

The lights shifted again to the left side of the stage. The three "accountants" were back again, but their mood was very different from that of the first scene. The month was April, six months after the previous scene, and an ominous sign was the presence of a fourth character on the stage, Douglas R. Carmichael, AICPA, playing the accountants' attorney, Bob.

The play:

(The same three men are present and in addition an attorney from the accountants' law firm is present. In this act the attorney will be a devil's advocate, challenging why and how certain things were done as they were.)

Tom: (Despairingly) What a mess! Not only have we lost AIC as a client, but Bob here indicates that he has had a preliminary discussion with the bank and they have indicated that they are considering bringing suit against both AIC and us for the bank loan that is in default. Other auditors have been called in and apparently there is a significant inventory shortage and a fairly substantial accounts receivable overstatement. I talked with the Treasurer of AIC and he told me that when the write-offs are made retroactive to December 31, the company will be in serious default. As we know, the bank loan required that net working capital not fall below $1,000,000 and the Treasurer indicated that it looked as though it is below $800,000.

Attorney: Yes, that data processing manager must have been really clever. He quit, you know, right after the investigations started. Did you fellows get to know him very well?

Dick: No, we didn't. The stuff he was turning out was beautiful and we had almost no trouble working with it. I understand that there is about $200,000 in missing inventory and that at least $50,000 of accounts receivable is uncollectible. I can't understand it. I thought we did a good job. In fact, we came in well below budget. By the way, is it true that the company has asked for cancellation of the audit bill?

Tom: Yes, when the shortages were discovered, and AIC realized the significance of them, they immediately asked for cancellation of the audit bill and a refund of the interim payment they made to us in early January. If we agree, it means a loss of about $25,000. I didn't like the tone of the newspaper article, particularly the headline, "Auditors fail to uncover shortage; local company in financial difficulty"; it could hurt our reputation here. In fact, I've had two or three calls from our other clients wanting to know what really happened. Dick, Harry, will you bring Bob up to date on what we think happened?

Dick: Glad to. As you know, AIC had about $20,000,000 in sales last year and at the year-end receivables were approximately $1,800,000 and inventory about $2,300,000. We observed the inventories at all but two locations and those two locations were quite small. We also followed normal procedures of confirming the accounts receivable. In fact, we used the computer to select the confirmations. We asked the data processing manager if he would have one of the programers write us a program which would read the accounts receivable file and print out all customers who had a balance in excess of $10,000 and every tenth account with a balance

. . . When the shortages were discovered, and AIC realized the significance of them, they immediately asked for cancellation of the audit bill and a refund of the interim payment they made to us in early January. If we agree, it means a loss of about $25,000.

below that amount. We had a couple of replies to our positive confirmations indicating that the accounts had been charged in error. We followed these up and saw that the proper transfers to correct accounts were made in January. We had a few of the normal replies to the negatives, mostly concerning cutoffs and payments in transit. I believe we followed these up adequately. Tell him about the inventory, Harry, you handled most of that.

Harry: Yes, it was pretty tough to observe the inventory, as these automobile parts are stored in floor-to-ceiling bins. Except for a few items, such as mufflers, car radios, spark plugs, batteries, very few individual items seemed to represent a very large dollar amount. We did have some trouble trying to trace our test counts into the final inventory as printed by the computer, but we were told that there was a lot of excess parts which could not be placed in the bins and that these items were consolidated with the original bin counts. Data processing prepunched cards for all items in inventory. These cards showed the part number, location, and unit cost. The employees distributed the cards throughout the warehouse and entered in pencil the quantities on hand of each item. During our observation, we listed several items and made many test counts, comparing our counts to the amounts shown on the individual cards. We found out later that the unit cost was really a wholesale cost and that AIC receives a wholesale distributor discount, so we had to make some overall gross calculations to arrive at the net cost of the inventory.

Tom: Did you account for all of the cards used?

Harry: Well, we thought we did. We had a record of all of the tag numbers. The data processing manager stated that they had made a preliminary run of the cards looking for missing numbers and had located all missing numbers. However, before processing of the inventory that we saw, all of the cards were sorted into part number sequence, extensions were calculated, and the final inventory printed. The inventory after deduction for the special distributor discount was very close to book and everyone seemed quite pleased. There are about 10,000 to 12,000 part numbers in each warehouse and the client used over 100,000 inventory tags. This made quite a computer printout.

Tom: Did you check clerical accuracy?

Harry: Well we had a problem there. There was no natural breakdown of the inventory into product lines and so the entire inventory was printed with only a grand total at the end. We did check some of the extensions and found them accurate. When the Treasurer called us, we went over there and spent a couple of days and apparently the grand total was overfooted by more than $100,000. Quite by accident, we also discovered that there was some duplication in the inventory. By that, I mean that 2,000 or 3,000 cards were included in inventory twice, creating another inflation of $50,000 to $75,000. If we'd had one of those generalized audit programs, we could have sorted the file in tag number order and caught the duplication.

Attorney: That's a good explanation, Harry, but what about the receivables?

Dick: I'll handle that. The new auditors did a 100 per cent confirmation and apparently have discovered many fictitious accounts. Before we were asked to leave, I had the chance to compare the preliminary list of those fictitious accounts against our list of confirmations mailed and there is not a single duplication. Apparently the computer program we used just failed to pick any fictitious item. I don't understand it.

Tom: Yes, and subsequent events proved that neither the order entry nor accounts receivable department maintained any kind of control over goods authorized to be shipped. The data processing manager told them it was too difficult to use prenumbered sales invoice forms and all invoices were numbered on the computer. Those shipments which were not to be billed were merely dropped from the files and there was no way of knowing that this happened. No one was reconciling goods shipped to customer billings.

Dick: And the inventory control people seemed to accept all of the explanations concerning the various differences between the physical counts and their perpetual records. Because data processing was always a week or two late in posting receipts for merchandise purchased, it was always difficult to reconcile physical counts to the perpetual records.

Harry: And yet, data processing turned out some of the best reports I've ever seen.

Attorney: I read some of your professional literature over the weekend, Tom, and, as I read it, you people really have no responsibility for catching fraud or embezzlement if you exercised the standard of care required in the circumstances. For a CPA the standard of care is defined by generally accepted auditing standards. Chapter One of SAP No. 33 states quite clearly that an auditor is responsible for failure

to detect fraud when, to quote, "such failure clearly results from failure to comply with generally accepted auditing standards." The most important evidence you can offer is your working papers. Do they support the contention that your examination was adequate in the circumstances and are they in good order?

Tom: Yes, they are. We have a good program of examination and our internal control checklist is complete, although a review of it shows some indication that we should have investigated the data processing activity a little more thoroughly. You know, our internal control review form is several years old and there is nothing in it concerning computers or data processing. We found out that several users were relying on data processing to keep everything balanced. Guess they were afraid to admit to us that they didn't understand the new system.

Attorney: I met with the client's attorney last Friday and they indicated that the officers of AIC are extremely displeased with your work. They also indicated that, although the shortage was very significant, the company has been able to obtain a waiver of the loan default and it looks as though they will be able to make the current payment due by mid-year. Apparently, they are fishing for a cancellation of the audit bill and return of those fees paid.

Tom: If that will do it, I'm inclined to think that we should comply and get out of this mess as soon as possible.

Attorney: The most pertinent standards in the circumstances seem to be the first general standard and all of the standards of field work. Two of them seem pretty clear. One relates to the training and proficiency of the auditor. We might be in trouble over that one. Tom, none of your people seems to have any training in computers. The second relates to the study and evaluation of internal control. Apparently, no review of any kind was made of the data processing department, even though we had some indication that data processing did exercise some control function, or, should I say, non-control function.

You know that none of the EDP employees was included in the fidelity bond and maybe that should have been commented upon.

Tom: Well, our people are well trained! We hire only college graduates and almost a third of the present staff have passed the CPA examination.

Attorney: I understand many audit firms are using statistical samplings of larger files. Would that have detected any of the problems, do you think?

Tom: Possibly, but I'm a little rusty on my statistics. We have always felt that the use of stat. sampling merely substituted one educated guess for another, and we have stuck to the auditor's judgment.

Dick: I've been thinking about some staff training in data processing and, possibly, sampling. The American Institute has several courses in both and two or three look like they might fit our needs.

Harry: I would certainly like to get some training in this area. That programing course I took in college wasn't much good in understanding how these computers work in business.

Dick: I think we should send several men to the "Control and Audit of EDP Systems" course and maybe to the "Systems Flow-Charting Course."

Tom: They're pretty expensive, aren't they?

Dick: Well, the control and audit course lasts five days and costs $375 for each participant. There would also be some travel costs.

. . . subsequent events proved that neither the order entry nor accounts receivable department maintained any kind of control over goods authorized to be shipped . . . Those shipments which were not to be billed were merely dropped from the files and there was no way of knowing that this happened.

Tom: That brings it up to about $600 for one man, plus the loss of a week's work. We only have a few other clients with computers and we've had no trouble with those jobs. Maybe we could buy a book or two and have the men study on their own time. Why don't we call the local community college and see if they offer any courses in computers?

Dick: I'll look into that.

Harry: (Wistfully) Well, we sure learned that computers aren't just big calculating and bookkeeping machines.

Lights up again on the right side of the stage. "This is auditing by the seat of the pants," said Bluestine. "There was poor separation of duties in the EDP area, which the auditors certainly should have noted but didn't," commented Johnson. "They neglected entirely proper testing of the input-output controls."

Lilly commented that there were several areas in the client company where audit software could have been used profitably but was not.

Johnson pointed out that it should have been obvious that there wasn't close enough supervision over the auditors who worked with the client company by the partner, Tom, and that Harry and Dick should never have permitted the EDP manager to write programs for the accounts receivable function.

"The inventory control—or lack of it—was really the heart of the problem. If item tags had been properly checked, if turnover by part number had been checked, if the slowest-moving items had been identified, a lot of discrepancies would have ben discovered early enough to save the situation," said Lilly.

Mullarkey summed up the opinion of the commentators. "This was audit by inquiry only. Undue reliance was placed on the reliability of the computer operations. If it's an accounting function and it's being handled by computer, it's the accountant's responsibility to review the internal control embodied in the computer program."

Concurrent sessions held

The audience at the conference then broke up into concurrent sessions concerned with audit techniques in different environments. Auditing in a time sharing environment was discussed by Dennis Fox, of Haskins & Sells, and Thomas Sampson, of Arthur Young & Company; the smaller practitioner and auditing of EDP by Lawrence McDonald, of Hungerford, Cooper, Luxon & Company, Ben Rose, of Elmer Fox & Company, and Arnold Schneidman, of Behrman, Schneidman & Co.; auditing via generalized audit programs was discussed by Keagle Davis, of Touche Ross & Co., John Mullarkey, and Richard Webb, Alexander Grant & Company. Auditing service-center-produced records was outlined by Douglas Carmichael, AICPA, W. Thomas Porter, professor of accounting, University of Washington, and Gordon Taubenheim, chairman, Champion Service Company.

The AICPA president at that time, Marshall Armstrong, of Geo. S. Olive & Co., was the Tuesday luncheon speaker, as reported in the September-October issue of MANAGEMENT ADVISER.

Tuesday afternoon was devoted to supplier sessions and Tuesday evening to informal orientation sessions, both for CPAs considering EDP activities and for those already involved in EDP activities.

Wednesday, May 26, the final day of the meeting, opened with a talk by Robert Schlosser, director of the AICPA Professional Development Division, on "First the Peter Principle, and Now Paul's."

Dr. Schlosser reviewed briefly how Professor Paul Armer of Stanford University has now added his "Paul Principle" to the well-known concepts of "Parkinson's Law" and the recent "Peter Principle," Professor Armer's concept being that "individuals often become incompetent over time at a level at which they once performed well because they become uneducated (technologically obsolete) at that level."

Dr. Schlosser said he believes Paul's Principle contributes directly to Peter's—which advances the theory, "In a hierarchy every employee tends to rise to his level of incompetence." Douglas Thomas, executive director of the Canadian Institute of Chartered Accountants, he reported, maintains that "unlike Parkinson and Peter, at whose hypotheses you could laugh while wincing, there is little to laugh about in the Paul Principle," and goes on to say, "However, unlike the Parkinson and Peter Principles, it's relatively easy to delay—if not forestall—the operation of the Paul Principle."

"I maintain," he emphasized, "that if you are successful in delaying or forestalling the operation of the Paul Principle, you will rarely be overtaken by Peter's," but he also observed that the apparent indifference of professional practice in the face of technological improvements presents a discouraging outlook toward ever gaining on the Paul Principle.

The group was informed, for example, that the approximate 15-year existence of the electronic computer as applied to business systems has not resulted in an understanding by more than a minority of CPAs of its applications in the auditing field. The group also was reminded that the CPA who is unable to review and evaluate controls in a client's EDP system is not observing generally accepted auditing standards. Moreover, he asserted, there are known cases of this type of continuous omission, subjecting the practitioner to serious legal risk.

Pinpointing areas of insidious operation of the Peter Principle—failure of a manager (supervisor, junior partner) due to lack of specific managerial training—and the Paul Principle—a case of eight different answers (two from CPAs) to a taxpayer seeking "expert" tax

advice—Dr. Schlosser continued with a suggested antidote as stated by Douglas Thomas, executive director of the CICA, when he wrote, "Every professional man knows that professional responsibility, to say nothing of intelligent self interest, demands that he must continually strive to improve his own standards."

P.D. work reviewed

Dr. Schlosser gave a resume of the work of the Professional Development Division of the AICPA, indicating that in the coming months there have been scheduled 26 regional programs at 237 locations and 40 seminars at 237 locations. He brought out the fact that no dues money is regularly used for professional development programs, but that the Professional Development Division is responsible for development of this material and must obtain coverage solely from the prices charged to states and participants.

Examples of specific antidotes to the Paul Principle were cited in advantages of the course in EDP Audit and Control; Statistical Sampling Workshop for aid to managers and partners in decision making with the sampling plan; various levels of staff training; manager development courses covering material of practical value to young professionals as well as partners; and courses in the tax areas to preclude the necessity—for example—of attempting to bluff one's way through developments of such urgency as brought about by the Tax Reform Act of 1969.

Following Dr. Schlosser's talk, there was a general session, "Win, Place, or Lose," divided into three consecutive panels, the first on Computer Center Operations, the second on Programing and Project Control, and the third on Contractual Agreements for Computer Services and Related Legal Implications of EDP.

The first of the three sessions, that on Computer Center Operations, had as panelists Robert Ivey, Windes, McClaughry & Co., and Robert McCarthy, Laventhol Krekstein Horwath & Horwath, and was moderated by Leonard Esstman, Kraft Bros., Esstman, Patton, Hurrell & Wehby.

Mr. Esstman in his introductory remarks said his firm, in Nashville, Tennessee, had joined with five other firms in the area about four years ago to form a joint data center. The result, he said: If the center could double its volume, it would double its loss. He then introduced Mr. Ivey to detail his slightly more rewarding experience.

Ivey, using slides with his talk, said that his firm, with 65 CPAs and staff members, had both its own computer and a terminal tied into a time sharing computer network. The terminal is used mainly for problem solving and staff training purposes, the computer proper, for the firm's own information needs and for clients' work.

He stressed the point that his firm does not work as a data center, that it serves only regular clients, so that it does not compete directly with service bureaus or the banks in the area offering computer services. Charges for each client job are determined, he said, on the basis of staff time recorded on time sheets, computer time taken from the computer log, and charges for the forms used.

Internal firm work accounts for about 15 per cent of the computer's time, he said; 10 per cent is small-client write-up work; and the balance is used for more complex client tasks.

"By the third month after our computer was installed, we were recovering the monthly rental cost of our computer through client charges. Ever since, the client charges have covered all costs with a resulting profit. . . ."

Mr. McCarthy, speaking of the Laventhol Krekstein Horwath & Horwath experience with in-house computers, which, as he pointed out, goes back to the early '60's, had a few words of warning for the audience.

On input and source documents, he said, it was absolutely essential to establish strict rules and abide by them.

"Don't accept Xerox documents as input, and avoid elaborate coding structures," he said.

One of the biggest problems in data processing, he went on, has come about through the development of too many characters.

"All of this slows input and so throughput," he said. It also contributes heavily to the error factor when alpha characters are used.

"With any punched paper tape —or optical font—device used for creating automatic input media, every care should be taken in the design of the data recording device to force the operator to use it properly. The time and effort spent in this phase of system design will come back one hundred fold," he continued.

From disk back to tape

In their computer installation, LKH&H started out with a disk-only system and then switched to magnetic tapes, he said. "From an audit trail and control point of view, this is much safer because the update of magnetic tape does not destroy the previous information as it does on disk. It is, therefore, still available at least until the tape is reused. The magnetic tape approach also eliminates disk copy or card punch routines that are used for back-up in disk-only installations."

Mr. Ivey interjected that his firm does not actually send computer-prepared billings for client services because it wants to hold open its options on the amount to be billed.

The next panel, moderated by Michael Moore, Arthur Young & Company, led off with Ted David, of Touche Ross & Co., who laid down some ground rules his firm had found useful in programing and project control.

Using slides, Mr. David said there was no real reason for data processing implementation in so many cases going years beyond the time scheduled for it, and costing two to three times the amount

that had first been budgeted for it.

Planning must encompass, he said:

1. What the job is all about—its specific objectives,
2. The individual jobs that will have to be done,
3. Assignment of personnel for each job and scheduling for each, and
4. Approval of all the plans and their turnover to production control.

"It's impossible to overestimate the importance of writing down everything that has to be done," he cautioned. "Each task level should have a time assigned for its completion. Each task should take not more than three weeks."

On project control, he said that a check should be made each week to ensure that the project is progressing as planned. If necessary, it should be rescheduled but a check should always be made on a weekly basis.

There should also be a continuing status report, he said, showing what problems are cropping up unexpectedly and the measures being taken to solve them. This status report in turn should be updated constantly to keep a constant record of what's been accomplished to date and what remains to be done.

Leonard Gilbert, S. D. Leidesdorf, the next speaker, stressed the necessity of complete understanding between the EDP department and those using its services.

"The system actually begins when another department requests something from EDP," he said. "That's why it's so essential that the analyst assigned to the system understand the user's language and terminology. Of course, it's also important for the user to try to understand the language of the EDP people." The ability to communicate requirements effectively and to implement solutions to these requirements in the system is the mutual responsibility of the user and EDP personnel.

Equally important, Mr. Gilbert noted, is the necessity that documentation, to the extent practicable, be in an understandable form, rather than a mathematical shorthand particular to the individual analyst. Documentation is a working "tool" prepared while the job is progressing, rather than a project to be undertaken after the system is completed.

Mr. Gilbert indicated that need for or quality of documentation was not dependent on the number of people involved or the size of the project. Documentation was equally necessary in a small "shop"; in fact, due to the limited personnel involved it could be more critical because of personnel turnover, security, etc.

To a question from the floor as to whether the need for documentation varied with the number of people involved in the project, he replied that since a larger job takes more detailed documentation, it generally did.

Legal steps outlined

The last panel of the morning and the closing session of the conference, moderated by Robert Nadel, Hertz, Herson & Co., had as speakers two attorneys discussing the legal implications of EDP.

The first, Roy N. Freed, of Widett and Kruger, said more satisfactory computer use could be achieved through better contracting practices. He also said there is a crisis in computer contracting because of bad practices. It is essential, he said, when about to buy or rent a computer:

1. To define at the very beginning of negotiations just what is wanted from the use of the computer system. "That's the basis of a good contract," he said. "It's also important to set supplier performance milestones immediately. If you don't identify every possible point you want covered, you're just buying trouble.

"2. Also, check the backup facilities very carefully for any machine you're planning to buy or rent," he warned. "If you're serious, get a firm commitment in writing. Gentlemen's agreements usually are worthless."

A complete written agreement between buyer and seller is almost as essential as a computer program for a system, he declared. "There are no standards in the market yet, so don't copy someone else's form or accept the manufacturer's routinely. But at least document all commitments by letters or by memos."

This legal approach will take longer than a more casual one, he conceded, and it usually will cost a little more in the beginning. But it will pay off in the end by reducing frictions and possible legal action.

As far as computer software is concerned, he said, the wise buyer will recognize that the supplier, in most cases, is a manufacturer selling goods rather than someone selling services.

"It makes a great difference if that is the true nature of the transaction as far as his warranties are concerned," he said.

The second panelist, Robert Bigelow, of Hennessy, McCluskey, Earle & Kilburn, discussing protection of proprietary programs, said the first rule was not to be overgenerous with them.

How can one protect his own programs?

Treat them as if they were trade secrets, he advised. A patent has the disadvantages that it takes three years to obtain, the program must be so different or so unique that it wouldn't be fairly obvious to a skilled programer, and in three years most programs are outdated anyway.

A copyright protects only against exact copies, not the logic, he pointed out. Changes in a few details of a program would make its protection very problematical.

"It's very difficult to prove ever that software has been stolen," he concluded. "The best thing to do is protect it as you would a trade secret; let as few people as possible know any details about it and keep the people who do know constantly aware of the need for secrecy."

Integrated systems, combining sophisticated management methods and advanced computer processing, can assist publishers in achieving their goals —

INTEGRATED SYSTEMS FOR PUBLISHING HOUSES

by Edward A. Schefer and Ernest B. Thompson
Arthur Andersen & Co.

On August 16, 1970, the *New York Times Book Review* contained an article, "In Publishing, the Word Is Trouble." The article's message was that publishing as an industry is having serious difficulties. Publishing houses are suffering from several maladies. Among the more serious are rising production costs, increasing scarcity of capital to support new editorial projects, and growing mobility of authors (which leads to costly competition for talent); adding to these problems is the fear that takeovers by conglomerates will reduce the creativeness of the publishers because of increased emphasis on profitability. Also, the conglomerate-owned publishers with ready sources of capital can make it difficult for independent houses to compete in the bidding for high-priced literary talent.

The product of the publishing business is essentially creative and therefore volatile. This volatility is amplified by the relationship between changes in our culture and the publishing industry, which attempts to reflect these changes and in turn is affected by these changes. For example, the recent campus unrest led to a marked decline in sales at college bookstores, requiring publishers to anticipate and make inventory-level adjustments.

Cultural change also demands that new books be published reflecting changed social patterns. The movement to include the Afro-American aspects of our society in academic programs has demanded that publishers provide the appropriate textbook and course material. However, there are some stabilizing factors, such as the backlist (active titles published prior to the current publishing year), that serve to differentiate publishing from other industries whose activities are purely creative.

Since these stabilizing factors are present and most publishers do op-

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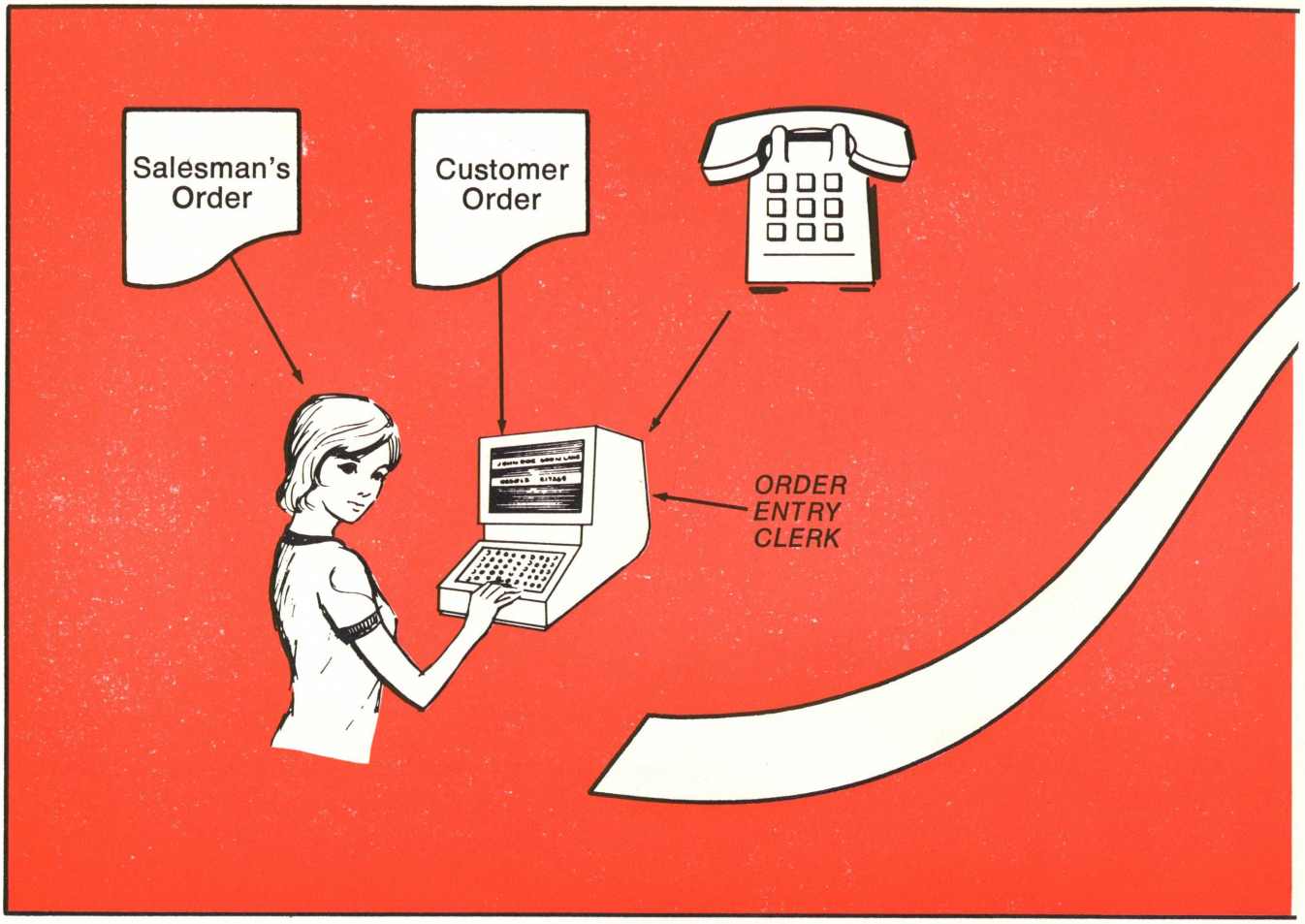
FIGURE 1



erate for a profit, the industry is similar enough to other businesses to adopt many of the more modern management techniques for cost reduction and profit improvement. Nevertheless, in the past many publishers have not made use of these techniques, partially because price increases could be freely used to cover increasing costs and maintain profitability. Thus, a strong immediate incentive to question current management practices was not present. Coupled with this lack of incentive was the concern which many publishers feel when discussing improved management concepts. They fear that too great an emphasis on the "business" of publishing may create an atmosphere in which the editorial and creative aspects of bringing new titles to the public will be stifled. These fears may be justified in some cases, but the obvious fact remains that the more profit a publisher generates, the more funds he has available to support the development of titles with literary significance.

In the current economic situation with its related increase in consumer awareness, price increases have often proven ineffective, since they simply cause decreased unit sales, which generate profits equal to or less than those based on a lower price. When this point is reached, those houses which have failed to take advantage of modern management techniques find their ability to continue profitably is hampered. Symptoms often accompanying the decreasing profitability include difficulties in responding to changes in the market place and in controlling the cost of the marketing effort. Decreased profitability also reduces the capital available to support new editorial projects so that fresh titles are not available to replace those which have ended their active sales life. This, of course, can lead into a self-feeding cycle of deterioration in the whole enterprise. More commonly, the house is able to continue adding to its list of new books, but fails to realize full profit potential due to inadequate control over production and other costs associated with the new books.

All in all, a number of major

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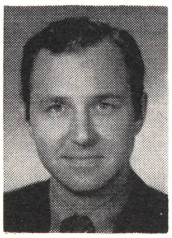
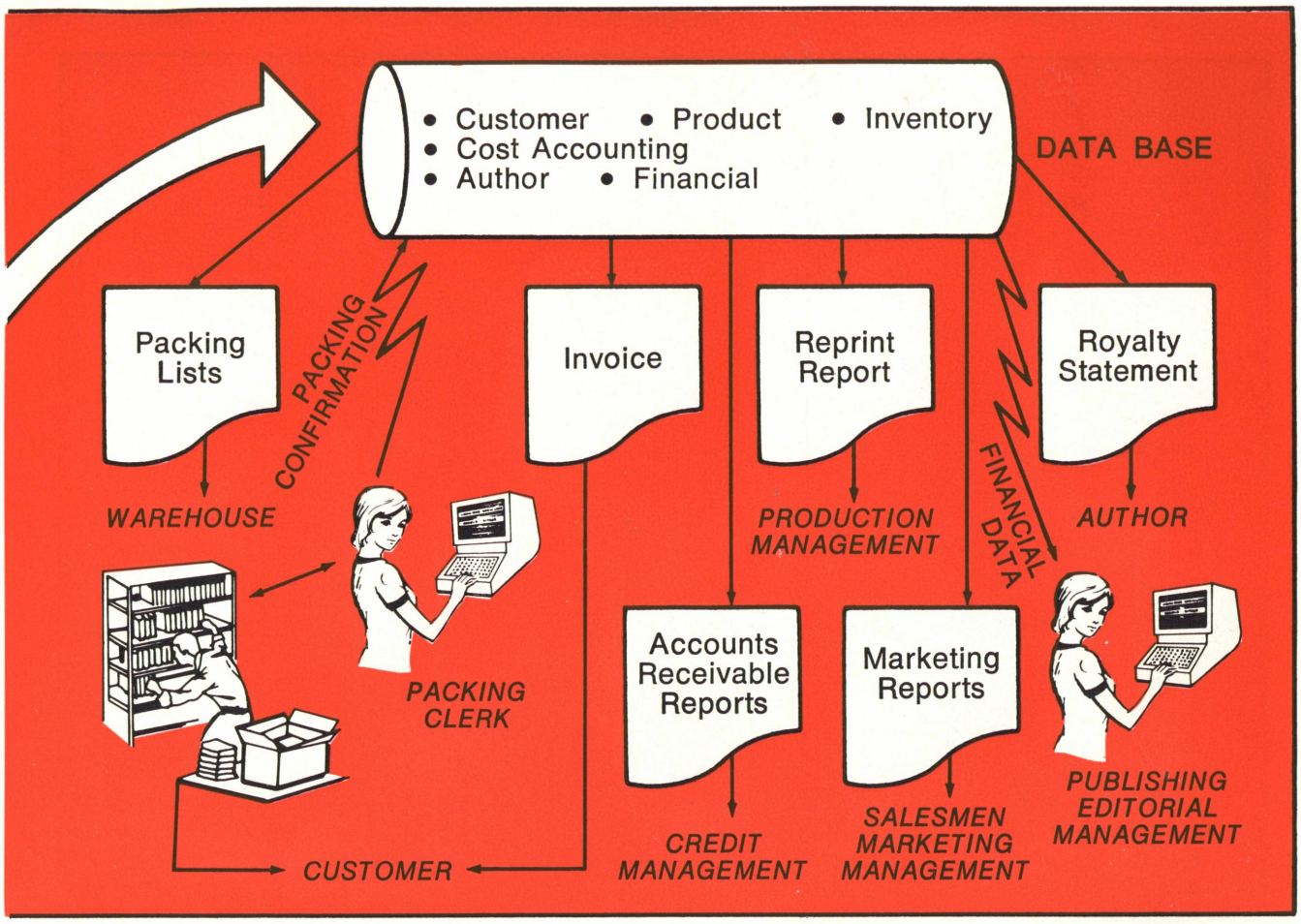


ERNEST B. THOMPSON is administrative services manager in the New York office of Arthur Andersen & Co. specializing in data processing. He was an instructor in accounting at the University of Missouri while working for his M.A. there. Mr. Thompson received his B.S. from Iowa State University. On several occasions he has been a guest speaker at data processing courses given by the American Management Association.



publishing houses are now in a position where it is desirable to promptly update management practices in many areas of the business. These houses are attempting to do so in shorter periods than many other firms in industries which began modernization programs much earlier.

Misunderstanding of computers

Simultaneously, the use of more sophisticated computers has started to permeate the industry. However, houses that have installed computers have had problems in developing the most efficient mechanized methods, and these problems have prevented them from realizing the full potential of the equipment. The computer is also underutilized since it is often regarded simply as a high-speed calculator, not as a management tool.

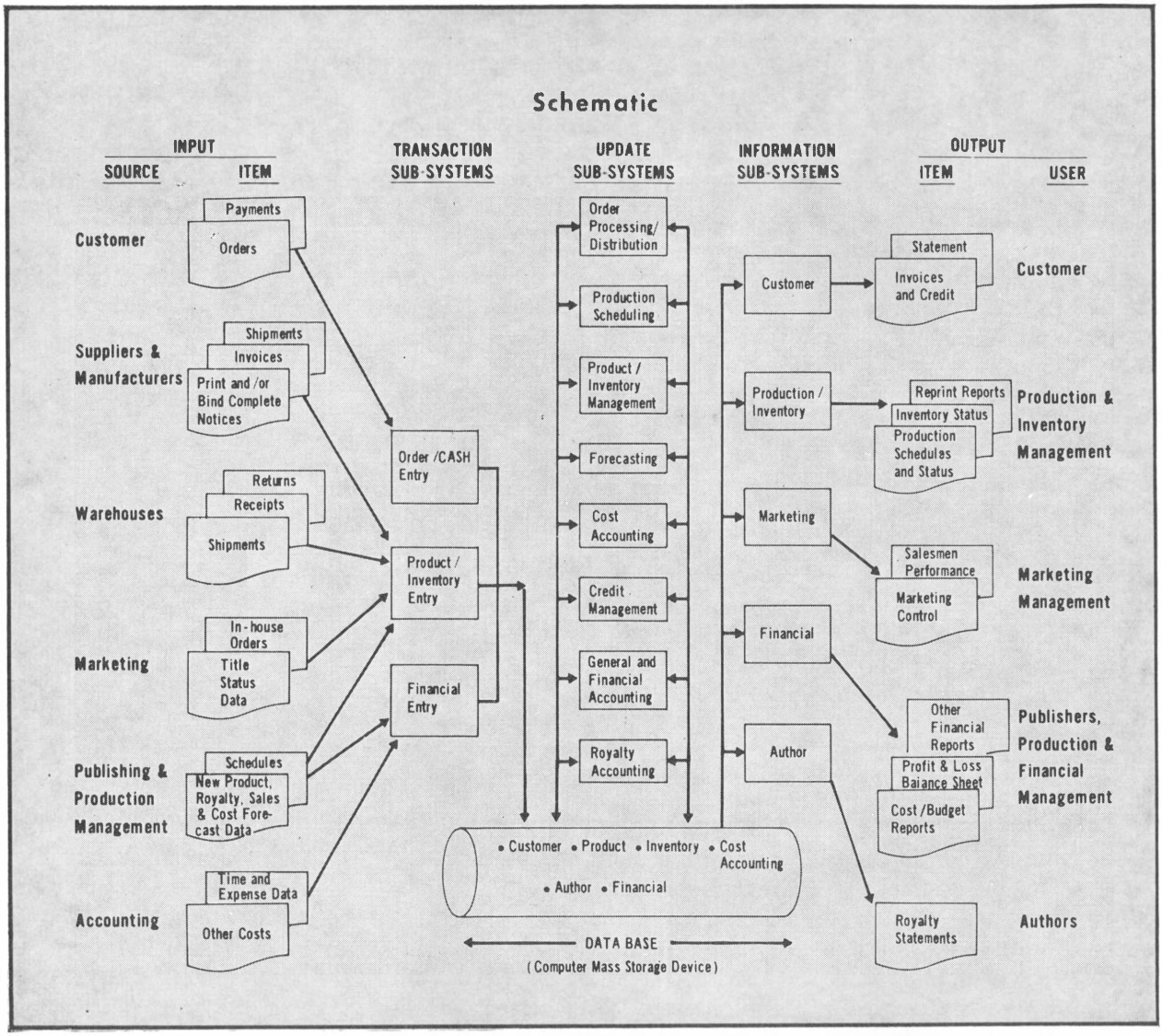
Attempts to solve these problems (those of installation of efficient data processing systems and of modernization of management practices) have led to the development of a new approach to the management functions of the publishing house, that is, the integrated system. Using this approach, outdated methods are replaced with sophisticated management techniques complemented by better organized and more accurate information. This information is obtained by taking full advantage of the processing capabilities of third generation computers. The integrated system for publishing houses has, therefore, a two-fold objective: the implementation of advanced processing methods and the introduction of up-to-date management techniques.

Master data files

A central concept of the integrated system from the computer processing viewpoint is the use of master data files. These files, or the "data base," are updated and used in the various processing subsystems and provide a central location for all data.

Usually the data base is updated through the input of data at a single point, as, for example, in the receipt of a customer order as pictured in Figure 1, above. Given the capabilities of today's computer systems, the order processing clerk might well have a cathode ray tube (CRT) with which to enter and validate the order information. This entry uses the Customer Master File by matching the customer's name or account number to determine credit information and shipping details. The books ordered are entered by a title code and edition number, and the Inventory Master File is used to determine the availability and best location for shipment. As availability is determined, packing lists are prepared for the picking of books from stock. Once packing is confirmed, the invoice is prepared and distributed. A receivable is created and the amount of credit available for the customer is reduced on the Customer Master File. If the total value of the order puts the customer over his credit limit, a message is sent to the order

FIGURE 2



clerk either to request approval of extension of additional credit or to backorder the over-limit items until payment of outstanding receivables is made, restoring the credit available to a sufficient level. Sales, inventory, and cost of sales are updated on the Product, Inventory, Author, and Financial Master Files. If this sale causes inventory for a title at a location or in total to fall to a predetermined level (that is, the inventory level, based on sales volume history and forecast, which will carry the book through the time required for reprinting without loss of sales), reports would be prepared notifying management of the need to make a decision to ship from a different location, schedule a reprint, or let the title go out of print. These reports would include a computer-calculated economic ordering quantity (that quantity which minimizes the total cost of ordering and inventorying a book) for review by management. Most of these actions occur automatically within the computer system and require no further manual entry of data, except for such items as the packing confirmation. A similar series of events could occur for other transactions.

Typical data flow

Figure 2, above, illustrates the flow of data in the integrated system for publishing houses. This diagram does not attempt to show all the possible data paths, but simply portrays some of the typical inputs and related processing, master files or "data base" and update processing, and information processing and related outputs that make up the system.

Among the areas where improvement can be realized by the introduction of modern management techniques and sophisticated processing are:

- *Financial*—Financial Planning and Control, Cost Accounting, General and Financial Accounting, and Financial Management.
- *Operational*—Order Processing, Production Scheduling, Inventory Management, Distribution, Marketing Data, and Forecasting Techniques.

After these areas have been upgraded by the application of better methods, almost all of them can

also be integrated in a computer system which provides for the use of common data. The specifics of these financial and operational techniques will be examined briefly to see how each can be improved in a publishing environment.

Before discussing the individual areas, two points should be recognized which may be helpful in understanding the operation of a publishing house. First, almost all of the larger houses are "editorial houses," which means that they do not operate printing plants or binderies. The actual physical manufacturing of the books is done by printers and binders under contract. Second, the houses are usually organized by book type with common departments being:

- *Trade*—for all general titles such as fiction, travel, sports, etc.
- *Juvenile*—for all children's books
- *Higher Education*—which handles all college-level titles, etc.
- *School*—concerning elementary and high school texts and other material.

Informal planning, which has served publishers in the past, is proving inadequate in today's environment. One of the keys to improved cost control is the financial planning and control (or budgeting) function. Historically, budgets and budgeting systems have been exercises in forecasting, but this is no longer adequate if the maximum potential for profit improvement is to be realized. The budget must be related to the steps in the management cycle: planning, execution, and control. A financial plan must be devised to achieve the publisher's goals, and the plan should be developed by all levels of management in all operating areas, not just the accounting department. This approach to budget development will give the publisher practical benchmarks against which to measure actual performance.

There are several factors to keep in mind when developing financial planning and control methods for a publishing house. First, the long lead time from the decision to publish a manuscript until completed books are ready for sale means that economic and environmental factors may change significantly over the life of a project. For example, the costs of paper, printing, and binding may increase significantly in the two or three years it may take to bring some books from conception to publication. Second, the printing, binding, and other costs related to work performed by outside vendors require the same careful planning and control as inside costs and must be included in overall budgets. Finally, advances to authors against royalties to be earned on future sales, often a substantial expense, also demand careful budgeting and control.

The publisher has a key role in helping his personnel to define their objectives and in evaluating the results in terms of previously set goals.

There are several developments in cost accounting techniques and reporting available to provide a significant improvement in benefits from the cost accounting function. While most publishers now maintain costs by book in one form or another, these are usually based upon an historical job order cost system, whereas experience in other industries indicates that some type of standard or estimated job order system is more advantageous. This type of system provides management with reports on variances for all cost categories to facilitate improved control. These reports can also indicate profitability by title (Figure 3, page 46), by author (Figure 4, page 46), by editor, by department (Figure 5, page 47), or by any other useful category. Work-in-process ledgers for each printing of a book (Figure 6, page 47) as well as costed inventory records can also be provided.

The cost system should also provide historical data on the full costs of title development and production for use in reprint quantity and pricing decisions. This "full cost" historical information should also be used in deciding whether or not

Informal planning, which has served publishers in the past, is proving inadequate in today's environment. One of the keys to improved cost control is the financial planning and control (or budgeting) function. Historically, budgets and budgeting systems have been exercises in forecasting, but this is no longer adequate if the maximum potential for profit improvement is to be realized . . .

FIGURE 3

CONTRIBUTION TO DEPARTMENTAL GROSS PROFIT—BY TITLE

HIGHER EDUCATION DEPARTMENT

Period Ending April 30, 1971

Book #451—Publication Month: 2-70—Title: Ticking & Tying
Job #73—Publication Price: $5.00—Author: A. E. Nesredna

Number of Books			Amount	Per Cent of Net Sales
2,200	Gross Sales		$11,000	110%
200	Returns and allowances		1,000	10
2,000	Net Sales		10,000	100
2,000	Cost of books sold:			
	Paper-Printing-Binding (PPB)	$5,000		
	Royalties	1,000		
	Total Cost of Books Sold		6,000	60
	Period Costs:			
	Plate amortization	1,000		
	Pre-publication expenses	1,000		
	Inventory revaluation	200		
40	Cost of sample copies	200		
60	Inventory write-offs	300		
	Variances—PPB	300		
	Total Period Costs		3,000	30%
	Gross Profit (Loss) of Book		$1,000	10%
	Inventory Turnover—			
	2 month sales in inventory			

FIGURE 4

CONTRIBUTION TO DEPARTMENTAL GROSS PROFIT—BY AUTHOR

HIGHER EDUCATION DEPARTMENT

Period Ending April 30, 1971

Author	Title	Net Sales	Gross Profit			Number of Books Sold (Net)	Pub. Month	Book Number
			Amount	% of Net Sales	% of Dept. Gross Profit			
Nesredna	XYZ Corp. History	$ 1,000	$ 400	40%	1%	2,000	7-69	492
Nesredna	Door Design	2,400	1,200	50	3	4,000	9-69	571
Nesredna	Ticking & Tying	40	2	5	0	14	2-70	451
Author Summary		3,440	1,602	47	4	3,014	—	—
Department Summary		$100,000	$40,000	40%	100%	20,000	—	—

FIGURE 5

DEPARTMENTAL GROSS PROFIT STATEMENT
JUVENILE DEPARTMENT
Period Ending April 30, 1971

	AMOUNT		PER CENT OF NET SALES
GROSS SALES		$105,000	105%
RETURNS AND ALLOWANCES		5,000	5
NET SALES		100,000	100
COST OF BOOKS SOLD:			
PAPER-PRINTING-BINDING (PPB)	40,000		
ROYALTIES	10,000		
TOTAL COST OF BOOKS SOLD		50,000	50
PERIOD COSTS:			
PLATE AMORTIZATION	10,000		
PREPUBLICATION EXPENSES	25,000		
INVENTORY REVALUATION	2,000		
COST OF SAMPLE COPIES	5,000		
INVENTORY WRITE-OFFS	1,000		
VARIANCES -- PPB	2,000		
TOTAL PERIOD COSTS		45,000	45
DEPARTMENTAL GROSS PROFIT		$ 5,000	5%

FIGURE 6

WORK-IN-PROCESS LEDGER—TRADE DEPARTMENT
Period Ending April 30, 1970
Book #493—Author: M. Berger—Title: Teleprocessing Made Simple

Vendor	Invoice Date	Description	Quantity	Unit Cost	Total	Costs				Plant Costs	
						Paper	Printing	Binding	Freight	Plate	Pre-Pub Expenses
		Beg. Balance			120	100			20		
Smith Bros.	4- 2-70	Engraving								1,000	
Preston Co.	4- 4-70	Reproduction								500	
Jones & Co.	4- 4-70	Paper-Text	10,000	.20		2,000					
Cogswell Corp.	4-10-70	Printing	10,000	.15			1,500				
Gerk Co.	4-11-70	Binding	10,000	.10				1,000			
Noll Trucking	4-18-70	Freight							70		
Falk Co.	4-21-70	Art Work									500
Brown Bros.	4-21-70	Fees									100
		Total for Month			4,570	2,000	1,500	1,000	70	1,500	600
		Ending Balance			4,690	2,100	1,500	1,000	90	1,500	600
Transfers Out:											
—To Bound Stock					4,090	2,000	1,000	1,000	90		
—To Variances					600	100	500				

to undertake new publishing projects for titles with similar cost factors.

Providing accurate statements and payments to authors for their earnings on books sold is a key factor in maintaining a good house-author relationship. This function can be complicated by the tax planning requirements of authors. By integrating the royalty system with the order processing system and storing various contract provisions and payment criteria, the computer can calculate the royalties earned, offset them against authors' advances, and prepare reports for the publisher and statements and checks for authors. Integration of the data for this function can also provide considerable clerical cost reduction in the maintenance of records and preparation of authors' statements.

Integration of data from cost and royalty accounting, order processing, credit management, and inventory management through computer processing can provide management with overall summary reports of the house's operating results. Such summaries include both income statements and a balance sheet. These reports may be compared to the budgets developed during financial planning, thus enabling the publisher to evaluate the progress of the house against established goals. This comparison will provide the basis for "macro-publishing" decisions (that is, those decisions related to the whole house as opposed to those for a single title) designed to correct deviations from objectives.

Financial management techniques (for example, return on investment or discounted cash flow analysis) which can be used to compare the projected cost and revenue flows of proposed publishing projects are gaining acceptance by financial managers as decision making tools. For the publisher these methods have special interest, since he is called on daily to decide which new publishing projects should be undertaken by his house. Although the financial criteria will not usually be the sole determination of a new title's acceptability, they should be carefully evaluated to determine the possible effect on the financial status of the house. This is especially true when substantial authors' advances against future royalties may be necessary to obtain new books.

Order processing is complicated by the multiplicity of marketing channels and product classifications. State, national, and international laws, as well as trade practices, are other complicating factors. Because all of the factors must be considered, the order processing function requires a vast amount of customer and product knowledge from which many clerical-level decisions must be made quickly.

Manual order processing is usually accomplished by a large group of employees, each a specialist with knowledge of only certain types of customers or products. Order processing, therefore, is especially suited for inclusion in the integrated system because the computer can retain the large quantity of product and customer information required to make, both quickly and accurately, the necessary order processing decisions.

The integrated order processing function determines the availability of an order line item from inventory data. If it is available, the system determines if the books can be shipped with regard to publishing date (that is, the date a book is to be announced) and copyrights (to ensure protection of the material). If it is not available, the system determines the customer's preference regarding back orders and notifies the order clerk of the expected date of shipment.

The problem of long lead times for new title development and the requirement that publishing dates coincide with the periods of highest demand both indicate the need for the introduction of scheduling techniques. Application of scheduling methods, such as CPM and PERT, to the development process for new books and to the reprint process for books with active sales will improve coordination of editorial and production activities. Scheduling all activities will result in improved budgeting, better cost estimating, and increased personnel utilization. Detailed schedules prepared at the start of a book's writing phase (based on past experience for type of title or author) are used to project the timing and manpower requirements for writing, editing, copy editing, typesetting, proofreading (by editor as well as author), production efforts, and printing and binding steps. These estimates are used as input to the computer. The computer summarizes requirements in future periods and produces reports used by management in budgeting, cost estimating, and manpower planning functions, as well as in the control of development and production activities.

Many publishers are utilizing two concepts, mentioned above, that are currently in use in commercial and industrial firms: economic order quantities and reorder points. The adoption of techniques based upon these concepts helps to avoid maintaining unnecessary inventory levels by pointing out uneconomical reprint decisions. By using the data provided by the scheduling, cost accounting, and order processing systems to update inventory information, reports which present suggested pricing changes (Figure 7, facing page) and which indicate economic reorder quantities based on past costs and sales and forecast sales (Figure 8, facing page) can be prepared automatically.

Distribution includes all of the processes which are necessary to bring a book to the reading public once its physical manufacture is completed at the bindery. Decisions must be made as to warehouse locations, transportation and shipping methods, and retail and wholesale outlets, as well as on the timing for release of books to all the various points in the distribution channels. The object of making these decisions correctly is not only to produce the maximum original sale of books but also to avoid the re-

FIGURE 7

REPRINT PRICING REPORT
HIGHER EDUCATION DEPARTMENT

Period Ending April 30, 1971

TITLE	AUTHOR	NEXT 12 MONTH FORECAST	ECONOMIC ORDER QUANTITY	ESTIMATED REPRINT ORDER DATE	REQ'D. SELLING PRICE – PER PRICING FORMULA	CURRENT SELLING PRICE	ACTION REQUIRED
AMERICAN HISTORY	P. JONES	20,000	17,500	5-15-71	12.50	10.00	YES
ANATOMY	M. LANDESMAN	12,000	24,000	NO ORDER			
TICKING & TYING	A. E. NESREDNA	15,000	10,000	5-1-71	4.50	5.00	NO

FIGURE 8

REPRINT ORDERING REPORT
HIGHER EDUCATION DEPARTMENT

Period Ending April 30, 1971

Title	Author	Available Inventory	Next 12 Month Forecast	Economic Order Quantity	Order to be Placed By	Bound Book Available Date	Out of Stock Date	No. Months Supply	Action Code
American History	P. Jones	14,000	20,000	17,500	5-15-71	7-15-71	8-15-71	3.5	1
Anatomy	M. Landesman	22,000	12,000	24,000	No Order			22.0	2
Ticking & Tying	A. E. Nesredna	3,000	15,000	10,000	5- 1-71	8- 1-71	7-15-71	2.5	3

Action Code Table:

1 Reprint

2 Excessive Stock (more than 1 year supply)

3 Reprint & Expedite

FIGURE 9

SALESMAN PERFORMANCE REPORT

TRADE DEPARTMENT

Period Ending April 30, 1971

SALESMAN: **SAM CELLAR**

ACCOUNT	PERIOD	TOTAL		TRADE		JUVENILE		MEDICAL	
		SALES	RETURNS	SALES	RETURNS	SALES	RETURNS	SALES	RETURNS
BRENTANO	APR	20,000	5,000	20,000	5,000				
	YTD	240,000	55,000	100,000	40,000	120,000	10,000	20,000	5,000
DOUBLEDAY	APR	5,000	1,000			5,000	1,000		
	YTD	35,000	3,000			35,000	3,000		
TOTAL	APR	25,000	6,000	20,000	5,000	5,000	1,000		
	± BUDGET	5,000	1,000	5,000	1,000				
	YTD	275,000	58,000	100,000	40,000	155,000	13,000	20,000	5,000
	± BUDGET	4,000	2,000			4,000	1,000		1,000

EXPENSES	SALARY	T & E	± BUDGET	GIFTS	± BUDGET
APR	1,000	1,500	800	500	100
YTD	12,000	13,000	2,000	4,000	400

turn of large numbers of books from retail outlets. (A common business practice of book publishers is to give full credit for books which are not sold and are returned by retailers.)

The great number of combinations of possible factors in selecting a distribution channel requires careful analysis by the publisher in order to achieve maximum exposure to readers' demand with a minimum of returns. The analysis is well suited to the computer, since large amounts of data on demand trends may be stored and used to project the best possible allocation of books to distribution centers. Management must also be alert as to the cost implications of various distribution channels in order to control expenses. The automation of data on these channels and related costs permits the ready computation of least-cost solutions to the economic problems of distribution.

Timely market data are required to give management the "feel for the market" necessary for determining which new titles to select and which existing items to reprint. The house's marketing system should provide comprehensive yet condensed reports of sales performance data and related expense information which fulfill the information needs not only of marketing management, but also of the publisher and editor. Even though the primary purpose of the marketing system is to improve marketing results, there are activities in the house, such as the selection of new titles or the establishment of a new publishing division, that are the responsibility of editorial and corporate management. The marketing system should provide the data needed by the people responsible for these decisions, as well as that required for control of the sales effort. That control is improved when deviations from expected sales and expense levels are reported with sufficient supporting detail at the lowest practical levels, usually by title. Such a series of reports might include one for each salesman (Figure 9, above), for all salesmen, or agents, in a department (Figure 10, facing page), and for all departments within the house (Figure 11, facing page).

Present systems in this area often generate a considerable number of reports each month. However, these reports often have to be supplemented by manual analysis of the machine output. The value of many of these reports is dubious, considering that the data are provided without any indication to management of where action is required or where significant market changes are occurring

The new system should recognize the need both to reduce the volume of output and to limit reports to meaningful information. Consequently, the output reports should be designed to provide for grouping data by department and account, as shown in Figures 9, 10, and 11, in a manner most suitable for measuring individual, departmental, and overall performance in comparison to budget. Areas which deviate significantly from budget are highlighted. This approach enables management at each level to focus on areas that require attention, rather than having to screen the results of all areas, and to take the action required to correct the problem areas.

Forecasting techniques may be used in support of both the marketing and inventory management systems. By manipulating historical and current data collected by these systems, the forecasting techniques are used in an attempt to anticipate the level of future demand. The importance of anticipating the level of demand is accentuated by current market and economic conditions. The forecasting techniques

FIGURE 10

SALES REPORT——TRADE DEPARTMENT

Period Ending April 30, 1971

AGENT	PERIOD	NUMBER OF ACCOUNTS	NET SALES	% DEPT.	± BUDGET	BACK ORDERS	% SALES	ADVANCE SALES	± BUDGET	RETURNS	% SALES	EXPENSES	± BUDGET
A. GINZBURG	APR	40	$ 10,000	5%	$ 2,000	$ 4,000	40%	$ 2,000	$500	$ 500	5%	$ 1,000	$ 200
	YTD	40	100,000	4	3,000	5,000	5	4,000	200	6,000	6	8,000	50
E. JACOBS	APR	4	2,000	1	(1,000)	–	–	100	(400)	1,000	50	800	200
	YTD	8	24,000	1	(7,000)	–	–	200	(800)	6,000	25	10,000	900
DEPT. TOTALS	APR	845	200,000	100	5,000	6,000	3	8,000	550	20,000	10	100,000	4,000
	YTD	1,125	2,000,000	100%	50,000	27,000	1%	12,000	700	200,000	10%	100,000	40,000

FIGURE 11

CORPORATE SALES ANALYSIS

Period Ending April 30, 1971

	TOTAL ALL DEPARTMENTS	TRADE DEPARTMENT	JUVENILE DEPARTMENT	HIGHER EDUCATION DEPARTMENT
NET SALES	400,000	200,000	100,000	100,000
± BUDGET	10,000	5,000	4,000	1,000
% CO. TOTAL	100%	50%	25%	25%
RETURNS	40,000	20,000	15,000	5,000
± BUDGET	4,000	3,000	500	500
% SALES	10%	10%	15%	5%
% CO. TOTAL	100%	50%	25%	25%
EXPENSES	200,000	100,000	60,000	40,000
± BUDGET	8,000	4,000	2,500	1,500
% SALES	50%	50%	60%	40%
% CO. TOTAL	100%	50%	30%	20%
YEAR TO DATE				
NET SALES	4,000,000	2,000,000	1,000,000	1,000,000
± BUDGET	100,000	50,000	40,000	10,000
% CO. TOTAL	100%	50%	25%	25%
RETURNS	400,000	200,000	150,000	50,000
± BUDGET	40,000	30,000	5,000	5,000
% SALES	10%	10%	15%	5%
% CO. TOTAL	100%	50%	25%	25%
EXPENSES	2,000,000	1,000,000	600,000	400,000
± BUDGET	80,000	40,000	25,000	15,000
% SALES	50%	50%	60%	40%
% CO. TOTAL	100%	50%	30%	20%

used should have these capabilities:

- Statistical mechanism to extrapolate available historical and current sales data into the future;
- Review procedure to permit management to revise the forecasts for any conditions unpredictable from historical data alone;
- Routine performance measurement to review the accuracy of prior forecasts, both statistical and those based on management revisions.

Integrated systems, due to their size and complexity, are often installed on a modular (one subsystem at a time) basis. When such a development plan is being prepared, it is essential that the first step be the complete detailing of the required interrelationships among subsystems. Unless these relationships are thoroughly planned, the initial modules may not be developed in accordance with subsequent integration requirements. The effectiveness of the integrated system is then diluted because the modules previously installed must be revised to allow for the missed interrelationships as each new module is added.

Having decided on a modular approach and conceived and documented the interrelationships among the modules, the publisher must work with and direct the systems group in determining module priorities. This decision will be based on such factors as:

- What business function most requires improved computer support?
- What function increases customer service most significantly?
- What function promises to produce the highest dollar benefits in increased sales or cost reduction?
- What function provides the best base for development of the remaining modules?

When the decision is reached, the module selected will be designed so as to incorporate the requirements of all future segments. The system linkages are a key factor in maintaining the integrity of the integrated system. Although it may not be possible to determine all linkages before beginning the first module, an attempt must be made to do so.

Initial module selection, based on economic considerations, merits elaboration. The analysis should, in fact, be carried out for the integrated system as a whole, as well as in determining the module with which to begin development of the system. It may well be that, having performed the economic analysis, the publisher will decide not to undertake a project of such size as the integrated system. The economics of such systems are often not evaluated as carefully as the expenditure involved requires. Preparation of detailed estimates of development costs and resultant savings is imperative before making the correct decision. This decision is not different from other business decisions and the value of the information received must justify the cost.

Should this analysis in fact justify the undertaking of the integrated system project, careful thought must be given to staffing the project team. The wide range of management areas involved requires a multidisciplinary team. Specialists from the operating areas of financial planning and control, order processing and credit management, operations research and marketing, cost and royalty accounting, and financial management should be included. The traditional approach, that is, a computer-oriented system analyst discussing requirements with the system's user and then designing and converting the system, is not adequate for the complexities involved. User personnel at the management level can and must make a significant, continuing contribution to the development effort if the integrated system is to be responsive to the house's information and processing requirements. Computer specialists in such areas as file design, teleprocessing, and operations will also be required, but they must be in addition to the management personnel described above. Such a team provides the best combination of talents to implement an integrated system.

If publishers are to maintain satisfactorily profitable operations, they must begin to introduce the management techniques which are the key factors in integrated systems.

The system which provides these capabilities will require a significant development effort in terms of time and expenditure. While the management techniques and related computer processing in each area, or subsystem, can be implemented on a piecemeal basis, the full benefits can be realized only when the installation of the entire integrated system is thoroughly planned and carefully controlled.

The necessity of carefully evaluating the economics of the integrated system has been discussed. As was emphasized, the house may be advised not to undertake such a project if it is not justified by the related costs and savings. Many of the management techniques mentioned can be successfully implemented without the computer. However, the maximum advantages are realized when sophisticated business methods and computer processing are combined. These advantages are:

- Improved management control through accurate, timely reporting of marketing, inventory, and cost data, compared to plans for each area.
- Optimal utilization of computer processing capabilities.
- Reduced costs through decreased clerical effort, improved inventory control and distribution, and faster, more accurate response to demand changes.

The integrated system thus aids the publisher in achieving financial goals without sacrificing literary and editorial objectives.

what people are writing about

BOOKS

Computers, Communications, and the Public Interest by MARTIN GREENBERGER (Editor), The Johns Hopkins Press, Baltimore, Maryland 21218, 1971, 315 pages, $12.50.

In this book, an edited record of a series of symposia sponsored by The Johns Hopkins University and The Brookings Institution in Washington between September, 1969, and May, 1970, eight well known speakers and a large number of almost as distinguished discussants offer some provocative ideas on have the computer and the communications technology with which it is increasingly intertwined can best be used to benefit mankind rather than to enslave it.

The series of lectures on the computer reproduced in this book was the second organized by Professor Greenberger (who is a professor of computer science at Johns Hopkins). The first, held at Massachusetts Institute of Technology in 1961, included, he says, "the first technical account of time sharing in the sense we use the term today."

The current volume probably contains nothing quite so historic. It does, however, offer a remarkably interesting group of papers by a well chosen set of speakers who are deeply involved in their subjects.

Perhaps the most original thinker of the lot is Herbert A. Simon, a professor of computer science and psychology at Carnegie-Mellon University. He attacks the problem of the information explosion (for which the use of the computer is at least partly responsible) by turning it inside out—"The obverse of a population problem is a scarcity problem. . . . a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the over-

abundance of information sources that might consume it."

As a general principle of information system design, he suggests the following: "An information-processing subsystem (a computer or new organization unit) will reduce the net demand on the rest of the organization's attention only if it absorbs more information previously received by others than it produces—that is, if it listens and thinks more than it speaks." In an information-rich world, to start the design of an information processing system by considering the information it will supply is doing things backwards. To be an attention conserver for an organization, an information system must be an information condenser. "The crucial question is how much information it will allow to be *withheld* from the attention of other parts of the system."

To conserve attention

In order to conserve attention, he points out, an information system can do one or both of two things: It can receive and store information that would otherwise have to be received by other systems, and it can transform or filter input information into output that demands fewer hours of attention than the input. This means that computers "must be taught to behave at a higher level of intelligence. This will take a large, vigorous research and development effort."

Civil liberties

One of the most controversial subjects included in the symposium discussion is the relationship between civil liberties and computerized data systems. Charles L. Schultze, who was Director of the Bureau of the Budget at the time its proposal for a national data bank center created such a storm, explains in the book that the plan was for a central statistical data bank whose data would be used only for legitimate statistical purposes, not to gain knowledge about specific individuals or institutions. Such a system, he maintains, would pose no threat to liberty if the following conditions were met:

Conditions specified

1. The system should be run by a highly competent statistical staff in a central statistical development agency established under Census Bureau confidentiality rules.
2. Matched sample files containing demographic and social-status information but excluding "dossier" types of information should be constructed.
3. Individual file data should be made available to users without individual identification. Where this is not feasible, computer techniques should be developed to let user computers manipulate the original data file and provide statistics to users without revealing the file data itself.
4. The central agency should cooperate with users to construct model files that could be manipulated by users.
5. The central agency should help analysts match special survey data with central data files, manipulate the matched data, and prepare the combined results in appropriate summary form. The system should ensure that individual files are never displayed.

Computer not the cause

Actually, according to Alan F. Westin, professor of public law and government at Columbia University, the basic issues of privacy and due process in record systems have been a growing problem for some time as military and law enforcement agencies have built up their dossiers on individual citizens. The problem is "seriously aggravated by computerization but . . . not caused by it."

He sees the solution as a matter of differentiating clearly among administrative, intelligence, and statistical systems and keeping them separate both "inside computerized data systems (as can be done technologically) and in the output of these systems." Professor Westin also suggests drafting of model statutes to define the core elements of individual privacy and due process that deserve protection in computerized information systems. "As a basic premise, when the information sought is personal and creates feelings of intrusion in reasonable men, the burden of justifying the need for such information should be on the agency that seeks to collect it."

Regulation needed

Some new regulatory institutions also may be needed, Professor Westin suggests. A new telecommunications agency might have jurisdiction to ensure the rights of citizens; public review committees of outside appointees should be created to monitor each computerized data system maintained by government; or an independent registry and rule-making commission on computerized data systems could be created.

Other topics

Other controversial topics on the agenda at the symposia include the role of the Federal Communications Commission in guiding the progress of the "combined revolutions in communications and information technology" (FCC Commissioner Nicholas Johnson finds its record so far inadequate) and the protection of property rights under the new technology (Ralph S. Brown, Jr., professor of law at Yale University, favors a modified form of copyright for computer programs with an application right attached, but some of the discussants lean toward patents for computer software). Both these discussions, carried on principally by lawyers, are somewhat technical.

The other subjects covered in the book are large time sharing networks (a forecast by John G. Kemeny, president of Dartmouth College); "compunications" (a coined term that seems to mean

computer communications) in the national decision making process, an analysis of intelligence systems by Anthony G. Oettinger, chairman of the Computer Science and Engineering Board of the National Academy of Sciences; education in modern society, a forecast that assumes the growth of computer-assisted training by James S. Coleman, professor of social relations at Johns Hopkins; and man and the machine, a philosophical discussion by Harvard Professor Daniel Bell.

Thanks to a remarkably select list of speakers, these symposia provide a discussion of these topics that is among the best balanced and freest of "hot air" yet recorded. The book is recommended to computer specialists and nonspecialists alike.

(Incidentally, this book is available at a 20 per cent discount to members of constituent societies of the American Federation of Information Processing Societies—of which the AICPA is one. Orders, at $10 a copy, must be prepaid and must include the individual's society membership number. They should be sent to AFIPS Press, 210 Summit Avenue, Montvale, New Jersey 07645.)

The EDP People Problem by FRED GRUENBERGER (Editor), Data Processing Digest, Inc., 6820 La Gijera Boulevard, Los Angeles, California 90045, 1971, 176 pages, $12 (paperbound).

This collection of 13 articles on the personnel problems in electronic data processing management, written by a dozen computer professionals, supplies few solutions but many helpful suggestions.

Nearly every computer failure or inadequacy can be traced to the software rather than the hardware —which means people. "When we come right down to it, all our problems are people problems," says the editor of this little volume, a reprint of a series of articles that ran in *Data Processing Digest* in 1969-70. "People Are the Problem and the Solution" is the title of his introductory chapter.

Authors representing consulting firms, employers of programers, and the programers themselves discuss such problems as the relations between EDP and user departments and between EDP and top management; identification of EDP talent; training and professional development; special problems of managing large computer installations and government EDP operations; and the role of women in data processing.

As in all anthologies, the chapters vary in quality. The contribution on private institutes for computer training, although admittedly biased (the author, the director of one of them, titled his article "Private EDP Schools: The Positive View"), is nevertheless thorough judicious, and constructive. The chapter on women in EDP, on the other hand, offers almost no information and little in the way of interesting opinion.

As a whole, the articles tend to be skimpy and somewhat superficial. All, however, stem from personal experience; thus, even the worst of them are refreshingly nonacademic in style and content and thoroughly practical in orientation.

Computers and Management: The Executive Viewpoint by VICTOR Z. BRINK, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1971, 172 pages, $7.95.

Writing from the viewpoint of top management, this Columbia Business School professor summarizes the findings of a survey of computer usage in more than 100 large organizations and presents his ideas for improvement.

Dr. Brink conducted "field research" on more than 100 large industrial corporations over a period of several years and actually visited about 30 of them. The objective was to determine what impact computers were having on general management practice and the related area of organizational policy. The approach was to talk to managers and learn their views, which, together with library sources and personal experience, formed the basis for his forecasts of trends and his recommendations for improvement.

The findings are, on the whole, familiar:

Findings no surprise

The companies studied have done an extensive job of computerizing the so-called clerical-type processing activities. There has also been substantial progress in production processing, including process control. In each case there has been relatively little effect on higher-level management.

Broader operating systems are under development in many companies, and increasing linkage of subsystems is popularizing the concept of an integrated management information system. "No really intelligent person believes" in the possibility of a genuine total system, but "there is a variety of views as to how far one can ultimately go in this direction."

Information improved

Computers have significantly improved the information available for the support of most management decisions. This is the goal in the increasing use of large-scale common data banks, which, however, have proved "extremely difficult" to develop. Considerable, but uneven, progress is being made in the use of management science techniques.

With improved information, management is able to plan over a longer period of time and to measure and evaluate the impact of an increasing number of pertinent variables. Better information also has resulted in improved control, through more accurate standards of performance, decision-rule systems,

faster reporting of results, and more extensive analysis of deviations from standards.

The computer's technical need for uniformity in data definitions and descriptions of operations is leading to standardization of data formats and procedures and thus more organizational cohesiveness.

Clerical personnel displacement has not proved to be a problem, although it may become one; clerical job satisfaction seems, if anything, to have improved. Middle management has not been reduced in size; in fact, its numbers have grown; and jobs have broadened rather than narrowed. The principal effects of the computer on organization structure seem to be a trend toward centralization and the growing use of project study groups.

In view of the controversy surrounding the impact of the computer on organization structure, one could wish that the author had not so rigidly avoided what he calls "the ambitious but frequently unrealistic extension of quantification to the analysis or organizational judgments reviewed." It would be interesting to know how many companies reported what—and that information would make it much easier to evaluate the extremely broad conclusions.

The author's forecasts and recommendations are even more vague and generalized. As in so many books addressed to top management, that orientation seems to become a justification for lack of concreteness. Acceptance of the author's views must rest entirely on his credentials rather than on the nature of his material. This is not a book for the student of EDP; it is for the high-level executive who knows either a great deal—or nothing at all—about computers.

Briefly listed

Writing in Business by J. S. Lindauer, The Macmillan Company, New York, 1971, 269 pages, $5.95.

Despite the breadth of its title, this book concentrates on letters. They include, however, sales promotion pieces, testimonials, resumes, and short reports. There is considerable stress on format. A glossary at the end reviews the basics of grammar, punctuation, capitalization, etc.

Guide to Locating New Products, TTA Information Services Company, 4 West Fourth Avenue, San Mateo, California 94402, 1971, 66 pages, $25.

This directory lists and describes 125 patent marketing companies, patent and product development organizations, international trade and licensing firms, product search companies, and specialized information services that concentrate on locating and/or developing new products for corporate clients. The information provided includes size of operation, services offered, clients, and financial statistics. The guide also discusses general sources of new products.

MAGAZINES

A Simulation Approach to Investment Decision by E. Eugene Carter, *California Management Review,* Summer, 1971.

This article outlines a computerized approach to the evaluation of proposed capital investments that would recognize the interaction among them by treating the entire body of possible projects as an investment portfolio.

A broadening of traditional capital budgeting techniques to permit the evaluation of a group of proposed projects in a computerized simulation of an investment portfolio is proposed by this author.

He rejects as unrealistic the use of a single objective (such as profit maximization) and instead suggests quantifying multiple goals, multiple constraints, and value alternatives and letting the manager choose among the trade-offs in goal fulfillment.

Two banks of data would be required for such a simulation. First, top management would need a simulation projecting sales, costs, earnings, and the like for the company without any additional capital projects. This is a "big job," the author concedes. A similar simulation model would be needed for each of the proposed capital projects. These individual models should be combined into a simulation of joint incomes, showing expected values, variances, and covariances of all projects. Then top management, using individual computer terminals, could vary the possible combinations of projects to assign priorities.

A good deal of space is devoted in this article to discussion of the role of each level of management in the portfolio selection process and to the mechanics of proposal and review. The heart of the proposal, the formulas for the various simulations, is barely touched on. It is not clear whether the author has ever attempted the design of such a simulation or whether he is talking purely in the abstract.

The basic idea presented in the article sounds like a good one. Its practicality and the validity of the results remain an open question in the absence of evidence that the technique has ever been tested in any way.

The Sex Barrier in Business by Eleanor Brantley Schwartz, *Atlanta Economic Review,* June, 1971.

Women are not about to take over the executive suite in American business. Surveying the attitudes of male executives, this author found them surprisingly frank in admitting their prejudices.

To learn how U.S. executives really feel about women in the executive ranks, this author surveyed 300 male executives from the largest U.S. corporations, 300 executives from small businesses, and 300 women who had achieved exec-

utive status. (The response rate ranged from 47 per cent for the women in the sample to 23 per cent for the small business leaders in the group.)

In a third of the companies women represent less than 2 per cent of all management personnel. The percentage is lowest in the small businesses, and there nearly all the women managers are employed at the first (or supervisory) level of management. Women make up about 1 per cent of the persons at the senior management level in the big businesses; there are no women at this level in the small businesses.

Experience reported good

Although nearly all the male executives reported that their experience with women in management positions had been "good" or "very good," most of the small-company male executives and nearly half of the big-company male executives admitted that there was discrimination against women in management.

More than half of the male executives felt that women were as capable in management positions as men; that women could make precise, clear decisions; that women did have the fortitude to dismiss subordinate personnel; that women did not use their femininity to achieve their objectives; that absenteeism among women was not higher than among men; that women were not overly sensitive to contradiction; that women did not expect special treatment; and that women did not work only to supplement their incomes.

Criticisms voiced

On the other hand, a significant number felt that women were too emotional in working with other women; that women had less career motivation than men; that women did not provide as large a return on investment in educational and training dollars as men; that women preferred not to work for other women; that men preferred not to work for women; and that women were not as dedicated to management as men.

Almost all the executives reported that their companies provided no special training to prepare women for management positions, and nearly half reported "no noticeable difference" in utilization of women since the enactment of the Civil Rights Act of 1964.

Prejudice against women is greatest among older managers, some respondents reported—with the exception that "the higher men go, the less biased they become." Women have to worry not only about male attitudes, some said, but also about female attitudes toward women in senior positions. "To a very large extent, they contend, women hold women back; and, ultimately, women's biggest challenge may not be one of gaining full acceptance by male executives as much as that of removing the distrust, competitiveness, and damaging jealousies of other females." A sad commentary.

These—and other—results of Professor Schwartz's study are interesting less for the conclusions—which are well known—than for the frankness with which the men surveyed admitted their prejudices. Her findings are being published in book form.

How to Measure Thinking by EMERSON A. BOEPPLE, JR., and L. A. KELLY, *Industrial Engineering*, July, 1971.

A representative of a consulting firm that specializes in work measurement and a client spokesman discuss a proprietary work-time-factor system that purports to measure mental processes.

As the proportion of production workers in the work force drops, white-collar and service workers are becoming the primary frontier for the spread of work measurement techniques; only about 5 per cent of these people are subject to any kind of work measurement system, according to these authors. Standard times have been worked out for some of the motions that are common in clerical work, but the spread of work measurement has been hampered by the facts that physical activities are less important than mental ones in most white-collar jobs and that mental processes cannot be observed directly.

Mento-Factor System

Now the Wofac Company, a division of Science Management Corporation, has come up with a work-factor system for mental work, known as the Mento-Factor System. Basic time values (called "fundamental mental process times") have been developed for 13 basic mental processes: eye motions (focus and shift), see, conduct, discriminate, span, identify, convert, memorize, recall, compute, sustain, decide, and transfer attention. The time value for a function, expressed in units of one-ten-thousandth of a second, represents "the net elapsed time required by thousands of simultaneous brain functions to accomplish a designated function. These basic elements, which become the common denominator for analyzing all work, form the Mento-Interval—the time required to complete one cycle of the mental process that occurs between eye motions. Mento-Intervals are combined to form a mental operation cycle—the time required to perform a complete mental task."

How it works

The system is applied in this way:

First, the objective of a mental task is defined, using the "definitions, rules of application, and clarification of difficulties" in the Mento-Factor manual. Then all "fundamental mental processes used by the operator are listed and the best method established." Then the "correct fundamental time values" for each process are assigned and added.

The Mento-Factor System, the authors claim, can be used to establish accurate time standards for "any non-creative or semi-creative" mental task, including visual inspection; counting; computer programing; reading or listening to instructions; sorting; assembly and inspection under microscopes; problem solving in engineering, accounting, or drafting; and proofreading, compiling, and editing activities.

The article described in some detail the application of the system at R. L. Polk & Company's City Directory Division in Detroit, Michigan, where it is being used to develop time standards for proofing and editing operations in the preparation of city directories. Other users include Motorola, Boeing, N. V. Philips Gloeilampenfabricken, and RCA.

All users, say the authors, "have been able to develop more effective methods and accurate and reliable standards for performing mental tasks using Mento-Factor." At Polk, there has been "significant achievement" in "maintaining or improving the quality of the work" and "recognition of appropriate human behavioral factors." No supporting evidence is cited. Nor is any evidence offered as to the validity of the breakdown of mental processes or of the standard times developed, other than the statement that they have been "field tested thoroughly."

The Development of Managerial Models by G. ANTHONY GORRY, *Sloan Management Review*, Winter, 1971.

There are two ways to improve the quality of managerial decision making: to provide better information and to make better use of the information available. This author thinks the first alternative has been overemphasized; he describes how helpful even a simple model can to be an operating manager when the manager has helped develop it and understands it.

The major emphasis of information systems designers, the author of this articles notes, has been on providing managers with better-quality information—more accurate, more detailed, more timely. This approach has been helpful in solving structured, relatively routine problems such as personnel scheduling and inventory control.

Model should be first

It will be much less productive, he feels, as information systems activities expand into the domain of higher management. More and better information will not necessarily be helpful unless it is properly used, and its use depends on the manager's understanding of his environment. Improvement in his understanding—or model—of the business environment should come first. A poor model may lead him to solve a problem incorrectly or to solve the wrong problem. And, since the model determines the information to be gathered, its development should precede the design of the information system.

Actual model described

The author describes the development of a model he designed for the plant manager of a company producing large, complex electronic equipment. Service to the parent company customer was the prime objective even though orders often arrived with short lead times. The diversity of the equipment details (more than 20,000 distinct configurations of finished equipment with 100,000 parts in inventory) plus the specialization of the equipment early in the manufacturing process made it difficult to forecast demand.

The original proposal was for a large-scale simulation model of the plant's production process, but the manager felt he needed immediate assistance. A relatively simple model—approximate and incomplete but faster to design—was decided upon.

Since the system designer was unfamiliar with the plant's processes, he leaned heavily on interviews with the manager for information about the various relationships involved. The resulting model, although simple, produced complex patterns of investment and output that proved remarkably similar to the plant's historical patterns.

The first question put to the model was whether, in response to increasing pressure from parent company management, the manager should stop all parts orders for a while. He felt the plant would "recover" from the resulting disruption in 10 to 15 weeks. When the proposal was tested in the model, it led to markedly higher variances in investment and output levels—not for 10 or 15 weeks but for more than a year. He decided not to risk it.

The model also was used in other, less significant ways. Its chief advantage, the author seems to feel, was that the manager accepted it because he had helped to create it. Do not assume, the author concludes, that "a manager's inability to make good decisions implies that he cannot make good parameter estimates."

The model also had substantial educational value, the author thinks: ". . . many information systems people tend to judge the value of models in terms of specific decisions which must be made. But educative models ultimately can improve managerial effectiveness by providing a better representation of the environment. The benefits may accrue over relatively long periods of time and in unanticipated ways."

ANNUAL INDEX

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AICPA Publications of Special Interest to MANAGEMENT ADVISER Readers

AUDITING AND EDP *by Gordon B. Davis*

Published in 1968, this book continues to provide authoritative information and guidance on the examination of business enterprises which use computers for recordkeeping. It is based on the broad experience of a special task force appointed by the American Institute and covers virtually every aspect of this important subject.

Extensively illustrated, the book discusses typical procedures and preferred practices for the proper management and control of computer operations to help the auditor in his review of the data processing system. It also describes in detail specific audit procedures, explains criteria for deciding which auditing approach is appropriate in different circumstances and provides information for evaluating the usefulness of various methods.

A concluding sections deals with problems raised by integrated systems, service centers and time sharing. *Cloth bound.*

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