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THE EVOLUTION OF TOP MANAGEMENT:
A FORECAST *

by
William H. Gruber

November 1967

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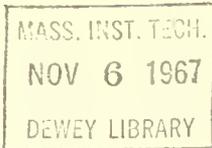


Preliminary Draft
For Comment

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A FORECAST *

by

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ABSTRACT

Examines the relationship between top corporate management and the behavioral science and systems analysis staffs. The low contribution of these staff functions to corporate performance is explained by three factors:

- (1) the failure of top management to recognize the value of these functional areas;
- (2) the training of the professionals who staff these functions; and
- (3) the location of these functions in the corporate structure.

Corrective actions that will provide for a better utilization of the new tools available to top management are suggested, and a model of a firm is developed that indicates the nature of the contribution that might be expected from the behavior science-systems analysis staffs.

THE EVOLUTION OF TOP MANAGEMENT: A FORECAST*

During the last decade there has been a significant increase in the resources available to high-level managers. New techniques and better trained professional personnel have become available to assist executives in achieving the objectives of their companies. Studies of the utilization of the new managerial resources have begun to appear, such as The Impact of Computers on Management (Myers, 1967) and Computer Simulation of Competitive Market Response. (Amstutz, 1967). The increase in the supply of econometricians, operations researchers and psychologists and in the greater quantity and improved quality of graduates from schools of business has provided top managers with a new kind of assistance that is of only very recent origin.

Competitive pressure has increased, however, as a result of (1) these new tools available to managers, (2) the increase in foreign

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competition (Quinn, 1966) and (3) the greater competition between materials as reported recently by the President's Council of Economic Advisors (1965). The pressure for managerial effectiveness has been further increased by the actions of the United States government to hold down prices (Burns, 1965) as well as to direct the attention of executives to a "public interest" that may, at least in the short run, have an adverse effect upon a company's performance (as when the government sets safety standards that are not in popular demand).

Thus, we have a set of forces that make it necessary for top managers to improve their performance, and we have a set of new tools to help them to manage more effectively.

One might expect that the availability of these new tools would have significantly altered the manner in which top executives make decisions and manage their operations. There appears to have been only a negligible change to date, and in this paper the evolution of top management toward a closer working relationship with their professional staffs will be suggested as the direction that needs to be taken in order to bring into actuality the potential in the new tools that have been developed to improve the effectiveness of top executives. These new tools exist in the training and abilities of the professional staffs that have increased in size in many corporations.

The reasons for the small contribution to top management from the staffs of psychologists, economists, and operations researchers that have been added to the overhead expenses of corporations will be analyzed in this paper. The effective utilization by top management of the new staff capabilities that are today available will then be forecast as the future experience to be expected by top managers.

The Training and Work of Professional Staffs in Corporations

The work of management scientists (psychologists, sociologists, economists, operations researchers) in corporations is a relatively new phenomenon. In the area of organization research social scientists have been engaged in attempts to improve performance of the people (white-collar and blue-collar; high-level and low-level) working in a corporation. Some examples of this kind of work are attitude surveys, managerial appraisal and development, research on the relationship between worker satisfaction and productivity, and organizational development work. By definition the focus of the organization research staff involves the company employees.

Economists and operations researchers, through the use of systems analysis, attempt to provide the information needed for corporate decisions. "Systems analysis" is a staff activity of even

more recent origin than "organization research" -- so recent that this functional staff group does not now exist in many corporations. Ford is one corporation that does have an effective systems analysis capability. The work of this group is described as the "continuous evaluation of Ford's costs, prices and profits, long-term planning for major capital investments and the far-out world of mathematical simulation" (Heinemann, 1967, p. E-13). It is interesting to note that the systems analysis group at Ford is part of the financial staff, while the organization research staff is usually associated with the personnel or labor relations staff functions.

The interaction between the organization research and the systems analysis staff may be a major reason why the contribution to top management of these two staff groups has been retarded. We have one set of scientists who work with people (attitude perception surveys, etc.) and another set of scientists who work with economic data (sales, profits, rates of return, etc.). Though the ultimate purpose of trying to understand the data on people is to improve the economic functioning of the corporation, those who work with the human factor have almost completely neglected the economic and financial consequences of their findings.* And the scientists who measure

*The reader who doubts this observation is invited to attempt a frequency count of articles written by organization researchers who present empirical evidence relating attitudes, laboratory training and the other interests of their trade with measures of economic performance such as change in profits or rate of return on investment. David McClelland (1966) has acutely analyzed the propensity of professionals trained with one focus to contribute in terms of that focus, and to neglect a problem that requires another perspective that is not in harmony with their professional training or values.

the economic output of the system have an inadequate understanding of the human input that generates the economic output. This situation, which shows a grave lack of communication between the two groups, both of which should perform functions vital to the welfare of a corporation but neither of which can see more than half the picture, has reduced the contribution that these two staff groups can make to the work of high-level corporate management. This disparity between the actual and potential contribution of the new professional staffs within corporations is too serious to continue indefinitely. The development within corporations of an organization research-system analysis function, merging the two groups, is the result forecast in this paper.

Cooperation and Coordination

Mason Haire (1964, p. 3) has tried to answer the question, "Why have the social sciences contributed so little to the practice of management?" He has suggested that too little developmental research based upon the recognized needs of corporate management is performed. Corporations have not created the internal mechanisms for the self analysis that would lead to the improvement of management. Resources are lacking for the collection and evaluation of critical systems information and the development of procedures for the testing and diffusion of managerial innovations.

The implementation of the proposal that the organization research-systems analysis efforts be merged into one functional unit with a close working relationship with top management will be an attempt to create more of this developmental research on the management of corporations.

The proposed merger will:

- (1) Facilitate the necessary shift of interest of traditionally trained social scientists away from their professional disciplines and toward the problems of management.
- (2) Provide a means of identifying the problems that require the attention of social scientists, and permit a more rational allocation of organization research-systems analysis resources.
- (3) Integrate the research findings of the various specializations in organization research by using models that link the research findings, thus better enabling the efforts of organization research to be applied to management practice.
- (4) Increase the communication between men who understand the human resources in an operation (the organization research people) and the men

who know how to keep score with the financial information of operations (the systems analysts).

- (5) Provide a staff capability that has enough potential contribution to managerial performance to warrant the attention of top management.

Nelson (1959) and Schmookler (1966) have found that need and some facilitating factor are often present when a technological innovation occurs. An examination of the needs for an organization research-systems analysis capability and the factors that facilitate the development of this capability now follows.

The need is a result of six forces: (1) the size of firms; (2) the speed of economic and technological change; (3) the increasing complexity of operations; (4) the higher level of performance required to survive under modern competitive conditions; (5) the utilization of decentralized operations and the consequent gap between top managers and lower level managers; (6) the change in the nature of costs from those readily programmable to those that do not vary directly with volume and require that employees have relatively greater freedom of action.

The factors which aid in facilitating the development of this systems capability, and in a sense back up the needs, are as follows: (1) the availability of large computers to cope with the data requirements; (2) the generation of much of the information required

for other purposes (cost control, etc.); (3) the increased availability of social scientists due to the graduation of more Ph.D.'s (4) the new quantitative training that is now received by social scientists and management students; (5) the increasing proportion of upper level managers with quantitative skills; (6) the spillover potential from successful subsystems efforts (especially in marketing distribution and production); and (7) the increased use in corporations of procedures such as long-range planning which increase the likelihood that managements will decide to commit funds for long-range organization research-systems analysis activity.

The Organization Research - Systems Analysis Relationship:
A Definition

Whenever anyone uses the word "systems" today, he must be prepared to define terms, because a wide range of meanings has been used in connection with the word. The definition which we use is not a generally accepted one, because there is probably no definition available that is inclusive enough to contain all the meanings that are used. Ours is a functional definition of the systems perspective, which we propose to be the natural center for the work of organization research.

Assume that there are people in a box. They produce output, and they are motivated by rewards, punishments, instructions and standards. This idea is presented in Figure 1, and is a first

A SIMPLE INFORMATION INPUT-OUTPUT SYSTEMS MODEL OF AN ORGANIZATION

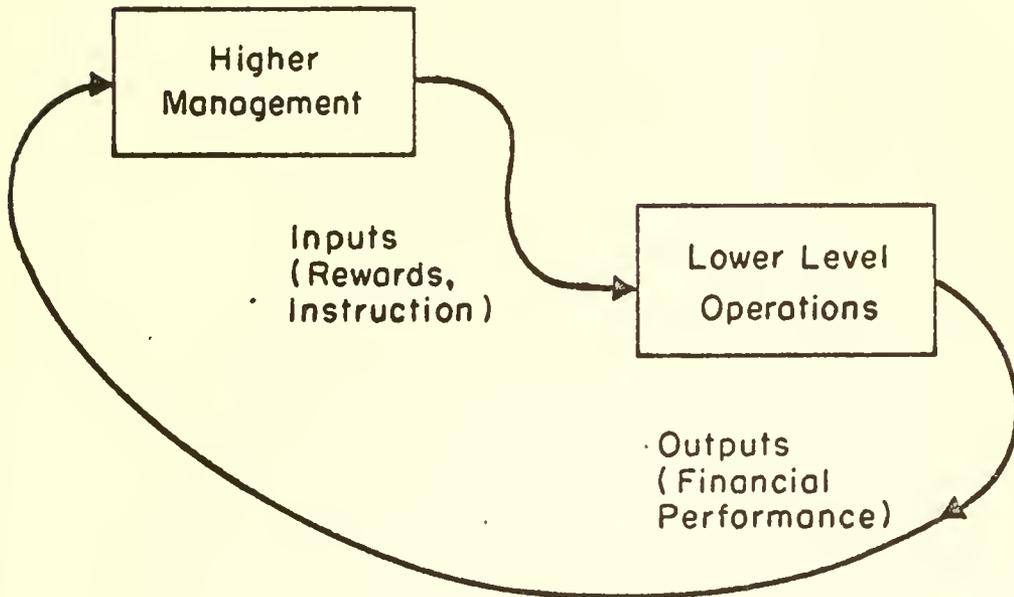


Figure 1

approximation to what we call the systems approach to organization research. This is a simple system with one output, information inputs from top management, some unseen actors, and a feedback loop to top management. This is a first approximation to the model which will be expanded later, and it is used here to develop an awareness of what we mean by a system.

It is useful to integrate the organization research and systems information components of the model because this is the critical link, and it is of primary interest. Note that there is information going into the box in the form of rewards and instructions. There are systems information and psychological components of each of these flows of information. The information is somehow processed within the box, and the output which appears also has systems information and psychological content. By definition, a system has, as we show here, interrelationships and a feedback mechanism.*

* "Systems watching" is a game with marvelous entertainment potential and those of us who play this game are often surprised at the blindness of those in power who seem not to understand the system. An interesting example of a situation which may fool the untrained observer is the fact that a poorly functioning system may appear not to have a feedback mechanism. But this does not mean that a feedback system is not present. The people who are taking advantage of the fact that there is no feedback system to top management are receiving feedback. Feedback to top management may come in a discontinuous manner that is sometimes called a crisis. The quality of the feedback system is perhaps one of the most useful tests of the efficiency of an operational system.

Systems are hierarchical in nature. It is possible to conceive of the flow of information and the organizational effects of actions by top managers as taking place along a series of action nodes, as seen in Figure 2. One of the major contributions of organization research--systems analysis in a corporation is to break the pattern shown in Figure 2 in order to give top management contact with lower levels of activity. Thus some of the distortions inherent in this kind of filtering process might be eliminated.

From this background information we may outline the stages of a systems approach:

- (1) Identify the organization to be studied (establish boundary conditions).
- (2) Determine the goals of this organization.
- (3) Seek key activities that occur in the effort to fulfill the organizational goals.
- (4) Examine the activity for sets of relationships and patterns of behavior or action.
- (5) Begin simulation or other forms of modelling at this stage.

Once steps 1-4 have been completed, it is possible to begin work on the organization research and information systems analysis that may lead to improved organizational performance. A major advantage of a systems perspective is that it leads to an analysis of

A SIMPLE INFORMATION FLOW SYSTEMS MODEL
WITH HIERARCHICAL RELATIONSHIPS

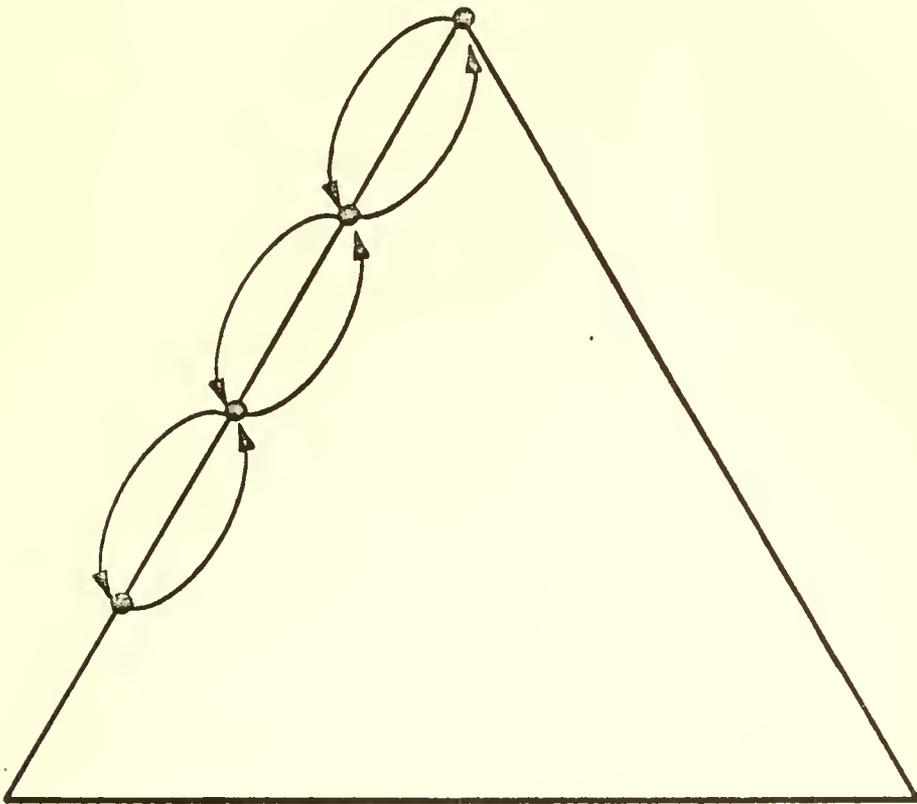


Figure 2

the total organization; and a view of the total system permits an evaluation which can provide for the best allocation of resources for the organization research-systems analysis effort.

The Involvement of Top Management

Managerial style and the organizational tone are set by the top management of a corporation. Since it is this group which sets goals, evaluates progress, and applies pressure or gives rewards in a corporation, it is vital that the higher levels of management be closely involved with the new organization research-systems analysis group.

- (1) Progress toward better corporate management begins at the top.
- (2) The contributions made to the fulfillment of corporation goals by investment in the organization research-systems analysis activity is a function of the level of management affected.
- (3) Many of the findings or procedures developed for top management will be applicable to lower level management.
- (4) Findings first developed with the participation of top management are more readily diffused throughout the corporation.

Some schools of organization research have developed the idea that when lower level people participate together with their superiors in decision-making that involves their work, they become involved and their contribution to corporate goals is increased (e.g., the "theory Y" approach of Douglas McGregor, 1960). In our case, participation of top management is necessary in order to improve the performance of top management. And the work of lower level people will also be improved as a direct result of the improved performance of top management: our concern is to increase the effectiveness of the personnel in the whole corporation, including those who control it.

The proposition that top management should recognize the value of the organization research - systems analysis function and participate actively in its activities is based upon the hypothesis that such involvement is necessary for the realization of the potential contribution that this effort can make to the management of a corporation.

The basis for this proposition should become evident when we examine (1) the functions of top management and (2) the need for better veridical perception by top management, a need that the organization research - systems analysis effort can help to meet.

1. The Functions of Top Management

If a systems focus must begin at the level of top management, it is necessary to specify the inputs from this source. Although the nature of the contribution that top management makes to a corporation is very complex and subject to investigation, we will use the following list as a first approximation.

- (1) Selection of corporate goals (e.g., rate of growth in profits and sales).
- (2) Implementation of some of the corporate goals through personal actions (e.g., negotiation of acquisitions).
- (3) Action on critical decisions (e.g., corporate debt policy, consideration of major innovations in marketing or product development).
- (4) Attempts to attain good performance from lower levels in the corporation.

One way of viewing the function of top management is shown in Figure 3. At any given point in time top management faces an environment that offers opportunities (e.g., markets) and constraints (e.g., competition). Top management has a set of resources at its command which, based upon environment and resources, sets high level corporate goals and strategies.* It is impossible

*This is somewhat too rational and does not consider the values of top management which vary between the managements of companies and even within the top management groups in a given company. It is therefore necessary to take the personal values of top management as an input.

THE POSITION OF TOP MANAGEMENT LINKING
THE RESOURCES OF A FIRM TO THE
EXTERNAL (TO THE FIRM) ENVIRONMENT

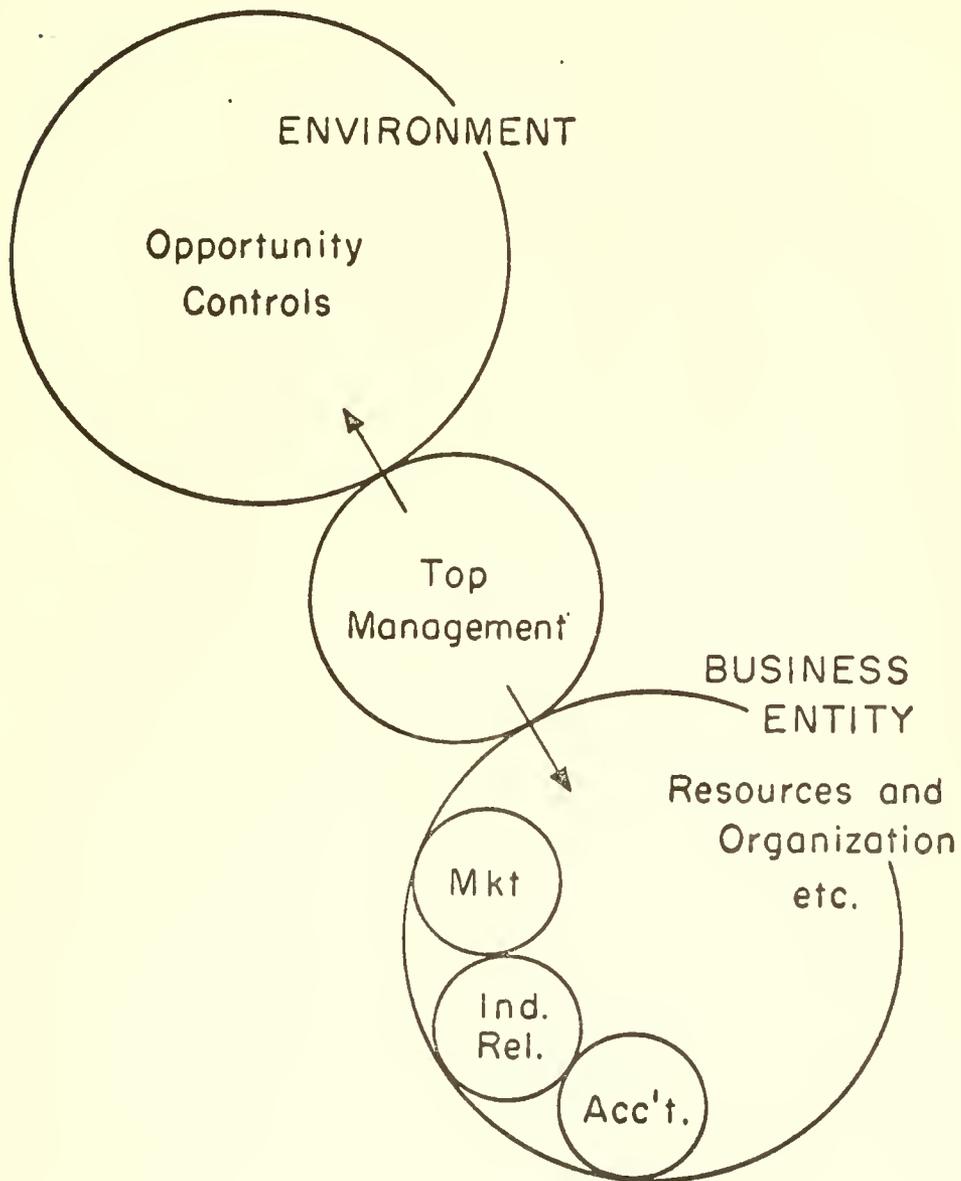


Figure 3

for the organization research - systems analysis group to work on a model for the fulfillment of the corporate goals unless these goals have been defined. Tradeoffs between goals, the willingness to accept risk or to increase pressure on subordinates are examples of the inputs that must be specified through the participation of top management.

The work of the organization research - systems analysis group will only begin at the top management level; much effort (in terms of units of research input) will also take place at lower levels in the organization. A corporation of any size is not one system, but a set of subsystems that are often only remotely related. The whole process of decentralization and the development of profit centers is an attempt to factor down a total system into relatively independent subsystems.* Then the subsystem (e.g., an operating division) is again factored down into a set of more related subsystems. Each major subsystem has an interface relationship with top management, and with the rest of the corporation. A subsystem has its own top-management -- thus it and the total corporation may be examined in like manner. This situation is presented in Figure 4.

*The trend toward decentralization has resulted in operating divisions that are large enough in size to justify calling the presidents or operating managers of such divisions "top management."

THE POSITION OF GROUP TOP MANAGEMENT LINKING
THE RESOURCES OF THE GROUP TO (1) THE EXTERNAL
ENVIRONMENT (TO THE FIRM) AND (2) TO THE INNER
ENVIRONMENT PROVIDED BY THE LARGER
ORGANIZATION TO WHICH THE GROUP IS A PART

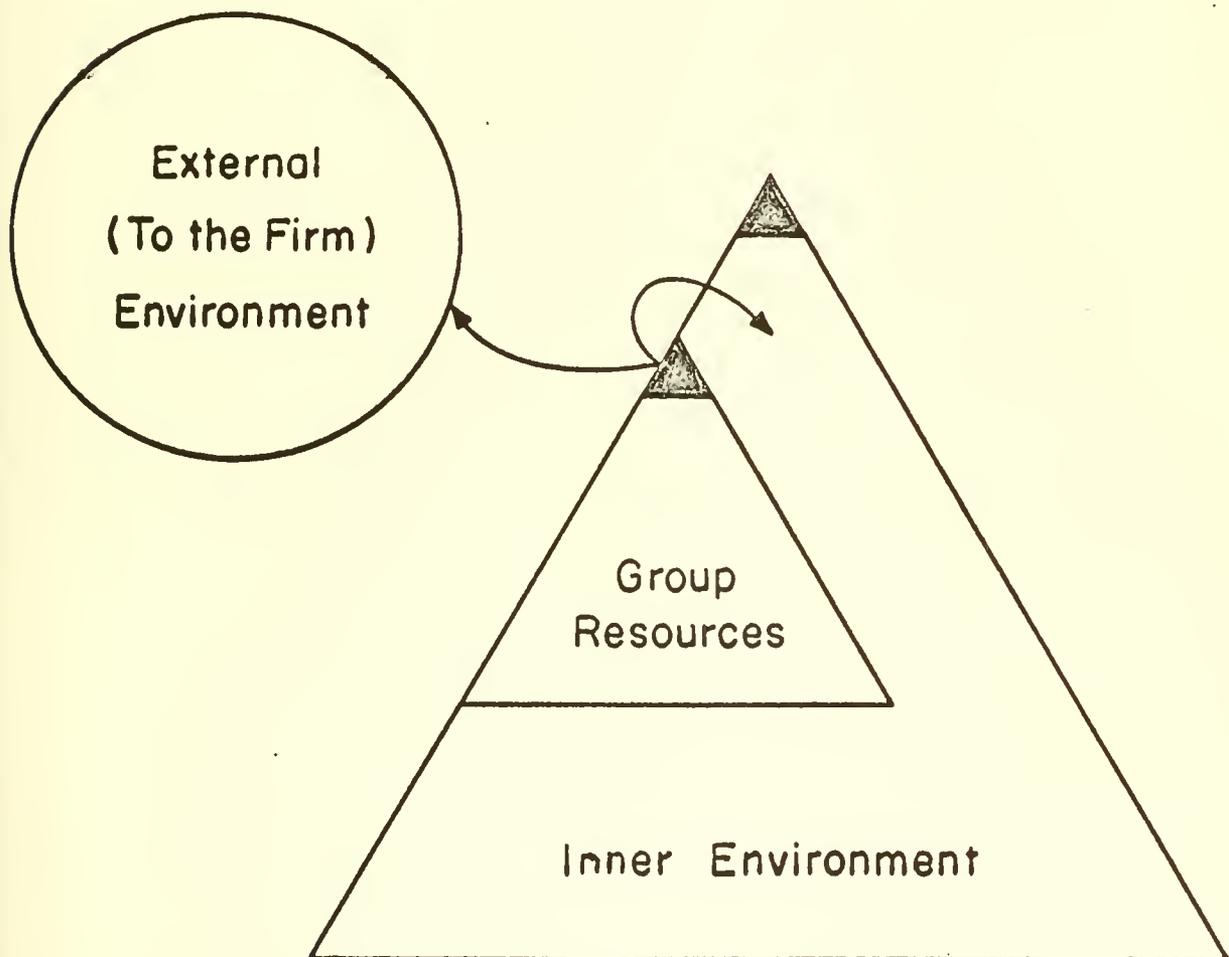


Figure 4

The position of a division top management may be represented by an input-output model like the one that was presented in Figure 1. Much of the work of the organization research--systems analysis effort at the corporate level would be devoted to the evaluation of the division subsystems--total system relationship. The work of the organization research- systems analysis effort at the division level would be to evaluate the functioning of the division subsystems. Note, however, that considerable attention would also be devoted to the interface between the subsystem and the total system. The input of a set of rewards, punishments, standards, and instructions from corporate top management is of critical importance to the operations of a subsystem.

2. The Importance of Veridical Perception

Veridical perception is the accuracy with which (in this case) top management seeks and obtains information about its environment, its resources, and the functioning of its organization (Schrage, 1965). And information, as we can easily see, is the central element of systems analysis.

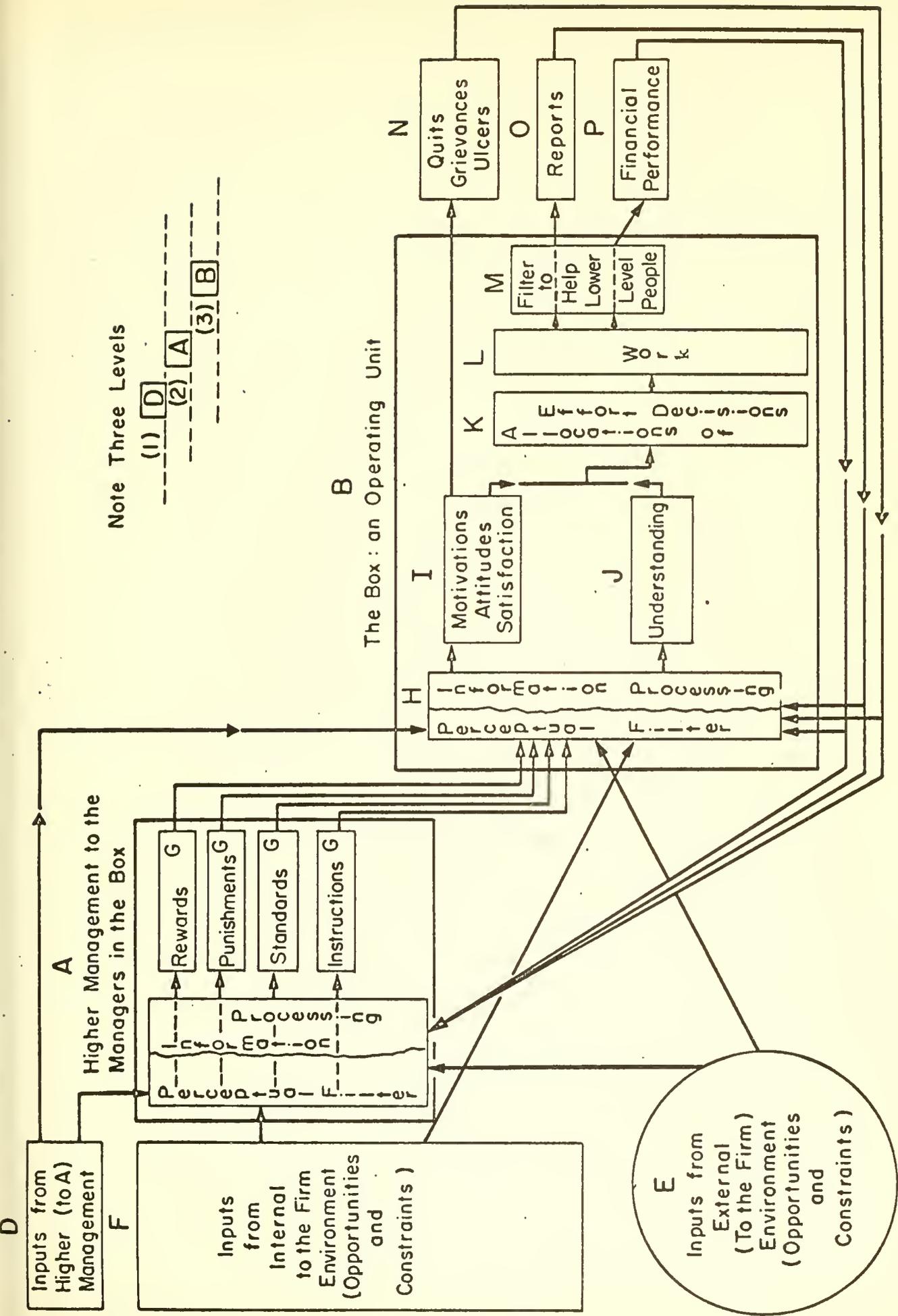
A major reason for the establishment of an organization research--systems analysis capability is to improve the veridical perception of top management. Since this is a major reason for the

existence of the organization research-systems analysis effort, it is difficult to conceive of success here without the active participation of top management.

The exercise of working on an organization research-systems analysis of a corporation is, itself, a valuable activity and is helpful in improving veridical perception. This idea was expressed by a top executive involved in a marketing simulation: "Even if there are significant errors in prediction, it is worth the expense because of the way it makes people think" (Amstutz and Claycamp, 1966, p. 45). The effect it has on the thinking of top management, the usefulness of a systems model for improved veridical perception, and the critical importance of information in this whole sphere of activity will be further emphasized with the presentation of a more complete model, which follows.

An Organization Research-Systems Analysis Model

There has been a recent increase in the efforts of systems analysts to build aggregate corporate models (Boyd, 1966). These models are less precise than lower structural level models, and their usefulness is at the present time largely a result of the contribution that they make to the understanding of a system too complex to model by traditional means. The model presented in Figure 5 is at a very high level of aggregation. It is not a work-



Note Three Levels

- (1) **D**
- (2) **A**
- (3) **B**

B
The Box: an Operating Unit

Important Components of this Model were Developed by Donald G. Marquis

Figure 5

ing model. Its purpose is to establish relationships that should be studied and unknowns that should be solved for by means of research.

A description of the parts of this model now follows:

- A. Higher level management than the management located in the box.
- B. Managers and workers of an organization unit under the direct control of the higher level managers at A.
- C. The processing of information by higher level management as filtered by the perceptions of these managers. Information inputs, fed into the system at this processing point which are distorted to varying degrees by the filter and then processed, are received from:
 - D. Managers at a higher level than the higher level to box management at A (note three recognized levels of management in model D A B).
 - E. Information external to the firm (see Figure 4).
 - F. Information inputs from sources internal to the firm (see Figure 4) N.O.P. Outputs from the box (b) and reported to higher level management (a).
- G. Based upon information D, E, F, N, O, P, as processed at C, there result inputs from higher level management to the box (from A → B) of rewards, punishments, instructions and standards.

- H. The managers and workers in the box (B) receive the inputs (G) from their immediate managers and they also receive inputs from the managers (D) above the higher level managers (A); inputs from the external (to the firm) environment (E); and from the internal (to the firm) environment (F); and inputs from the performance that is produced in the box (N, O, P).
- I. As a result of the filtering and processing of information inputs (D, E, F, G, N, O, P) at H, the people in the box (B) develop motivational and satisfaction attitudes; and
- J. An understanding of what they are supposed to be doing, how well they have performed, the structure of rewards, punishments, opportunities, etc.
- K. The combination of motivation (I) and understanding (J) leads to the decision of how to allocate time and effort to the various activities for which they are responsible.
- L. This leads to the kinds of work and the quality and quantity of work accomplished.
- M. Rarely do people want their superiors to see their real output (L). A filter is located at M to indicate the natural distortion that results from attempts to make one's work look as good as possible.
- N,O,P. The system now produces three outputs: nonfinancial information such as quits, grievances and ulcers (N); reports to higher management (O); and financial performance (P).

It is important to recognize that this is an aggregate model and that there are many layers even within a box at level B. There are therefore boxes within boxes until the very top of the corporation is reached. The higher level managers (A) are not concerned with the box-within-box phenomenon, provided that the functioning of the subsystems does not adversely affect the measures of B's output as seen by A management. There are many relationships and information flows that are not specified in the model because of the focus on the $A \rightarrow B \rightarrow A \rightarrow B$ systems pattern. Some important information flows and interrelationships that have not been specified in Figure 5 are: (1) the performance from B that is measured by P has an information input into operating units of the firm as seen in F; (2) reports from F to higher managers at D about the performance input P; (3) information from the external environment E to higher management D that will affect the input from D to A; (4) an information loop to D from the outputs N, O, P of the operating unit in the box B should be indicated as some information leaps over the next level management A and reaches D.

Development Work on the Organization Research--Systems Analysis Model

We are now ready to examine the new organization research--systems analysis group whose function will be to do the developmental work on models such as the one presented in Figure 5. A first observation is that once a set of relationships, filters, perceptual barriers to understanding and communication, and the sources of inputs and outputs has been specified, it becomes possible to develop an integrated research program to study the functioning of the system. This kind of systems approach is adaptive, and the system will be altered as better managerial understanding is developed because of the research effort.

When the management at level A sits down with the manager of the organization research--systems function and studies this model, a list will be made to specify the relationships that are to be studied and the information that is to be gathered. The management at A will be forced to think about the expectations from operations B, and they will need to study the quality and usefulness of the feedback N, O, P.

What is the level of agreement between the output N, O, P and the rewards, punishments, standards, and instructions G? How accurately do the people in the box seem to understand these inputs from A? Do the men at A and the personnel in the box B have a similar understanding of the performance P/standard G ratio? How do any differences in this understanding affect the response of the operating personnel B to the rewards G/performance P ratio?

The findings described by Lawrence Ferguson (1966) may help to illustrate the nature of this development work. In a study of managerial career patterns, he found that out of a population of managers ranked by performance after five years of service, 83 per cent of the managers who ranked in the top 10 per cent had left the company by the end of twenty years of service while only 43 per cent of the managers ranked in the bottom 50 per cent had left the company. This is the kind of information that should be generated in order to develop the veridical perception needed by top management.

If Ferguson had been working with the close participation of top management on a long-range development program to complete the model specified in Figure 5, his finding could have been related to such other systems information as (1) the relationship between salary level and managerial performance; (2) the speed with which managers with high potential are recognized; (3) the reward structure for management development (i.e., does it pay managers to hide good men in order to keep them for their own operations, e.g., Alfred, 1967); and (4) the communication channel upward for new ideas and the degree of facility with which the organization is able to accept innovation. One would expect that Ferguson's finding would be relevant to all these other questions for which information should be available.

Just as there are now procedures for checking out physical systems, in time the art of improving the veridical perception of managers will become a science, and there will be a set of organization research—systems analysis programs for checking on the health of an organization. Some of these will be in real time or continuous; others will be in the form of an annual physical; and still others will be ad hoc problem-solving procedures designed to cope with specific situations.

The model which we have just described is one which can be seen to improve over time. The improvement occurs because of the learning curve produced when feedback from the work of the organization research—systems analysis effort is utilized. Each stage of work in the development of a systems understanding of an organization leads to the next stage of analysis.

Just as a total system is factored into subsystems for analysis, the development work done by the organization research—systems analysis group will likewise be factored into stages of effort and fields of specialization. The systems perspective first permits this factoring of activity to be divided into manageable units, and then allows for the accumulation and integration of the research findings that result from this development work. The activity of the organization research—systems analysis group will take place more at the development level, once our suggested proposals have been implemented.

Diffusion of Findings

In production, product development and marketing, firms are often aware of what other firms are doing, and there have been any number of imitation studies (Mansfield, 1963a, 1963b). If an improved technique is introduced in one company, it is possible to calculate the loss of competitive position that would result if it were not introduced by other companies, and the acceptance of the new technique usually follows. The recent studies of the lag by U. S. steel firms in introducing the basic oxygen furnace are examples of this kind of analysis (Adams and Dirlam, 1966). This diffusion of more efficient techniques, and the calculation of the financial returns which occur as a result of such innovations, are activities vital to any organizations -- but there has been a surprising absence of this kind of study in the field of organization research.

There now exist, in the literature of organization research and systems analysis, many research findings that have been very poorly diffused. How many firms have applied the methodology suggested by Ferguson (1966) to determine their success in keeping their good managers? What organizational procedure exists in most firms to integrate the findings of social scientists over time and to apply

these findings in managerial practice? A review of the literature uncovers all kinds of research findings. Vroom (1964), for example, gives a report of Bingham's work in 1932 in which it was discovered that there was a marked increase in performance when a measuring device was made available to keep visible score of the work of physical laborers. How many firms have tested such a finding and, if validated, how many have applied it in locations where similar work was involved? How many firms have used the findings of Meyer, Kay, and French (1965) and altered their performance appraisal procedures to achieve the increases in improvement reported in that study? How many of the firms that did alter their appraisal procedures as a result of the Meyer, Kay, and French findings also utilized control groups and other methods of verifying through their own experience that the findings of the Meyer, Kay, and French study were generally applicable and not merely a set of findings resulting from errors not caught in the research methodology that was utilized?

David Sirota (1966) has reported the experience of an IBM plant where blue-collar productivity was raised through the utilization of a reward system based upon improvement over a workers' past performance instead of the more traditional use of engineering standards. His discussion of the contribution of blue-collar employees in methods improvement is very much in harmony with other findings

(Lesieur, 1958; McGregor, 1960). How many firms have developed a formal procedure for intracompany diffusion after a managerial innovation in one part of the firm has been made and found to be effective? How quickly will Sirota's findings on the success of one IBM plant be utilized in, say, the majority of IBM's operations? How many firms that do apply Sirota's findings also have a system of evaluation to assess the improvement resulting from the adoption of his recommendation?

Researchers in the field of technology (e.g., Mansfield, 1963b) report that innovation (the adoption of inventions) is more costly and involves greater risk than invention, and this is probably also true in the field of organization research. If this is the case, what procedures have been developed to protect a corporation from introducing the utilization of an imperfect invention from the field of organization research or systems analysis? Some of these questions have been raised by Ferguson (1964) and Haire (1964), but because a systems perspective capability has not been part of the organization research function, because organization research people do not attempt to develop measures of their contribution to the financial performance of corporations, because top managers have not participated in this work,* because the whole focus of organization research

*If this assertion were not accurate, more affirmative answers could have been given to the previous set of questions about the procedures for the implementation within corporations of organization research findings.

has been at too low a level within the corporation -- for these reasons the suggestions of Ferguson, Haire and others have gone largely unheeded. The set of forces and facilitating factors listed at the beginning of this paper will, however, bring about the practical implementation of this new organization research—systems analysis capacity, whose purpose, as we have seen, is to improve this situation by concentrating on the creation of an improvement process within the corporation.

Information, Understanding and the Education of Managers

There are now within some corporations two staff functions between which there tends to be little communication: the personnel or organization research staffs and the management information systems or systems analysis staffs. These two staff groups perform services that appear to be similar in some ways to the work of the organization research—systems analysis staffs that will eventually be developed.

But collecting and analyzing information and developing an understanding of a system will be only the first stages of the work of the organization research—systems analysis function. Successful systems development requires the cooperation of the managers involved in the operations that are being studied. An organization research—systems analysis effort is not a one short, quick look at a problem.*

*See A. G. Begeed-Dov, "Why Only a Few Researchers Manage" (1966) and D. R. Heany, TIMS (Institute for Management Science) Talking to Itself?" for examples of the problems resulting from the traditional training and relationships that professional management science people tend to have.

It is a continuing program that provides adaptive models that better reflect the actual operations as the models are tested and altered by actual experience.

The organization research—systems analysis function should be as involved with the education of management as it is with its work on the analysis of operations. The resulting improvement of operations will be the product of a cooperative effort; success, measured by progress toward specified organizational goals, will be a result of the ability of line management to work with the new professional staff organization research—systems analysis function.

As new managerial techniques are developed with increasing rapidity, the educational facet of the work of the organization research—systems analysis staff will be of great importance in the diffusion of new knowledge. The combination of an analysis function with an education responsibility should result in better communication between the managers and the organization research—systems analysis staff. The success of this new staff will depend as much on the ability to educate as it will on the ability to analyze and develop systems.

A commitment to understanding and improving the operations of a corporation or of an operating division is necessary to successfully utilize the organization research—systems analysis function. Corporate self-analysis on a continuing basis requires

that managers at all levels be willing to continue their education, to improve their managerial capabilities, and to increase their understanding of the operations for which they are responsible. The development of an organization research—systems analysis capability also creates the ability and commitment to measure and evaluate the progress of the operating divisions. And the present economy, with its rapid change and intense competition, requires precisely this commitment to improvement and attainment of rapid rates of progress.

Conclusion

Some companies have already begun to develop this organization research--systems analysis capability. The threat of competition from a rival who might develop the capability first will accelerate the speed with which progress is made. The diffusion of innovations in this field will also be facilitated as a result of competitive pressure.

All signs point in one direction -- toward the development within corporations of an organization research—systems analysis capability that is focused on high-level problems. This effort will have such recognized importance that top management will be directly involved in managing this capability. The implementation of the output of the organization research—systems analysis will be necessary for the fulfillment of corporate goals because of the level of competition that will be present.

The important question now is not whether these kinds of changes will occur, but rather which firms will lead the movement and take advantage of the edge that comes with good timing. Increasingly, such firms will be the ones cited as examples of well-managed corporations. Charnes and Cooper (1962) compared Thucydides' History of the Peloponnesian War and Eisenhower's Crusade in Europe and were able to find that there was little difference between observations on organizational practice and problems, despite the fact that nearly 2500 years separated the authors. Such is the rate of progress in management that the interval of an additional twenty-five to fifty years may make a greater difference in high-level managerial capability than did the previous 2500 years.

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