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TECHNICAL REPORT 26

MIDDLE MANAGERS' EXPECTATIONS OF THE FUTURE WORLD OF WORK: IMPLICATIONS FOR MANAGEMENT DEVELOPMENT

John A. Haas

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February, 1969

DISSERTATION

MIDDLE MANAGERS' EXPECTATIONS OF THE FUTURE WORLD OF WORK: IMPLICATIONS FOR MANAGEMENT DEVELOPMENT

by

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University of Pittsburgh

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ABSTRACT

MIDDLE MANAGERS' EXPECTATIONS
OF THE FUTURE WORLD OF WORK:
IMPLICATIONS FOR MANAGEMENT DEVELOPMENT

John A. Haas, Ph.D.
University of Pittsburgh, 1969

The future world of work has been the subject of considerable prognostication by scholars and businessmen, particularly recently. While these predictions differ widely, they unanimously augur a world vastly different from the present one. Today's middle manager, therefore, is faced with the very real danger of becoming obsolete--today's skills and knowledge will not enable him to effectively manage tomorrow's corporation.

The purposes of this study are: 1) to provide a means by which managers may assess the future world of work and to describe it by means of these assessments; 2) to compare present with past predictions of the same future point in time, in order to identify continuing and changing trends; and 3) to examine the effect an assessment of the future has on managers' subsequent plans for their own training and development.

Two instruments were developed to serve these purposes. The first, a World of Work Questionnaire, was divided into two parts and administered to different subsamples of managers. One part contained

those items considered "rational" in content, the other contained "behavioral" items. Items concerned various dimensions of the world of work, and managers were to indicate their best estimates of future directions in these dimensions. The second instrument, the Personal Development Plan, listed various skills, abilities, areas of knowledge, and training methods. Managers were asked to indicate for each the value to them of receiving further training. Half the sample completed this before completing the World of Work Questionnaire, the other half after assessing the future. Each half of the sample was again randomly divided in half, to answer either the rational or behavioral form of the World of Work Questionnaire. A total of 139 managers responded to the instruments. Personal data were also collected.

Results of the managers' assessments of the future world of work are presented for the sample as a whole, and then according to functional fields. Meaningful subgroups of items relating to the individual managers of the future and those relating to the future organization were formed and discussed. While present predictions were found to agree with those past predictions that have gone undisputed to now, additional light was shed on the more controversial areas of concern, such as the relative roles of computers and middle managers. Experimental results show a tendency for managers who first assess "rational" aspects of the future to recognize greater urgency for a wider range of training content areas and methods. However, managers who first responded to the behavioral form of the

World of Work Questionnaire, were found not to perceive greater training urgency than did subjects in the control groups which first completed the Personal Development Plan. The latter result was not consistent with what was hypothesized.

The study demonstrates that the opportunity to systematically attend to particular aspects of the future can lead managers to broaden the scope of what they consider relevant training for them. Further, response bias caused by the specific dimensions of the future suggested to managers, was demonstrated not to affect the results. Discussion focuses on the implications of this approach for the individual in guarding against his own obsolescence, and for the organization in planning and implementing a manager development program consistent with its own needs and those perceived by its managers. It was suggested that future research employ a single World of Work assessment form involving as many of the relevant dimensions of the future as possible, but no more than necessary, and then arrive at a specific action proposal for redesigning the tested organization's management development program in ways indicated by results.

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I. Introduction

A. Statement of the Problem

It has been said that the only thing about America that is constant is change itself. To the basic American values of democracy, equality, and regard for the individual, Mann and Neff (1961) would have us add 20th century values of progress, efficiency, science and rationality, and achievement and success. And there is evidence that the rate of change and the adoption of these values are both increasing rapidly. As an example of this change, today's 30-year old American has witnessed nearly a 350% increase in constant-dollar gross national product (GNP), from $192.9 billion to $669.2 billion, with only a 36% growth in total work force, from 55 million to 75 million (see Table 1.1). The computer has been used by business firms since 1955, when the GNP was $438.0 billion. In 1967, estimated GNP is $669.2 billion, a 50% increase in 12 years with only a 14% increase in total work force. Further, the contribution to total GNP made by each member of the work force, has increased 157% since 1938, and 34% since 1955. Table 1.1 summarizes these data. Changes in GNP, productivity and standard of living, however, tell only part of the story. With advanced technical knowledge--first to mechanization and now to automation and the computer--are associated certain costs, both to the blue-collar worker and the corporate manager. It is the effects

TABLE 1.1

GNP, TOTAL WORK FORCE, AND PRODUCTIVITY
IN SELECTED YEARS SINCE 1938

Year	(1) GNP (in billions of 1958 dollars)	(2) Total Work Force (in millions of people)	(3) GNP per Worker (1)÷(2) (in thousands of dollars)
1938	192.9	55.0	3.5
1955	438.0	65.7	6.7
1967*	669.2	74.7	9.0

*estimated

SOURCE: Economic Report of the President, 1968.

of this knowledge on today's middle manager that is the subject of this inquiry.

> Many people foresee greater changes in the practice of management in the next 20 years than in the past 2,000, with the high-speed computer playing both a dynamic and a catalytic role in these changes. Some view the anticipated changes with great enthusiasm . . . others . . . look at this whole rolling advance with various degrees of trepidation. (Katz, Knight, & Massey, in Wadia, 1966, p. 311).

With conscious recognition of the changes that are occurring, comes a fear that the manager armed with yesterday's skills faces obsolescence tomorrow. Many serious predictions and forebodings have appeared in the literature of many disciplines, outlining likely directions of change in the future. Business managers, being fairly well-read in certain kinds of relevant literature, have probably read several predictions as to future directions toward

which the manager is headed. For example, he is to become more "professional," is to make more "rational" decisions, and is to employ methods associated with the "new information technology." But how many managers have actually reflected on what all this means to them and their future careers? How many have taken steps toward identifying those areas in which training or retraining is essential to their progress in the management hierarchy? Managers today often spend upward of 60 hours per week at their jobs, and may argue that with this kind of daily pressure, it is difficult, if not impossible, to find the time for this introspection. As it is, they may argue, they can't find enough time to engage in the long-term planning their department so desperately needs. So how can they be expected to find the time to think about their own long-term goals? Besides, the argument goes, if the company decides that its managers require certain kinds of training, it will make sure they receive it. The reply to this argument is simple: there is only one person who can prevent a manager from becoming obsolete--the manager himself. He must plan for his own development, and then execute his plan.

The transition from general and specific predictions of the future to the formulation of a plan for self-development is often a difficult one to make, and may in part account for most managers' lack of such plans. "Difficulty in developing managers frequently stems from difficulty in bridging the gap between theory and practice."

(Merrill & Marting, 1958, p. 27). One purpose of this study is to provide such a bridge--to enable managers to define where they are, where they are going, when and how.

1. Describing the Future World of Work

In this study, managers were exposed to a systematic review of their future jobs and the future organization, stating their expectations with respect to various statements about them. Job aspects included future demands on their time, useful skills and areas of knowledge, and shifts in various job-related dimensions. Organizational variables included its composition (characteristics of its managerial employees), its structure, its activities, and its internal and external concerns. One purpose of this study, then, is to describe the future world of work that today's middle managers foresee, first as a total group, and then according to meaningful subgroups. An attempt was made to identify those dimensions along which change is predicted, as well as those for which no change is foreseen, and to describe directions of changes. These predictions are discussed in light of their implications for future corporate direction, as they represent the views of tomorrow's business leaders.

2. Comparing Predictions.

Managers' predictions of areas of emphasis and de-emphasis in the future world of work may be meaningfully compared with those made by businessmen and scholars over the past decade, which focus

on the same future time--1980. Starting with Leavitt and Whisler's (1958) bold predictions, which appeared in their Harvard Business Review article, "Management in the 1980's," literally hundreds of others have been stated. These have ranged all the way from popularized prose to scholarly theses, from armchair theories to empirically-supported deductions. They deal with a variety of job- and organization-related areas and are directed at various audiences. In spite of their diversity, however, they all agree on one point--that the computer will play an increasingly significant role in almost every conceivable aspect of the world of work and our lives in general. A second purpose of this study, therefore, is to compare middle managers' evaluations and impressions with those made by people further removed from actual operations of the enterprise, in an effort to determine areas of consistent differences of opinion.

3. Evaluating an Approach: Theory to Practice.

The third, and primary, purpose of the study is to determine the effectiveness of a technique for translating predictions into a practical method for planning personal development. This can be partially accomplished by comparing the development plans formulated by managers before reviewing dimensions of future change, with those formulated after having this experience. Previous research (see Bass, 1965; Cyert & March, 1963; Lindblom, 1964; and March, 1964) leads one to expect that a systematic review of a problem will lead to more effective plans or solutions than will the more intuitive "shotgun" approaches. It is toward providing a means for systematically reviewing the future and testing the effect of this review that the present study is directed. A question then arises: Does the specific content of statements about the future world of

work determine the kinds of training managers feel they will need, or is the mere fact that they have this systematic, detailed look at the future sufficient to allow the development of an effective plan? This is really a question of the effect of having a "set," on subsequently evolving a plan for personal development. Set is defined as certain expectations which "make the individual's behavior at a given time selective." (Sherif & Sherif, 1956, p. 93). Thus, "[t]he immediately preceding problem-solving experiences . . . may set the individual toward a particular type of solution and keep him from seeking others . . ." (Costello & Zalkind, 1963, p. 375). To translate this into the framework of this study, two of the four groups to which managers were randomly assigned completed a World of Work Questionnaire prior to formulating their Personal Development Plans. One of these groups of managers dealt primarily with "rational" aspects of the future world of work, the other with "behavioral" aspects.[1] Both groups completed the identical Personal Development Plan, containing both "rational" and "behavioral" kinds of training content and methods. According to "set theory," those managers who completed the questionnaire containing "rational" items should indicate the need for more training in technical, quantitative, objective skills and areas of knowledge, using individual rather than group techniques. Similarly, those completing the

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[1]These terms are defined on the instruction sheet of the pretest World of Work Questionnaire. See Appendix B. To classify items as "rational" "behavioral," or "neither," a pretest of the instrument was conducted. For a description of the pretest procedure and definitions used as a basis for classifying items, see Appendix B . A summary of pretest results is also found in this Appendix.

questionnaire containing "behavioral" items should indicate a greater desire for the more social, human relations kinds of skills and areas of knowledge using group rather than individual techniques.

B. Major Hypotheses

1. Managers who complete a Personal Development Plan prior to systematically viewing the rational or behavioral aspects of the future world of work will see less urgency in the various types and methods of training than will those who first systematically view these aspects of the future, regardless of whether they are behavioral or rational.

Before reporting two other major hypotheses, Table 1.2 will be explained. To test the effect of set, the two groups who completed a World of Work Questionnaire prior to the Personal Development Plan may be compared with respect to the kinds of training they feel more and less important to them vis-a-vis the Questionnaire items to which they have responded. Table 1.2 presents this design, with four numbered cells representing groups of managers. Cells 1 and 2 include those managers who completed the "rational" questionnaire; cells 3 and 4, those managers who completed the "behavioral" questionnaire. Cell #1, for example, would represent those managers who completed the "rational" World of Work Questionnaire and the felt urgency about receiving "rational" training with respect to content and method.

2. Managers responding primarily to behavioral-type questions about the future world of work will:

a) feel a greater need for training in behavioral, human relations, or social areas, and will prefer the more behavioral methods for receiving this training, than will those responding

TABLE 1.2

PARTIAL RESEARCH DESIGN: THE EFFECT OF SET

Type of questionnaire completed prior to Personal Development Plan	Mean responses by managers completing the Personal Development Plan after either a "rational" or "behavioral" World of Work Questionnaire:	
	Rational training	Behavioral training
Rational	1	2
Behavioral	3	4

to rational, objective-type items. The reverse will be true for those responding to rational-type questions. Using the numbered cells in Table 1.2, 1 < 3, 4 < 2.

b) feel greater urgency for behavioral than rational types and methods of training. 1 < 2, 4 < 3.

3. There will be no differences between the urgency felt by respondents to the "rational" questionnaire for rational kinds of training, and the urgency felt by respondents to the "behavioral" questionnaire for behavioral kinds of training. 1 = 4

C. Design of the Thesis

The subject of this study requires focusing on three major areas: the definition of the world of work, predictions of the future world of work, and implications for management development. The thesis deals with each of these areas of concern as background in fulfilling the purposes of the study, as stated in Section A of this chapter.

Chapter II is concerned with defining the world of work. It considers the manager as an individual in his job; and the organization, including its activities, characteristics and internal and external factors which affect its operations.

Chapter III considers the individual manager insofar as he has already been affected by the computer and information technology, and as he is expected to be further influenced in the future. Many of the predictions made by businessmen and scholars over the past decade with respect to the manager are presented here.

In Chapter IV, the primary focus is on the organization. Again, the effects of automation to date and predictions as to future effects are covered in some detail.

Chapter V discusses the broad topic of management development, including its use in organizations to date, future directions, and the importance of the individual in preventing his own obsolescence.

The methodological approach taken by this study is the topic of Chapter VI. A description of the sample of managers who responded to the instruments, a description of the instruments and the procedure followed in the actual data collection are discussed in this chapter.

Chapter VII presents the results of the study, in light of the descriptive, comparative, and experimental purposes outlined above.

In Chapter VIII, a discussion of the interpretation of the results is presented. Included here are statements about and reasons for support or rejection of the three major research hypotheses. This chapter also includes an analysis of differences between predicted and perceived aspects of the future world of work.

Summary and conclusions are presented in Chapter IX, together with implications of this study for further research.

II. DEFINING THE WORLD OF WORK

Before indicating how managers and organizations are likely to change in the next decade, it will be necessary to define terms. The purpose of this chapter is to describe briefly the concepts of a "manager," in terms of what he is and what he does; an "organization," in terms of its structure, purposes or goals and composition; and "organizational concerns" in terms of political, social and economic factors that influence the manager and his organization. All three elements contribute to perceptions of and attitudes toward the future, as they constitute the past and present upon which predictions of the future are based.

A. The Individual Manager

1. What is a manager?

a. Responsibilities. Most generally, a manager is someone who gets things done through other people. More specifically, managers have the responsibility for ensuring the economic health of the enterprise, by controlling such factors as the production process, the sales and marketing functions, and the financial position of the organization. Moreover, they must maintain for the organization a competitive position in the relevant industry, which involves keeping abreast of technological advances, engaging in research and development activities within their own firms, maintaining

satisfactory labor and community relations, and being sensitive to the needs of the publics they serve. Although much has been written of the increasing separation of corporate ownership from control,[1] the manager is, on paper, at least, responsible also for providing for an adequate return on investor's capital.

Interactions between managers must be channeled in such a way that their responsibilities are effectively carried out in a coordinated, purposive, non-haphazard manner. Considered in this way, management is more than simply a collectivity of individuals, is a "process of achieving desired results by influencing human behavior within a suitable environment" (Wadia, 1966, p. 2). The emphasis on management as a process of influencing people is succinctly stated by Harbison & Myers (1959) who quote Lawrence A. Appley's definition of management as "the development of people and not the direction of things...Management is personnel administration." (p. 11)

In contrast to this emphasis on directing other people, Ohmann (1958) states that managers are in charge of work and not primarily in charge of people. Concepts such as "participative management" are, in his view, simply one means for achieving the primary responsibility. Work is the end, not good personal relationships.

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[1]See, for example, Berle (1959) and Berle (1954).

b. Characteristics. Uppermost on many lists of managerial characteristics is strong internal motivation. Beyond this, Flory (1965) states:

> Managers function under a compelling urge for action. They derive tremendous satisfaction from a feeling of accomplishment in their field. They strive to be superior in whatever they attempt, for they have a low tolerance for mediocrity. They fit no stereotype because they abhor rigidity. They are bored with inactivity and find it difficult to provide periods of quiet reflection and contemplation. (p. 29)

Guzzardi (1965) follows the same tone by characterizing the manager as serious, competitive, aggressive, confident, independent, decisive, pragmatic and academically narrow. In a summary of the literature dealing with predictors of executive effectiveness, Dunnette (in Wickert & McFarland, 1967) lists the following psychological factors: intelligence, dominance, self-confidence, desire for power and money, political and social manipulability, high level of aspiration, forcefulness and assertiveness. In an empirical study, Henry (in Leavitt & Pondy, 1964) combines psychological variables with abilities in characterizing the successful executive as one who: 1) shows high drive and achievement desire; 2) views superiors as a controlling but helpful influence; 3) has a strong upward mobility drive; 4) is able to organize unstructured situations; 5) can weigh alternatives and make decisions; 6) has a strong self-structure or self-identity; 7) is active and aggressive; 8) fears failure; and 9) has a strong reality orientation.

c. Abilities. In looking at what abilities a successful manager possesses, Flory (1965) translates his list of characteristics into the following manifest abilities: 1) make sound judgments; 2) get along with people; 3) understand people; 4) meet the unexpected with composure; 5) plan and organize; 6) delegate; 7) manage others; 8) act vigorously; 9) communicate effectively; 10) blend all action with finesse. Hull (in Ramo, et al. 1964) defines management ability as "the ability to state a goal and reach it--through the efforts of other people--and satisfy those whose judgment must be respected--under conditions of stress." (p. 34). Relevant judges of a manager's actions include, in addition to one's superiors: stockholders, the government, employees and customers.

Another way of looking at abilities of successful executives is to see what contributes to the unsuccessful one. Brown (1964) lists subordinates' views of ineffective executive behavior, including: 1) failure to delegate; 2) inability to accept subordinates ideas; 3) failure to give support to subordinates; 4) indecisiveness; 5) lack of self-confidence; 6) failure to communicate; 7) lack of trust or respect for others; 8) extreme self-interest; 9) inadequate judgments.

d. Needs. In addition to basic human needs, such as physical and safety needs, McClelland (1961, 1962) has characterized the manager as possessing, among others, a strong need to achieve.

Bass (1967 has proposed several others including wealth, independence, self-realization, prestige, affection, security, expertness, leadership, service, duty and pleasure.[2]

2. What does a manager do?

In an early work, Barnard (1938) classified executive functions as falling under three headings: the maintenance of organization communications; the formulation of purpose and objectives; and the securing of essential services from individuals. This scheme is probably too broad to tell us how a manager spends his time. Davis (1949) indicates that planning, organizing and controlling are the three functions managers perform to which Newman (1951) adds assembling resources, directing and "non-delegated activites." Harbison and Myers (1959) feel that all managerial activity can be meaningfully categorized into four functions: 1) the undertaking of risk and the handling of uncertainty; 2) planning and innovation; 3) coordination, administration and control; and 4) routine supervision. By way of contrast, the well-known Ohio State Leadership Studies (Shartle, 1956) considers the following 14 activities a comprehensive list: 1) inspection of the organization; 2) investigation and research; 3) planning; 4) preparation of procedures

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[2]These lists are meant to be suggestive only, representing only a sample of the many articles and volumes that have appeared on the subject. Raines (1966)lists no less than 10 "schools of thought" regarding the purpose and meaning of management. For neat empirical studies of physical, personality, value, ability and interest characteristics of managers, the reader is referred to Guzzardi (1965) and Mahoney, Jerdee & Nash (1961).

and methods; 5) coordination; 6) evaluation; 7) interpretation of plans and procedures; 8) supervision of technical operations; 9) personnel activities; 10) public relations; 11) professional consultation; 12) negotiations; 13) scheduling, routing and dispatching; 14) technical and professional operations.

To aid managers in characterizing their current jobs in order to better be able to predict future changes, the present study had managers estimate the percentage of total time spent in each of six classes of activities: planning, investigating, coordinating, evaluating, supervising and negotiating. The categories are based on a study done by Mahoney, Jerdee and Carroll (1965), in which managers from various companies were asked to estimate their time allocations among eight activities. Because staffing and representing occupied the least proportion of time, (4.1% and 3.2% respectively), they were dropped from the original Mahoney et al list. Space was provided for additional activities not covered by the ones listed. The definitions for the six categories appear in Appendix B.[3]

To sum up, there are certain aspects about managers as individuals and collectively that we can take as given and constant. We can assume, for example, as Professor Henry does (in AFMR, 1968), that managers of the future will exhibit the same characteristics, have the same basic responsibilities, require the same general

---

[3]This discussion lists only a few of the studies designed to learn what managers do. Interested readers will find others in Brooks (1955), Drucker (1954), Haas, Porat and Vaughan (1969, in press), Hemphill (1960), Katz and Kahn (1965), Sayles (1964) and Wadia (1966).

abilities and feel the same needs as do today's managers. Further, we can assume that managers will spend their time performing the same general functions as they do now, although the specific activities within these general functions will undoubtedly change as a result of continued technological advances.

B. The Organization

As with managers and management, there are certain aspects of the organization that are basic and unchanging. Others are dynamic, but perhaps cyclical. After defining what is meant by the "organization," we shall briefly trace the development of organizational theory and discuss some of the "constants" and "variables" relevant to the organization.

1. What is an "Organization?"

Most basically, an organization is a social unit deliberately constructed to seek specific goals (Parsons, 1960). It is characterized, according to Etzioni (1964), by:

> 1) Divisions of labor, power and communication responsibilities which are . . . deliberately planned to enhance the realization of specific goals.
>
> 2) The presence of one or more power centers which control the concerted efforts of the organization and direct them toward its goals . . .
>
> 3) Substitution of personnel, i.e., unsatisfactory persons can be removed and others assigned to their tasks. The organization can also recombine its personnel through transfer and promotion. (p. 3)

A more complex definition is offered by Pfiffner and Sherwood (1960):

> Organization is the pattern of ways in which a large number of people, of a size too great to have intimate face-to-face contact and engaged in a complexity of tasks, relate themselves to each other in the conscious systematic establishment and accomplishment of mutually agreed purposes. (p. 30).

This definition is based on the assumptions that organizations are large, complex, rational by intent and goal(s) directed. The two definitions given are probably as good as any that have appeared. The point is that all organizations, regardless of their nature, consist of two or more people whose activities are coordinated and goal-directed.

In dealing with larger organizations such as a government bureau interrelated activities require rigorous control and coordination in order to accomplish goals and avoid chaos. Perhaps the most influential theory to define such organizations was postulated by Max Weber at the turn of the century.[4] From Weber's model of the "ideal type" organization, we may glean at least six general principles.[5]

1) There are established rules of conduct designed to assure uniformity of similar tasks and coordination among different tasks. This avoids the search for new solutions to each problem and case that arises.

2) There is an established hierarchy, where each lower office is under the control and supervision of a higher one. Because a manager is responsible for his own actions and those of his subordinates, he has authority over subordinates.

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[4]See Gerth, H.H. & Mills, C.W., translators. From Max Weber: Essays in sociology. (New York: Oxford University Press, 1946).

[5]This paraphrasing of Weber's original work was taken from Blau (1964, Chapter 2), Etzioni (1964, Chapter 5), March & Simon (1959, Chapter 3), and Pfiffner & Sherwood (1960, Chapter 4).

3) There is a clear-cut division of labor such that each activity has a staff of specialists, each responsible for efficient performance of his segment of the operation. Training of these specialists is an integral part of this principle.

4) There exist specified spheres of competence. This suggests that the relationships between various specializations should be known and observed.

5) The rules and policies of the organization, which are clearly specified, are administered impersonally and impartially, and infringements of them punished in the same way.

6) Employment is on the basis of technical competence and is protected against arbitrary dismissal. There is also a system of promotion, based on seniority, achievement, or both.

The principles of Weber's bureaucracy have been outlined in detail, first, because many of them can be observed in some form in virtually all modern corporations. Second, his was the first attempt to clearly define a formal organization and one which has been subject of untold analyses, empirical studies and reformulations. Finally, and most significantly, in spite of a great shift in emphasis away from the formal, impersonal principles Weber described, organizations are increasingly returning to many of the same principles with the advent of the computer.

2. A Brief History of Organization Theory[6]

a. The Classical Approach. March and Simon (1958) pointed out that traditional organizational theory stems from two main sources: Frederick W. Taylor, whose "scientific management" holds

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[6]The sources used for this analysis were purposely limited in the interest of brevity. Other relevant sources include Barnard (1938) Haire (1959), Haire (1962), Rubenstein & Haberstroh (1960), and Scott (1961).

that man is motivated by fear of hunger and the search for profit, so that if material reward is closely related to work effort, the worker will be motivated to perform to his maximal physical capacity (Etzioni, 1964); and 2) Gulick and Urwick, who espoused a theory of administrative organization, characterized by departmentalization by functions (Pfiffner & Sherwood, 1960) and coordination between them.[7] Argyris (1957) summarized the significant aspects of this line of thinking in four principles.

1) Task (work) specialization. If it is true that concentration of effort on a particular task increases the quality and quantity of output, then as the number of similar things to be done increases, the need for specialization should increase.

2) Chain of command. A hierarchial structure is necessary in order that each successively lower level of specialization as one goes up the hierarchy is responsible for controlling, directing and coordinating the interrelationships between the successively more specialized functions below it.

3) Unity of direction. This means that the goal(s) of each unit, the paths to them and the strength of the barriers to be overcome must be defined and controlled by the leader.

4) Span of control. This principle asserts that administrative efficiency is increased if a leader has control over no more than six subordinates having interrelated responsibilities.

Bass (1965) states these principles in the form of eight traditional rules of formal organization:

1. Someone should be responsible for supervising all essential activities.

2. Responsibility for specific acts should not be duplicated or overlapping.

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[7]For a discussion of some of the criticisms levied against this purely rational approach to organizations, see Carzo & Yanouzas (1967); Etzioni (1964); and March & Simon (1958).

3. No one position should have too numerous or complex duties. Duties should be meaningfully clustered so that position holders do not have responsibility for a wide assortment of unrelated acts.

4. Responsibilities should be written, clear and understood by job occupants.

5. Authority to make decisions should be commensurate with responsibility for those decisions.

6. Authority should be delegated so that decisions take place as close as possible to the point of action.

7. Executives should have no more than five to seven subordinates reporting to them; first-line supervisors no more than 20.

8. Every occupant of each position should know to whom to report and who reports to him. The chain of command should be recognized and followed. (pp. 234-238).

b. The Human Relations School. In 1927-32, Elton Mayo conducted a series of studies at Western Electric Company's Hawthorne Works for the purpose of testing certain scientific management predictions.[8] Far from confirming the principles of "scientific management," these studies were the first to raise the issue of social or group norms as determinants of effort and productivity and to cast aspersions on the purely scientific, hierarchial, structural approach to the study of organizations. They also gave rise to the notion that man is motivated at least

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[8]The interested reader will find elaboration on the specifics of these studies in Etzioni (1964), Lawrence et. al. (1961), and Roethlisberger & Dickson (1939). For a more philosophical and theoretical work, see Mayo (1945).

as much by non-economic rewards, such as affection and respect, as by economic ones. In their study of resistance to change, Coch and French (1948) demonstrated the desirability of worker participation in making decisions affecting them, thus underscoring the potential force of the informal (social) group.

In sum, the Human Relations Approach came to emphasize the importance of: 1) communication between levels in the organization; 2) participation by lower levels in decision making; and 3) democratic leadership (Etzioni, 1964). While Scientific Management assumed that satisfaction would result from efficiency, the Human Relations approach assumed that efficiency would result from satisfaction.[9]

c. The Structuralist Approach. Given these two rather extreme approaches, it is not surprising that there emerged a third, representing a synthesis of the other two. Structuralists see conflict to be inevitable and continual between: the formal and informal structures; organizational and personal needs; management and workers; staff and line; superior and subordinate; and functional groups. This is especially so as there is increased specialization of tasks, as jobs become repetitive and uncreative, and as workers seek social relationships as a means of combating this. They further feel that conflict is or can be a "healthy phenomenon," as expression of differences will lead to better

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[9]The partial list of analyses dealing with the Human Relations School and its contrast with Scientific Management principles is given here for the interested reader: March & Simon (1958, Chapters 3 and 4), McGregor (1960), and Swanson, et. al. (1952, especially articles by Lewin, Lippitt, and White).

decisions and ultimate organizational peace, by virtue of having faced these differences rather than glossed over them (Etzioni, 1964). The study of organizational conflict has itself been the subject of much sophisticated and rigorous quantitative and qualitative analysis, under such names as game theory and utility theory.[10]

d. Decision Theory. Simon, in his Administrative Behavior (1957), expressed the now popular view that the decision is the basic unit of the organization. Until 10 or 15 years ago, the textbook description of decision making, by use of the "rational-comprehensive" approach, included: 1) recognizing the existence of the problem; 2) identifying the series of possible alternative courses of action, 3) considering the entire complex of consequences that would result from each alternative; 4) choosing the alternative that best serves the criterion set of values (Simon, 1957). This approach is more suitable for relatively simple problems than for the more complex ones facing management today. Simon and his colleagues at Carnegie Tech have devoted considerable effort to developing the theory, "that the basic features of organization structure and function derive from the characteristics of human problem-solving and rational human choice." (March & Simon, 1958, p. 169).[11] Given such realistic limitations as time and human

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[10]The following represent a sample of literature dealing with organizational conflict: Argyris (1957a); Coser (1956); Leavitt (1964); March & Simon (1958, Chapter 5); Pondy (1967); Scott (1965); and Schelling (1961).

[11]For a more thorough review of work by the Carnegie Tech group, see Cyert & March (1963); March & Simon (1958); Simon (1965); Simon (1960). A comparison of the "rational-comprehensive" and "successive limited comparisons" methods can be found in Lindblom (in Leavitt & Pondy, 1964, pp. 61-78).

intellectual capacity, man's problem-solving behavior is not "optimal" or "maximal" but rests on the following propositions:

1. Individuals do not attempt to maximize utility but seek to achieve alternatives that are "satisfactory." A satisfactory alternative is one that is better than the "level of aspiration."

2. The level of aspiration changes over time, going up when achievement goes up, coming down when achievement comes down. It adjusts upward faster than downward.

3. If the individual sees an alternative that is satisfactory, he will not search very vigorously for additional alternatives. (March, in Leavitt & Pondy, 1964, p. 449).

This is referred to as the principle of "bounded rationality."

From decision theory have arisen such sophisticated mathematical formulations as statistical decision theory, linear programming, information theory inventory theory, distribution theory, communication theory and others. Of course, advances in these areas could not possibly be made without the aid of the computer, but the basic postulates of decision theory provided the foundation. The computer effects, present and future, will be discussed more fully in Chapters III and IV.

Aspects of some or all of these approaches are observable in virtually any organization today. If any single theory of organizations will emerge, it will undoubtedly embody many of the principles outlined above.

C. Other Organizational Issues

In addition to tracing the historical thread of organization theory, there are certain organization-related issues that should be discussed separately. With no particular theoretical referent qua "schools of thought," to be sure, they are imbedded in all these schools. They will be briefly discussed under two headings: structural issues, and other organizational concerns.

1. Structural Issues.

a. Centralization vs. Decentralization. With the rapid increase in organizational size, number of products, geographic marketing areas and complexity of technology, many firms have found it virtually impossible to maintain effective control over operations from a single headquarters. They have, therefore, delegated much decision making authority to lower levels, thereby obeying the traditional concept of keeping decisions close to their point of application. Decentralization may occur along geographic lines, divisional lines or functional lines, or even some combination of these. Increasingly, these units, responsible for maintaining their own operating efficiency, are referred to as "profit centers." A decentralized firm may still have direct links with headquarters, as, for example, financial centralization may be retained, but by and large, decisions are made locally.[12]

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[12]See Dale (1955) for further analysis of this issue.

b. Staff vs. Line Managers. By definition, a "staff" department is one that does not have direct responsibility for operations, but rather performs some specialized service or control, or provides information and advice to "line" managers (Strauss & Sayles, 1960). Bass (1965) criticizes the utility of the line-staff distinction, on grounds that it separates the planners from the doers, when the two functions should be combined. Other factors leading to line-staff friction include:

1) Staff are experts and tend to make decisions themselves rather than advise line managers.

2) Because staff only sees part of the picture, this can lead to erroneous decision-making, impairment of line responsibility and conflict among subordinates as to who is boss.

3) In decentralized organizations, staff departments have dual and often conflicting responsibilities--to their immediate supervisor, usually a line manager who heads the unit, and to the central office staff group (Strauss & Sayles, 1960).[13]

The issues of line vs. staff takes on special significance with the advent of the computer.

c. Functional vs. Project Structure. Particularly in applied research and development departments or organizations the question arises whether to organize around projects or maintain functional departments. Under project organization, when a problem enters

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[13]For an earlier study of these issues, the reader is referred to Dalton (1950). See also McGregor (in Schultz & Whisler, 1960, p. 105-118).

the laboratory a group is formed to handle it. This group contains the necessary human resources, and works together both geographically and administratively (Shepard, in Leavitt & Pondy, 1964). When the project is completed, the group is dissolved. By contrast, under functional organization, there exist several specialist groups. A problem is routed to relevant specialists, either in its entirety or broken into parts.[14]

d. The systems concept. This kind of model represents a kind of synthesis of the functional and project types. Essentially, under the systems model the organization is viewed as a complex of interrelationships of specific individuals and functions. Organization revolves around tasks (functions) and resources are allocated to these tasks according to requirements. This permits greater flexibility, as the recombination of resources assigned to tasks reduces wastage. Systems design and analysis is itself becoming a highly specialized field, and will undoubtedly play a central role in organizations, particularly where computers are in use.

e. Number of levels. Simon (reported by Argyris, 1957) makes the point that the span of control concept increases the number of organizational levels and increases the "administrative

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[14]Shepard (in Leavitt & Pondy, 1964) discusses advantages and disadvantages of each form of organization, concluding that project organization, while attractive on the surface, is really the less efficient form.

distance" between individuals. This violates the principle in formal organization theory that "administrative efficiency" is enhanced by keeping at a minimum the number of organizational levels through which a matter must pass before it is acted upon." (Argyris, 1957, p. 17). One way of conceptually handling this issue, suggested by Likert (1961), is to view the organization as consisting of overlapping groups. Thus, every individual above the lowest rank except the chief executive is a member of two groups--one consisting of his peers and his boss and the other of himself and his subordinates. In this way, "planning and deciding are conducted by those who will execute the plans and decisions." (Bass, 1965, p. 273).

f. Communication. Problems in this area are really imbedded in all structural considerations. As noted above, increased complexity and the greater degree of specialization accompanying technological advances, create the need for lateral or cross-functional communication as well as vertical. Communication down the hierarchy is usually in the form of directives, policy statements and requests for information. Such communication may be one-way or two-way--the former being faster, but more frustrating to the receiver, and, conversely, the latter more complete, more satisfying, more accurate, but slower.[15] Upward communication requires a two-way communication, whereby the receiver provides rapid feedback to the sender. Horizontal communication must be

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[15]This subject is dealt with extensively by Leavitt (1964) and Bass (1965), both of which also cover communication networks, barriers to communication and communication as related to coordination.

particularly effective, as it competes with rumors, which travel along the same channels (Bass, 1965). There is usually no provision for lateral communication on formal organization charts, but unless channels are established the grapevine will flourish via informal routes.

g. Leadership Issues. Basically, three styles of leadership exist. Coercive leadership, founded on the concepts of authority and status in the hierarchy, was the form prescribed by classical organization theorists. Persuasive and permissive or participative styles emerged into practice as a result of the Human Relations school of thought. Permissiveness, not to be confused with laissez-faire, implies general rather than close supervision, and an exchange of ideas between supervisors and subordinates leading to decisions. A person's esteem--his worth as a person regardless of his position in the organization--plays a large part in a supervisor's success at persuasive leadership (Bass, 1965).[16]

2. External and Other Organizational Concerns.

a. Social Responsibility. There are those who believe that for an organization, "The essence of free enterprise is to go after profits in any way that is consistent with its own survival as an economic system (Levitt, 1958, p. 44). In this view, public relations and welfare should be considered only when it makes good

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[16]The interested reader will find articles dealing with leadership issues in the following volumes of readings: Cartwright & Zander (1960); Leavitt & Pondy (1964). Other major relevant works include: Bass (1965), Bass (1960), Bennis (1966), Harbison & Myers (1959), and McGregor (1960).

economic sense. By and large public welfare, say proponents of this view, should properly be left to the government, and attempts by the private sector to assume this responsibility will render governmental efforts impotent. Others feel that big business can only justify its tremendous economic, social and political power by managing its affairs in the public interest. Beyond the issue of legitimacy, Adolph A. Berle, Jr. (1954, 1959, 1965) argues that big business is constrained by public consensus, which has demanded the development of a "corporate conscience." Still others argue that social responsibility is motivated by fear that big business would otherwise lose autonomy via legislation (Cheit, 1964).[17]

b. Relations with the Government. Historically, businessmen have always been active in politics. While their direct participation has perhaps decreased, their power has been felt in other ways (S.D. Walton, 1966). Politicians at federal, state and local levels are keenly aware, for example, of the vote-getting and fund-raising powers of business leaders and their professional organizations, and so are sensitive to their feelings and weigh them carefully before making legislative decisions. This degree of influence, however, does not compare with that exercised by government over business. One need only look to the steel crisis of 1962 and the aluminum price crisis of 1965, to see evidence of executive pressure forcing business to retreat from what the

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[17]This subject has been too widely debated to be adequately presented here. For additional pertinent sources, the reader is referred to Bowen (1953), Frederick (1960), Eells (1960), Selekman (1959), C. Walton (1966), S.D. Walton (1966). For the applications of ethical and religious principles to business, see Bursk (1959), Campbell (1957), Childs and Cater (1954), H.L. Johnson (1957), Ohmann (1955) and Tawney (1926).

President interpreted as inflationary action.[18] For examples of legislative and judicial control, one may cite the existence of the many regulatory agencies, such as the Interstate Commerce Commission, and the Federal Trade Commission, which set the parameters within which our "free enterprise" economy must operate.

In addition to its regulatory powers, the Government, particularly the Department of Defense, is a major consumer of the output of many industries. Given these kinds of dealings and interrelationships, it is not surprising that the role of business in government affairs has been a subject of concern to responsible businessmen.[19]

c. Labor relations and union power. Some have expressed the view that labor has assumed a position of such power that society has more to fear from "big labor" than from "big business." (See, for example, Walton, S.D. 1966). Strikes in some industries have posed serious threats to the U.S. economy. To help combat this, the Government has provided a procedure for obtaining emergency court injunctions against work stoppages. The present relationship between corporate management and its labor unions, which can range from open hostility to mutual accommodation, plays a large role in determining future developments.

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[18]For a discussion of these issues, see Haas, Porat, Tan & Young (1966).

[19]For further reading in the areas of business-government relations and the political environment, see Hacker (1965), A.M. Johnson, (1965), Massel (1964), S.D. Walton (1966), and Wilcox (1966).

d. Other concerns. The following, while no less important than the preceding are only listed here to be referred to again in later chapters. Other concerns of the organization include: manpower planning and development; "technological unemployment," and effects of automation and "information technology."

D. Conclusion

In this chapter, the world of work has been defined in terms of the individual as a manager, the organization as a collectivity of managers and activities and concerns external to a particular organization, but relevant to the environment of all organizations. The issues that were raised, because they help define the world of work, will play some role in the future; and therefore, merit the attention of both individual managers and corporate planners in their attempts to prepare for the changes to come.

In the above discussion, the primary focus was on general issues of the past and present, with no predictions of the future. The entire field of automation and its impact on individuals and organizations was omitted, largely because it relates more to the future than the past. It is to the computer era and its future implications that we now turn.

III. The Future and the Individual Middle Manager

Many prognostications have appeared in the last decade as to the fate of the middle manager, the leader of tomorrow's corporations. Motivated largely by the widespread use of computers by business organizations, significant changes in the role, activities and responsibilities of managers were predicted. The purpose of this chapter and the one following is to delineate some of the trends already apparent, which have been used as bases for predicting the future of middle managers and organizations. Many of these predictions will later be compared to those of a sample of middle managers, who will be directly affected by the eventual truth or falsity of them.

A. The Computer Era and Middle Managers

Myers (1967) reports that in 1955, there were 10 to 15 computers installed worth about $30 million. In 1966, there were 28,500 computers worth $7.8 billion and by 1970, it is predicted that there will be 60,000 worth $18 billion. We turn first to some of the areas in which the introduction of the computer has already had a significant impact on managers.

1. Decision Making

Simon (1960b) conceptualized a continum of decisions, with "programmed decisions" and "non-programmed decisions" as polar points.

a. Programmed decisions. Programmed decisions are ones that are repetitive and routine and for which a standard procedure has been developed to handle them. Even if this procedure is not documented, it is practiced and is programmable. In Simon's terminology, a "program" is "a detailed prescription or strategy that governs the sequence of responses of a system to a complex task environment" (Simon, 1965, p. 59).

To the extent that computer algorithms have been developed to handle the more routine matters, much of the decision making responsibility formerly reserved for middle managers has been wrested from them. Thus, the computer has been programmed to make decisions in such areas as inventory control and production scheduling, while in other areas it serves primarily as an extension of human brainpower by speeding up calculations. Regardless of the specific mathematical tool used, Simon (1965) describes a general procedure for making programmed decisions.

1. Construct a mathematical model that satisfies the conditions of the tool to be used and which, at the same time, mirrors the important factors in the management situation to be analyzed.

2. Define the criterion function, the measure that is to be used for comparing the relative merits of various possible courses of action.

3. Obtain empirical estimates of the numerical parameters in the model that specify the particular, concrete situation to which it is to be applied.

4. Carry through the mathematical process of finding the course of action which, for the specified parameter values, maximizes the criterion function (p. 71).

Simon hastened to point to several prerequisites which must be satisfied before applying the above procedure: a) the criterion function must be defined quantitatively; b) parameters must be numerically estimated with sufficient accuracy for the task; c) the model must fit the problem--if nonlinear relationships are essential for accuracy, linear programming is not the appropriate tool to use; and d) the problem must be small enough to be justified in terms of the time and cost required for calculations. If parameters are too stringent, calculating costs become prohibitive; if they are too lax, the results will be too far removed from reality to be useful. The goal is to arrive at a decision that is better than one that could be arrived at using common sense without the mathematics.

b. Nonprogrammed Decisions. Decisions are nonprogrammed if they are unique, unstructured and of some consequence. To aid managers in making non-programmed decisions, the computer employs "new information technology," including statistical techniques, models, and simulations developed largely since World War II. Some of these, such as linear programming, depended on the development of the computer to make them practical to use, in terms of return on financial, time and human resource investment. Increasingly, the use of models and simulations are being applied to marketing, budgeting and other areas for forecasting, distribution

and systems analysis. Use of these techniques, collectively "management science," has given managers more facts upon which to base decisions. This makes it conceivable, as Tean (1965) points out, to define limits within which more decisions are to fall, eventually making even these decisions more routine and allowing top management to delegate more of the decision making responsibility to middle managers. But there is some question as to whether decision making authority is consistent with responsibility for decisions.

For nonprogrammed decisions, then, middle managers still have an important function to perform. Before they may be entirely programmed, more must be learned about the human problem-solving process, including such components as search activity, perceptual clues, and the definitions of such terms as "judgment," "intuition," and "insight." (Simon, 1965). A systematic analysis of such problems would involve applying a heuristic, or set of sequential steps to be used in approaching any problem. These may include the kinds of decision rules described above (see page 33) or more abstract ones, such as how to formulate appropriate decision rules.

2. Specialization.

The computer, while an analytical tool of inestimable potential, requires a human staff with varied competences in order to approach this potential. In addition to computer maintenance

people, operators, programmers and other technical experts, specialists at middle and supervisory levels of management are increasingly needed to plan, design, implement and analyze the computer system. It is the responsibility of these managers to understand sub-assemblies and subgroups of operations and their interrelationships and positions in the entire system (Hurd, 1964). Most of the middle managers who will work directly with these converted functions have had no training in computer science, systems design or other "computer era" fields, and so must depend on the ability of the specialists to design the computer application and the information generated from it in a useful way. This presents the manager with a communications problem, as he does not know enough about what is possible vis-a-vis a particular computer application, and the specialist often does not know enough about the function he is converting to make it maximally effective. As one bank manager said of attempts to communicate with a specialist, "If he begins to talk in computer language, I know I'm right." Similarly, the middle manager often finds it difficult to exercise authority over a subordinate specialist, even though he is responsible for the results of the subordinate's efforts.

3. Staff-Line Conflict and Resistance to Computers.

The kinds of computer specialists referred to above are, at the present time, generally considered staff personnel. Undoubtedly, much of the blame for conflict between these managers and the

operating staff can be placed on the communication problems--a "credibility gap"--already mentioned.

As specialists engage in the kinds of model-building activities described by Simon (see p. 33), and which the line manager doesn't understand, anxiety is produced among "uninitiated" middle managers. They hear of systems analysis, increased coordination between functions, and programmed decision making; and quite naturally, suspect that their own decision making prerogatives are being reduced, (Fiock, 1962).[1] Related to this is the fear that the computer is making their decisions more visible to top management because of the remote location of most computer facilities. (Vaughan & Porat, 1967).

Berkwit (1966) feels that in spite of assurances that the middle manager is not being replaced by a computer, nor will he be, he is apt to exhibit "resentment, fear, anger, stubborness, ignorance, rigidity, mistrust, or plain incompetence." (p. 42). Perhaps the underlying cause of the anxiety boils down to the fact that the middle manager has no assurance that once he relinquishes old ways of doing things to ways "suggested" by staff people, he will still have adequate facilities for getting the job done (Fiock, 1962).

Another cause for resistance is the increasing necessity to keep up with the changing technology. One would expect that

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[1] In Fiock's article "Seven Deadly Dangers of EDP," he cites middle manager resistance as one of the more important ones. The others are: poor procurement practices; ignorance of procedures; "service" over "control" as the major emphasis, inadequate staff; poor staff location in the organization structure; and biased evaluations.

educated, motivated young executives would easily recognize trends in management, such as the increasing use of "management science" techniques, and realize the implications if they do not become conversant in them. Yet Berkwit (1966) reports they do not. It is this realization, among others, that the instrument to be used in this study is to instill.

B. Predictions: The Future of Middle Managers

In reporting some of the many prognostications that have appeared in the literature in the last decade, it is often difficult--and perhaps undesirable--to isolate factors relevant primarily to individual managers from those dealing with the larger concept of the organization. However, for reasons of consistency and ease of conceptualizing the dimensions of change, such separation will be maintained.

The year 1985 is often viewed as the end of the computer revolution in terms of the rapid changes it will cause. Undoubtedly, this future data also has a certain urgency about it, as there is disturbing realization that an Orwellian world will be technologically feasible by that time, but must be avoided at all costs! As Simon (in Anshen & Bach, 1960) clearly stated, "Within the very near future--much less than twenty-five years--we shall have the technical capability of substituting machines for any and all human functions in organizations." (p. 22). No one, Simon included, predicts the occurrence of such an event, and many doubt that the

computer will ever have the capability of which Simon wrote.[2] The problem is to try to predict where and how the computer will have its greatest impact.

1. Functional Effects.

Leavitt and Whisler (1958) believed that the new information technology would have its greatest impact on middle and top management levels. Many of the functions now performed by middle managers, will, in their view, become highly programmed while others will become "deprogrammed," depending on how easily they may be quantitatively measured, the economic pressure for programming them, and the willingness of present jobholders to have functions programmed. Thus, the production function has been programmed to a much greater extent than has labor relations.[3] Leavitt and Whisler continue their analysis by predicting that the more programmed functions will be delegated to lower management levels; the less programmed, more creative functions will be handled by top management; and the middle manager, as we know him today, will largely disappear.

One of the major predictions made by Leavitt and Whisler (1958) is that information technology will serve to raise the boundary between operations and planning, so that responsibility for planning

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[2]For an expression of some of the doubts raised during Simon's original presentation of this idea, see Anshen's "Management and Change" in Anshen & Bach, 1960, pp. 199-238.

[3]Labor relations have, however, been affected by computer technology. See, for example, Taylor (in Dunlop, 1962) and Barbash (in Somers, Cushman & Weinberg, 1963.)

will be removed from middle managers. Ironically, this means the group that is responsible for planning the change to information technology, is also the group to be most affected by it (Whisler, 1965). Regardless of who assumes the responsibility, in order to take advantage of the new capabilities, strategic planning must become one of the key organizational functions. Many believe that to move upward in tomorrow's organization, a manager must conceive of the organization as a system, and understand the concepts and values of strategic planning and decision making.[4] Simon (1960a) proposed that as the computer takes over more and more of the routine, day-to-day decisions required for control over operations, middle managers will have less excuse for letting emergencies preclude time that should be devoted to planning. In short, managers will be forced to adopt a longer time perspective.

This raises the broader questions of whether the middle manager of the future will be more of a generalist or whether he will continue in the present trend of increased specialization. It is generally agreed that the future manager will be more highly educated, but the content of his education is a subject of much speculation. Some argue that with automation will come further

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[4]See, for example, Buckingham (1961), Diebold (1964), Rezler (1964), Schoderbek (1965), Whisler (1965), and Whisler & Shultz (in Wadia 1966, pp 340-344). In an interesting case dealing with the strategic planning issue, Mainer (1968) defines strategy as "concerned with the relationships between organization, its resources and capabilities, and its total environment . . . Strategic Planning seeks to identify those corporate actions which will yield the greatest advantage under various assumptions about the company and its environment." (p. 40, emphasis mine).

role differentiation and increased problems of coordination and communication (Davis, 1963). Others see the future manager as equipped with basic tools such as quantitative techniques of decision making, heuristic problem-solving ability, a systems concept of the organization, and knowledge of information theory and analysis, which he may apply to any facet of the organization for which he is given responsibility. In short, he will be a "super generalist," and as such will be readily promotable into top management ranks.[5]

Ansoff (1965) foresees that managers will use their newly available time in a search for better decision rules. In this search they will have the opportunity, as never before, for a study of the relationships between their functions and the rest of the organization. Thus, while functional identity will continue, there will be greater similarity in the kinds of work managers do.

2. Social Effects.

Diebold (1964) perceives the era of automation as one primarily of social change. Machine systems deal with the communication and use of information, which is the very core of our social system.

> The real potential, and the enormous problem, automation poses to the manager is that the environment in which the enterprise exists is changing, rapidly and completely. As the goals, aspirations, needs and wants of the individual shift and shift again and again through the human social change induced by automation, the economic realities that sustain the enterprise will change. (p. 31).

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[5]Some of the major works dealing with this topic include: Anshen (in Dunlop, 1962, pp. 66-83); Rezler (1964); Schoderbek (1965); Whisler & Shultz (in Wadia, 1966, pp. 340-344).

Proponents of this view believe that if our technological innovations are to realize their potential value, we must develop social innovations to keep pace. As computers take over routine decision making, tomorrow's managers will focus on larger, more long-range tasks, such as development of subordinates, customer contact and public relations (Whisler & Schultz, in Wadia, 1966). Far from obviating the need for middle managers, the computer may be viewed as the vehicle toward job enlargement, greater individual satisfaction, and greater creativity in management. In Anshen's (1969) view, middle managers will be "top managers in miniature," (p. 92) expanding into non-operation areas traditionally reserved for their superiors.

The study of the social implications of information technology properly falls in the realm of behavioral science, which Wadia (1961) defines as "a body of systematized knowledge pertaining to how people behave, what is the relationship between human behavior and the total environment, and why people behave as they do." (p. 8). Applied to management, behavioral science studies the dynamics of social interaction--between individuals and groups--upon which the success of information technology so much depends. Argyris,[6] in studying the social dynamics in organizations concludes that "the biggest single barrier to effective decision

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[6] Argyris has studied the interaction of individual and organization extensively. See Argyris (1967, 1964a, 1964b, 1962, 1957a and 1957b).

making . . . was the way the executives dealt with each other and the kinds of group dynamics they created." (Argyris, 1967, p. 18). This becomes particularly important in communications between line and staff, functional managers and technical specialists, and, if Hurd's (1964) prediction is correct, between systems analysts at supervisory levels and management generalists at middle levels. Human relations training has become common in industry, a point which will be dealt with more extensively in Chapter V.

3. Needed Skills and Knowledge.

Although management development is the subject of Chapter V, some of the areas in which development will be needed deserve mention here. Frederick (1963), in summarizing the components of a predicted general theory of management, provides a clue as to the skills and knowledge future managers will need. Such a theory will be scientific in emphasis, mathematical, reliant on the behavioral sciences and philosophical inasmuch as it will deal with values and ethics. Relatively new concepts, such as cost/benefit analysis, program budgeting, model utilization and other management science techniques, will play an increasingly important part in a manager's activities. Knowledge of computer capabilities and the computer's role in the organization will also assume greater importance. Further, competence, rather than seniority or number of subordinates, will determine promotability (Argyris, 1957b; Berkwit, 1966). This list will be compared with managers' own perceptions in Chapter VII.

4. The Man-Machine System.

Several authors have characterized the future organization as a man-machine system, rather than as separate functionaries. As Simon (1960a) perceived such a system, computers would initially take over routine (programmed) decision making, while managers will employ "systems thinking" and heuristic problem solving techniques to make the less structured decisions. The ultimate decision of whether to automate nonprogrammed decisions will be economically rather than technologically determined, in Simon's view. That is, where the investment of resources into programming a simulation model of human thinking results in significantly better decisions, computers will be used in preference to managers. Otherwise, human decision makers will be relied upon, and managers who have the knowledge and skill in this area will have a definite advantage over those who do not.

Ramo (in Ramo et al, 1964) sees the man-machine system performing two functions: 1) immediate and effective control over day-to-day operations, and 2) high-level planning, goal-setting, system design and analysis, and modifying the organization's activities to reflect dynamic, real-world parameters.

5. Number of Jobs.

The fear of technological unemployment or displacement has been expressed often, and the retraining of obsolete employees has

been proposed equally often as the solution. Mann and Hoffman (1960) make the point that absorption into non-automated parts of the organization may only be postponing eventual displacement. Some managers may move to government, some to top management, and some to more service-oriented ends of the business (such as sales or public relations). But, according to Michael (in Hacker, 1965), this will account for relatively few middle managers.[7] What is required is a concerted, planned, conscious effort to retrain people in areas that will serve their needs and society's in ways that are compatible with the "new information technology." To a great extent, it is the responsibility of each individual manager to take a hard look at the future and determine for himself what steps he must take in this direction.

Lee (1964) studied a company over a 5-year period following its first computer installation, and observed a decrease in both clerical and management personnel, although management accounted for an increased percentage of total employees. He felt, however, that the full impact of this first conversion was still to come. This point is made also by Whisler and Shultz (in Wadia, 1966):

> Although a greater number of clerical than managerial employees will be displaced, the percentages are reversed. More than a third of the managers will be displaced while only about a fifth of the non-managers will be so affected. (p. 341).

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[7]Michael (in Hacker, 1965, pp. 183-215) presents a gloomy outlook for workers and managers alike. Most of the proposed solutions do not, in his view, go far enough to prevent the "silent conquest" threatened by automation.

Other companies, such as Metropolitan Life and Gulf Oil have experienced as much as 75% growth in sales since their first computer installation, with the number of middle managers employed remaining largely constant (Berkwit, 1966).

That the number of middle managers will decrease significantly, there is little doubt, according to Leavitt and Whisler (1958) and Shultz & Whisler (1960). Yet, Guzzardi's (1965) study of several thousand middle managers showed that "at his level of management, the young executive has no fear that he will some day have to surrender his power of decision to a computer." (p. 120). Michael (in Hacker, 1965) cautions against this kind of thinking and failure to recognize the imminent danger facing the manager, worker and indeed, all society.

> If this world is to exist as a coherent society, it will have to have its own "logic" so that it will make sense to its inhabitants . . . If the new "logic" is to resolve the problems raised here, it will have to generate beliefs, behavior, and goals far different from those which we have held until now and which are driving us more and more inexorably into a contradictory world run by (and for?) ever more intelligent, ever more versatile slaves." (p. 214).

C. Summary

In this chapter we have described the modifications already apparent as a result of the impact of the "new information technology." Observations of past and present trends in the management functions have led to numerous predictions as to the future of

the middle manager. One of the primary focuses of this study will be to describe the ways in which today's middle manager views himself and his job ten years in the future. In order to contrast present views with predictions made up to a decade ago (but concerning the same future date), some of the specific predictions reported in this chapter are summarized below.

1. Obsolesence and the Need for Retraining.

a. In the future, managers will need skill in both quantitative analysis and decision theory, and behavioral science. (Frederick, 1963).

b. Knowledge of the capabilities and limitations of the "new information technology" will be essential for advancement into top management ranks in the future. (Anshen, 1960).

c. The proportion of managers displaced by automation will be greater than the proportion of clerical people so displaced. (Whisler and Shultz, in Wadia, 1966).

d. Additional training in computer-related areas will be essential for middle managers' advancement. (Davis, 1963).

e. Middle managers will be most affected by the new information technology, as planning will become a top management function and decisions left to middle managers will be more routine, even to the point of being computerized. (Leavitt & Whisler, 1958).

2. Time Allocations and Middle Manager Functions.

a. Automation will lead to a greater degree of management specialization. (Davis, 1963; Uris, 1963).

b. The manager of the future will be much more of a generalist than is today's manager. (Schoderbek, 1965).

c. The sales function will become of increasing importance to management, as most of the production function will be under computer control. (Rezler, 1964).

d. In the future, managers will spend more time analyzing information and planning than they do now. (Haas, Porat & Vaughan, 1969, in press).

e. There will be increased emphasis in the organization on strategic planning (Diebold, 1964; Whisler, 1965).

f. As computers make more and more routine decisions, managers of the future will spend more time in customer contact and public relations work. (Whisler & Shultz, in Wadia, 1966).

g. Managers will be forced to adopt a longer time perspective and devote more time to planning. (Simon, 1960a).

3. Man and the Computer.

a. Managers in the future will scarcely make any decisions without the assistance of computers. (Katz, Knight & Massey, in Wadia, 1966).

b. Younger managers see the computer changing their jobs more than do older managers at the same level of the organization. (Vaughan & Porat, 1967).

c. Middle managers are generally not concerned that the computer will take away much of their decision making authority. (Guzzardi, 1965).

d. The future will see a preponderance of man-machine systems for decision making. (Ramo, in Ramo et al, 1964).

e. Machines will only take over those functions in which they hold a comparative cost advantage over managers in their decision making capacity. (Simon, 1960a)

f. The relationships between managers and technical specialists will not change, provided managers become aware of the total environment and the parts played by specialist/subordinates. (Glossbrenner, 1964).

We turn now to the effects of automation on the organization to date, and predictions as to the likely future effects.

IV. The Future and the Organization

Automation has significant implications for the organization's decision making and authority structures, and can cause both realignment of departmental structures and alteration of the power structure. (Mumford, 1967). As in the last chapter, the effects of the computer to date will be traced first, followed by predictions about the corporation of the 1980's.

A. The Computer Era and Organizations

The development of EDP equipment coincided with industries' need for such equipment, regardless of which was cause and which effect. According to Postley (1960), organizations required the use of computers to achieve one or more of the following objectives:

> 1) To deal with increased complexity in data processing.
>
> 2) To deal with increased volumes in data processing and
>
> 3) To reduce data processing costs for a given level of complexity and volume.
>
> All these objectives usually involve increased timeliness and accuracy requirements. (p. 10).

Additional, more future-oriented considerations included pressure exerted by competition, expansion of research and development activities, desire to maintain a progressive image to the firm's various publics, and anticipation of new applications once the immediate operating pressures have abated.

1. Computer Management

Largely because of the ease of conversion and mounting volumes of paper work, the first application many organizations placed on the computer was accounting records. Therefore, computer management was often under the control of financial management rather than a special computer staff. In a recent study by the staff of Booz, Allen & Hamilton, the management consulting firm, control of the computer became the responsibility of the financial or administrative services staff in 84% of the firms studied, while a separate computer staff had control in only 16% of the cases (Taylor & Dean, 1966). Perhaps this was done with a view toward avoiding a "credibility gap" between computer-oriented groups and operating staff once the scope of computer applications was extended. But an underlying reason was the expressed view that it is easier to teach operating people about computers than it is to teach systems people about a business.[1]

The change to EDP is usually determined more by short-term pressures than long-range planning (Delehanty in Myers, 1967;

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[1] In a recent unpublished study of the impact of computers in small banks (Vaughan, Porat & Haas, 1968), it was found that, in the entire sample of 438 bank managers, 41% felt it was easier to teach bankers about computers than computer specialists about banking, 41% felt the converse to be true, and 17% said they didn't know. Among bank computer managers, however, 59% felt they could learn banking more easily than bankers could learn about computers.

Porat, 1968; and Taylor & Dean, 1966). Once the immediate data processing problems (catalysts for the computer decision) have been solved, companies usually become aware that they are not realizing the cost savings originally anticipated, and that in order to justify the existence of the computer, additional uses must be found for it or planned in greater detail.[2] Again referring to the Booz, Allen & Hamilton study, (Taylor and Dean, 1966; Dean, 1968) it was found that when new applications were attempted, there was no concommitant effort to add computer people with the necessary capabilities and experience to effect a successful conversion plan.

2. Organization Structure and the Computer.

With the realization that the original computer staff is insufficient for the larger tasks which the computer is to perform, comes an effort to acquire systems analysts, whose job it is to improve the existing applications and to plan and evaluate the need for new computer-based applications. Often, computer usage by separate functions leads to high-cost duplicate systems, which call for a group of managers so located in the corporate structure that they may plan and coordinate the automation and EDP activities of various segments of the organization, including the efforts of the systems analysts. The increasingly common existence of a planning group, rather than a single person

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[2]Computer salesmen, with remarkable consistency, seem to underestimate the cost of obtaining a computer and overstate the cost savings and other advantages. In addition to the hardware (main processor and peripheral equipment) and soft ware (programs and assembly routines), there are costs in building a computer facility, making other parts of the data processing system compatible with the computer, etc., which are difficult to assess, much less to predict.

charged with this responsibility, points to a structural change attributable to the advent of the computer. Specifically, this group has responsibility for gathering information, making projections, charting the company's course vis-a-vis its automation program and reviewing and evaluating progress (Schoenhofen, 1967). Operating personnel are often uncomfortable with the power position of the planning group, particularly if it is composed of high-level specialists who are fairly new to the organization. The line manager, who is trying to achieve satisfactory operations, is largely subject to the decisions of this planning group when trying to gain access to the computer in accordance with plans drawn up by his own systems analysts. The politics of such a situation can easily get out of hand. If, on the other hand, the planning group is composed largely of operating personnel, they are likely to be inexperienced in dealing with computer systems and cause considerable delays in achieving the desired results.

A few innovative companies are beginning to view the organization as an integrated system, and are taking steps to tie together two or more functional areas. Some also have definite plans for integrating the computer system. For the most part, such efforts are still in the planning stage, but their very conception represents an influence of the computer era. To be sure, any attempts at integration--be they organization wide or

only between two functional areas--will have political and social ramifications throughout the organization, as discussed below. Until now, however, the majority of corporations have not altered their structure significantly since the arrival of the computer. Only as the broader application of scientific management techniques to production and other major operations takes place, do the planning and coordinating requirements become apparent.

A few firms have undergone some reorganization at the top levels of management. For example, Ford Motor Company now has a three-man Chief Executive Office; National Biscuit Company has a four-man Executive Department; and Itek Corporation has a five-man Executive Office (Berry, 1967). Again, this solution has its problems, as it requires "perfect" communication to be successful. There is a tendency to "blame the other guy" for faulty decisions, so that final responsibility still lies with one man in practice, if not in theory.[3] Nonetheless, Joel Hunter, President of Crucible Steel Corporation, recognized a "tendency at the top to include more than a single executive in the role of chief executive in order to provide greater breadth. I suspect this will grow in larger and more complex companies" (cited by Murray, 1967).

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[3]Berry (1967) points out that this is not the case in Europe, where many large firms are family-owned. On the death of the head of the family, authority is divided among the surviving members. Thus Royal Dutch/Shell has a seven-man executive committee, Phillips has 11 and Unilever N.V. has 23 men at the helm with equal responsibility for top-level decisions.

In sum, organizations are now approaching the point of controlling the computer and understanding its capabilities and limitations. Applications are being planned and coordinated, at least by the more experienced users. "The computer function, not only technologically but also managerially, has come of age." (Dean, 1968, p. 91).

B. Predictions: The Future of Organizations

The effect of new information technology on the decision making structure of the organization has been the subject of numerous predictions. Intimately related to this are such topics as power relationships, communication channels, breadth of responsibility and the nature of organizational control. As Whisler & Shultz (in Wadia, 1966) point out, "The fascinating aspect of these transition problems is that the decisions which will have to be made about altered organization structure and altered pay and status relationships will immediately and directly affect those charged with the responsibility for these decisions." (p. 343).

1. Issues of Organizational Structure.

a. Centralization vs. Decentralization. Leavitt and Whisler (1958) made one of the earliest predictions of the effect information technology would have on decision making and control: that it would make centralization easier, and

> If centralization becomes easier to implement, managers will probably revert to it. Decentralization has, after all, been largely negatively motivated. Top managers have backed into it because they have been unable to keep up with size and technology. They could not design and maintain the huge and complex communication systems that their large, centralized organizations needed. Information technology should make recentralization possible. It may also obviate other major reasons for decentralization. For example, speed and flexibility will be possible despite large size, and top executives will be less dependent on subordinates because there will be fewer "experience" and "judgment" areas in which the junior men have more working knowledge. (p. 43)

Further, because the time between discovery and application of new knowledge is constantly being reduced, the organization must be able to react swiftly, and this demands more central control. Thus, top management will accept information technology, as it will "allow the top to control the middle just as Taylorism allowed the middle to control the bottom." (Leavitt & Whisler, 1958, p. 43). This line of reasoning contributes also to their prediction that there will be a reduction in the number of middle managers, as we know them today. In a later article, Whisler (1965) reviewed some of these original predictions, and contended that observed changes to date supported the prediction of recentralization of management control, particularly in areas where the computer has been applied.

In an extensive study of the implications of automation, conducted by Fortune, Burck (1965) noted that for the past 25 years, decentralization has been occurring for the primary reason tha "the science of gathering and passing on information was not

far enough advanced" (p. 103) to keep up with the larger and more complex organizations that were emerging. To solve the problem, firms were divided into functional divisions, each with decision making authority and often with assigned profit goals. But this is no longer necessary.

> The machine's power to help U.S. managers control their operations has generated what appears to be nothing less than a pervasive recentralization or reintegration movement . . . [T]he computer is now radically altering the balance of advantage between centralization and decentralization . . . The problem is not how to get information to the top, but how to decide on the "exception" information that management needs to act effectively. (Burck, 1965, pp. 102-103).

In reaching the same conclusion, Simon (1960b) emphasizes that, because machines "communicate" more quickly and efficiently than do humans or with human intervention, there is a considerable saving to be realized in avoiding the need to communicate between systems (divisions). He foresees the organization as a single, coordinated system with the computer the coordinating factor. Thus, information can be collected and integrated for use by management, and this calls for centralized control.[4]

There is another view, that while future organizations will recentralize to an extent, they will not differ significantly in operation from their present decentralized forms. The computer

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[4]Many others also predict future recentralization of the organization, advancing arguments similar to the ones presented in the text. See for example, Anshen (1962); Davis (1963); Lipstreu & Reed (1965); Whisler (in Myers, 1967); and Shultz & Whisler (1960).

may be centrally located to handle information transmitted to it, and then feed this information back to divisional managers for applications. Developments in the area of data transmission, will make it possible to continue decentralized management of operations.[5] President Robert G. Dunlop of Sun Oil Company, summed up this view by stating that the typical corporate structure

> ... will probably be in the direction of greater centralized control of planning, resource allocation and reporting activities, while at the same time providing for more decentralized execution of line functions ... (quoted in Murray, 1967, p. 26).

By contrast, Whisler (1965) predicted that the centralizing effect of the computer will be felt primarily in the machine-controlled areas of the operation. Counterbalancing this, however, will be a loose, flexible, decentralized structure staffed largely by the research-oriented professionals (of which there will be many) charged with the planning and coordinating responsibilities. Bass (1965, Ch. 7) also discusses the need for flexible organization structures.

There is some agreement that divisional computers, by and large, are undesirable, unless the specific nature of the work requires this. Brabb and Hutchins (1963) wrote:

> A centralized processing unit is valuable for dealing with numerous undispersed operations and is probably mandatory for highly centralized management control. On the other hand, divisional data processing facilities may often be justified by the nature and volume of

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[5] A strong case for continuation of divisional control is made by Dearden (1967), in which he states reasons why he feels Leavitt and Whisler (1958) were incorrect in their prediction.

> divisional activity and degree of local autonomy. . . . Centralization of data processing, however, does not preclude stages or phases of data processing at the divisional level. (p. 37).

Thus, the trend toward decentralization may at least be partially reversed.

Others foresee the continuance of decentralized management as a result of the now popular profit center concept. W. Cordes Snyder, Jr. (Board Chairman of Blaw-Knox) said recently that with increased size and complexity of operations, "it is more important than ever to decentralize into smaller profit centers, but with overall control." (quoted by Murray, 1967, p. 25). Murray (1967) goes on to suggest that the computer center itself may become a profit center in future corporations, while serving to link others to headquarters and each other. This would provide some rationale for locating the systems planners and coordinators in the computer division, thereby making it the most powerful segment of the organization.[6]

b. The Role of Staff Personnel. With increased awareness of the value of research has come a simultaneous increase in the number of scientists, engineers and other professionals employed by organizations. This will be a highly mobile, independent group, and in order to retain them, organizations will

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[6]Mann and Neff (1961) make the point that managers' expectations as to the future structure of the organization can play a large part in its coming to pass. If they expect it to become more decentralized, they will engage in less directing, controlling and order giving, and more motivating and developing of others.

will have to provide challenging problems and the freedom to be creative.[7] The rigid decision making hierarchy will not be applicable to these professionals, in Whisler's (1965) view, as they prefer working more or less as equals. This creates problems in coordination, cooperation, and understanding between the research staff and the rest of the organization, calling for new organizational design concepts which are not yet apparent.

Much attention has also been devoted to assessing the future role of programmers and systems analysts, designers and planners. Currently, computer programmers are rather highly-paid technical specialists. Simon (1960a), for one, does not believe this will continue, as computers will be programmed to program themselves. But he and others also predict that high-level systems people will become more of an elite group. Leavitt and Whisler (1958) predicted that computer experts, operations researchers and the like will be very close to top management. They will provide alternatives for organizational action, which top management will consider in arriving at decisions. Anshen (in Dunlop, 1962) agrees with this view, stating that while this elite group will exert considerable influence in top-level decision making, they will not themselves assume top management responsibilities. It is likely, however, that future top managers will be drawn from this elite, as well as from lower ranks of management, by virtue of the competences they possess. (Argyris, 1967)

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[7] Kirkpatrick (in AFMR, 1968) also makes this point.

Whisler and Shultz (in Wadia, 1966) make the point that in the future, all managers will resemble today's staff men more than line managers in terms of their knowledge, attitudes, behavior and interests. In agreeing with this view, Rush (in Shultz & Whisler, 1960) stated that in his company (Standard Oil of New Jersey)

> ... there is a growing realization ... that managers of the future must have some awareness not only of the capabilities of electronic data processing systems but also of the technical aspects of systems construction and maintenance. (p. 201).

c. Number of Organizational Levels and Departments. Simon (1960b) pointed out that hierarchies are natural organizational forms for any complex system. This is so both with respect to departmentalization of operations and authority structure. Aside from being natural, this form is also efficient, as it requires much less transmission of information than do other types of systems. For these reasons, Simon (1960b) predicts:

> 1. Organizations will still be constructed in three layers: an underlying system of physical production and distribution processes, a layer of programmed (and probably largely automated) decision processes for governing the routine day-to-day operation of the physical system, and a layer of non-programmed decision processes (carried out in a man-machine system) for monitoring the first-level processes, redesigning them, and changing parameter values.
>
> 2. Organizations will still be hierarchical in form. The organization will be divided into major subparts, each of these into parts, and so on, in familiar forms of departmentalization. The exact bases for drawing departmental lines may change somewhat. Product divisions may become even more important than they are today, while the sharp lines of demarcation among purchasing, manufacturing, engineering and sales are likely to fade. (Reprinted in Simon, 1965, p. 110).

Most writers agree that future organizations will maintain top, middle and lower levels of management and functional departments. However, the composition of these levels and departments are likely to change, both in number and content. Leavitt and Whisler (1958) summed up the results of the shifts they foresee by depicting the future organization as a football balanced on a bell. Thus, there would exist a large top staff group, a large body of lower level managers and very few middle managers. Argyris (1967), Bass (1965) and Whisler (1965) see the emergence of a flexible structure for top level, innovative, unstructured decision making, with a pyramidal shape for the more routine functions.

Although he predicts a recentralizing trend, Whisler (1965) also predicts an overall reduction in the number of levels in the organization within the basic three. This will be accomplished by combinations of existing levels, rather than their removal.[8]

d. Authority Structure. It has been pointed out that a shift in the authority structure is inevitable, as whoever controls the computer will be a position to exercise considerable authority. Whisler (in Myers, 1967) cited two trends in the placement of the computer. One is to place responsibility at a high level, such as top management staff, and the other is moving it away from any one functional department to a neutral location. Both will probably be in evidence in the future.

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[8] As an example of this Whisler cites the introduction of SAGE into the North American Defense Command (NORAD). Details may be found in Whisler (in Myers, 1967, pp. 29-30).

2. Social Changes.

If computers serve to strengthen the boundary between the top and lower organizational levels (Leavitt & Whisler, 1958), take over more and more decision making responsibility (Simon, 1960a) and make their human specialists an organizational elite (Leavitt & Whisler, 1958), what will be the social implications? There is no substantial agreement on this issue. Some, such as Lipstreu and Reed (1965) predict that as decision making becomes more routine, the social structure of the organization will become more impersonal. Others, such as Murray (1967), believe that man is a social animal and will find other means for satisfying his social drives. Some believe that in the future, organizations will show a greater concern for managers as human beings, including their attitudes, values and social behavior. (Merton, cited by Anshen, in Anshen & Bach, 1960; Kirkpatrick in AFMR, 1968). In the event that this does not occur, managers may well turn their social energies outward, to the community, thus using the time that has been freed for them by virtue of the computer's decision making ability. It is indeed difficult to consciously plan social change--it somehow has a way of taking care of itself. But, as Diebold (1964) pointed out, the problem cannot be left to organizations, behavioral scientists or any other single group to solve alone--it must be solved by all society. "The proper role of public policy is to create the conditions necessary to leadership in the human use of this new technology." (p. 32).[8]

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[8]There have been others who have addressed themselves to some of the social correlates of information technology. See for example, Buckingham (1961, 1964); Michael (in Hacker, 1965) and Gagne (Ed., 1962).

3. The Organization in Society

As decisions become more routinized, organizations will turn some of their attention outward (Shultz & Whisler, 1960), giving managers (and others) more time to devote to social problems in the community. Some have even gone so far as to predict that organizations might well establish separate departments to keep an eye on the social effects of organizational decisions,[9] and commit research funds to finding solutions to social problems (Hohorst, 1968). This leads to a further prediction, that the goal of profit-making will be shared with the goal of service to society (Berle, in Anshen & Bach, 1960; Weston, 1968).[10]

Berle (1954; 1959; 1965) has written extensively about the relationship between corporations and society. While in theory, the owners have control over corporate policy by virtue of their voting rights, in fact this is not the case. Corporate stock has increasingly been purchased by pension trusts, investment houses, and, to a lesser extent, life insurance companies. If this trend continues, and Berle (in Anshen & Bach, 1960) predicts it will, these groups represent an enormous potential source of

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[9]This idea was first brought to my attention during a personal discussion with Dr. William C. Frederick of the Graduate School of Business, University of Pittsburgh.

[10]Berkely (1962) has devoted a section of his book to the social responsibilities of computer personnel. A particular danger he cites is the reliance on computer decisions and results before programs have been thoroughly tested and debugged.

power over corporations. It also means that the individual is virtually powerless, except in his role as consumer and his voice in the "public consensus." Further, social problems may not be limited to this country alone. Lilienthal (in Anshen & Bach, 1960) foresees the multinational firm as the archetype of the future business firm, which has social implications for foreign societies as well, perhaps even more serious and difficult to solve than our own.[11]

C. Summary

In this chapter cogent aspects of the present corporate organization were described and predictions of future developments resulting from the "new information technology" were presented. Some of the major predictions which have appeared in the literature and were discussed in this chapter are summarized below.

1. Centralization vs. Decentralization

   a. There will be an increased tendency toward recentralization of the organization. (Leavitt & Whisler, 1958; Lipstreu & Reed, 1965; Shultz & Whisler, 1960; Anshen, 1962; and Kirkpatrick, in AFMR, 1968).

   b. There will be a tendency to decentralize the organization into profit centers, but under central control. (Snyder, quoted in Murray, 1967).

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[11] The whole area of international management and problems involved in expansion by American corporations into foreign countries is beyond the scope of this study. The interested reader should consult Harbison and Meyers (1959) and a section devoted to the subject in Wadia (1966) for both substantive material and further references.

c. Future organizations will exhibit greater centralized control of planning, resource allocation, and reporting activities, while line functions will exercise decentralized decision making prerogatives. (Dunlop, quoted in Murray, 1967).

d. Because future organizations will be staffed largely by research-oriented professionals, its authority structure will be more decentralized than it is today. Centralization will only occur in machine-controlled aspects of operations. (Whisler, 1965).

2. Staff Function and Management Competence

a. Computer programmers will become less influential than they are now, as computers will be programmed to program themselves. (Simon, 1960a)

b. There will be a great increase in the number of "management scientists" in top management staffs. (Toan, 1965).

c. Jobs in systems planning and research and development will move upward, as staff positions close to top management. (Leavitt & Whisler, 1958).

d. Professional experts in automated data handling will occupy positions of growing importance and will exercise greater influence on the whole system of information processing and decision making. (Anshen, in Dunlop, 1962).

e. Future organizations will rely more on competence than on the coercive power of executives in determining promotability. (Argyris, 1967).

3. Organizational Structure

a. There will be an overall reduction in the number of levels in future organizations. (Shultz & Whisler, 1960; Whisler, 1956).

b. The hierarchial structure of organizations will continue, as it is both natural and efficient. (Simon, 1960b).

c. Organization structure will change from pyramidal shape to resemble a football balanced on a bell (large top management group, small middle and large lower groups). (Leavitt & Whisler, 1958).

d. The organization will be pyramidal for routine jobs (which require authoritarian leadership), but for more innovative work a project or other flexible design will be employed. (Argyris, 1967; Whisler, 1965).

e. The line separating middle and top managers will be more clearly drawn and more difficult to cross. (Leavitt & Whisler, 1968).

f. Automation will result in an increase in the ratio of supervisors to workers, i.e., span of control will be increased. (Lipstreu & Reed, 1965).

4. Social Concern: Internal and External

a. Automation will result in more impersonal social (informal) organization as decision making becomes more routine, (Lipstreu & Reed, 1965).

b. Organizations will focus less on internal relationships and control problems, and more on outward relationships. (Shultz & Whisler, 1960).

c. Organizations of the future will exhibit increased social concern and social power. (Anshen, in Anshen & Bach, 1960).

d. Organizations of the future will exhibit a greater concern for managers as human beings--their values, attitudes and social behavior. (Merton, cited by Anshen, in Anshen & Bach, 1960).

e. The future will show an increase in meetings, phone calls and other forms of verbal communication, as a means of combating both the impersonality of the computer and the paper explosion it will cause. (Murray, 1967).

f. The trend toward widespread stock ownership by pension trusts and investment companies will continue, causing a concentration of potential power over corporations. (Berle, in Anshen & Bach, 1960).

Before comparing managers' predictions to those presented in the preceding two chapters, it will be necessary to introduce the subject of training and retraining that managers will be likely to need in order to prepare themselves for occupying their future roles as directors of the business organization. This is the subject of the following chapter.

V. The Future and Management Development

There is general agreement that 1) the skills and knowledge required of future managers will be quite different from those considered sufficient today, and 2) the great majority of today's middle managers will require retraining if they are to survive in the rapidly changing business world. As it is now, the status of the firm's computer technology is often considerably more advanced than the ability of most managers to use it effectively.

The first section of this chapter will deal with the theory behind management development and its use by corporations to date. The second section will cite examples of corporate approaches to the management development process. Finally, predictions as to future training needs and the importance of individual readiness and motivation to develop himself will be discussed.

A. What is Management Development?

1. Theoretical Considerations.

There are those who believe that the essence of the management process is the development of people.[1] It is the duty, therefore, of every manager to ensure the improvement of skills and behavior of subordinates, second in importance only to getting

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[1]This view was expressed by Lawrence A. Appley, past President of the American Management Association in the Foreward to Merrill and Marting (Eds., 1958). He goes on to point out that in reality, managers cannot be developed, but can only be led to develop themselves. This is discussed more fully in Section C of this chapter.

the job for which he is responsible accomplished satisfactorily. It has been noted above that no longer is mere seniority or number of subordinates the primary criterion of promotability, but rather the competences a manager possesses. It is toward the development of these competences, as constantly redefined in light of technological advances, that management development is directed. Because improved performance is a function of both initial ability and the motivation to learn,[2] effective training requires the active participation of the trainee.[3]

a. Management Development Defined. House (1967) defines management development as "any attempt to improve current or future managerial performance by imparting knowledge, conditioning, attitudes or increasing skills." (p. 13). Schein (in Leavitt & Pondy, 1964) provides the following definition, perhaps more operational than the preceding one:

> [Management development is] the problem of how an organization can influence the beliefs, attitudes and values . . . of an individual for the purpose of "developing" him, i.e. changing him in a direction which the organization regards to be in his own and the organization's best interests. (p. 331, emphasis mine).

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[2]There is some controversy as to whether the two are additively or multiplicably related, but agreement that both are involved. For discussions of this point, see Vroom (1964) and Bellows et al, (1962).

[3]Much has been written on the subject of managerial learning and training. This and Lippitt (1966) nicely summarize the relation between various learning theories and the training function. Skinner (in Leavitt & Pondy, 1964) discusses the importance of reinforcement to learning. See also McGehee and Thayer (1961).

Argyle and Smith (1962) wrote that the skills to be improved may be both intellectual and social. In order for the aims of a management development program to be realized, its contents must be understood and accepted by members of the organization (Drucker, 1953), and this requires some concern for individual needs. Chowdhry (1963) found a greater involvement in the development process if the idea of attending is self-initiated and if the managers are involved in decisions regarding their own training and development. This also means that there must be some assurance that results of the training will be of use to the manager (i.e. that positive transfer of learning will occur), that he is equipped with the basic skill or knowledge upon which the training activities will be built, and that an adequate opportunity will be provided for learning to occur. (Bellows et al, 1962, Chapter 3).

In depicting a "coercive persuasion" model of change, Schein (In Leavitt & Pondy, 1964) perceives management development as a "process of influence" involving unfreezing of old patterns of behavior; changing into new ones; and refreezing, or internalizing these new patterns.[4]

b. Creating the Climate for Development. House (1967, Chapter IV) outlines a "commitment approach" to designing an

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[4]Levinson (1962) addresses himself to the importance of identification in the change process. He points out that where a management development staff does the actual training, the opportunity for identification is not provided. He suggests that managers be taught principles of coaching and counseling in order that they may, in turn, be the manager developers, thus permitting identification to take place. Leigh (1966) espouses a similar view. Levinson also points out why coaching often fails today.

organization-wide development program, underscoring the importance of creating an atmosphere in the organization that is conducive to management education. This involves not only the commitment of top management to the value of such a program, but also their active participation in its design.[5] It is here that the fault for program failure often lies. Genesco President, B.H. Willingham, has said, "Executive development is the most important function of top management, and any leadership shortage is indicative of failure of top management to fully meet this responsibility." (reported by Perham, 1966, p. 91). Stated another way,

> . . . when the organizational conditions support the development effort, a manager will be significantly more likely to transfer the learning effort to his job. Knowledge of the nature and operation of the climate factors will, furthermore, help managers determine appropriate strategies for their own efforts. (House, 1967, p. 98).

c. Specialists or Generalists? While advising college-age youths to pursue a liberal education, businesses are not adhering to this policy in their hiring practices (Weiner, 1965). Schoenhofen (1967) criticizes the fact that today's manager is too much of a specialist, and places the blame for this both on the business schools and business hiring practices. In his view, future managers will need to rely on imagination and innovation as much as on the

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[5]For further discussion of this point and others in creation of the proper climate for development, see Reilly and Muller-Thym (in Merrill & Marting, Eds., 1958, pp. 33-46) and Crawford (in Bursk, Ed., 1953, pp. 7-17).

technical skills; and, therefore, a liberal education will best prepare him for his future role. The same approach should be used in the organization's management development program, as top executives are now and will increasingly be generalists, familiar with a broad range of technical and non-technical areas (Scheer, 1967). It is this broader approach that some feel should be adapted by universities and business schools, (Rogers, 1966). Curriculum development in the business field should represent the combined thinking of academicians and businessmen to a greater extent than it now does.

2. The Growth of Management Development Efforts

The practice of managers engaging in development work can be traced back to the days of Taylor's "scientific management." He and the Gilbreths recognized the need to prepare managers for assuming greater responsibility in the direction of the enterprise (Merrill & Marting, Eds., 1968). The American Management Association (AMA) meetings of the 1920's discussed the identification and development of executive potential. Because of the management manpower shortage resulting from World War II, corporations began to look to the universities for assistance in developing their managers. Programs were established at the University of Chicago (1945) as well as those of Pittsburgh, (1949), Pennsylvania (1950), Indiana (1951) and Northwestern (1951) (Powell, 1962). In a 1954 survey of AMA member firms, 54% had formal programs of their own,

and an additional 21% had one or more coordinators of development efforts, even though they had no formal program in progress (Merrill & Marting, Eds., 1958). In a similar survey conducted by the Bureau of National Affairs in 1967, "about three fourths [of the 228 firms sampled] conduct some type of continuing program of developmental training for their present executives." (Personnel Policies Forum, 1967, p. 2).

Development is accomplished using a variety of methods, some quite recent.[6] Since the computer has come into use, new techniques of training, such as simulation and "business games" have appeared. The development effort has been updated in other ways as well. For example, many firms have separate programs for different age groups of managers to account for elapsed time and different content of prior formal educational backgrounds (Dunn, 1967). Similarly, business has been careful not to allow technological training to preclude the importance of human relations-type training. Bernthal (1963) has described a continuum of management training, ranging from the intellectual methods (lectures, guided discussions and conferences) to vicarious experiences (case study, incident method, role play and simulation); to social awareness (T-groups); and finally complete behavioral transformation (psychotherapy and psychoanalysis). Dill, Crowston and Elton (1965) classified learning as acquisitional,

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[6] A partial reference list for each of the various training methods in common use appears in Appendix A.

experiential or exploratory. They may also be classified as on-the-job versus off-the-job methods (Bass & Vaughan, 1966) or individual versus group methods.

B. The Current Status of Management Development

1. Location of Training.

To an increasing extent, management development programs include a combination of on- and off-the-job training. On-the-job training was long considered adequate to prepare the manager for his future role, as what was required was "data experience," whereby over time the manager acquired a "feel" for the kinds of information needed for decision making (Vaughan, Haas & Porat, 1968). Today, however, information is much more complete, complex and varied, so that intuition alone will not produce the kinds of decisions demanded of managers. The need for greater breadth of managerial experience has been recognized, and use of various off-the-job training techniques has become widespread. Some of the major advantages and disadvantages of each method are presented in Table 5.1.[7] Rather than offer one type of training exclusively, many organizations make use of a combination of both in their overall development programs. Of course, selection of the specific programs, both internal and external to the organization, is a function of numerous variables unique to the organization; and so no one prescription would be universally applicable.

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[7]A number of sources discuss the advantages and disadvantages of each type of training under various conditions. See, for example, Bass and Vaughan (1966); McGehee and Thayer (1961); Oberg (1963); and Vaughan, Haas and Porat (1968).

TABLE 5.1

SUMMARY OF ADVANTAGES AND DISADVANTAGES IN ON- AND OFF-THE-JOB TRAINING METHODS

	On-the-job	Off-the-job
ADVANTAGES	1. Practicality--manager produces while he learns. 2. Avoids problem of transferring what is learned to work situations.	1. Permits trainees to devote full attention to the training effort, away from job pressures. 2. Makes available a wider range of programs than the firm could offer on its own.
DISADVANTAGES	1. Tendency to emphasize production rather than training. 2. Much of the value of the training experience depends on the competency and interest of the superior/trainer.	1. Failure to provide for the application of materials learned--transfer of learning 2. Can become expensive, unless training goals are carefully viewed when selecting program.

2. Corporate Use of Management Development Techniques.

The 1967 Bureau of National Affairs study revealed that about one-third of the 228 companies have formal training programs while about three-fourths conduct informal programs (Personnel Policies Forum, 1967).[8] In addition, seventy percent of the firms reported that the training offered is voluntary. Sums spent for

[8]Formal programs are defined as planned programs which managers follow as a natural course of development, regardless of individual circumstances. Informal programs are not necessarily haphazard, but are more geared to individuals and are likely to be on a voluntary basis, a factor which, Chowdhry (1963) found led to greater involvement in the development process.

management development ranged from $1,000 to $45,000 annually, although some firms could not respond to this question meaningfully. The most common subjects covered in training programs are economics, management, business law, finance, public relations, accounting, managerial psychology, liberal arts and humanities (p. 14). The most popular techniques are job rotation (used by 39% of all companies), role-playing (by 18%), lectures (by 34%) and outside education (by 19%). Formal evaluation of the effectiveness of the management development programs is conducted by only 21% of the firms surveyed.[9]

In another empirical study of 49 corporate management development programs, Foreman (1967) found that 45% had formal training programs, 33% had informal programs, and 22% used a combination of both. The techniques most commonly used were conference and discussion (93%), job rotation (76%), special projects (71%), case studies (49%), problem solving (49%), management games (18%), role playing (18%), programmed instruction (16%), sensitivity training (9%). Ninety-four percent used university courses, 90% used management seminars, 86% used AMA courses, 41% used correspondence courses, and 27% used National Management Association courses.

International Business Machines (IBM) established an Executive Development Department in 1956 to determine training needs and

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[9]The Personnel Policies Forum (1967) reports extensively on individual responses of participants from the various firms represented. While too specific to include in this study, many of the observations made reveal interesting approaches and problems encountered in designing and implementing comprehensive management development programs.

conduct and establish programs to satisfy those needs. The result was a four-week program for middle managers which concentrates on teaching the following skills: organization theory, finance, industrial relations, individual and group processes, and the multinational firm. The higher level Executive School is a five-week program using case studies, lecture-discussions, role playing, business simulations, written and oral presentations and outside reading. Managers concentrate on public affairs, technological and social change, international economics, management analysis, and decision making. The entire fifth week is devoted to the study of government affairs.

Wiora and Trego (1961) described one company which offered twelve classes covering various aspects of the manager's job by means of discussion, role-playing, individual reports and cases. The authors report a great increase in both morale and performance, which they attribute not to the content of the training, but to the obvious interest top management had in the program. This instilled in the managers the motivation to seek their own development, including the identification of skills and knowledge they felt they needed.

A program undertaken by Standard Oil of New Jersey placed emphasis on diagnostic, procedural and evaluative skills of the individual as a group member, a group representative and a change agent (FRHB, 1960).[10] The program combined the use of

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[10]Much of the responsibility for this program was assumed by Robert Blake, the developer of the famous "managerial grid," later expanded into a total development program he markets under the title, "Organization Training Laboratory." See Blake (in FRHB, 1966, pp. 7-31) and Blake and Mouton (1964). As part of the Standard Oil program managers explored power relationships by means of "grid-type" analyses.

"development groups" and group exercises, with groups consisting of eight managers chosen at random from various organizational levels.[11]

C. Management Development in the Future

1. Directions for Future Management Development Programs.

One of Whisler and Shultz' (in Wadia, 1966) predictions was that managers will be engaged in more formal training in the future, and that organizations will, of necessity, turn to the university to provide it. This could either mean errolling managers in lengthy university-conducted development programs, or recruiting individuals from those universities to conduct training programs for the specific organization. They further note that this greater formal training represents a social trend as well as one forced by the state of technology. Cyert and Dill (1964) wrote that the primary role of universities will be to teach knowledge and skills, to train managers to be developers themselves and to themselves conduct basic and applied research for eventual use by business firms. More broadly, Bursk (1967) feels that managers will have to develop: 1) technical knowledge and information relative to their own job; 2) broader understanding of functions other than their own; 3) skills in decision making and human relations; and 4) motivation to acquire and apply the preceding three.

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[11]Several authors have formulated overall approaches to the management and organization development problem. Examples are the commitment approach (House, 1967) and the Organizational Training Laboratory which utilizes Blake's "managerial grid" (Blake and Mouton, 1964). See also O'Donnell (1968) and Scott (1963).

Many predict that the future emphasis will be away from concern with administration and control, and toward the arts of strategic planning, model utilization, goal setting and decision making.[12] Unless managers are trained in some of these areas, they risk losing authority to the staff specialists who have been trained. (Vaughan & Porat, 1968). Levinson (1962) speculates on the value of training managers to serve as coaches and developers, in addition to the more academic kinds of skills, so that they can supplement formal training programs with on-the-job development (see footnote 4 on page 69).

Perhaps more than anything else, businessmen and scholars all agree that development should be continuous. As one businessman put it:

> Tomorrow's managers will not be developed tomorrow. Their development is taking place today and will continue long into tomorrow. If you want to know the caliber of the manager of tomorrow, take a look at the nature and character of today's manager development process.
>
> Managers cannot be developed, or develop themselves, overnight. It is an educational process, and there is no short-cut to adequate education. These are not blue-sky, pious, theoretical observations. They are cold, practical, validated realities. (Appley, in Ramo et al, 1964, p. 50).

Perhaps the weakest part of today's management development programs is that they are inadequately appraised. Provisions should be made for evaluation and re-evaluation 1) by organizations,

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[12]See, for example, Cyert & Dill, 1964; Uris, 1963; and Whisler, 1965.

to ensure that the organization's needs and those of its managers are being met; and 2) by managers, to ensure their own development goals are being achieved. It is toward providing a tool by which managers can state their development goals, that this research is directed.

2. The Role of the Individual in Management Development.

a. Motivation. It is not enough simply to have training programs available to managers or to submit them to various kinds of development programs. They must want to undergo training. In Chapter II, motivation was described as the foremost psychological characteristic of managers. Often, however, they are motivated more by today's challenges than by tomorrow's; more by current than future performance. In his own self-interest, however, a manager cannot afford to let today's pressures preclude his thinking about tomorrow's world of work and his role in it. Thus a large part of a successful development effort is to increase the manager's own desire to learn. "A man who wants to develop himself does--a man who wants to be developed rarely is." (Hull, in Ramo et al, 1964, p. 39).

b. Awareness. Terms such as "statistical decision making," "information technology," "rational problem solving," "systems analysis and planning," and "operations research" have become "buzz-words" to most managers, although many men have only the most rudimentary understanding of what they mean and how they are used.

They may figure that if learning these skills is important, the organization will make sure they receive the necessary training.

> But executives today cannot afford to be diverted or wait for others to provide a vaccine against obsolescence. Knowledge, skills, attitudes, and understanding are possessions which men acquire for themselves, not gifts which a company or a university can bestow. (Dill, Crowston & Elton, 1965, p. 119).

Until the manager asks himself what it all means to him and his future, the modern buzz-words remain simply buzz-words.

The organization can help create this awareness in the individual manager--really an attitude of self-development. To a large extent, it depends on the commitment and participation of top management in the development program (House, 1967). It also requires providing jobs that stretch and challenge manager capacities, and identifying and rewarding those who are providing for their own growth (Hull, in Ramo et al, 1964). Still, "[i]deally, . . . each manager should go through a careful process of self-examination, and if necessary, indoctrination." (Berkwit, 1966, p. 107). The ultimate goal of the organization should be, as Gardner (1963) suggests, "to shift to the individual the burden of pursuing his own education." (p. 12).

c. Planning. Self-education involves at least three steps: 1) establishing a learning agenda; 2) planning a strategy for learning; and 3) evaluating the chances for success. (Dill, Crowston & Elton, 1965). One of the primary benefits intended for the managers who participated in this study was accomplishment

of the first step. It is prerequisite to the other two and the most important. Dill et al (1965) indicates three parts of a learning agenda, all of which are provided for within the scope of this study:

> 1. Statements of aims--changes that they would like to make in their knowledge, skills, attitudes, values, or relationships with other men and organizations.
>
> 2. Definitions of areas for study, search, reflection, or testing--lists of activities, experiences, or questions that can help them accomplish their aims.
>
> 3. Ideas about priorities--feelings of preference or urgency about what should be learned first. (p. 120, numbers provided).

The authors note that "[w]ell-stated learning agendas proved to be rare among our interviewees." (p. 121).[13]

D. Summary and Conclusions

Broadly, management development is defined as an attempt to improve a manager's performance by training in various skill, knowledge, and/or attitudinal areas. It is a "process of influence," whereby old forms of behavior must be abandoned, changed behavior taught, and then cemented into the manager's intellect and personality. For a management development program to be successful, managers from the top down must be committed to its principles and content. This includes involvement in the selection of appropriate techniques and

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[13] Dill, Crowston, and Elton (1965) interviewed 70 middle manager graduates of a program in administration, as a method of "exploring the process of self-education in management and experimenting with ways of encouraging and facilitating it." (p. 120). While interviews were recorded, they mention that the format of questioning did not permit a quantitative statement of results.

training content, consistent with organizational and individual needs. In most instances, the use of off-the-job training methods should supplement on-the-job techniques, as lack of time and lack of competent trainers from among organizational employees, make the latter approach inadequate in itself.

Management development is really self-development. A manager must be motivated to learn, he must be aware of the consequences of not pursuing his own development, and he must plan the kinds of training he will need. This last area involves identification of the skills and knowledge he will need, ways in which to acquire this training and a list of priorities.

In a sense, the first five chapters represent an introduction to the research which follows. The world of work has been defined, predictions as to future changes in a manager's job and in his organization have been presented, and the subject of management development has been described in some detail.

As stated in Chapter I, the primary intents of this research are in three directions: 1) to describe the ways in which managers perceive the future world of work; 2) to compare these perceptions to predictions made over the last decade; and 3) to test the effect of a systematic view of the future world of work on self-development plans. We turn now to results of the research.

VI. Methodological Approach

A. Measuring Instruments

Each respondent completed four instruments.[1] The description and purpose of each is discussed separately.

1. Personal Data Sheet (PDS)

This contains items concerning the manager's personal background and current job. Included are questions relating to his age, education, the function or department in which he works, the number of subordinates reporting directly to him, the number of years he has been with the company and in his present job, and whether he characterizes his job as primarily line or staff. The respondent is also asked to provide a brief description of the job he would like to hold 10 years in the future. This is to bring into focus a definite goal to use in thinking about the future and the kinds of skills and knowledge he will need to prepare himself for his "ideal" job. Respondents also were asked to indicate the kinds of previous training they have had, if any. Items on the PDS are used as independent variables to describe the future world of work as predicted by the sample. Some of the items are also used to test the effect of the questionnaire upon the subsequent development plan each manager formulated.

2. Estimates of Current Time Allocations (ETA)

The primary purpose of this instrument is to allow managers to focus on their present jobs before trying to predict the changes that

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[1]Copies of the instruments appear in Appendix C.

might occur in the future. Thus, before completing the major instruments, the manager gets a clear idea both of what he is doing now and what he would like to be doing in 10 years. The items on ETA were already described (see Appendix C, p.144). Space is provided for any activities a manager feels cannot be subsumed under the six major categories presented.

3. The World of Work Questionnaire (WWQ).

The purpose of WWQ is to obtain managers' expectations about their jobs and the organization 10 years in the future. The instrument contains several statements concerning various dimensions of the future world of work. For each, the respondent is asked to indicate the likely future direction, by checking one response from among the five presented. Choices fall along a continuum, from "will greatly increase" or "will definitely occur," to "will greatly decrease," or "will definitely not occur."

Specific items on the WWQ came from several sources, including: 1) a self-administered training exercise, a preliminary version of which was developed by a number of social scientists;[2] 2) a thorough search of the literature by the author; 3) suggestions of social scientists and other business school faculty members;[3]

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[2]"Exercise Future," from A Program of Exercises for Management and Organizational Psychology, Pittsburgh: Management Development Associates, 1967. The exercise was developed by Drs. E.C. Ryterband, B.M. Bass, J.A. Vaughan and L.W. Porter, with the collaboration of Drs. M.D. Dunnette and A.M. Porat.

[3]At the Graduate School of Business, University of Pittsburgh.

4) suggestions of corporate management development personnel; and 5) suggestions of 60 evening MBA students who pretested the instrument.[4] In selecting items, the intent was to prevent response bias by virtue of the specific aspects of the future included in the questionnaire, and the above persons reviewed the instrument with this in mind. On the basis of pretest results, two WWQ forms were constructed, one containing those items categorized by the pretest sample as "rational" and the other containing those items categorized as "behavioral." The remaining items were included in both forms of the instrument. The "rational" WWQ (WWQ_r) contains 64 items, and the "behavioral" WWQ (WWQ_b), 52 items.

4. Personal Development Plan (PDP)

This instrument consists of 51 possible skills and areas of knowledge where managers might desire further training in preparation for the world of work 10 years from now. In addition, it contains 24 training techniques which they might employ to acquire this training. Items were obtained from the same sources as WWQ items. To a large degree, the items are closely tied to the possible changes presented in WWQ. For each item, the respondent is asked to indicate the importance of receiving training in that area or by that technique. By means of this instrument, the manager is establishing what Dill, Crowston and Elton (1965) have termed a "learning agenda," as described on page 80 of Chapter V.

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[4]For a description of the pretest procedure, see Appendix B.

The pretest sample also categorized the PDP subject areas and techniques as "rational," "behavioral," or "neither." Although all managers in the final sample responded to the same PDP, this classification was needed to test hypotheses 2 and 3 (see pages 7 and 8).

B. Research Design

The middle management sample was randomly divided into four groups, differing only with respect to the WWQ form to be completed and the order in which the instruments appeared in the questionnaire packet. The design is summarized in Table 6.1. Packets of questionnaires were labeled Forms A, B, C, and D, reflecting the order of their contents, but managers had no knowledge of the meaning of the Form designation. Appropriate instructions preceded each questionnaire packet (see Appendix C). The total time estimate for completion of all items was 65 minutes.

TABLE 6.1
RESEARCH DESIGN

Management Group	Order in Which Forms Were Completed			
	1	2	3	4
I	PDS	ETA	WWQ_r*	PDP
II	PDS	ETA	PDP	WWQ_r*
III	PDS	ETA	WWQ_b**	PDP
IV	PDS	ETA	PDP	WWQ_b**

* Management groups I and II received a WWQ dealing primarily with rational, quantitative, objective aspects of the future world of work.

** Management groups III and IV received a WWQ dealing primarily with behavioral, social, subjective aspects of the future world of work.

C. Procedure and Sample Description

A total of 139 usable responses were received and analyzed.[5] Of these, 57 (41%) were middle managers attending a two-week training program. They came from all over the country and are employed by a large electrical manufacturer. On the second day of the program, they were asked by the instructor (himself a manager in charge of management development) to complete and return the questionnaire packets the following day. Questionnaire forms were distributed randomly and equally among the four Forms.

The remaining 82 (59%) respondents were middle managers from the Pittsburgh area, employed by a large metals manufacturer. They were asked by the corporation's management development department to voluntarily cooperate in the study by completing the questionnaires and returning them directly to the researcher. Slightly more than 57% of the 143 packets mailed out were returned. The four Forms were again randomly distributed. The unequal Group sizes (see Table 6.2) reflects the fact that questionnaires were not received from all managers in this group.

Table 6.2 summarizes the number and percent of managers falling into the various PDS categories. The sizes of the four groups (see Table 6.1) were 34, 34, 40 and 31 respectively. The average age of respondents was 43.00 years (σ = 7.99).

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[5]One questionnaire packet was received subsequent to the initial data analyses. Also, there were occasional blanks on the questionnaires. For these reasons, totals do not add to 139 in some instances.

TABLE 6.2

SUMMARY OF SAMPLE CHARACTERISTICS

1. Age Group	No	%
Less than 24	0	0.0
24 to 30	3	2.2
31 to 37	24	17.4
38 to 44	50	36.2
45 to 51	46	33.3
52 to 58	11	8.0
59 to 65	3	2.2
Over 65	0	0.0
No response	1	0.7
Total	138	100.0

2. Function	No	%
Production	19	13.8
Finance	16	11.6
Personnel or Training	20	14.5
Research & Development	5	3.6
Sales or Marketing	32	23.2
Computer or EDP	7	5.1
Engineering	26	18.8
Law	3	2.2
Other	10	7.2
Total	138	100.0

3. Education Beyond High School	No	%
None	2	1.4
Business or Economics	34	24.7
Science or Engineering	84	60.9
Liberal Arts	18	13.0
Other	0	0.0
Total	138	100.0

4. Time With Company	No	%
Less than 2 years	0	0.0
2 to 5 years	6	4.4
6 to 10 years	17	12.3
11 to 20 years	73	52.9
Over 20 years	42	30.4
Total	138	100.0

5. Number of Subordinates	No	%
None	25	18.1
5 or less	58	42.0
6 to 10	39	28.3
11 to 20	11	8.0
Over 20	3	2.2
No response	2	1.4
Total	138	100.0

6. Time in Present Job	No	%
Less than 1 year	33	23.9
1 to 2 years	33	23.9
2 to 5 years	51	37.0
6 to 10 years	13	9.4
Over 10 years	8	5.8
Total	138	100.0

7. Line or Staff	No	%
Purely Staff	46	33.3
Mostly Staff	32	23.2
About half and half	21	15.2
Mostly line	18	13.0
Purely line	18	13.0
Cannot say	3	2.2
Total	138	100.0

8. Previous Training	No	%
Yes	109	79.0
No	29	21.0
Total	138	100.0

VII. Results

In this chapter only the descriptive and experimental results will be presented. A more complete discussion and comparisons between current predictions of middle managers and predictions made over the past ten years will appear in the following chapter.

A. Describing the Future World of Work

In this section, questions asked of the 138 middle managers have been grouped by topic to aid in the presentation of results. Comparative data is presented by function, this breakdown accounting for more response variability than any other of the PDS items. In each table, items have been ranked according to means, the greatest predicted increase having the highest rank. It should be remembered that all items were not asked of all managers. Those items judged "rational" were asked of the 68 managers in Treatment groups I and II, those items judged "behavioral" were asked of the 70 managers in groups III and IV and the remaining items appeared in both forms of WWQ. The N for each item is presented in the tables that follow.

1. The Individual Manager of the Future

a. Time allocations. (Table 7.1). Planning is one activity to which managers feel they will be devoting considerably more time in the future. Long-term Planning (more than three years ahead) was given a mean response of 4.51 out of a possible 5, therefore seen as a claimant of more time in the future than it is currently.

Table 7.1

MANAGERIAL TIME ALLOCATIONS FOR TOTAL SAMPLE AND BY FUNCTION

Time Demand	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Long-term planning (more than three years ahead)	68	4.51	.66	4.4 (7)	4.8 (13)	4.7 (3)	4.5 (20)	4.4 (10)	4.3 (9)
Evaluating people and proposals	70	4.44	.71	4.2 (12)	4.5 (13)	4.0 (4)	4.9 (13)	4.5 (10)	4.6 (7)
Planning and implementing organization and technological change	68	4.38	.78	4.4 (7)	4.4 (13)	4.3 (3)	4.5 (20)	4.5 (10)	4.4 (9)
Short-term planning (less than three years ahead)	68	4.06	.88	4.4 (7)	4.3 (13)	4.7 (3)	4.0 (20)	3.7 (10)	3.7 (9)
Promoting personal growth	70	4.03	.62	3.9 (12)	3.8 (13)	4.0 (4)	4.3 (13)	3.7 (10)	4.4 (7)
Reviewing information	68	4.00	.97	4.7 (7)	3.8 (13)	4.0 (3)	4.2 (20)	3.9 (10)	3.8 (9)
Organizational policy statements	138	3.93	.87	3.8 (19)	4.0 (26)	4.0 (7)	4.2 (33)	3.7 (20)	3.9 (16)
In meetings rather than alone	138	3.91	.79	3.8 (19)	4.2 (26)	4.4 (7)	3.9 (33)	3.7 (20)	3.6 (16)
Coordinating activities of individuals and groups	70	3.84	.86	3.7 (12)	4.4 (13)	4.0 (4)	3.8 (13)	3.8 (10)	3.9 (7)

Traveling on company business	138	3.60	1.15	3.8 (7)	3.8 (13)	4.5 (3)	3.7 (20)	4.0 (10)	3.9 (9)
Negotiating with people outside the organization	70	3.41	1.10	3.1 (12)	3.8 (13)	2.7 (4)	3.4 (13)	3.6 (10)	4.0 (7)
On company business per week	68	3.13	.93	3.8 (7)	3.8 (13)	4.5 (3)	3.7 (20)	4.0 (10)	3.9 (9)
Supervising	70	2.94	1.16	2.6 (12)	3.4 (13)	3.0 (4)	3.1 (13)	2.9 (10)	2.9 (7)
Alone rather than in meetings	138	2.53	1.11	2.7 (19)	2.3 (26)	2.5 (7)	2.9 (33)	2.3 (20)	2.3 (16)
Spent searching for information	68	2.43	1.27	2.6 (7)	2.5 (13)	1.7 (3)	2.8 (20)	2.0 (10)	1.3 (9)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

Short-term Planning and Planning and Implementing Technological and Organizational Change were also judged as claimants of more time in the future, with means of 4.06 and 4.38 respectively. Thus, one can see a prediction that "Cresham's Law of Planning" -- i.e. that long-term will drive out short-term planning -- will be invalidated. Another important activity to which more time will be devoted is Evaluating People and Proposals ($\bar{x}$ = 4.44). Time for this latter activity presumably will be taken from that now spent Searching for Information, an activity which managers feel will require slightly less time in the future than it now does ($\bar{x}$ = 2.43).

The sample feels that more time will be required Promoting Personal Growth ($\bar{x}$ = 4.03) and Reviewing Information ($\bar{x}$ = 4.00). At the same time, most of the managers believe they will be spending less time Alone ($\bar{x}$ = 2.53) and more in Meetings ($\bar{x}$ = 3.91). (Presumably, the time spent promoting personal growth will make them more effective in meetings.)

Among the most variable responses were those relating to predicted time to be spent Searching for Information. Managers in functional areas where much use has already been made of computers, i.e. computer and financial managers, predicted they will decrease their time commitment to this activity to a greater extent than do other managers.

b. Consulting patterns. (Table 7.2). There is general agreement that the number of contacts between managers and the Computer Staff will increase to some extent in the future ($\bar{x}$ = 4.21). The same is predicted for number of contacts with the Public ($\bar{x}$ = 4.04), although EDP and production managers see less of an increase for their own public contacts. There is some indication that greater

Table 7.2

FUTURE MANAGERIAL CONSULTING PATTERNS

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Number of contacts with computer staff	138	4.21	.87	4.3 (19)	4.1 (26)	4.1 (7)	4.3 (33)	4.2 (20)	4.2 (16)
Number of contacts with public	71	4.04	.76	3.9 (12)	4.1 (13)	3.7 (4)	4.2 (13)	3.9 (10)	4.4 (7)
Number of contacts with persons of superior rank in the organization other than immediate superior	71	3.96	.75	3.7 (12)	4.1 (13)	3.7 (4)	3.8 (13)	3.9 (10)	4.4 (7)
Number of manager-subordinate consultations	71	3.49	.84	3.6 (12)	3.4 (13)	3.8 (4)	3.2 (13)	3.6 (10)	3.7 (7)
Number of contacts with immediate superior	71	3.14	1.07	3.3 (12)	3.2 (13)	3.3 (4)	3.4 (13)	3.7 (10)	2.4 (7)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

increase in number of contacts with others above them in the organization ($\bar{x}$ = 3.96) than with their own immediate superiors ($\bar{x}$ = 3.14).

c. Desirable skills and knowledge. (Table 7.3). There is a strong overall prediction that additional training in all areas presented will be essential to promotability, although some differences in importance are felt by managers in different functional fields. All managers regardless of specialization view knowledge of Management Principles, Human Relations, Computer Capabilities, and Analytical Techniques of Decision Making as of increasing importance. Production and EDP people more than others feel they will need the ability to attend to many diverse Kinds of Information. While personnel and financial managers feel it will be desirable to know Probability Theory and Use of Models and Simulations, they do not see as particularly urgent the need for receiving training in these fields (see page 106).

d. Manager's role in the organization. (Table 7.4). Computer managers believe they will come to enjoy even greater Influence over the Organization's Activities, and other managers basically agree. Most managers feel the Status (official) of Computer Managers will increase in the future, with the director of computer services at the top levels of the corporate structure. But the line managers also feel they will have a greater voice in determining and Planning Computer Applications, a judgment supported by the EDP managers as well. While managers predict that the Computer will be programmed to Make More Decisions, these will presumably be routine ones, as

Table 7.3

DESIRABLE SKILLS AND KNOWLEDGE

Skills and Areas of Knowledge	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Knowledge of management principles	138	4.67	.54	4.8 (19)	4.6 (26)	4.6 (7)	4.6 (33)	4.7 (20)	4.8 (16)
Knowledge in human relations	71	4.57	.62	4.6 (12)	4.6 (13)	4.5 (4)	4.6 (13)	4.6 (10)	4.7 (7)
Knowledge of capabilities of the computer	68	4.41	.64	4.3 (7)	4.4 (13)	5.0 (3)	4.4 (20)	4.5 (10)	4.8 (9)
Knowledge of analytical techniques of decision making	68	4.41	.59	4.6 (7)	4.6 (13)	5.0 (3)	4.4 (20)	4.3 (10)	4.4 (9)
Importance of training to promotability	138	4.38	.77	4.4 (19)	4.5 (26)	4.0 (7)	4.4 (33)	4.5 (20)	4.6 (16)
Skill attending to many and diverse kinds of information	68	4.32	.68	4.7 (7)	4.2 (13)	5.0 (3)	4.2 (20)	4.1 (10)	4.3 (9)
Additional knowledge in area of specialization	68	4.15	.84	3.6 (7)	3.8 (13)	4.0 (3)	4.3 (20)	4.5 (10)	4.2 (9)
Knowledge of Probability Theory	68	4.00	.79	3.7 (7)	3.8 (13)	4.3 (3)	4.0 (20)	4.1 (10)	4.4 (9)
Knowledge of Models and simulations	68	3.89	1.00	3.9 (7)	4.0 (13)	5.0 (3)	3.4 (20)	4.0 (10)	4.4 (9)
Skill in computer programming	68	3.37	1.03	2.9 (7)	3.4 (13)	3.3 (3)	3.4 (20)	3.4 (10)	3.8 (9)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

Table 7.4

MANAGER'S ROLE IN THE ORGANIZATION

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Relative influence of computer managers over organizational activities	68	3.94	.65	4.0 (7)	3.8 (13)	4.3 (3)	3.9 (20)	4.0 (10)	4.2 (9)
Role of operating manager in planning computer applications	68	3.94	.95	3.4 (7)	4.1 (13)	4.7 (3)	3.8 (20)	4.1 (10)	3.8 (9)
Number of decisions made by computers rather than managers	68	3.93	.87	4.0 (7)	4.1 (13)	4.7 (3)	3.7 (20)	3.8 (10)	4.3 (9)
Power and status of computer managers	138	3.72	.88	3.4 (19)	3.8 (26)	4.1 (7)	3.6 (33)	3.7 (20)	3.9 (16)
Likelihood that the computer operation will be directed by a top corporate-level executive	68	3.59	1.13	3.6 (7)	3.4 (13)	3.7 (3)	3.3 (20)	4.1 (10)	3.7 (9)
Control over middle manager decisions by upper level managers	138	2.51	1.09	2.8 (19)	2.8 (26)	2.7 (7)	2.6 (33)	2.6 (20)	2.4 (16)
Extent to which the computer reduces need for human supervision	71	2.14	1.14	2.0 (12)	2.7 (13)	1.3 (4)	1.9 (13)	2.0 (10)	2.6 (7)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

the Need for Human Supervision will not diminish. This latter judgment is most clear to EDP managers and made to a lesser degree by engineers and financial managers who have probably been most affected by computers to date.

2. The Organization of the Future

a. Organization structure. (Table 7.5). A more flexible structure is predicted for the future organization, whereby Project Organization will be substituted, at least to some degree, for the traditional departmental structure. Paradoxically, this prediction is made more strongly by those managers who would be least involved in this shift of structure. This is consistent with the general notion, expressed throughout the questionnaires, that the future organization will continue toward More Decentralized decision making. But it is inconsistent with the prediction, particularly by production and EDP managers, that the Number of Specialized Functions will increase. Managers feel that the Number of Levels in the organization will remain about the same, so that change will be lateral rather than vertical.

b. Organization composition. (Table 7.6). Not surprisingly, the manager of the future is more likely to be a College Graduate, according to the present sample. Again, Specialization of Managers will be a continuing trend. Engineers in particular predict an increase in their numbers, although in general the Proportion of Staff Managers, such as Information Technologists, is expected to increase. When asked whether Top Management will be Specialists, EDP,

Table 7.5

FUTURE ORGANIZATION STRUCTURE

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Shift to project, rather than functional, structure	68	4.01	.74	4.1 (7)	3.8 (13)	4.3 (3)	4.1 (20)	4.1 (10)	3.9 (9)
Number of specialized functions	68	3.93	.85	4.3 (7)	3.8 (13)	4.3 (3)	4.0 (20)	3.6 (10)	3.8 (9)
Likelihood that the practice of having a single chief executive officer will change	138	3.38	1.29	3.4 (19)	3.2 (26)	3.5 (7)	3.4 (33)	3.0 (20)	3.8 (16)
Number of management levels	138	3.20	.92	3.0 (19)	3.5 (26)	4.0 (7)	3.2 (33)	2.8 (20)	3.3 (16)
Decision making structure[2]	138	2.45	1.14	2.9 (19)	2.7 (26)	3.0 (7)	2.3 (33)	1.9 (20)	2.1 (16)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

[2]For this item, the higher the mean the greater the predicted shift from decentralized to centralized structure.

Table 7.6

FUTURE ORGANIZATION COMPOSITION

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Proportion of managers who are college graduates	68	4.40	.75	4.1 (7)	4.2 (13)	5.0 (3)	4.5 (20)	4.2 (10)	4.6 (9)
Number of technical specialists	68	4.12	.71	4.1 (7)	4.2 (13)	4.0 (3)	4.2 (20)	4.2 (10)	4.3 (9)
Number of management jobs	138	3.92	.79	3.7 (19)	4.2 (26)	3.9 (7)	3.8 (33)	3.9 (20)	3.9 (16)
Proportion of employees in staff positions	138	3.70	.95	3.7 (19)	3.8 (26)	4.1 (7)	3.5 (33)	3.8 (20)	3.6 (16)
Role of information technologists	68	3.60	1.10	3.0 (7)	3.5 (26)	4.3 (3)	3.8 (20)	3.6 (10)	3.3 (9)
Degree of specialization at top management levels	68	3.40	1.10	2.7 (7)	3.1 (13)	4.0 (3)	3.7 (20)	3.1 (10)	3.8 (9)
Number of middle managers	138	3.38	.91	3.3 (19)	3.7 (26)	3.6 (7)	3.4 (33)	3.0 (20)	3.4 (16)
Extent of managers being displaced due to technological advances	71	3.09	1.16	2.4 (12)	2.9 (13)	3.8 (4)	3.0 (13)	2.8 (10)	3.0 (7)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

[2]The higher the mean, the more respondents feel it will become a staff rather than line function.

sales and finance managers thought this would be likely, while others felt no change would occur in degree of specialization.

All managers, regardless of function, predicted a greater increase in the Number of Management Jobs in general than in the Number of Middle Management jobs. In keeping with this notion is the prediction that Displacement of managers Due to Technological Advances will not occur to any great degree (EDP managers are the one exception in this prediction).

c. Organizational emphases and concerns. (Table 7.7). According to the present sample, the emphasis placed on the collection and dissemination of information will be greatly increased in the future. All managers are quite convinced that they will increasingly Depend on Computer Generated Information, and that the organization will rely on Systems Analysis and Cost/Benefit Analysis to determine the Information Needs of its managers. In this and other managerial tasks, Creativity and the generation of New Ideas and Superior's Rating of Performance will be rewarded, while Seniority will have a decreased effect on promotion.

Organizations are to also exhibit increasing concern for their personnel needs. Managers in this area, but others as well, predict greater Planning of Manpower needs, greater emphasis on Management Development and greater concern for Human Needs in general. To an extent, the organization will turn its attention outward also, to interact more with Customers and others. The greater Research and Development effort that is predicted will be guided to a greater

Table 7.7

FUTURE ORGANIZATIONAL EMPHASES AND CONCERNS

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Dependence on computer-generated information	68	4.53	.53	4.6 (7)	4.8 (13)	4.7 (3)	4.4 (20)	4.6 (10)	4.8 (9)
Emphasis on creativity and new ideas	68	4.51	.84	4.7 (7)	4.8 (13)	4.3 (3)	4.4 (20)	4.4 (10)	4.7 (9)
Emphasis on systems analysis	68	4.51	.73	4.6 (7)	4.8 (13)	5.0 (3)	4.3 (20)	4.5 (10)	4.9 (9)
Attention devoted to management development	71	4.34	.50	4.3 (12)	4.4 (13)	4.5 (4)	4.0 (13)	4.5 (10)	4.6 (7)
Emphasis on research and development	68	4.25	.75	4.1 (7)	4.5 (13)	4.0 (3)	4.3 (20)	4.1 (10)	4.2 (9)
Attention devoted to analysis of information needs	68	4.24	.63	4.7 (7)	4.1 (13)	4.7 (3)	4.2 (20)	4.2 (10)	4.2 (9)
Emphasis on cost/benefit analysis	68	4.24	.78	4.3 (7)	4.1 (13)	5.0 (3)	4.3 (20)	4.3 (10)	4.2 (9)
Attention devoted to manpower planning	71	4.20	.93	3.9 (12)	4.1 (13)	4.5 (4)	4.0 (13)	4.6 (10)	4.4 (7)
Concern for human needs	71	4.20	.71	4.4 (12)	4.2 (13)	3.7 (4)	3.9 (13)	4.3 (10)	4.3 (7)

Attention devoted to financial control	68	4.06	.85	3.9 (7)	4.0 (13)	4.7 (3)	4.1 (20)	4.0 (10)	4.2 (9)
Shift from emphasis on internal operations to external affairs (public relations, customer contact)	138	3.85	.98	4.0 (19)	4.1 (26)	2.8 (7)	3.8 (33)	3.7 (20)	3.8 (16)
Concern for consumer's needs	71	3.79	.75	3.6 (12)	3.7 (13)	4.0 (4)	3.9 (13)	3.7 (10)	4.3 (7)
Importance of superior's evaluation in determining promotion rate	71	3.51	.93	3.4 (12)	3.8 (13)	3.5 (4)	3.7 (13)	3.5 (10)	3.6 (7)
Use of profits as a measure of success	68	3.50	1.12	4.1 (7)	3.9 (13)	2.7 (3)	3.4 (20)	3.6 (10)	3.2 (9)
Concern with technical matters	68	3.47	1.10	3.9 (7)	3.3 (13)	3.3 (3)	3.4 (20)	3.2 (10)	3.8 (9)
Emphasis on group rather than individual decision making	71	2.70	.76	3.5 (12)	3.6 (13)	3.2 (4)	2.7 (13)	3.1 (10)	3.6 (7)
Role of experience (seniority) in determining promotion rate	71	1.93	.85	2.0 (12)	1.9 (13)	2.5 (4)	1.9 (13)	2.0 (10)	1.7 (7)
Use of sales volume, rather than profits, as a measure of success	68	1.91	.92	1.6 (7)	2.0 (13)	1.7 (3)	2.1 (20)	1.9 (10)	1.7 (9)

[1]Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

extent by Consumers' Needs.

The success of the organization will continue to be measured by Profits. While other factors may enter into the determination of success, sales volume will not be one of them.

d. The organization in society. (Table 7.8). Among the external concerns of the organization will be Social Welfare and other Social Problems, Politics and Government. The greater political involvement will mean greater influence over government policy making, but will not affect the Cordiality of Business-Government Relations. Stockholders are one "outside" group whose influence on the organization will not change from its present (practically non-existent) level.

While Union-Management Cooperation will increase slightly in the future, managers do not feel that the organization will assume any responsibility for employee welfare now borne by unions and the community.

There was very little variation by functional area of respondent for items under this subheading.

e. Other organizational issues. (Table 7.9). Significantly, greater expansion is predicted for organizations of the future, both with respect to Product Diversification and the Development of International Markets. Consistent with this are predictions of greater Movement of Managers Between Countries. This means, according to the managers in the sample, a longer Planning Period and projects of slightly Longer Duration (especially noted by production managers).

Table 7.8

THE ORGANIZATION IN SOCIETY

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Involvement in social problems	71	4.57	1.00	4.5 (12)	4.5 (13)	4.7 (4)	4.6 (13)	4.6 (10)	4.7 (7)
Degree of involvement in politics and government	71	4.31	.84	4.4 (12)	4.5 (13)	3.7 (4)	4.7 (13)	4.2 (10)	3.9 (7)
Concern about social welfare	71	4.29	.63	4.1 (12)	4.4 (13)	4.0 (4)	4.4 (13)	4.5 (10)	4.3 (7)
Role of business in government policy making	138	3.81	.81	3.7 (19)	4.1 (26)	3.6 (7)	3.8 (33)	3.7 (20)	3.8 (16)
Degree of information exchange between organizations	138	3.61	.78	3.9 (19)	3.5 (26)	3.6 (7)	3.5 (33)	3.1 (20)	3.3 (16)
Degree of union-management cooperation	71	3.51	.74	3.2 (12)	3.4 (13)	3.2 (4)	3.7 (13)	3.6 (10)	3.7 (7)
Amount of antitrust investigation	138	3.47	.89	3.7 (19)	3.5 (26)	4.0 (7)	3.4 (33)	2.9 (20)	3.9 (16)
Number of U.S. businesses	138	3.40	.59	3.4 (19)	3.4 (26)	4.0 (7)	3.3 (33)	3.3 (20)	3.7 (16)
Cordiality of business-government relations	71	3.16	1.07	2.6 (12)	3.5 (13)	2.3 (4)	3.3 (13)	3.6 (10)	3.3 (7)
Role of stockholders in policy making	138	3.03	.73	3.0 (19)	3.1 (26)	3.0 (7)	3.1 (33)	3.0 (20)	3.0 (16)
Likelihood that organizations will perform functions for workers which are now performed by unions and the community	71	2.76	1.11	2.7 (12)	2.8 (13)	3.5 (4)	3.1 (13)	2.1 (10)	2.7 (7)

[1] Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

Table 7.9

OTHER ORGANIZATIONAL ISSUES

	Total Sample			Mean Response, by Function (Number in parentheses is N responding)					
	N	Mean[1]	S.D.	Production	Engineering	EDP	Sales and Marketing	Personnel	Finance
Development of international markets	68	4.47	.53	4.6 (7)	4.8 (13)	4.3 (3)	4.3 (20)	4.6 (10)	4.2 (9)
Variety of products offered	68	4.13	.69	4.0 (7)	4.0 (13)	4.3 (3)	4.2 (20)	4.3 (10)	4.0 (9)
Amount of consulting with the academic community	138	4.05	.82	3.7 (19)	4.3 (26)	4.0 (7)	3.9 (33)	4.2 (20)	4.4 (16)
Movement of managers between countries	138	4.01	.79	3.9 (19)	4.0 (26)	4.3 (7)	3.8 (33)	3.9 (20)	4.3 (16)
Length of planning period	68	3.70	1.00	4.3 (7)	3.4 (13)	4.3 (3)	3.7 (20)	3.7 (10)	3.6 (9)
Management of computer services[2]	68	3.44	1.27	4.0 (7)	3.2 (13)	4.3 (3)	3.6 (20)	3.8 (10)	3.4 (9)
Length of organization projects	68	3.35	1.00	3.7 (7)	3.4 (13)	3.3 (3)	3.0 (20)	3.5 (10)	3.4 (9)
Extent of control over employees' lives	71	3.09	.78	3.4 (12)	3.2 (13)	3.3 (4)	2.9 (13)	2.8 (10)	3.3 (7)
Difference between president's and workers' salaries	138	2.89	1.13	2.9 (19)	2.9 (26)	2.4 (7)	2.5 (33)	3.0 (20)	3.3 (16)
Number of unskilled employees	68	1.60	.73	1.4 (7)	1.8 (13)	1.0 (3)	1.8 (20)	1.6 (10)	1.3 (9)

[1] Responses may range from 1 to 5. Means have been converted when necessary so that in all cases 1=will decrease greatly, 3=will remain as it is now and 5=will increase greatly.

[2] For this item "increase" indicates that a greater degree of centralization is predicted for computer management.

It will also mean fewer Unskilled Employees.

Management of Computer Services will tend to be more centrally managed, as specified primarily by production and EDP managers. This will occur in spite of a general trend toward greater decentralization of organizational structure.

B. Describing Self-Perceived Training Needs

All managers responded to the PDP, although some did so prior to completing WWQ (control groups) and others after completing WWQ (experimental groups). Below are listed the responses of the sample as a whole and by functional area, regardless of Treatment. The items have again been grouped by type to simplify the presentation, and are listed in decreasing order of urgency. After describing overall training priorities, the discussion will view the expressed needs of particular functional groups of managers. Data for the discussion which follows are to be found in Tables 7.10, 7.11 and 7.12. Responses again range from 1 (this training is essential for me) to 5 (this training will be of no foreseeable benefit to me).

1. Training Needs Expressed by Sample as a Whole

a. Skills and abilities. In general, the responses to items suggested in this section of PDP are seen as more urgent than are the Areas of Knowledge, discussed below. (Perhaps this is because of their "applied" rather than "theoretical" character.) The range of means for the 19 skills listed is 1.4 to 2.6 (except for the mean of 2.6 for Training in Public Relations, 2.2 is the lowest mean response, which suggests definite utility for training in these areas).

Table 7.10

URGENCY FOR RECEIVING TRAINING IN VARIOUS SKILLS AND ABILITIES

RBN*	A. Skills and Abilities	Total Sample (N=139) Mean	S.D.	Means by Function: Production	Engineering	EDP	Marketing and Sales	Personnel	Finance
(R)	Evaluating	1.4**	0.7	1.4	1.2	1.3	1.5	1.6	1.2
(R)	Decision making	1.4	0.9	1.6	1.3	1.3	1.4	1.2	1.4
(R)	Planning	1.5	0.7	1.2	1.6	1.1	1.4	1.5	1.4
(B)	Motivating	1.5	0.8	1.5	1.3	1.7	1.6	1.5	1.4
(B)	Supervising	1.5	0.9	1.6	1.3	1.3	1.4	1.5	1.6
(B)	Verbal and written communication	1.5	0.9	1.7	1.3	1.6	1.6	1.6	1.4
(N)	Organizing	1.6	0.7	1.4	1.5	1.3	1.6	1.8	1.2
(N)	Coordinating	1.6	0.8	1.6	1.3	1.3	1.7	1.9	1.4
(B)	Human Relations	1.6	0.9	1.8	1.6	1.4	2.0	1.3	1.5
(B)	Managing Change	1.7	0.9	1.6	1.9	1.6	1.8	1.6	1.6
(B)	Perception of Others' Needs	1.8	1.1	2.0	1.9	1.9	1.8	1.5	1.7
(B)	Public Speaking	1.8	0.9	2.0	2.0	1.6	1.9	1.7	1.7
(B)	Representing the Organization	2.0	1.0	1.9	1.7	1.9	2.4	2.0	2.0
(B)	Resolving Conflict	2.0	1.1	2.1	2.2	2.1	2.2	1.6	1.7

(B)	Staffing	2.1	1.1	2.1	2.0	1.9	2.3	2.3	1.6
(R)	Investigating (Processing Info)	2.1	1.0	2.0	2.0	1.4	2.4	1.9	2.3
(R)	Analytical Problem Solving	2.2	1.0	2.2	2.5	1.9	2.3	2.1	1.6
(R)	Understand Computer Output	2.2	1.2	2.1	2.6	1.8	2.1	2.2	1.9
(B)	Public Relations	2.6	1.2	2.5	2.9	2.6	2.5	2.3	2.8

*R indicates this has been classified as a "rational" item
B indicates this has been classified as a "behavioral" item
N indicates this has been classified as a "neither" item.

**Responses may range from 1 (this training is essential for me) to 5 (this training is of no foreseeable benefit to me).

Table 7.11

AREAS OF KNOWLEDGE AND THE URGENCY FOR RECEIVING TRAINING

RBN*	B. Areas of knowledge	Total Sample (N=139) Mean	S.D.	Means by Function: Production	Engineering	EDP	Marketing and Sales	Personnel	Finance
(R)	Courses in field of specialization**	1.7 +	1.0	2.1	1.6	1.6	1.8	1.3	1.6
(B)	Personnel Administration	2.0	1.1	2.0	2.1	1.6	2.0	2.5	1.6
(R)	Methods of forecasting and prediction	2.1	1.1	1.5	2.6	1.7	1.8	1.5	2.4
(B)	Organization Theory	2.1	1.0	2.0	2.4	2.0	2.3	1.8	1.8
(R)	Economic Theory	2.1	1.0	1.7	2.5	2.3	2.0	1.8	2.4
(R)	Financial Management	2.1	1.1	1.4	2.6	2.3	1.9	1.3	2.7
(R)	Accounting Principles	2.3	1.1	1.8	2.6	2.1	2.1	1.7	2.9
(R)	Program Budgeting (or Cost Benefit Analysis)	2.4	1.1	2.0	2.3	2.1	2.4	2.4	2.5
(R)	Systems Analysis	2.4	1.1	2.0	2.0	1.6	2.5	2.6	2.8
(B)	Business-Government Relations	2.4	1.2	2.1	3.1	2.3	2.3	2.2	2.6
(R)	Manpower and Material Resource Allocation	2.5	1.2	1.9	2.7	2.0	2.7	2.7	2.1
(B)	Behavioral Science in Business	2.5	1.2	2.3	2.9	2.6	2.7	2.4	1.9
(R)	Marketing or Marketing Research	2.5	1.2	2.1	3.2	2.1	1.5	2.7	3.1

(B)	General Psychology	2.5	1.1	2.6	2.9	2.6	2.6	2.5	2.4
(R)	Cost Estimation	2.6	1.2	2.4	2.2	1.9	2.5	2.7	3.0
(R)	General Computer Course	2.6	1.2	2.6	2.6	2.3	2.6	2.6	2.5
(B)	Role of Business in Society	2.6	1.0	2.3	2.9	2.6	2.5	2.7	2.3
(B)	Principles of Learning	2.7	1.2	3.0	2.6	3.0	2.8	2.6	2.5
(B)	Political Implications of Decisions	2.7	1.2	2.6	3.0	2.3	2.7	2.7	3.0
(B)	Labor Relations	2.7	1.4	1.8	2.7	2.1	3.4	3.1	2.2
(R)	Operations Research	2.8	1.1	2.7	2.6	2.4	2.9	2.8	2.9
(R)	Business Law	2.8	1.2	2.6	3.2	3.1	2.6	2.2	3.3
(R)	Statistical Decision Theory	2.9	1.1	2.4	3.1	2.6	2.8	2.6	3.0
(N)	International Management	3.0	1.3	2.7	3.2	3.1	3.2	2.6	3.2
(R)	Production and Inventory Control	3.0	1.3	1.6	3.2	2.1	3.3	2.5	3.4
(R)	Mathematical and Statistical Analysis	3.1	1.2	3.1	2.8	2.4	3.4	2.1	3.4
(B)	Sociology	3.1	1.1	3.0	3.7	3.0	3.0	3.1	2.8
(R)	Research Methodology	3.2	1.1	3.2	3.3	2.4	3.2	3.2	3.4
(R)	Model Construction and Utilization	3.3	1.2	3.3	3.1	2.4	3.5	2.8	3.2
(R)	Computer Programming	3.4	1.1	3.7	3.2	2.1	3.5	3.4	3.3
(N)	Foreign Languages	3.5	1.2	3.5	3.0	3.7	3.5	3.4	3.9
(B)	Anthropology	3.8	1.1	4.0	4.3	3.6	3.7	3.9	3.4

*R indicates this has been classified as a "rational" item
B indicates this has been classified as a "behavioral" item
**N indicates this has been classified as a "neither" item
N = 98 for this item.
+Responses may range from 1 (this training is essential for me) to 5 (this training is of no foreseeable benefit to me).

Table 7.12

DESIRABILITY OF VARIOUS TRAINING METHODS

RBN*	C. Training Methods	Total Sample (N=139) Mean	Total Sample (N=139) S.D.	Means by Function: Production	Engineering	EDP	Marketing and Sales	Personnel	Finance
(R)	Read business and professional journals	1.6**	0.8	1.4	1.5	1.6	1.6	1.5	1.9
(N)	Attend lectures by well-known speakers	1.6	0.7	1.6	1.5	1.4	2.0	1.6	1.7
(R)	Attend conferences, seminars, workshops	1.8	0.8	1.8	1.7	1.6	1.9	2.1	1.5
(N)	Join business or professional societies	2.0	1.0	2.0	1.6	1.7	2.0	2.3	2.0
(N)	Rotate jobs within domestic organization	2.0	1.1	1.8	1.8	1.6	2.1	2.0	2.3
(R)	Attend, with colleagues from many companies, extended executive programs	2.2	1.0	2.1	2.2	2.3	2.3	2.2	2.2
(R)	Attend, with colleagues from only your company, extended executive programs	2.3	0.9	1.9	2.2	2.4	2.4	2.1	2.4
(R)	Attend university courses in area of specialization	2.3	1.1	1.7	2.6	2.3	2.5	1.8	2.2
(N)	Work with case material	2.3	1.1	1.9	2.5	2.4	2.6	2.3	2.2
(R)	Attend courses in business areas other than field of specialization	2.4	0.9	2.1	2.7	2.4	2.3	2.6	2.5
(R)	Read "programmed" texts	2.5	1.0	2.1	2.2	2.4	2.7	2.5	2.9
(B)	Guided group discussions	2.6	0.9	2.6	2.6	2.1	2.7	2.7	2.6
(R)	Guided (assigned) reading	2.6	1.0	2.4	2.3	2.7	2.9	2.6	2.4

(B)	Engage in community or civic work	2.7	1.2	2.5	2.8	2.1	2.5	3.3.	2.7
(R)	Work with simulations (business games)	2.7	1.1	2.1	2.8	2.3	2.9	2.7	2.6
(N)	Rotate jobs in divisions or subsidiaries abroad	2.8	1.2	2.6	2.4	2.0	2.8	3.0	3.0
(N)	Ask for additional on-the-job training from superiors	2.8	1.2	2.6	2.7	2.0	2.9	3.2	2.5
(R)	Get advanced training in technical areas	2.9	1.2	2.9	2.7	2.0	2.9	3.3	3.2
(N)	Attend national and state conventions	2.9	1.2	2.8	2.7	2.6	2.8	3.5	3.1
(B)	Sensitivity training (T-groups)	2.9	1.1	2.7	3.1	3.0	3.1	2.9	2.8
(B)	Leaderless group discussions	3.0	1.0	3.2	3.0	2.3	2.8	2.8	3.3
(R)	Enroll in advanced degree program	3.0	1.2	2.4	2.9	2.7	3.4	2.7	2.9
(R)	Written assignments	3.2	1.2	3.4	2.9	2.6	3.0	3.2	3.6
(N)	Work for Federal Government on leave of absence from company	4.3	0.9	4.2	4.6	4.3	4.2	4.1	4.4

*R indicates this has been classified as a "rational" item
B indicates this has been classified as a "behavioral" item
N indicates this has been classified as a "neither" item.

**Responses may range from 1 (this training is essential for me) to 5 (this training is of no foreseeable benefit to me).

Decision making and Evaluating are most needed areas for training, followed closely by Planning, Motivating, Supervising and Verbal and Written Communication. Although still considered to be of value to the managers, lower on the list are Public Relations, Understanding Computer Output, and Analytical Problem Solving.

b. Areas of Knowledge. Response means in this section fell between 1.7 and 3.8, indicating less urgency than was felt for the skills listed above. In addition to desiring courses in their areas of specialization, managers generally indicate a desire for training in Personnel Administration, Methods of Forecasting and Prediction, Organization Theory, Economic Theory and Financial Management. Relatively little value is seen for training in Anthropology, Foreign Languages, Computer Programming, or Model Construction and Utilization.

c. Training methods. The more traditional methods for managers to learn are preferred by the present sample. In fact, Reading Business and Professional Journals, attending Lectures, Conferences, Seminars and Workshops are almost required as a matter of course for managers in today's large corporations. Job Rotation and Membership in Professional Business Organizations are also felt to be valuable. Of questionable value are Working for the Federal Government, carrying out Written Assignments (such as research reports), Enrolling in an Advanced Degree Program, and engaging in Leaderless Group Discussion.

2. Training Needs of Functional Subgroups

This discussion suggests a way organizations might view and interpret results for the purpose of modifying their management

development programs. Although not detailed for purposes of reporting this study, organizations have available to them comparative results along other dimensions of the PDS which may be considered before making any decisions to modify existing programs.

a. Production managers. Planning is the area in which these managers feel the greatest need for additional training, followed closely by organizing, evaluating and motivating. All these areas are related, and evidently the skill these managers now possess is a source of frustration. Production managers also feel the need for training in financial management, and to a somewhat lesser extent in accounting principles and economic theory, reflecting the general trend in industry toward greater efforts at production cost reduction. Also quite important to this group in particular are training in labor relations, production and inventory control and methods of prediction and forecasting. They join other managers in the desire to receive training by reading professional and business journals and attending lectures. Production managers feel attending relevant university courses in their area of specialization to be a useful way of learning, yet feel the kind of knowledge learned thereby to be less urgent than do managers from other departments.

b. Engineers. Among the major skill deficiencies of engineers, as interpreted by their desire for training, are evaluating, decision making, motivating, supervising, and coordinating. They see relatively less value in developing skill in public relations and the areas in which they already have expertise, such as analytical and computer-related skills. Many differences in needs for knowledge

relate primarily to areas engineers see as less relevant than do other managers. These include business-government relations, marketing or marketing research, and behavioral science in business. Engineers do not differ in any significant way from the total sample of managers with respect to desired training methods.

c. Computer managers. Although there are fewer computer managers in the sample than other functional types, they exhibit a greater desire for training in general than do other managers. Perhaps this is explained by the fact that they are in a relatively young discipline, and have therefore received more training more recently than have many others. They may therefore have a greater realization than others that continued training in various areas is a necessity if one is to keep pace with rapid changes in the technology and character of business in general. This realization is one of the benefits that the experience of going through these questionnaires was intended to provide.

They, more than other managers, feel the need to develop their planning, organizing and coordinating abilities. Motivating seems to be less of a problem for this group than others, although training is still seen as valuable. They also desire more than any other group, knowledge of research and analytical procedures. They believe job rotation and advanced training in technical areas quite valuable learning methods.

d. Marketing and sales managers. These managers generally see less need for training in the skills listed on the questionnaire than

do other managers, perhaps because this field has undergone less, but still significant, changes than have most others. They have a desire to keep pace with whatever new knowledge is brought to bear in their field, particularly methods of forecast and prediction. They appear to be more anxious to learn what is possible to apply to their forecasting methods than knowing the analytical procedures or actual models to be used. The training methods preferred by marketing managers do not differ greatly from those of the sample as a whole.

e. Personnel managers. Decision making and human relations are the two areas in which these managers feel the greatest need for training, followed by motivating, planning and perceiving others' needs. Staffing, one of the major responsibilities of these managers, is a skill they feel less than do others the need for additional training. Next to knowledge of personnel administration, labor relations and other courses specifically related to their jobs, these managers would like to know more organization theory and behavioral science. They consider attending professional conferences and lectures, taking university courses and working with case materials to be among the most beneficial learning methods.

f. Financial managers. These more than other managers feel the need for greater skill in evaluating, organizing, staffing, and analytical problem solving. They would like to take courses in financial management more than others see the need for courses in their own special fields. In addition, they see the need for more

knowledge of forecasting methods, accounting principles and economic and organization theory. More than any other group, they feel the need for knowledge of mathematical analysis and business law. They feel that keeping current with professional literature, attending lectures and university courses to be among the best methods for their training.

C. Experimental Findings

In this section, results pertaining to tests of the hypotheses are presented.

1. Treatment Effects on Self-Perceived Training Urgency

All Ss responded to all 75 items on PDP. Of these items, 37 had been judged "rational", 26 judged "behavioral", and the remaining 12 judged "neither". The mean response for each type of question and the total PDP for each Treatment group are shown in Table 7.13. From this it can been seen that the means of the experimental groups were lower on the "rational" and "neither" subtests of the PDP than were those of the control groups, indicating higher priorities attached to the various subjects and techniques of training. It will also be noted, although not of primary concern, that for all treatment groups, the mean score for items that were neither rational nor behavioral was higher than either of the categories and the total score, indicating lower priorities for these items. The responses of experimental Treatment III, which completed WWQ_b prior to PDP, were slightly higher (less perceived urgency) than those of the control groups, indicating that the WWQ_b was less effective as a catalyst to recognition of training need than was WWQ_r.

TABLE 7.13

MEANS OF RESPONSES TO RATIONAL, BEHAVIORAL AND TOTAL PERSONAL DEVELOPMENT PLAN, BY TREATMENT GROUP [1]

Treatment Group[2]	N	Rational Items (K=37)	Behavioral Items (K=26)	Neither Items (K=12)	All Items (K=75)
Experimental					
I (WWQ_r)	33	2.24	2.28	2.38	2.30
III (WWQ_b)	39	2.41	2.36	2.55	2.45
Control					
II	34	2.43	2.33	2.60	2.44
IV	29	2.52	2.32	2.57	2.47
II & IV	63	2.47	2.33	2.59	2.46
Total	135[3]	2.40	2.32	2.53	2.42

[1]The lower the mean, the more urgent the perceived need for training.

[2]See experimental design, p. 86, for further explanation of differences between treatment groups.

[3]Four respondents did not complete the PDP.

This finding is discussed below and in the following chapter.

To test these differences for statistical significance, several analyses of variance were run using a randomized block design with repeated measures. Table 7.14 summarizes the analysis between the four Treatments and the three PDP subtests. The differences between PDP subtest means of Treatment groups were not significant. Within-subject scores did differ significantly, reflecting the greater urgency felt for rational and behavioral content and techniques of training than for non-classified items, and the greater urgency felt by all but Treatment I Ss for behavioral than for rational training. T-tests of the differences between the means for Treatment II

TABLE 7.14

ANALYSIS OF VARIANCE SUMMARY:
FOUR TREATMENT GROUPS VS. PDP SUBTESTS

Source	SS	df	MS	F
Between subjects				
A: Treatments	1.81	3	0.60	---
error a	99.36	131	0.76	
Total between	101.17	134		
Within subjects				
B: Tests	2.88	2	1.44	14.26**
AxB: Treatments				
x Tests	0.59	6	0.10	1.00
error b	26.54	262	0.10	
Total within	30.01	270		
Total	131.18	404		

** $p < .01$

and those of Treatment IV showed no significance (rational: $t = -0.14$; behavioral: $t = 0.05$; neither: $t = 0.14$; total: $t = -0.29$). Both groups were given PDP prior to WWQ, so this result was expected. To test the effect of previously completing WWQ_r or WWQ_b on the PDP, Treatment groups II and IV were combined (see Table 7.13). A similar analysis was run comparing the combined experimental treatment groups with the combined control groups. Results were identical to those shown in Table 7.14, that is a significant F within-subjects.

To further test for differences, attention was focused on only the behavioral and rational PDP subtests. Each Experimental treatment group was compared to a combination of the control groups, as

shown in Tables 7.15 and 7.16. While the difference between Treatment I and Treatment II + IV were not significant (Table 7.15), an interaction effect did occur. Inspection of Table 7.13 leads to the conclusion that the previous WWQ_r did lead Treatment I Ss to recognize greater urgency for rational kinds of training. Further, both in the I vs. II + IV and the III vs. II + IV, there was a significant difference in subtest scores, such that behavioral kinds of training were seen as of generally greater importance than rational (Treatment I is an exception already noted).

TABLE 7.15

ANALYSIS OF VARIANCE SUMMARY:
EXPERIMENTAL TREATMENT I (WWQ_r) VS. CONTROL TREATMENTS COMBINED,
ON BEHAVIORAL AND RATIONAL PDP SUBTESTS

Source	SS	df	MS	F
Between subjects				
A: Treatments	0.84	1	0.84	1.63
error a	48.55	94	0.52	
Total between	49.39	95		
Within subjects				
B: Tests	0.36	1	0.36	3.87*
AxB: Treatments x Tests	0.37	1	0.37	3.98*
error b	8.72	94	0.09	
Total within	9.45	96		
Total	58.84	191		

* $p < 0.05$

TABLE 7.16

ANALYSIS OF VARIANCE SUMMARY:
EXPERIMENTAL TREATMENT III (WWQ_b) VS. CONTROL TREATMENTS COMBINED,
ON BEHAVIORAL AND RATIONAL PDP SUBTESTS

Source	SS	df	MS	F
Between subjects				
A: Treatments	0.01	1	0.010	---
error a	57.17	100	0.57	
Total between	57.18	101		
Within subjects				
B: Tests	0.66	1	0.66	6.17*
AxB: Treatments				
x Tests	0.11	1	0.11	1.06
error b	10.67	100	0.11	
Total within	11.44	102		
Total	68.62	203		

* $p < 0.05$

To complete this part of the analysis, a comparison was made between rational and behavioral PDP subtest scores of the Treatment groups. These results are summarized in Table 7.17. Again, scores showed lack of significant difference.

Subjects who completed WWQ_r prior to PDP (Treatment I) tended to indicate a greater overall desire for training and a greater desire for all types of training than did Ss who completed PDP before responding to one of the WWQ forms. Most other results are in the indicated direction, although differences are again below the level of statistical significance. That is, Ss who first completed WWQ_r indicated slightly greater realization of urgency, even for behavioral kinds of training, than did those who completed PDP first. This is less true for Ss who first completed WWQ_b.

TABLE 7.17

ANALYSIS OF VARIANCE SUMMARY:
COMPARING EXPERIMENTAL TREATMENT GROUPS ON RATIONAL AND BEHAVIORAL PDP SUBTEST SCORES

Source	SS	df	MS	F
Between subjects				
A: Treatments	0.60	1	0.60	1.18
error a	35.66	70	0.51	
Total between	36.26	71		
Within subjects				
B: Tests	0.01	1	0.01	
AxB: Treatments x Tests	0.06	1	0.06	
error b	5.90	70	0.08	
Total within	5.97	72		
Total	42.23	143		

2. Experimental Groups and the Existence of Set

To test whether the type of questions asked of respondents on the WWQ influenced the kinds of training content and method subsequently judged as urgent, several more tests of differences between means were run. According to psychological "set theory", Ss who responded to WWQ_r should have felt greater urgency for "rational" training than 1) they did for "behavioral" training, and 2) did those who first responded to WWQ_b. The converse should be true for those who responded to WWQ_b with respect to "behavioral" training and in contrast to respondents to WWQ_r. (This will be seen more clearly by referring to Table 1.2 and the statement of Hypotheses 2 and 3, pages 7-8.) The results of these tests (Table 7.18) indicate

no significant differences. In all cases the appropriate variances from the analyses of variances were used in calculations. Implications of this are discussed in the following chapter.

3. A Word About the Reliability of PDP

An odd-even reliability check of rational, behavioral and all PDP items was run, using data from the entire sample (N=135). That is, six mean scores were computed for each individual, odd-numbered rational items, odd behavioral and odd of all items, and even rational, behavioral and total. The correlation coefficient between odd- and even- numbered rational items was computed to be 0.92, and that for behavioral items was 0.86. Applying the Spearman-Brown

TABLE 7.18

TESTING FOR THE EXISTENCE OF SET IN PDP RESPONSES OF EXPERIMENTAL TREATMENT GROUPS

Treatment	Type of PDP Items	Respective Means	t
I	Rational vs. Behavioral	2.24 vs. 2.28	-0.51
III	Rational vs. Behavioral	2.42 vs. 2.36	0.84
I vs. III	Rational	2.24 vs. 2.39	-1.07
I vs. III	Behavioral	2.28 vs. 2.33	-0.47
Treatment I response to Rational PDP items vs. Treatment III response to Behavioral PDP items		2.24 vs. 2.36	-1.20

formula[1] to these odd-even coefficients, one obtains total score reliability estimates of 0.96 and 0.93 respectively. The correlation between total rational and total behavioral scores was 0.67, as shown in Table 7.19. The fact that significant but lower correlations resulted between than within PDP subtests, is indicative that rational and behavioral items represent related internally consistent (reliable) subtests that have some elements in common and some different in terms of felt urgency.

TABLE 7.19

CORRELATIONS BETWEEN RATIONAL AND BEHAVIORAL SUBTESTS OF PDP, BY TREATMENT GROUP

Treatment	N	$r_{rat\ v.\ beh}$
I	33	0.67
II	34	0.71
III	39	0.70
IV	29	0.66
Total	135	0.67

[1] $r_{nn} = \frac{2r_{oe}}{1 + r_{oe}}$

VIII. Discussion

A. Comparing Predictions of the Future World of Work

In this section, predictions presented in the previous chapter will be compared to those made over the last 10 years by businessmen and scholars, as presented in Chapters III and IV. A summary of these predictions appears on pages 47-48 and 64-66. A basic difference between these predictions and previous ones is that in the present study the predictors were middle managers who carry most of the burden of operating the organization. Earlier predictions were made primarily by top managers and academicians who, regardless of how familiar they think they are with the modern corporation, are removed from its daily operation. While middle managers will not make most of the decisions that will lead to the changes they predict, their current positions may well make them aware of impending change before the decision makers who will actually bring them about.

1. Predictions Regarding the Future Manager

a. Obsolescence and the need for retraining. Frederick's (1963) prediction that there will exist a greater need for skill in decision theory techniques and human relations is strongly supported by the current sample (means of 4.41 and 4.57 respectively). The same is true for Anshen's (1960) and Davis' (1963) stress on increased knowledge of computer capabilities ($\bar{x}$ = 4.41). While managers in the present sample agree with Leavitt and Whisler (1958) in predicting more computerized decisions, they do not agree that their own

decision making authority will be usurped or controlled by top management, nor do they feel their responsibility for planning will be reduced. Neither do they agree with Whisler & Shultz' (in Wadia, 1966) prediction of great displacement of middle managers due to automation.

b. Time allocations and middle manager functions. With respect to predictions of greater specialization (Davis, 1963; Uris, 1963) and also predictions that managers will become generalists (Schoderbek, 1965), the current sample emphatically agrees with the former. There will be more specialized functions, more specialists (even at top levels to a degree) and a slightly greater proportion of employees in staff positions. Several people had predicted that managers will engage in planning to a much greater extent than at present. A quick look at Table 7.1 will confirm that respondents in this study emphatically and uniformly agree. There is also substantial agreement that more time will be spent analyzing information, greater emphasis placed on customer contact and public relations, and the adoption of a longer time perspective in planning.

c. Man and the computer. The present sample agrees with Guzzardi's (1965) respondents in having little concern that the computer will take much of their decision making authority, although they will depend considerably on computer-generated information in making their decisions (see Katz, Knight and Massey, in Wadia, 1966). Managers also agree that they will have increased contact with specialists, such as computer staff, even though these specialists

may be at subordinate levels of the organization. No identifiable differences existed in present results which suggest that younger managers perceive greater change in their jobs than do older managers at the same organizational level.

2. Predictions Regarding the Future Organization

a. Centralization vs. decentralization. Predictions in this area of concern may be found to cover about any contingency. The present sample agrees with Whisler's (1965) conclusion that the trend toward greater decentralization will continue, although it is not clear whether the premises leading to this conclusion are the same as those used by Whisler. Managers do feel that the computer will be under central control, with input and output transmitted to the decentralized points of decision. Snyder's (in Murray, 1967) suggestion that the decentralized structure will be in the form of profit centers is supported by the manager sample.

b. Staff function and management competence. Most managers in the present sample feel that information technologists will come to occupy an increasingly influential role in the organization, as predicted by Anshen (in Dunlop, 1962). In fact, managers predict that management of computer services will fall in the hands of a top level, corporate executive, and that in general top management ranks will include a greater number of specialists. Further, the present sample supports Argyris' (1967) prediction that promotion will be more a function of superior's evaluation of performance and less a function of seniority in the future. There is wide recognition that

additional training will be necessary in order for managers to acquire the requisite level of competence, as discussed above. This emphasis on specialization of function and competence as determinants of promotability had direct implications for stated training needs of managers in the experimental groups.

d. Organization structure. Managers disagree with Whisler's (1956) and Shultz & Whisler's (1960) prediction that the number of managerial levels in the organization will decrease in the future. If anything, managers expect a slight increase in number of levels, although a much greater lateral increase into specialized fields in keeping with the greater predicted product diversification. Contrary to Leavitt & Whisler's (1958) prediction that middle management ranks will almost vanish, the current sample foresees a slight increase in the number of middle managers and a fairly large increase in the number of managers in general. They also predict a decrease in number of unskilled employees, which refutes Lipstreu & Reed's (1965) prediction that there will be an increase in span of control.

e. Social concern: internal and external. While managers agree with the many predictions that increased attention will be turned outward, they also forecast increased concern for the needs and values of the organization's employees, supportive of the Merton (in Anshen & Bach, 1960) prediction. There is little doubt in the minds of the middle managers that the organization will become involved in social power. Managers do not foresee any change with respect to power exerted by stockholders over organizational policy making, although the question asked of managers did not focus specifically on the

concentration of stock ownership predicted by Berle (in Anshen & Bach, 1960). Finally, managers feel that they will be spending less time alone and more in meetings, but whether this is to combat feelings of impersonality brought about by the increasing presence of the computer (see Murray, 1967) is not clear.

3. Implications of the Comparisons

Part of the reason for conducting this study was to determine whether past predictions are still perceived as accurate, assuming they once were, and to resolve some of the many contradicting predictions that have appeared. By presenting predictions of the people about whom these businessmen and scholars were primarily concerned when making their own predictions, one can get a clearer and more up-to-date picture of where the future world of work is headed. By and large, those past predictions which were unrefuted are still valid in the opinion of a sample of middle managers. Those that were the subject of some controversy have had some additional light shed upon them. To the middle manager now faced with preparing himself for a future that is perhaps less certain than it was in any time past, the availability of empirical data to add to those armchair philosophies he may have read, should permit him to make a more realistic assessment of his training needs.

B. Analysis of an Experimental Approach

1. A Review of the Hypotheses

a. Treatment effects. The first hypothesis stated that managers

who completed either WWQ_r or WWQ_b subsequent to completing PDP will see less urgency in receiving various types of training, employing various methods than will those who first systematically view the future by completing a WWQ. While statistical evidence does not support this hypothesis, neither did they contradict it. Treatment group I (WWQ_r) in particular felt greater training urgency than did those in all other groups. That is, the differences were considerably more pronounced between respondents in Treatment I (prior WWQ_r) and Treatments II + IV (PDP first), than between groups III and II + IV. Thus, the rational WWQ was a greater catalyst to recognition of training need. This may in part have been a function of the fact that WWQ_r was longer than WWQ_b by 12 items. Or, it may be explained by the fact that WWQ_r discussed the role of the computer in the organization, which most managers recognize with varying degrees of comprehension as the most significant change to occur over the next 10 years. The opportunity to make specific what may have only been vague notions may have caused the entire prior questionnaire to "hit home" to a greater extent than did WWQ_b. The interaction effect that was observed between Treatment I Ss' responses to the rational PDP subtest and Control group responses supports the notion that WWQ_r had a catalytic effect on the urgency felt by these managers for rational kinds of training. That is, they could see in the PDP specific ways to prepare for the "rational" kinds of changes they now more clearly foresee.

Viewing the behavioral items on PDP may provide a clue as to why there was no difference found between respondents in Treatment III

and those in the control groups on PDP. For many years several of the behavioral kinds of training suggested on WWQ_b have become organizational bywords. Specific references in popular literature and top management policy statements to the organization's involvement in societal affairs, emphasis on participative management, increased public mindedness and the popularity of social responsibility doctrine have made managers recognize that these are to become widespread organizational phenomena. The key word may be specificity. Whereas the computer is recognized as a significant force of change, the nature of its affect is less well understood than are some of the specific activities labeled "behavioral". For this reason, managers may uniformly recognize the value of training in such "God, mother and country" areas as Motivating Subordinates, Supervising, Managing Change, Verbal and Written Communication, Perceptions of the Needs of Others, Human Relations, and the like.

The fact that perceived need for training in items classified as neither rational or behavioral was much less than for classified areas, may be related to the fact that they were unclassifiable. That is, the nature of the training may be less clear for these items than for others, reflected both by the pretest sample which was unable to classify them and by the present managers who saw them as less urgent. For example, training in Organizing and Coordinating are unclear as to what may be involved. Other areas of training, such as International Management and Foreign Languages may be of questionable value to managers. Two thirds of the items not classified are training techniques with which managers may be unfamiliar

(such as Government Work or Case Material) or disenchanted (such as Conventions or Job Rotation).

b. The existence of set. The second and third hypotheses make predictions in accord with psychological "set theory". In essence, the second predicts that Ss responding to a WWQ with items that are primarily rational will respond to the PDP in a way that suggests greater felt urgency for rational kinds of training. Further, this hypothesis predicts that the PDP's produced by these Ss will differ from those evolved by Ss who previously responded to a WWQ comprised of primarily behavioral items. The third hypothesis states that Ss in Treatment I will perceive the same urgency for rational training that Ss in Treatment III will for behavioral training. Results showed that in no instance did differences occur as predicted. It is true that Ss in Treatment I saw greater urgency for rational kinds of training than did Ss in Treatment III, but so did they for behavioral and "neither" kinds of training. In the case of Treatment III, WWQ_b did not lead to greater perceived urgency for behavioral kinds of training than was seen by managers in the control groups. While this lends support to Hypothesis 3 and refutes Hypothesis 2, this is the desirable result. What it implies is that the specific content of the systematic view of the future world of work does not obviate the potential value of the procedure. One of the concerns constantly kept in mind in developing the WWQ and PDP instruments was the possibility of biasing the PDP's by virtue of the specific items contained in both forms. Therefore, the attempt throughout the development phase of the study was to exploit as many

sources of ideas as possible, so as to include in the instruments as many of the possible dimensions of the world of work as possible (it was also the rationale for the lengthy discussions in Chapters II-V). However, results show that set theory does not operate in completing the PDP subsequent to completion of one of the WWQ forms, so that the mere opportunity to make a systematic review of the future can be enough to achieve the desired result, i.e. greater recognition of the need for training. This result is in fact indicated by the significant correlation between the behavioral and rational subtests of PDP. Although not as high as the reliability of each subtest, it still suggests the existence of a general factor in PDP, such that, for WWQ_r at least, the prior experience results in general expression of greater training urgency. Ultimately, of course, the WWQ should contain as many of the relevant dimensions of the world of work as possible, particularly rational-type items, but these need not be homogeneous. It is an important finding, however, that one need not be disturbed by the possibility of bias if an important dimension is excluded or if unintentional homogeneity exists in some respect.

2. Implications of the Study

a. Value to the individual manager. First, by specifically focusing on dimensions of the future world of work systematically, privately and for his own edification, and then thinking about them, and predicting whether, in what direction and to what degree they will change, managers are able to crystallize what may have been only vague, imprecise notions previous to this experience. These

are changes that will directly affect his career, and WWQ offers the manager an opportunity to pinpoint the world toward which he is headed. Granted, it is quite impossible to predict the future precisely. All one can do is act on the basis of one's best estimates of what will occur, and WWQ asks the manager for these estimates. It is hoped that going through WWQ will serve to motivate the manager to act in accord with his predictions.

The second benefit to the individual is a plan of action which he evolves for himself and which will allow him to prepare himself to effectively cope with the world of work he foresees. The PDP offers a check list of skills, abilities and areas of knowledge that might or might not be of value, as well as a list of training techniques which might be employeed to acquire the needed skills and knowledge. By completing PDP, the manager is left with a statement of the relative value of receiving additional training in them. A course of action is thereby indicated, i.e. to seek training he perceives as essential, then training seen as valuable but not essential and to avoid as much as possible training that he feels would be of little or no use to him. Of course, the PDP should be updated periodically to reflect training he has undergone since last completing it and also changed perceptions he may have vis-a-vis the future world of work, if it is to maintain its utility. Thus, this procedure provides a means for meeting the most critical deficiency observed by Dill, Crowston and Elton (1965), i.e. the establishment of a "learning agenda", including a statement of learning aims, definitions of areas for study, and ideas about

priorities.[1]

The fact the WWQ_b did not affect subsequent PDP responses does not invalidate the technique. One would suspect that the stated training needs of Ss in Treatment III are at least based on a more solid, purposive foundation than are those stated by control groups Ss. In future research, a single WWQ which includes behavioral but concentrates on rational dimensions of the future might well produce more consistent and positive results.

b. Value to the organization. First, by means of this exercise, those managers responsible for planning and conducting the organization's management development program have available to them statements of managers' self-perceived training needs. To the extent that satisfaction of these needs is equally important as satisfaction of the organization's needs in terms of skills and knowledge of its managers, this data will present consideration of both in planning new or modified programs. In addition to the overall data, each manager's personal data accompanies his WWQ and PDP forms. By reviewing the needs of managers along many of the PDS dimensions, as was done for functional area in this study, it will be possible to gear specific development programs to those managers who expressed desire for training in those areas. From this, the organization may

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[1]The managers who participated in the study were evidently quite interested in the exercise. The summary of results, which had been promised to participants, was delayed by programming problems. My contacts at one of the participating corporations informed me that several of the managers who had participated had inquired when the results would be available. This caused a flurry of activity on my part to minimize the delay, but it was gratifying to learn of their interest, even some four months after they completed the forms.

decide, for example, to offer sensitivity training to younger middle managers, an operations research course to production people, and a leadership seminar to those with more than 8 subordinates according to responses to the Personal Development Plan managers submit. It may also decide to encourage certain groups of managers to take certain business courses at a local university, or certain industrial engineering or statistics courses. Participants in specific programs will thus be a more highly motivated group, which in turn will contribute to the success of that program. In sum, this exercise provides the organization with an empirical statement of what had been assumed before with respect to the training needs of its managers. This is not to suggest that all training desired should be offered by the organization, but that knowledge of what these needs are and how widespread is the expression of them, can lead to a more rational procedure for making those decisions.

Secondly, the organization will have honest (because of anonymity) appraisals of ways in which its managers view their future jobs and the future organization. By comparing these perceptions to stated organizational goals, plans and policies, areas of conflict and misunderstanding can be identified and attended to in time to avoid what may be more serious problems.

Third, organizations increasingly base their management development programs on recommendations of scholars, consultants or their top managers, which may well be inconsistent with what its managers perceive as important for them. This exercise permits the review of plans or actions based on earlier predictions or recommendations

of people less familiar with the operation. This is not to suggest that recommendations of these people should be ignored, but only that they should be considered in conjunction with the stated needs of those to be affected by those recommendations.

IX. Summary and Conclusions

There were three primary purposes of this study: 1) to describe the world of work 10 years hence, as perceived by today's middle managers (future top managers); 2) to compare predictions made by this group to those made by business men and scholars over the past decade, but about the same future point in time; and 3) to evaluate the effectiveness of an attempt to provide managers with a means of planning the training they will need to prepare them for the world of work they foresee.

Two basic questionnaires were developed. By means of a World of Work Questionnaire (WWQ), managers were to specify changes they foresee over the next decade. The WWQ included the widest possible range of dimensions of the world of work, as outlined in Chapters II through IV. Two forms of the instrument were developed, one consisting primarily of rational, objective, substantive, quantitative items and the other composed of behavioral, subjective, social, qualititative items. Half the sample of 139 middle managers responded to each WWQ form. The second instrument, a Personal Development Plan (PDP), asked managers to indicate the importance of receiving training in various skills, abilities and areas of knowledge, as well as techniques by which to acquire this training. Although all managers completed the PDP, half did so prior to completing one of the WWQ forms and half subsequent to the WWQ. The experimental design is specified in Table 6.1, page 86.

A. Summary of Results

1. Describing the Future World of Work

In addition to the two forms described above, managers completed a Personal Data Sheet. This provided a number of variables which could be used to compare managers' perceptions of the future world of work. Differences in perceptions of managers from various functional departments were presented as an example, together with overall mean perceptions. Predictions were grouped according to meaningful topics. Items concerning the individual manager were subdivided into those relating to his future time allocations, consulting patterns, desirable skills and abilities and his role in the organization. Items pertaining to the organization were subdivided into those concerning its structure, composition, major concerns, position in society and other issues.

2. Comparing Present with Past Predictions

By and large, predictions made by the present sample of middle managers supported those past predictions which had not been refuted up to now. The sample did shed light on past predictions that have been the subject of some controversy over the years, as they represent current thinking of practitioners rather than past thinking of scholars and high level businessmen. For example, the present sample predicts the continuation of the trend toward greater decentralization of decision making, but a tendency to greater centralization of control over the computer function.

3. Evaluation of the Experimental Approach

While not nearly as dramatic as anticipated, results tended to partially support the first hypothesis, which states that managers who completed either the rational or behavioral form of WWQ prior to completing PDP would see greater urgency for more training areas and methods than would those who first completed PDP. This was the case for Ss who first responded to WWQ_r, but not for those responding first to WWQ_b. However, the support for this hypothesis did not achieve statistical significance, for reasons speculated upon in Chapter VIII.

The second hypothesis, in line with what psychological set theory would propose, stated that managers who first completed the rational form of WWQ would show a greater need for training in rational kinds of skills and knowledge than in behavioral kinds of knowledge or than would those who first completed the behavioral form of WWQ. The converse was predicted for those managers who first completed the behavioral WWQ. No support was found for this hypothesis, suggesting that the specific content of a WWQ will have little effect on the subsequent PDP managers evolve and will not obviate the potential utility of the approach.

The third hypothesis was supported by the results. It stated that no differences will occur between the importance attached to rational kinds of training by managers who first complete the rational WWQ and the importance attached to behavioral kinds of training by those who complete the behavioral form of WWQ.

B. Conclusions

The most important general conclusion to be reached from this study is that the approach to assessing the future world of work and then translating this assessment into a workable course of action for managers and organizations to pursue has potential utility. Several articles have appeared in the literature which suggest the need for a vehicle by which managers can determine a "learning agenda" as well as an order of attending to that agenda. Under "Gresham's Law of Planning" routine planning drives out abstract and long range planning, but planning to satisfy one's own career needs comes after even abstract organizational planning in the manager's hierarchy of priorities. It is felt that by means of the present procedure, the level of abstraction is reduced to where a quite specific, programmed series of steps is indicated by managers for their own development. This is not to suggest that this study has produced a panacea -- indeed results were less than conclusive -- but only that further work along this line would be in order, as discussed below. Some of the specific conclusions to be drawn are summarized in the following statements:

1) There appears to be little danger of biasing assessments of managers' training needs by virtue of the specific questions asked of managers regarding the future. While an attempt should be made to touch upon as many of the relevant dimensions as possible, (for reasons of face validity of the instruments if for no other reasons) the evidence suggests that the method will achieve favorable results even if unintentional omissions are made.

2) The WWQ form dealing with "rational" of the relevant dimensions of the future world of work, in fact led managers to a greater realizaion that additional training is absolutely essential and that they are not now adequately prepared to face the future.

3) Although some results were in predicted directions, there probably would have been a more pronounced difference in PDP's evolved by the experimental and control groups if a) a single WWQ form had been administered, containing a greater percentage of relevant dimensions of the world of work, but emphasizing rational aspects; and b) the exercise had been couched in a management development effort, whereby, the utility of results to respondents could have been emphasized to a greater extent.

While the results of this study were not terribly gratifying in terms of demonstrating the potential utility of the approach both to managers and their organizations, some further research is indicated, which could improve its effectiveness. Some possible future studies are outlined below:

1) To test whether a single WWQ form containing a fairly complete listing of relative dimensions would lead to more pronounced differences between the PDP's completed prior and subsequent to WWQ. The single WWQ would contain fewer than the total of 92 items presented in the two present forms, and would place emphasis on the role of the computer and its effects throughout the organization. Deleted items would be those that correlated highly with one or more of the others in the original forms.

2) To test the approach in a "live" organization, whereby training needs expressed by managers would be compared to existing organization management development programs, additional areas of training suggested by the results would be implemented for homogeneous groups of managers desiring such training, and a follow-up study would be conducted to determine actions taken by managers and by the organizations based on both the PDP and WWQ's.

3) To retest a sample of managers a number of years after they first complete the WWQ and PDP, to determine the consistency of trends now predicted and to identify perceptions of new directions toward which the world of work is headed.

APPENDIX A: Techniques of Management Development with References

	Method	References
1.	Lecture	Argyle & Smith (1962) and Bennett (in Merrill & Marting, 1958, pp. 183-189).
2.	Guided Discussion	Argyle & Smith (1962); Bennis, Benne & Chin (1961, Chapters 6 and 7); Cartwright & Zander (1960); and House (1965). See also "T-Groups."
3.	Conferences	
4.	Films	
5.	Case Study	Andrews (1953); Benne (in Bennis, Benne & Chin 1961, pp. 631-636); Lawrence et al (1961); and McFeeley & Mussman (in Merrill & Marting, 1958, pp. 158-166).
6.	Incident Method	Pigors & Pigors (in Bennis, Benne & Chin, 1961, pp. 710-716).
7.	In-Basket Technique	Lopez (1966)
8.	Role Playing	Bass and Vaughan (1966, pp. 101-104); Bradford & Lippitt (in Merrill & Marting, Eds., 1958, pp. 167-182) Levitt & Jennings (in Bennis, Benne & Chin, 1961, pp. 706-710) & Tosi (in House, 1967, Chapter 5). For a comparison of role playing and case method, see Solem, (1960).
9.	Simulations (Business Games)	Babb, Leslie & Van Slyke (1966); Bass & Vaughan (1966, pp. 104-110); Cohen & Rhenman (1961); Cyert & Dill (1964); Deep, Bass & Vaughan (1967); Dill, Jackson & Sweeney (1961); Jensen (in Wadia, 1966, pp. 326-330); Raia (1966); and Shubik (1964, Part 5).
10.	Sensitivity Training (T-Groups)	Argyris (1964b); Bass (1960); Bass & Vaughan (1966; pp. 119-127); Bradford, Gibb & Benne (1964); Burke & Bennis (1961); Carron (1964); House (1967a; esp. Ch. 5); Leighton (1949); Paine (1965); Shepard (in Bennis, Benne & Chin, 1961, pp. 637-643); Tosi (in House, 1967, Chp. 5); Wikstrom (in Wadia, 1966, pp. 166-169); and Wilson, Mulle, & Morton (1968).
11.	Programmed Group Exercises	Bass (1966; 1967).
12.	Job Rotation	Sargent (in Merrill & Marting, 1958, pp. 124-130); Tosi (in House, 1967, Ch. 5).

13.	Understudy or Executive Assistant Program	
14.	Coaching	Levinson (1962); and Mace & Mahler (in Merrill & Marting, 1958, pp. 99-110).
15.	Individual Research	
16.	Programmed Instruction	Bass & Vaughan (1966, pp 112-119); Hughes (1962); Jacobs, Maier & Stolurow (1966); and Olfeish (1965).
17.	University Development Programs	Andrews (1966); Cyert & Dill (1964); Gross (in Ramo *et al*, 1964, pp. 17-29); Powell (1962); and Wadia (1961).
18.	University Degree Programs	
19.	Extensive Seminars and Other Programs	

General reference volumes, covering a variety of techniques, include: Bass & Vaughan (1966); Bellows, Gilson & Odiorne (1962); Bennis, Benne & Chin (1961); Bernthal (1963); Hall (1958); House (1967); McGehee & Thayer (1961); Personnel Policies Forum (1967); and Rowland (1958).

APPENDIX B: Pretest Procedure

1. Sample Description

The primary two instruments (WWQ and PDP) were pretested on June 3, 1968 using a sample of 59 young managers pursuing a Master of Business Administration degree at the University of Pittsburgh. They hold full-time jobs while attending classes in the evening on a part-time basis. At the time of pretesting, all managers were enrolled in a course in Behavioral Science in Business. Their average age is 28.6 years, with a range of 22 years to 41 years. They perform a variety of organizational functions, come from diverse educational backgrounds, have been with their company an average of just over two years and represent staff more than line positions. With the exception of their age (and correlates among personal variables), the pretest sample closely resembled the experimental sample.

2. Procedure

The original WWQ form contained 90 items separated into those concerning the individual manager (35 items) and those concerning the organization (55 items). The original PDP contained 66 items (15 skills, 27 areas of knowledge, and 24 training methods). To assure greater validity in the final instruments, managers were asked to respond to the items as honestly as possible, and to note any items that were vague, awkwardly stated, or redundant. They were also asked to indicate any aspects of the world of work or content

or methods of training which they felt deserved consideration but which was not included.

In addition to pretesting the questionnaires for clarity, comprehensiveness, and ease of responding, and to evolve more reliable final instruments, the 60 managers were asked to indicate for each item of WWQ and PDP, whether it deals with a "rational" subject, a "behavioral" subject, or "neither."

Definitions for the three terms were provided, as follows:

> RATIONAL items are those dealing with substantive issues. In general, they relate to quantitative, scientific, engineering, mechanistic, logical, "cut-and-dried" issues. They deal with objective issues rather than subjective or emotional ones.
>
> BEHAVIORAL items are those dealing with social or human relations kinds of issues. In general, they relate to emotional, human, qualitative, judgmental, "people" issues. They deal with subjective issues rather than objective ones.
>
> NEITHER items are those which you cannot honestly place in either of the above categories. While the size of this category should be much smaller than the other two, there will probably be some items for which this category will be needed.

It was made clear to respondents that the term "neither" was also to be used for those statements which they felt contained both rational and behavioral elements equally.

The decision rule adapted for constructing the final instruments was classification of a statement as "behavioral," "rational," or "neither" by 60% of the entire sample (for this instrument, 35 of the 59 respondents). Table B.1 summarizes the results. The final WWQ instruments contained either rational or behavioral items, plus those categorized as neither. Further, all instruments were modified

according to any recurring suggestions of additions, deletions or rewording. This particularly affected the PDP, as several additions were suggested and incorporated.

TABLE B.1

SUMMARY OF PRETEST RESULTS

		Number of Items Judged By At Least 60% of the Sample As			
Questionnaire	Subsection	Rational	Behavioral	Neither	Total
World of Work	Individual*	15	12	8	35
	Organizational*	24	15	16	55
	Total	39	27	24	90
Personal Data Plan (PDP)	Skills	6	7	2	15
	Areas of Knowledge	15	10	2	27
	Training Methods	12	4	8	24
	Total	33	21	12	66

*The subsections on WWQ were randomly merged in the final instruments.

APPENDIX C: Measuring Instruments

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C-1: Instructions for Managers in Groups I and III

ASSESSING AND PLANNING FOR THE FUTURE

General Instructions

Included in this booklet is a series of four survey instruments, which should require about one hour to complete. While they are part of a larger study, their primary purpose is to allow you to focus on the World of Work as you think it will look 10 years from now. It is hoped that these instruments will help you to crystallize your thinking about your future job and the future of your organization. In addition, it will permit you to plan the steps to follow to prepare yourself for the role you hope to assume in the World of Work you foresee.

Please be assured that all individual information will be held in the strictest confidence. Do not place your name anywhere on these pages. Your birth date is requested on the first page of each instrument, simply to permit us to identify your questionnaires should they become separated. Please complete all pages in the order in which they appear. Answer all questions, even if you are not sure of a particular response. The future cannot be predicted with certainty, so the best basis for action is the best current estimate we can make. While each question should be carefully considered for its implications as you see them, do not spend too much time on any one of them. Specific instructions, where relevant, appear on the page just preceding each instrument. Before turning to the questionnaires, a brief description of their contents follows.

1. Personal Data Sheet - requests certain information about your background, present job, and possible future job.

2. Estimates of Current Time Allocations - In order to assist you in focusing on aspects of your present job, this form asks you to estimate how you spend your time among six broad classes of activities.

3. World of Work Questionnaire - presents a series of statements about various aspects of the future World of Work, and asks you to indicate the direction you expect them to take in the next 10 years.

4. Personal Development Plan - asks you to state the relative value to you of having additional training in various skills, areas of knowledge, and using various training techniques.

C-2: Instructions for Managers in Groups II and IV

PLANNING FOR AND ASSESSING THE FUTURE

General Instructions

Included in this booklet is a series of four survey instruments, which should require about one hour to complete. While they are part of a larger study, their primary purpose is to allow you to focus on the World of Work as you think it will look 10 years from now. It is hoped that these instruments will permit you to plan the steps to follow to prepare yourself for the role you hope to assume in this World of Work. In addition, it will help you to crystallize your thinking about your future job and the future of your organization.

Please be assured that all individual information will be held in the strictest confidence. Do not place your name anywhere on these pages. Your birth date is requested on the first page of each instrument, simply to permit us to identify your questionnaires should they become separated. Please complete all pages in the order in which they appear. Answer all questions, even if you are not sure of a particular response. The future cannot be predicted with certainty, so the best basis for action is the best current estimate we can make. While each question should be carefully considered for its implications as you see them, do not spend too much time on any one of them. Specific instructions, where relevant, appear on the page just preceding each instrument. Before turning to the questionnaires, a brief description of their contents follows.

1. Personal Data Sheet - Requests certain information about your background, present job, and possible future job.

2. Estimates of Current Time Allocations - In order to assist you in focusing on aspects of your present job, this form asks you to estimate how you spend your time among six broad classes of activities.

3. Personal Development Plan - asks you to state the relative value to you of having additional training in various skills, areas of knowledge, and using various training techniques.

4. World of Work Questionnaire - presents a series of statements about various aspects of the future World of Work, and asks you to indicate the direction you expect them to take in the next 10 years.

C-3: PERSONAL DATA SHEET

Birth Date: Month Day Year

Function:

__ Production
__ Finance
__ Personnel or Training
__ Research and Development
__ Sales or Marketing
__ Computer or EDP
__ Engineering
__ Other (please specify)

_____

Education beyond high school:

__ None
__ Business or Economics
__ Science or Engineering
__ Liberal Arts
__ Other (please specify)

_____

How long have you been an employee of your company?

__ Less than 2 years
__ 2 to 5 years
__ 6 to 10 years
__ 10 to 20 years
__ Over 20 years

How many persons report directly to you? (This is probably less than the total number in your department)

__ None
__ 5 persons or less
__ 6 to 10
__ 11 to 20
__ Over 20

How long have you been in your present job (present title)?

__ Less than 12 months
__ 12 to 23 months
__ 2 to 5 years
__ 5 to 10 years
__ Over 10 years

How would you characterize your job? Is it staff-advisory or do you have line responsibilities and authority?

__ Purely staff
__ Mostly staff
__ About half and half
__ Mostly line
__ Purely line
__ Cannot say

On the lines below, please give a brief description of the job you would like to hold 10 years from now. Include a possible title and areas of responsibility that the job is likely to entail.

Possible Title_____

Areas of Responsibility_____

_____

_____

_____

_____

PERSONAL DATA SHEET (Continued)

Other than initial training and orientation in performing duties associated with your job, have you ever participated in any organized, planned, formal organizational training programs?

__ Yes (Proceed to next question)

__ No (Proceed to next page)

Briefly describe the program(s) in which you have participated. Continue any answer for which insufficient space is provided, on the bottom half of the page.

What type of person conducted the program? (e.g. university trainer, company trainer, etc.)

_____

What subject(s) were covered?_____

_____

_____

What format was used?

__ lecture, conference, workshop

__ small group discussion and study

__ individual study

__ other (describe briefly)_____

_____

In your opinion, how effective was the program(s)?_____

_____

Date of Birth: Month Day Year

C-4: ESTIMATES OF CURRENT TIME ALLOCATIONS

Please estimate how much of your total working time you typically spend under average working conditions in each of the following functional activities. Write a whole number (between 0 and 100) beside each activity, indicating the approximate percent of your total time spent doing your job in that activity. You will probably be able to make better estimates if you read the entire list of activities before responding to a particular one. Note that the total distribution of time should add up to 100 percent.

	Amount of Time I Actually Spend
1. PLANNING: Plans include goals, strategies, and courses of action. Work scheduling, budgeting, setting up procedures, setting standards, preparing agendas, and programming are all examples of planning.	____
2. INVESTIGATING: (Processing information): Processing information includes arranging for the collection and preparation of information, usually in the form of records, reports and accounts. Inventorying, measuring output, preparing financial reports, recordkeeping and preparing information for the computer are common examples of managerial information processing.	____
3. COORDINATING: Coordinating includes exchanging information with individuals and groups within the organization in order to relate and adjust programs. Advising other departments, expediting, informing superiors, and representing one's own departmental matters are common instances of coordinating.	____
4. EVALUATING: Evaluating includes assessing and appraising proposals, reports and observed performances. Employee appraisals and inspection of actual production as well as production records, judging financial reports and analyzing computer output are all examples of evaluating.	____
5. SUPERVISING: Supervising includes directing, instructing and leading subordinates. Counseling training and explaining work procedures as well as disciplining and handling complaints are part of the supervisory function.	____
6. NEGOTIATING: Negotiating includes representing one's organization when dealing with individuals or groups outside the organization, such as customers, suppliers, sales representatives, government and civic groups, and professional associations.	____
7. OTHER(please specify). _____	____
_____	____
_____	____
	100%

*Adapted from Pittsburgh Administrative Review, Part 3. Developed by Bernard M. Bass and James A. Vaughan. Pittsburgh: Management Development Associates, 1966.

C-5: WWQ(Rational) - Groups I and II

Birth Date: Month Day Year

Form A-1968

WORLD OF WORK QUESTIONNAIRE

The following statements indicate possible dimensions of change in the World of Work as it will be 10 years from now. The statements refer to you as a manager, aspects of your future job, and the future activities and concerns of your organization. If you expect to retire in less than 10 years, think in terms of your present job as it will be 10 years hence.

For each statement, please place an "X" beside the alternative which represents your current best estimate of what will happen over the next decade. Try to think objectively. That is, indicate what you think will actually happen, aside from whether or not you would like it to occur.

1. Amount of time actually spent on company business per week.

   __will be much greater
   __will be somewhat greater
   __will be about the same
   __will be somewhat less
   __will be much less

2. Time to be spent in long-term planning (more than three years ahead).

   __will spend much less
   __will spend a little less
   __will spend about the same amount
   __will spend a little more
   __will spend much more

3. The amount of time spent working alone.

   __will be greatly increased
   __will increase somewhat
   __will not change
   __will decrease somewhat
   __will be greatly reduced

4. The importance of additional training to promotion to higher executive positions.

   __will be reduced considerably
   __will be reduced to some extent
   __will remain as it is
   __will be increased somewhat
   __will be increased considerably

5. Demand by the organization for creativity and generation of new ideas.

   __will be much less
   __will be slightly less
   __will remain as it is now
   __will be slightly more
   __will be much more

6. Emphasis on merit (quality of performance) in determining salary.

   __will be much greater
   __will be somewhat greater
   __will not change
   __will be somewhat less
   __will be much less

7. Time spent dealing with statements of organizational policy.

__will spend much less
__will spend a little less
__will spend the same amount
__will spend a little more
__will spend much more

8. Knowledge of probability theory (for decision making).

__will be of no value
__will be of little importance
__will make no difference
__will be fairly important
__will be extremely important

9. The number of contacts with the computer and EDP staff.

__will decrease greatly
__will decrease somewhat
__will not change
__will increase somewhat
__will increase greatly

10. Time spent reviewing information for decision making purposes.

__will spend much more
__will spend a little more
__will spend as much as I do now
__will spend a little less
__will spend much less

11. Time spent in meetings rather than alone.

__will spend much less
__will spend a bit less
__will spend the same amount
__will spend a bit more
__will spend much more

12. More knowledge in my field of specialization.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little importance
__will be of no value

13. Dependence on computer-generated information.

__will increase greatly
__will be somewhat increased
__will not change
__will be somewhat decreased
__will decrease greatly

14. Knowledge of principles of management and administration.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little importance
__will be of no value

15. The number of decisions made by the computer.

__will be much lower than now
__will be somewhat lower
__will remain as it is now
__will be somewhat higher
__will be much higher than now

16. Knowledge of the capabilities of the computer.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little importance
__will be of no value

17. Time to be spent in short-term planning (more than three years).

__will spend much more
__will spend a little more
__will spend the same amount
__will spend a little less
__will spend much less

18. Partipation in planning and implementing organization and technological change.

__will be much less
__will be a little less
__will not change
__will be a little more
__will be much more

19. Concern with technical, scientific and engineering matters.

__will be much greater
__will be slightly greater
__will remain as it is now
__will be slightly reduced
__will be much reduced

20. Skill in attending to many and diverse kinds of information.

__will be of no value
__will be of little importance
__will make no difference
__will be fairly important
__will be extremely important

21. Control by upper level managers over decisions made at middle and lower levels.

__will be considerably reduced
__will be reduced to some extent
__will not change
__will be increased to some extent
__will be considerably increased

22. Complexity: the number of specialized functions in the organization.

__will be greatly decreased
__will decrease somewhat
__will not change
__will increase somewhat
__will be greatly increased

23. Knowledge and skill in computer programming.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little importance
__will be of no value

24. The number of technical specialists at lower management levels.

__will increase greatly
__will increase somewhat
__will not change
__will decrease somewhat
__will decrease greatly

25. Time spent searching for and processing information.

__will be greatly reduced
__will be reduced somewhat
__will not change
__will be increased somewhat
__will be greatly increased

26. The role of absolute level of profits as a measure or organizational success.

__will increase greatly
__will increase slightly
__will not change
__will decrease slightly
__will decrease greatly

27. Knowledge of the use of models and simulations.

__will be of no value
__will be of little importance
__will make no difference
__will be fairly important
__will be extremely important

28. Emphasis on systems analysis, design, and planning.

__will be much less
__will be a little less
__will not change
__will be a little greater
__will be much greater

29. Emphasis on analysis of information needs of various parts of the organization.

__will become much greater
__will become somewhat greater
__will not change
__will become somewhat less
__will become much less

30. Emphasis on cost-benefit analysis or program budgeting.

__will decrease sharply
__will decrease a little
__will not change
__will increase a little
__will increase sharply

31. Knowledge of analytical techniques of decision making.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little use
__will be of no value

32. Emphasis on research and development activities.

__will be much greater
__will be a little greater
__will remain about the same
__will be a little less
__will be much less

33. Specific attention devoted to financial control.

__will be sharply reduced
__will be somewhat reduced
__will not change
__will be somewhat increased
__will be sharply increased

34. The length of the planning period for the organization.

__will be much shorter
__will be a little shorter
__will not change
__will be a little longer
__will be much longer

35. The difference between the total salary of the president and total wages of workers.

__will increase greatly
__will increase a little
__will remain as it is now
__will decrease a little
__will decrease greatly

36. The variety of products or services offered by the organization.

__will decrease sharply
__will be somewhat less
__will remain the same as it is
__will be somewhat greater
__will increase sharply

37. The number of unskilled employees.

__will be much greater
__will be slightly greater
__will not change
__will be slightly less
__will be much less

38. The decision making structure of the organization, as represented by the organization chart.

__will become much more decentralized
__will become somewhat more decentralized
__will stay as it is now
__will become somewhat more centralized
__will become much more centralized

39. Concern about sales volume, rather than profits, as the most important criterion of organizational success.

__will be greatly reduced
__will be reduced to some degree
__will not change
__will be increased to some degree
__will be greatly increased

40. The number of management levels in the organization between supervisors and the president.

__there will be many more
__there will be slightly more
__there will be the same number
__there will be slightly fewer
__there will be many fewer

41. The number of middle managers (those between first-level and the corporate executive group).

__will decrease sharply
__will decrease to some degree
__will not change
__will increase to some degree
__will increase sharply

42. The duration of projects taken on by the organization.

__will be of much shorter duration
__will be somewhat shorter
__will not change in length
__will be somewhat longer
__will be of much longer duration

43. Organizational consulting with the academic community.

__will become much greater
__will become slightly greater
__will remain as it is now
__will become slightly less
__will become much less

44. The proportion of employees involved in administration and staff support services.

__will be much less
__will be somewhat less
__will not change
__will be somewhat greater
__will be much greater

45. The exchange of information between organizations, now considered by them as confidential.

__will increase considerably
__will increase to some extent
__will remain as it is now
__will decrease to some extent
__will decrease considerably

46. The role of information technologists (those involved with the computer and the information processed and generated).

__will be purely a line function
__will be more line than staff
__will be half line, half staff
__will be more staff than line
__will be purely a staff function

47. Concern for marketing the company's products (distinct from sales volume).

__will be much less
__will be somewhat less
__will remain as it is now
__will be somewhat more
__will be much more

48. The role of stockholders in the organization's policy- and decision-making.

__will increase greatly
__will be slightly greater
__will not change
__will be slightly less
__will decrease greatly

49. The proportion of managers who are college graduates.

__will decrease sharply
__will decrease a little
__will not change
__will increase a little
__will increase sharply

50. Degree of specialization of managers at higher levels

__will be much greater
__will be somewhat greater
__will not change
__will be somewhat less
__will be much less

51. The influence of computer and EDP managers over the activities of the organization.

__will be greatly reduced
__will decline somewhat
__will not change
__will increase somewhat
__will be greatly increased

52. Emphasis on project, rather than traditional functional-line, organization.

__will become much greater
__will become slightly greater
__will remain as it is now
__will become slightly less
__will become much less

53. The amount of antitrust investigation and legislation.

__will be greatly reduced
__will be less than at present
__will not be different
__will be more than at present
__will be greatly increased

54. The idea of one man, rather than a group, having ultimate authority for corporate decisions.

__will definitely continue
__is more likely to continue
__don't know; can't say
__is more likely to change
__will definitely change

55. The management of the organization's computer services.

__will become much more centralized
__will be somewhat more centralized
__will not change
__will be somewhat more decentralized
__will become much more decentralized

56. The role of business in government policy- and decision-making.

__will be much greater
__will be slightly greater
__will not change
__will be slightly less
__will be much less

57. The number of management jobs.

__will be much reduced
__will be a little lower
__will not change
__will be a little higher
__will be much greater

58. The role of operating managers, as contrasted to that of the computer staff, in planning computer applications.

__will increase significantly
__will increase to some extent
__will not change
__will decrease to some extent
__will decrease significantly

59. Shift in emphasis from internal operations to such things as public relations and customer contact.

__will very likely occur
__is more likely than not
__don't know; can't say
__is fairly unlikely
__will not happen

60. The power or influence exerted by computer center managers.

__will be greatly reduced
__will be reduced to an extent
__will not change
__will be increased to an extent
__will be greatly increased

61. Movement of managers between countries, if organization has international operations.

__will increase greatly
__will increase slightly
__will not change
__will decrease slightly
__will decrease greatly

62. Emphasis on the development of international markets by the organization.

__will increase considerably
__will increase to some extent
__will not change
__will decrease to some extent
__will decrease considerably

63. The computer operation in the organization will be directed by a top corporate-level executive, having broad administrative/management services responsibilities.

__will quite certainly not occur
__will probably not occur
__don't know; can't say
__will probably occur
__will quite certainly occur

64. The number of business enterprises in the U.S.

__will increase sharply
__will increase somewhat
__will not change
__will decrease somewhat
__will decrease sharply

C-6: WWQ(Behavioral) - Groups III and IV

Birth Date: Month Day Year

Form C-1968

WORLD OF WORK QUESTIONNAIRE

The following statements indicate possible dimensions of change in the World of Work as it will be 10 years from now. The statements refer to you as a manager, aspects of your future job, and the future activities and concerns of your organization. If you expect to retire in less than 10 years, think in terms of your present job as it will be 10 years hence.

For each statement, please place an "X" beside the alternative which represents your current best estimate of what will happen over the next decade. Try to think objectively. That is, indicate what you think will actually happen, aside from whether or not you would like it to occur.

1. The number of business enterprises in the U.S.

   __will increase sharply
   __will increase somewhat
   __will not change
   __will decrease somewhat
   __will decrease sharply

2. The role of length of experience in the company in determining promotion rate.

   __will be much less important
   __will be slightly less important
   __will not change from present policy
   __will be slightly more important
   __will be much more important

3. The amount of working time spent alone, rather than with others.

   __will be greatly increased
   __will increase somewhat
   __will not change
   __will decrease somewhat
   __will be greatly reduced

4. Involvement of managers in politics and government affairs.

   __will be considerably reduced
   __will be slightly reduced
   __will remain as it is now
   __will be slightly increased
   __will be considerably increased

5. The importance of additional training to promotion to higher executive positions.

   __will be of no value
   __will be of little importance
   __will make no difference
   __will be fairly important
   __will be extremely important

6. Time spent evaluating people and proposals.

   __will spend much more
   __will spend a little more
   __will spend the same amount
   __will spend a little less
   __will spend much less

WWQ_b-2

7. The number of contacts with my immediate superior.

__will be greatly increased
__will increase somewhat
__will not change
__will decrease somewhat
__will be greatly decreased

8. The decision making structure of the organization, as represented by the organization chart.

__will become much more decentralized
__will become somewhat more decentralized
__will stay as it is now
__will become somewhat more centralized
__will become much more centralized

9. Time spent negotiating with people outside the organization, such as customers and suppliers.

__will spend much less
__will spend a little less
__will spend the same amount
__will spend a little more
__will spend much more

10. Emphasis on merit (quality of performance) in determining salary.

__will be much greater
__will be somewhat greater
__will not change
__will be somewhat less
__will be much less

11. Control by upper level managers over decisions made at middle and lower levels of management.

__will be considerably reduced
__will be reduced to some degree
__will not change
__will be increased to some degree
__will be considerably increased

12. Importance of superior's evaluation of a manager's performance as a determinant of promotion to top management levels.

__will become much more important
__will become slightly more important
__will not change in importance
__will become slightly less important
__will become much less important

13. Time spent supervising activities of subordinates.

__will spend much more
__will spend a little more
__will spend the same amount
__will spend a little less
__will spend much less

14. Shift in emphasis from individual to group or committee decision making.

__will be quite unlikely
__will probably not happen
__don't know; can't say
__will probably happen
__will quite likely happen

15. The number of contacts with persons above me in the organization other than my immediate superior.

__will be greatly decreased
__will decrease somewhat
__will not change
__will increase somewhat
__will be greatly increased

16. Knowledge of principles of management and administration.

__will be extremely important
__will be fairly important
__will make no difference
__will be of little importance
__will be of no value

17. The computer will provide necessary control over individual performance, reducing the need for human supervision.

__will quite likely occur
__is more likely than not
__don't know; can't say
__is fairly unlikely
__will not occur

18. Knowledge and skill in interpersonal relations.

__will be of no value
__will be of little importance
__will make no difference
__will be fairly important
__will be extremely important

19. Time spent traveling on company business.

__will spend much more
__will spend a little more
__will spend the same amount
__will spend a little less
__will spend much less

20. Time spent in meetings rather than alone.

__will spend much less
__will spend slightly less
__will spend the same amount
__will spend slightly more
__will spend much more

21. Time spent coordinating activities of individuals and groups.

__will spend much more
__will spend a little more
__will spend the same amount
__will spend a little less
__will spend much less

22. Attention and resources devoted to management training and education by the organization.

__will become much greater
__will become somewhat greater
__will not change
__will become somewhat less
__will become much less

23. The displacement of managers due to technological advances.

__will be a serious problem
__will be a problem to some extent
__don' know; can't say
__will probably not be a problem
__will certainly not happen

24. The number of contacts with the computer and EDP staff.

__will be greatly decreased
__will decrease somewhat
__will not change
__will increase somewhat
__will be greatly increased

25. The organization will take over many functions for workers now performed by unions and the community.

__will quite likely happen
__is more likely to happen than not
__can't say; don't know
__is unlikely
__will not happen

26. Time spent dealing with statements of organizational policy.

__will spend much less
__will spend a little less
__will spend the same amount
__will spend a little more
__will spend much more

27. The nature of business-government relations.

__will be much more cordial
__will be slightly more cordial
__will not change
__will be slightly more strained
__will be much more strained

28. Time spent by managers in their own development and training.

__will greatly increase
__will increase to some extent
__will not change
__will decrease to some extent
__will greatly decrease

29. Top management support for a management development program involving all managers.

__will be much less
__will be somewhat less
__will remain as it is now
__will be somewhat more
__will be much more

30. Frequency of manager-subordinate consultations.

__will be much more frequent
__will be a little more frequent
__will not change in frequency
__will be a little less frequent
__will be much less frequent

31. Attention devoted to manpower planning.

__will be considerably less
__will be slightly less
__will not change
__will be slightly more
__will be considerably more

32. The difference between total salary of the president and total wages of workers.

__will increase greatly
__will increase a little bit
__will remain as it is now
__will decrease a little bit
__will decrease greatly

33. The number of management levels in the organization between supervisors and the president.

__there will be many more
__there will be a few more
__it will remain constant
__there will be a few less
__there will be many fewer

34. The idea of one man, rather than a group, having ultimate authority and responsibility for corporate decisions.

__will definitely continue
__is more likely to continue
__don't know; can't say
__is more likely to change
__will definitely change

35. The number of contacts with the public and the community.

__will be greatly decreased
__will decrease somewhat
__will not change
__will increase somewhat
__will be greatly increased

36. Organizational consulting with the academic community.

__will become much greater
__will become slightly greater
__will stay as it is now
__will become slightly less
__will become much less

37. Concern about social welfare in making organizational decisions.

__will be much less
__will be reduced somewhat
__will not change
__will be increased somewhat
__will be much greater

38. The exchange of information between organizations, now considered by them to be confidential.

__will increase considerably
__will increase to some extent
__will neither increase nor decrease
__will decrease to some extent
__will decrease considerably

39. Shift in emphasis from internal operations to such things as marketing, public relations, and customer contact.

__will quite likely occur
__will more likely occur than not
__don't know; can't say
__will more likely not occur
__will certainly not occur

40. The extent of the organization's concern for human values.

__will be much less
__will be slightly less
__will remain as it is now
__will be slightly greater
__will be much greater

41. Company's control over managers' personal lives.

__will become much greater
__will increase somewhat
__will not change
__will decrease somewhat
__will become greatly reduced

42. Union-management cooperation.

__will be greatly reduced
__will be reduced to some extent
__will not change
__will be increased to some extent
__will be greatly increased

43. The role of stockholders in the organization's policy- and decision-making.

__will increase greatly
__will be slightly greater
__will not change
__will be slightly less
__will decrease greatly

44. The influence of the consumers over organizational activities.

__will be much greater
__will be slightly greater
__will not change
__will be slightly less
__will be much less

45. The number of middle managers (those between first-level and the corporate executive group).

__will decrease sharply
__will decrease to some degree
__will not change
__will increase to some degree
__will increase sharply

46. The proportion of employees involved in administration and staff support services.

__will be much less
__will be somewhat less
__will not change
__will be somewhat greater
__will be much greater

47. The role of business in government policy- and decision-making.

__will be much greater
__will be slightly greater
__will not change
__will be slightly reduced
__will be much reduced

48. The amount of antitrust investigation and legislation.

__will be greatly reduced
__will be reduced somewhat
__will not change
__will be increased somewhat
__will be greatly increased

49. The number of management jobs.

__will be much lower
__will be slightly lower
__will not change
__will be slightly higher
__will be much higher

50. The movement of managers between countries, if the organization has international operations.

__will increase greatly
__will increase slightly
__will not change
__will decrease slightly
__will decrease greatly

51. Involvement of organizations in social problems, such as urban renewal, the crime rate, and racial unrest.

__will become much less
__will become somewhat less
__will remain as it is now
__will become somewhat greater
__will become much greater

52. The power or influence exerted by computer center managers over the organization's activities.

__will be greatly reduced
__will be reduced to an extent
__will not change
__will be increased to an extent
__will be greatly increased

Date of Birth: Month Day Year

C-7: PERSONAL DEVELOPMENT PLAN

Below are listed a variety of Skills, Areas of Knowledge, and Training Methods. These lists are not meant to be exhaustive, but only suggestive of possible areas in which you may feel you would like additional training, and possible methods for obtaining it. Areas that are not found on the lists, or do not adequately suggest the content of training you would like, should be added freely. Space has been provided for this purpose. Remember, this represents training you feel will prepare you for the future position to which you aspire.

For each Skill, Area of Knowledge, and Training Method, place a number to the left, in accordance with the following scale.

1. Essential for me

2. Quite valuable for me, but not essential

3. Could be valuable or not, I'm not sure

4. Of little value to me

5. Of no foreseeable benefit to me

In addition, place an "X" to the right of each Skill, Area of Knowledge, and Training Method in which you have already had or are now receiving training.

A. SKILLS

___ 1. Planning

___ 2. Investigating (Processing Information)

___ 3. Coordinating

___ 4. Evaluating

___ 5. Supervising (Leadership)

___ 6. Staffing

___ 7. Representing the Organization

___ 8. Motivating

___ 9. Decision Making

___10. Conflict Resolution

___11. Analytical Problem Solving

___12. Managing Change

___13. Organizing

___14. Understanding Computer Output

___15. Community (Public) Relations

PERSONAL DEVELOPMENT PLAN (continued)

___16. Cost Estimation
___17. Perception of the Needs of Others
___18. Verbal and Written Communication
___19. Public Speaking
___20. Human Relations
___21. Others (please specify)

___a. _____
___b. _____
___c. _____
___d. _____
___e. _____

B. AREAS OF KNOWLEDGE

___ 1. Accounting Principles
___ 2. Economic Theory
___ 3. Marketing or Marketing Research
___ 4. Methods of Forecasting and Prediction
___ 5. Financial Management
___ 6. Systems Analysis, Planning or Design
___ 7. Program Budgeting or Cost-Benefit Analysis
___ 8. Operations Research
___ 9. Research Methodology
___10. Specific Courses in my Field of Specialization (please specify this field) _____
___11. Computer Programming
___12. General Computer Course
___13. Personnel Administration
___14. Labor Relations
___15. Statistical Decision Theory
___16. Model Construction and Utilization
___17. Mathematical and Statistical Analysis
___18. Behavioral Science in Business Course
___19. Law (Business-Related)
___20. General Psychology
___21. Organization Theory

PERSONAL DEVELOPMENT PLAN (continued)

___22. Principles of Learning
___23. Sociology
___24. Anthropology
___25. Role of Business in Society
___26. Foreign Languages
___27. International Management
___28. Business-Government Relations
___29. Political Implications of Decisions
___30. Manpower and Material Resource Allocation
___31. Production and Inventory Control
___32. Others (please specify)

___a._____
___b._____
___c._____
___d._____
___e._____

C. TRAINING METHODS

___ 1. Work With Case Materials
___ 2. Attend University Courses in my Specific Area of Specialization (please specify this area)_____
___ 3. Enroll in an Advanced Degree Program (M.A., M.S., M.B.A., or Ph.D.)
___ 4. Work with Simulations (Business Games)
___ 5. Participate in Sensitivity Training (T-Groups)
___ 6. Read Programmed Texts (Self Instructional Materials)
___ 7. Read Business and Professional Journals or Magazines
___ 8. Join Business or Professional Societies
___ 9. Attend Lectures Given at Work and Elsewhere by Noted, Up-to-date Speakers
___10. Rotate Jobs Within the Organization, such as Different Functional Areas, Plants, or Divisions in the U.S.
___11. Rotate Jobs in Branch or Subsidiary Operations Abroad
___12. Attend Courses in Business Areas Other than my Field of Specialization

PERSONAL DEVELOPMENT PLAN (concluded)

___13. Attend Conferences, Seminars, or Workshops

___14. Attend National and State Conventions

___15. Get Advanced Training in Technical Areas, such as Computer Technology, Operations Research, Analytical Methods

___16. Ask for Addition On-the-job Training from Superiors

___17. Ask for a Leave of Absence to Work for the Federal Government

___18. Engage in Community or Civic Work

___19. Leaderless Group Discussions

___20. Guided Group Discussions

___21. Written Assignments, such as Research Reports

___22. Concentrated, Extended Courses Conducted by a University or Training Institute, to be Attended by Yourself and Others from your Company

___23. Concentrated, Extended Courses Conducted by a University or Training Institute, to be Attended by Yourself and Colleagues from a Variety of Organizations

___24. Guided (Assigned) Readings

___25. Others (please specify)

___a. _____

___b. _____

___c. _____

___d. _____

___e. _____

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13. Abstract

The future world of work has been the subject of considerable prognostication by scholars and businessmen, particularly recently. While these predictions differ widely, they unanimously augur a world vastly different from the present one. Today's middle manager, therefore, is faced with the very real danger of becoming obsolete--today's skills and knowledge will not enable him to effectively manage tomorrow's corporation.

The purposes of this study are: 1) to provide a means by which managers may assess the future world of work and to describe it by means of these assessments; 2) to compare present with past predictions of the same future point in time, in order to identify continuing and changing trends; and 3) to examine the effect an assessment of the future has on managers' subsequent plans for their own training and development. (Con't)

Abstract/Con't.

Two instruments were developed to serve these purposes. The first, a World of Work Questionnaire, was divided into two parts and administered to different subsamples of managers. One part contained those items considered "rational" in content, the other contained "behavioral" items. Items concerned various dimensions of the world of work, and managers were to indicate their best estimates of future directions in these dimensions. The second instrument, the Personal Development Plan, listed various skills, abilities, areas of knowledge, and training methods. Managers were asked to indicate for each the value to them of receiving further training. Half the sample completed this before completing the World of Work Questionnaire, the other half after assessing the future. Each half of the sample was again randomly divided in half, to answer either the rational or behavioral form of the World of Work Questionnaire. A total of 139 managers responded to the instruments. Personal data were also collected.

Results of the managers' assessments of the future world of work are presented for the sample as a whole, and then according to functional fields. Meaningful subgroups of items relating to the individual managers of the future and those relating to the future organization were formed and discussed. While present predictions were found to agree with those past predictions that have gone undisputed to now, additional light was shed on the more controversial areas of concern, such as the relative roles of computers and middle managers. Experimental results show a tendency for managers who first assess "rational" aspects of the future to recognize greater urgency for a wider range of training content areas and methods. However, managers who first responded to the behavioral form of the World of Work Questionnaire, were found not to perceive greater training urgency than did subjects in the control groups which first completed the Personal Development Plan. The latter result was not consistent with what was hypothesized.

The study demonstrates that the opportunity to systematically attend to particular aspects of the future can lead managers to broaden the scope of what they consider relevant training for them. Further, response bias caused by the specific dimensions of the future suggested to managers, was demonstrated not to affect the results. Discussion focuses on the implications of this approach for the individual in guarding against his own obsolescence, and for the organization in planning and implementing a manager development program consistent with its own needs and those perceived by its managers. It was suggested that future research employ a single World of Work assessment form involving as many of the relevant dimensions of the future as possible, but no more than necessary, and then arrive at a specific action proposal for redesigning the tested organization's management development program in ways indicated by results.

14. Key Words

World of Work Questionnaire
Management development
Self-identified training needs
Personal Development Plan
"Rational" dimensions of the future
"Behavioral" dimensions of the future

The Management Research Center (MRC) of the College of Business Administration, conducts selected programs of research in individual, small group and organizational psychology, with special emphasis on the study of managerial behavior in industrial organizations. Through enlarging our understanding of how today's manager deals with increasingly complex organizational problems, the Center hopes to furnish behavioral foundations for the development and education of the manager of the future. MRC is supported by the Ford Foundation, Office of Naval Research and The University of Rochester.

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Field studies as well as broad scale surveys are under way in banking and other industries to study the effects of the computer and EDP on managerial and organizational behavior. An attempt is being made to gauge the impact of computers on organizational life in general and managerial behavior in particular.

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