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## New Dimensions of Accountancy

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# THE NEW DIMENSIONS OF ACCOUNTANCY

*As a new year begins, it is only appropriate to look into the future. In these pages, the author looks at three relatively new disciplines which will may be an important part of accountancy in the 1970s and beyond.*

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The most important phenomenon of the twentieth century is the dramatic knowledge explosion in every field of human endeavor. This century will, however, also be remembered for its incomprehensible success in large-scale projects requiring the harmonious use and coordination of knowledge and techniques of numerous disciplines which might at the first glance seem unrelated. Disciplines now no longer can stand alone and retain their usefulness; they must draw heavily on each other's concepts and techniques if they intend to be capable of solving the increasingly complex problems of our present day world.

The discipline of accountancy is no exception. While it was in the past solely concerned with the accumulation of financial transactions of entities and periodically reporting their results to interested outside parties, it has recently recognized that to survive as a profession it must expand its scope of knowledge and techniques, as well as its activities, in many ways. Its members now consider it also their objective to assist management (or, in other words, insiders) in their everyday planning, controlling, and decision-making tasks. They even expect to be part of the management team which makes the decisions and to account for their success or failure thereafter.

With the expansion of the scope of knowl-

edge of the discipline and the added activities, the image of the accountant as the stoop-shouldered man with the green eyeshades patiently putting columns of figures into huge bound books has become history. Today's accountant is more likely a dynamic, quite vocal, and certainly active member of the management team, extracting from a third generation computer relevant data for special decisions with everyday casualness. Or he may simulate with the help of a corporate model the future impact of policy changes contemplated by management.

If job titles are any indication as to the scope of a position, descriptions such as chief bookkeeper and controller have been increasingly replaced by titles such as manager of the comprehensive information system, director of the communications system, or director of information intelligence, indicating clearly the dramatic changes in job scope and content which took place in the recent past.

Accounting is now defined even by outsiders as "a broad term that denotes certain theories and procedures for collecting and reporting useful information concerning the activities and objectives of an organization."<sup>1</sup>

<sup>1</sup>Carl Thomas Devine, *Encyclopaedia Britannica*, Vol. 1, 1965, p. 78.

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In the Spring of 1971, Dr. Ramanauskas visited Georgia State University as a special guest of the Georgia Board of Governors, where she was enrolled in five graduate courses in decision science.

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A frequent speaker in business fields, Dr. Ramanauskas has had more than 25 articles published in professional journals and is the author of the German language booklet, "The Moneyless Way of Wage Payments."

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No longer is accounting identified solely with the financial sphere, but it is now more and more recognized as a discipline consisting of procedures for recording, classifying, reporting, and interpreting all quantifiable functional experiences of an enterprise with the goal to promote effective management. Expressed in maritime terms, today's accountant is not the commander of the ship (that is management's role), but he is the navigator, the one who controls the direction. He is the one who must keep the commander continuously informed as to how far he has come, where he is, what speed he is making, the resistance encountered, and the variations from the course.

What specifically are the added dimensions which produced such dramatic changes in scope and image of the discipline of accountancy and the people engaged in it? Is this broadening and deepening process now concluded or is it still in flow? Are we on the threshold of unparalleled gains of disciplinary effectiveness or are we squandering our talents on fad and fetish?

### ***The Total System Concept***

One of the major by-products of the scientific management movement of the past several decades is the recognition of the firm as a complex system, resembling more a living organism rather than a machine. Without attempting to push the relationship between firms and biological systems too far, one may say that a firm (as well as a biological being) is a set of activities and functions that must be carefully coordinated to insure health and growth. Although a firm is not alive, it has to behave very much like a living organism to survive and to succeed.

While a living organism has a ready-made effective organizational structure (with built-in controls, reflexes, and feedback to the brain), such has to be carefully designed for the man-made firm. Just as the growth and the success of a biological system depend upon its ability to coordinate its various functions and to adjust them to its supporting environment, the most important determinant of a firm's potential for growth, improved efficiency, and attainment of goals is the ability of its management (the brain) to manipulate effectively the various units and functions comprising it and to cope with its more or less hostile environment.

While it was believed in the past that optimization of subunits and functions of a firm automatically would result in a comparable improvement of the overall well-being, it is now realized that only careful coordination of the activities of all subunits and functions

guarantees the attainment of the overall objectives, whatever they may be.

This new realization stems from research results in system theory and cybernetics, which have taught us that any system, a biological one as well as a business firm, consists of a hierarchy of goal-seeking control units, wherein each level is influenced and coordinated in its attitudes, behavior, and decisions by the next higher level ones.

The influencing and coordinating of all sub-functions at the various operational levels is accomplished by a system of internal information flows or, in other words, by a comprehensive information system, which encompasses quantifiable information of the functions and activities of all levels and which also possesses all the necessary automatic built-in horizontal and vertical controls and feedbacks.

Such a comprehensive information system, if constructed with full knowledge of the functional interrelationships and interactions of all subunits or segments of an enterprise, provides management at all levels with complete and unbiased information relevant to specific decision-making needs. Through its automatic built-in horizontal and vertical controls, it even eliminates many routine decisions which had to be made by humans in the past. By providing information without delay, it improves operational control because it makes possible remedial actions in problem areas before serious losses occur.

So far in real life such comprehensive integrated information systems are achieved only rarely, and the information relevant for management's decision making needs is mostly still provided by loosely tied subsystems.

However, the advances in electronic data processing and the resulting revolution in information technology do kindle the hope that the complex information system dream will be realized on a broader scale in the very near future.

Already the computer and the knowledge about functional interrelationships and interactions gained by the total system concept have produced changes in many organizational structures. Many lower-level clerical and routine middle-management tasks and decisions have been taken over by the computer. Although it was first feared that this would result in the elimination of middle-management positions, they have assumed now even greater importance than before as tactical planning and control functions have been moved to those lower organizational levels where they are much more effective anyway. Concomitantly, top management has been enabled to devote more attention to the understanding of the

system interrelationships, to nonroutine decision making, and to strategic and long-range planning.

The most obvious results of the advances in the computer technology were, however, the dramatic revisions in the data reporting requirements in order to take full advantage of the ability of the computer to accept, store, rearrange, and process data with never before dreamed of speed and flexibility.

Many organizations have painfully learned that it no longer makes sense to support separate, disjointed, and uncoordinated functional area information systems for marketing, production, personnel, and financial accounting, but that it is much more economical to build electronic data banks or pools of information from which relevant decision data and reports for the specific operational activities can be readily drawn at demand.

How did all these developments affect the accountants? To secure their position at the head of the data accumulation network within the organizations and to earn a place on the management team, they had to broaden and deepen their knowledge about the interactions of all the various functions and activities making up an enterprise. In order to accumulate and provide all data required for special managerial decision situations, they had to become well versed with the capabilities of the electronic data hardware and to familiarize themselves with a computer language to be able to extract data for sudden needs.

Even the sacred auditing functions of the public accountants were affected by these new developments. In the past the accounting data to be audited was contained in various ledgers and was easily accessible; now it is stored invisibly in some part of an electronic brain. To carry out audit engagements effectively under the new automated conditions, the traditional audit trails of the past had to be modified to the new circumstances. The auditor had to acquire a basic understanding of the workings of the electronic data accumulation hardware, the procedural steps performed by it, and the automatic control devices incorporated in it.

The concept of auditing "through" the computer (instead of around it as in the past) is coming to the fore. With the excellent tests and controls that can be incorporated within a well-designed computerized information pro-

cessing system, external evidence is continuously decreasing in importance. Of course, we are still far away from a complete switch in emphasis from external evidence to mere contemplation of the machinations of computerized information systems. Auditors still need some opportunity to gain contact with reality, but the sampling of external evidence is becoming more and more only a tool to confirm the effectiveness of the information system rather than a means to verify directly the fairness of the individual account balances.

### ***The Impact of Operations Research***

Another challenge posed to accountants by advances in the scientific management movement is caused by management's increasing use of quantitative analysis techniques originally developed in fields such as science, engineering, and economics. These new techniques and approaches, commonly summarized under the heading of operations research or quantitative methods, have proven quite useful already. The clear analytical thinking that underlies them is beginning to show its influence upon managerial attitudes at large and does cast, as a sort of intangible bonus, new light on the general processes and problems of management itself.

To define operations research one could say that it is a set of mathematical and statistical techniques which make it possible for the first time in history to approach complex management problems on an objective basis by replacing intuition and subjective judgment with scientific methods, thereby minimizing the risk of being wrong.

They do this by a rigorous search for, and a more precise definition of, the central problems or issues, the clear identification of the specific relevant factors, and by a description of all the major relationships of the particular situation in form of a model. Those models (after they are tested for validity) then provide a conceptual representation of the realities and make possible manipulation or simulation so that the cause and effect relationships can be studied and the results of alternative actions can be measured in advance.

A further advantage of operations research is that it focuses attention on the whole system and not just its subsegments by considering the

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**"The presumption that an entity should not change an accounting principle may be overcome only if the enterprise justifies the use of an alternative acceptable accounting principle on the basis that it is preferable."**

**Opinion Number 20, "Accounting Changes,"  
Accounting Principles Board of AICPA**

interdependence of all variables incorporated in the model. It brings all the appropriate disciplines of science, whether they be mathematics, statistics, economics, behavioral science, systems concepts, or computers, to bear on each problem.

It is, therefore, no surprise that we see increased application of such techniques as linear programming, sampling, probability theory, regression analysis and other statistical methods, project evaluation and review technique (PERT) and critical path scheduling, exponential smoothing in forecasting, mathematical simulation, and a host of other techniques that would have been viewed by management as very esoteric only a few years ago.

Some of these techniques such as economic lot size and economic order formulae as well as break-even analyses have been applied in business for many years, although only in very rudimentary form. Others only gained prominence recently. Their application is now increasing as they come into the hands of practical people, such as managers and accountants with an understanding of the business complexities and a recognition of the limitations imposed on the techniques when applied to business situations. Those people realize what operations research specialists frequently forget, that the business is not a laboratory situation, that the economic environment cannot be excluded or controlled at will, that measurements are rarely precise, and that some elements cannot be measured at all but must be carefully estimated. They also realize that historical data are spotty, that time factors are likely to be critical, and that unpredictable problems with people may develop.

Despite those limitations, however, it has been established that a more scientific approach to complex managerial problems, a higher degree of quantification, and the establishment of mathematical relationships among variables do produce valuable results. Even if operations research does not provide (as advocated at the outset) absolute certain answers to all problems, it does provide a reduction in the areas of uncertainty so that management judgment can be more effectively applied, with a greater probability of being right a greater percentage of time.

For many years the management accountant had played the preeminent role in supplying information to management for the purpose of planning, controlling, and decision making. When operations research techniques suddenly became prominent in the early sixties, some members of the accounting discipline felt that their attention-directing and problem-solving functions were threatened by this new breed

of information specialists, the operations researchers.

To avoid such takeover, they advocated the expansion of the scope of accounting to include the new mathematical and statistical techniques, since the data provided by them really represents refined measurements of similar data already provided by accountants for management.

They felt "that if the administration process of decision making turns to areas of management science, it is evident that accounting must expand its scope to include operations research, cybernetics, simulation, and related methods, if it is not to be absorbed by the broader functions of business measurement."<sup>2</sup> They concluded that the controller or the director of the management information system ". . . , as the manager closest to the information and the one responsible for its validity, has the responsibility for using these latest modern tools of decision making to make the task of decision making as easy and clear-cut as possible."<sup>3</sup>

Others felt that to assume complete responsibility of the operations research techniques would create a challenge far too great to accept because the accountant would need to be not only a competent accountant but also a mathematician, a statistician, a physicist, an engineer, a data processor, etc. This is why the team approach to operations research is so essential and why its success depends upon the harmonious working relationship of men with different educational backgrounds.

Nearly a decade later, the role of the accountant in operations research is quite clearly emerging now. The accountant has become not only increasingly knowledgeable in quantitative techniques, but it has become more and more obvious that he has potential usefulness as a full fledged member of the operations research team. As a result of his intimate knowledge of the entire firm, the accountant has proven especially useful in the verbal model building process. His value at the data collection stage has been gratefully attested by people outside of the accounting profession. Since the models frequently require data not previously processed by the information system, modifications in the scope of data accumulation are required. Accountants have to revise their system for reporting performance

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<sup>2</sup>Norton M. Bedford, "Emerging Tools for Managerial Accounting," *NAA Bulletin* (October 1961), p. 33.

<sup>3</sup>Robert B. Sweeney, "Business Use of Linear Programming," *Management Accounting* (September 1965), p. 39.

**"But, surely, something is out of kilter if practitioners are required to do what educators can do far better—to develop a basic understanding of the discipline of professional accounting and its function in society."**

**Marshall S. Armstrong**  
President, AICPA

to be consistent with the model that was used to make the decision in the first place.

The third area of substantial usefulness for the accountant is in solution control. Because of his position within the firm, he can detect deviations of actual relationships from those assumed in the construction of the model. His familiarity with most aspects of the business, as well as with the information system, puts him in a unique position to discover and to identify problems which might be solved effectively by operations research techniques, although this, of course, is not totally his obligation.

Summarizing, one may say that the accountant is more and more becoming an essential member of the operations research group. His role consists of recognizing possible applications and identifying the relevant variables and their relationship—in other words, building the verbal model. It is also his responsibility to modify or to design the information system in such a way that it will provide relevant and reliable data for the model. He *should* actively participate at the actual construction and implementation stage in order to add the needed practical element to the operations research team.

### ***Recognition of Behavioral Aspects***

As if all the previously discussed evolutions were not enough to handle, we are witnessing at the present the emergence of another new dimension in our discipline, namely, behavioral accounting. It is only recently that accountants became aware of the behavioral structure within which they function and fully realized that accounting figures are both a cause and an effect of human behavior. Accountants are becoming aware that they can deliberately design their systems so as to influence employee motivation, morale, and productivity. They are acknowledging for the first time that their responsibility extends beyond the simple measurement and data aggregation to include the perception and use of their information by someone else.

The new emerging subdiscipline, behavioral accounting, considers the impact of the process of measuring and reporting on people, which is a dramatic addition to the strictly technical problem of carrying out those processes which were the traditional functions of accounting.

Behavioral accounting feels that "in accepting his responsibilities the accountant must become involved and concerned with questions such as what and how to measure and to report, how these measuring tasks should be implemented, for whom he is creating the information, and, in many cases, why the users will be concerned with the results of his efforts."<sup>4</sup> Behavioral accounting even goes further by asking "what effects the accounting process has upon individual and collective behavior and how these effects can be altered by changes in the systematic manner in which accounting is carried out."<sup>5</sup> It is also concerned with how the processes and reports of accounting can be used to help individuals and organizations to attain the goals that they have set for themselves or which have been determined by the environment in which they operate.

The behavioral movement in accounting clearly has a great deal of impetus as judged by the output of recent articles. But what is it and how do the articles relate to one another or to behavioral research in general?

The research studies recently completed and in progress are quite diverse, but they can be grouped into three separate classifications. The first group deals with the developments in the nonaccounting oriented behavioral sciences. They draw general conclusions as to the usefulness of certain concepts and theories and their possible implications for accounting principles and practices. The second type of studies attempts to examine the effects of accounting on people's behavior, particularly as they make decisions. And finally, the third group experiments with knowledge from the behavioral sciences by applying it to organizational design and the construction of accounting systems, with the overall goal of improving their effectiveness and efficiency since they rely largely upon people and their judgment.

Practically all of the behavioral studies so far have one important feature in common; they are published in academic journals. Today the impetus in behavioral accounting comes chiefly from the academic branch of the profession, and the research findings have

<sup>4</sup>William J. Bruns, Jr. and Don D. Coter, *Accounting and its Behavioral Implications*, McGraw-Hill Co., 1969, p. 3.

<sup>5</sup>Op. cit.

not yet (to any noteworthy extent) been translated into management action.

However, the studies have produced quite interesting results and insights into the ways and causes of human behavior, which will definitely have considerable impact on accounting theories and practices in the very near future.

Budgeting and profit planning are areas in which the human factors are more important than the strict accounting techniques. It is now quite clearly understood that the success of any planning system depends finally upon its acceptance by the employees who are affected by the goals set therein. Ideally, the attitudes should be sympathetic, cooperative, and cost-conscious. But because budgets place individuals under the spotlight, the natural reaction to the restrictions, criticism, and control imposed by them is resistance and self-defense. Too many department heads and foremen think that budgets represent a penny-pinching, negative brand of managerial pressure. To them the word budget frequently is as popular as layoff, strike, or pay decrease. To make a budget work, the employees must be carefully educated to understand and to accept the role of budgets as positive vehicles for organizational improvement and not as heinous means of squeezing the last drop of sweat out of employees. They must learn to look at budgets or profit plans as systematic tools for establishing standards of performance, for providing motivation, for gauging results, and for helping management and the company as a whole to advance toward the objectives set for the benefit of all concerned.

Without a thoroughly educated and cooperative management and labor force, budgets and profit plans (no matter how sophisticated they may be technically) are only a drain on company funds and a hindrance rather than a help to efficiency in operations.

Research meanwhile has clearly established that "high budgets" (those which can be attained only rarely or not at all) will lower the aspiration levels and the motivation of employees in the long run. Such budgets often cause the workers to feel even further separated from management and they arouse the feeling of fear, resentment, or hostility.<sup>6</sup> A typical reaction is that the budget will be increased if it is met in the current period—so why try to meet it? Such high budgets are obviously imposed ones—handed down as orders by top-management without giving

lower- and middle-management, or the employees, a chance to participate in the preparation process.

Some authors, on the basis of current research, have found a clear correlation between employee participation in the budget preparation and increases in group cohesiveness and goal acceptance. But it was also found that when participation is allowed it cannot be a hypocritical attempt at pacification or the results on employee morale and motivation will be even worse than the nonparticipation approach would have produced.

Another area which has direct effect upon employee behavior is performance measurement and feedback. Management, as current investigations disclosed, is learning that all too often big gaps exist between good intentions and desired results. What management perceived as fair and optimal for its employees in general was not so considered by those employees. Such a reaction may lead to widespread discouragement, cynicism, and alienation.

At present one researcher found single, multiple, and composite criteria techniques in use in performance measurement.<sup>7</sup> Accounting, as we are all aware, normally provides only single measurement criteria, such as either rates of return or more or less static cost standards. It really comes as no surprise that any single criterion technique is usually seriously inadequate because it induces the people controlled by it to concentrate solely on one facet and to ignore all other criteria or company goals.

Multiple criteria performance measurement techniques do realize that the firm has more than one goal. The third method in use, the composite criteria technique, goes even further by recognizing that some goals are more important to the overall well-being of the organization than others. Therefore, it places numerical ratings or different weights on each of the multiple criteria when using them for measurement. But research has shown that, regardless which of the techniques is used, there is a likelihood of undesirable results since human nature almost dictates that people will focus on certain goals (normally their pet goals) to the exclusion and the detriment of others.

Interesting discoveries have also been made as to the correlation of employee attitudes and

<sup>7</sup>V. F. Ridgeway, "Disfunctional Consequences of Performance Measurements" in *Information for Decision Making*, pp. 3, 5.

<sup>6</sup>George J. Beuston, "The Role of the Firm's Accounting System for Motivation" in *Information for Decision Making*, edited by Alfred Rappaport, Prentice-Hall, 1970, p. 371.

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purposes since the deductibility is then considered a problem of financial accounting for tax expense, not depreciation expense.

Illustrated by a series of tables, a method is developed for normalizing, or smoothing, income for successive years by proportional allocation of permanent depreciation differences. The author deems this advisable "as long as the underlying reality is not obscured" since fluctuations in post-tax income tend to deceive both market analysis and trend projectors.

Constance T. Barcelona  
The Camargo Club (Cincinnati)

"*The Dark Side of Decision Making*", Robert C. Ferber, *Management Review*, Vol. 60, No. 3, March 1971.

Mr. Ferber, president of a New York management consulting firm, states "Given that an executive can get the facts when he needs them, certain qualities ensure his good decision-making ability." These qualities are competence, openmindedness, and luck. Mr. Ferber further states "Conversely, an executive turns to the dark side of decision making if he is incompetent, closeminded, and unlucky." Another quality influencing an executive's deci-

sions is his subconscious—some prefer to call it unconscious—decision making.

Sometimes executives who normally think clearly use rationalization to implement their subconscious decisions. In Ferber's words, "Organizations are temporarily hobbled by limitations of know-how and information flow, but they can be permanently crippled if powerful executives continually make rationalized decisions for too long."

Mr. Ferber suggests remedies including internal checkpoints, external checkpoints, and audits of subconscious decision making. Internal checkpoints include psychotherapy, self perception, and sensitivity training. External checkpoints include superiors and peers. The author recommends that each business make a continuing audit of important decisions with unfortunate results to determine the extent to which the decision was made subconsciously. Although he admits the suggestion for a decision audit may seem Orwellian, he believes that subconscious bad decisions are prevalent in human organization and that in many cases the effective operation of such an audit could spell the difference between success and failure.

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quality of performance with respect to frequency of performance feedback received by employees.<sup>8</sup> It was found that more frequent performance feedback results in significantly higher attitudes and performance ratings, which would indicate that it is imperative that employees are informed as soon as possible whether they are succeeding or failing.

Another area plagued with drastic behavioral complications is the interpretation of the previously discussed decision models, since they are based on the assumption that the users are economic people, which is not necessarily true.

Because all accounting information is aimed at internal and external users, hardly any major accounting issue can be resolved without making some assumptions about behavior.

Although so far all the findings in behavioral accounting are uncoordinated and several more

years will pass until general principles and concepts—or a conceptual framework with broad applicability—will be developed, one can already foresee the far reaching impact this new subdiscipline will have and the fundamental reorientation in accounting concepts, procedures, and systems it will cause.

### Conclusion

In an attempt to answer the questions posed at the outset, it is obvious that accounting presently is in a stage of evolution never before experienced, either in degree or in scope. Not one, but three major new dimensions are emerging, each one of dramatic impact. The integration process of these new disciplines is still far from conclusion since the new dimensions themselves are not yet finally crystallized.

One thing, however, can be said—we are at the threshold of unparalleled gains in the effectiveness of our discipline. Its future will be as bright as ever, since the people practicing it have proven that they are capable of responding to the new demands and the drastic changes resulting therefrom. They have demonstrated that they are willing to pay the price for living in a dynamic, fast-changing world, in a world in which nothing is static.

<sup>8</sup>Doris M. Cook, "The Effect of Frequency of Feedback on Attitudes and Performance" in *Accounting and its Behavioral Implications*, p. 233.