Human Resource Planning

Challenges for Industrial/Organizational Psychologists

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A BSTRACT: Human resource planning has traditionally been used by organizations to ensure that the right person is in the right job at the right time. Under past conditions of relative environmental certainty and stability, human resource planning focused on the short term and was dictated largely by line management concerns. Increasing environmental instability, demographic shifts, changes in technology, and heightened international competition are changing the need for and the nature of human resource planning in leading organizations. Planning is increasingly the product of the interaction between line management and planners. In addition, organizations are realizing that in order to adequately address human resource concerns, they must develop long-term as well as short-term solutions. As human resource planners involve themselves in more programs to serve the needs of the business, and even influence the direction of the business, they face new and increased responsibilities and challenges.

In an early treatment of the topic, Vetter (1967) defined human resource planning as

the process by which management determines how the organization should move from its current manpower position to its desired position. Through planning, management strives to have the right number and the right kinds of people, at the right places, at the right time, doing things which result in both the organization and the individual receiving maximum long-run benefits. (p. 15)

Contemporary human resource planning occurs within the broad context of organizational and strategic business planning. It involves forecasting the organization's future human resource needs and planning for how those needs will be met. It includes establishing objectives and then developing and implementing programs (staffing, appraising, compensating, and training) to ensure that people are available with the appropriate characteristics and skills when and where the organization needs them. It may also involve developing and implementing programs to improve employee performance or to increase employee satisfaction and involvement in order to boost organizational productivity, quality, or innovation (Mills, 1985b). Finally, human resource planning includes gathering data that can be used to evaluate the effectiveness of ongoing programs and inform planners when revisions in their forecasts and programs are needed.

Because a major objective of planning is facilitating

an organization's effectiveness, it must be integrated with the organization's short-term and longer term business objectives and plans.' Increasingly this is being done in leading organizations, although in the past business needs usually defined personnel needs and human resource planning, which meant that planning became a reactive process. The reactive nature of the process went hand-in-hand with a short-term orientation. Now, major changes in business, economic, and social environments are creating uncertainties that are forcing organizations to integrate business planning with human resource planning and to adopt a longer term perspective. For example, according to Kathryn Connors, vice president of human resources at Liz Claiborne,

Human resources is part of the strategic (business) planning process. It's part of policy development, line extension planning and the merger and acquisition processes. Little is done-in the company that doesn't involve us in the planning, policy or finalization stages of any deal. (cited in Lawrence, 1989, p. 70)

John O'Brien, vice president of human resources at Digital Equipment Corporation, describes an integrated linkage between business and human resource plans as one by which human resource and line managers work jointly to develop business plans and determine human resource needs, analyze the work force profile in terms of future business strategies, review emerging human resource issues, and develop programs to address the issues and support the business plans. According to O'Brien, such joint efforts occur when human resource planners convince corporate business planners that "human resources represent a major competitive advantage" ("Planning with People," 1984, p. 7) that can increase profits when managed carefully. This article describes

some of the activities that industrial/organizational (I/O) psychologists are engaged in as they seek to improve the competitiveness of organizations through effective human resource planning.

Factors Underlying Increased Interest in Human Resource Planning

Undoubtedly, there are many factors that account for the increased attention directed to human resource planning, but environmental forces-globalization, new technologies, economic conditions, and a changing work force-seem particularly potent (Dumaine, 1989; Dyer & Heyer, 1984; Greenhalgh, McKersie, & Gilkey, 1986). These create complexity and uncertainty for organizations. Uncertainty can interfere with efficient operations, so organizations typically attempt to reduce its impact; formal planning is one common tactic used by organizations to buffer themselves from environmental uncertainty (Thompson, 1967).

The changing characteristics of the work force, which is but one important environmental factor, make the need for planning evident. Between 1976 and 1980, the labor force grew an average of 2.8%, but between 1991 and 1995, the rate of growth will drop to 1.1 %. Additionally, whereas more than 3 million people joined the labor force in 1978, less than 2 million people are projected to enter the labor force each year from 1987 to 1995. Comparatively, the proportion of younger people (aged 16 to 24) and older people (aged 55 and over) in the work force will decline. People aged 25 to 54 will constitute a greater percentage of the labor force, increasing from 61% in 1975 to 73% in 1995. The number of mothers in the work force with children under one year old increased from 42% in 1980 to 55% in 1989. The ethnic mix of the labor force is also changing. The Bureau of Labor Statistics estimates that ethnic minorities will account for 57% of the growth in the labor force between now and the year 2000. Of the approximately 25 million workers added to the work force between 1985 and 2000, 42% are expected to be native White women and only 15% are expected to be native White men. Fully 22% are expected to be immigrants (Glickman, 1982; Johnston & Packer, 1987; "Managing Now," 1988; "Needed," 1988; Nelton, 1988).

All of these demographic projections have significant implications for managing human resources, thereby increasing the importance of human resource planning (Coates, 1987; Davis & Associates, 1986). The changing demographics mean there will be fewer entry-level employees, so competition among employers will increase. In addition, the changing demographics signal changes in the abilities, skills, interests, and values of tomorrow's work force. For example, shortages of many types of skilled workers are imminent, including tool-and-die makers, bricklayers, shipbuilders, mechanics, machinists, and engineers ("Early Retirement," 1987). Even if organizations are willing to train new employees, the task may be difficult, as the U.S. Navy has found. At a time when many of its training manuals required 12th-grade reading skills, nearly one fourth of the high school graduates who entered the Navy read below the 10th-grade level (National Alliance of Business, 1986). Such statistics are alarming when compared to projections indicating that the levels of various skills needed for new jobs are likely to increase in the future (see Johnston & Packer, 1987).

A consideration of how the values of workers who will soon make up the majority of the work force differ from those who will begin to leave it suggests additional changes on the horizon. There is already evidence of growing resistance from employees to relocation. Greater emphasis on self-evaluation and a reduction in loyalty and dedication to employers makes it more difficult for organizations to assume they can move employees around anywhere and anytime (Maccoby, 1988; Mills, 1987). A decline in organizational loyalty is occurring at the same time that workers are feeling insecure about their employment (Hay Group, 1988).

A recent study comparing the work values of those over 40 years old with those under 40 years old suggested other types of changes for which organizations must prepare. For example, employees from the younger generation, who grew up during the Vietnam war, do not trust authority as much as do members of the older generation, who are products of the World War II era. The younger generation thinks work should be fun, whereas the older generation sees work as a duty and vehicle for financial support. Younger employees believe people should advance as quickly as their competence permits, whereas older workers believe that experience is the necessary road to promotion. Finally, this study found that for the younger generation, "fairness" means allowing people to be different, but for the older generation it means treating people equally ("Work Attitudes," 1986).

Changes in the work force are just one aspect of the environment stimulating the need for human resource planning. The demographic changes are somewhat predictable, but when they are considered in combination with changing technology (see Davis & Associates, 1986) and many of the other external changes described elsewhere in this issue (e.g., by Offermann & Gowing, pp. 95-108), they pose significant challenges for human resource planning and contribute to its changing status during the past two decades.

A Model for Describing Human Resource Planning

In the remainder of this article, we describe the activities engaged in by human resource planners in leading organizations. Throughout our discussion, we describe four phases of human resource planning: (a) gathering and analyzing data to forecast expected human resource demand, given business plans for the future, and to forecast future human resource supply; (b) establishing human resource objectives; (c) designing and implementing programs that will enable the organization to achieve its human resource objectives; and (d) monitoring and evaluating these programs (Burack, 1988; Odiorne, 1981). Ac-

tivities related to the four phases of human resource planning are described for three different time horizons: short term (up to one year), intermediate term (two to three years), and long term (more than three years). These correspond to the typical time horizons for business planning. Using the same conventions that line managers use to distinguish between activities with differing time horizons is one step human resource planners can take to facilitate integration of their efforts with the needs of the business (Hennecke, 1984; Migliore, 1984, 1986; Walker, 1978).

Although the four phases of human resource planning are conceptually the same regardless of the time horizon, there are practical differences in the operationalization of the four phases as the time horizon is extended. Therefore, we describe the activities related to planning for each time horizon separately and in turn, beginning with short-term planning. We begin with the shorter term planning horizon because historically the activities of many I/O psychologists have been carried out for the purpose of achieving shorter term objectives. As organizations and I/O psychologists began to recognize the potential benefits of engaging in longer term planning, however, consideration of longer term issues became more common. As a result, as is described near the end of this article, many I/O psychologists are now engaged in activities designed to prepare organizations for the 21st century.

In separating our discussion of the phases of human resource planning activities according to three time horizons, we do not mean to suggest that organizations segregate their planning activities in this fashion. The reality is that organizations must integrate their activities across the four planning phases as well across all three time horizons, as is shown in Figure 1. As the feed-forward and feed-back arrows connecting the four phases of planning illustrate, planning activities within a time horizon are linked together into a dynamic system. Early phases (e.g., demand and supply forecasts) serve as inputs to later phases (e.g., setting objectives). Equally important, organizations can-learn-from the results generated during the evaluation phase and then apply what is learned to make adjustments in objectives and programs.

In addition to the arrows linking the four phases of planning within each time frame, Figure 1 includes arrows to illustrate (a) how longer term objectives can influence shorter term planning (dotted-line arrows), (b) how shorter term evaluation results can influence projections about future human resources and programs designed to meet future demands, and (c) how the results achieved through the implementation of human resource programs can influence business plans. The arrows connecting planning activities for different time horizons are important to note because they emphasize that planning for one time horizon typically has implications for another. For example, long-term planning almost always prompts the development of programs that need to be implemented in the short term and intermediate term. In addition, the evaluation results obtained for shorter term programs often lead to reevaluation of longer term pro-

Figure 1
Dynamic Linkages Among Components of a Fully Integrated System of Business and Human Resource Planning

CONTENT OF HR SYSTEM   MR PLANNING ACTIVITIES   TIME NORIZDI(
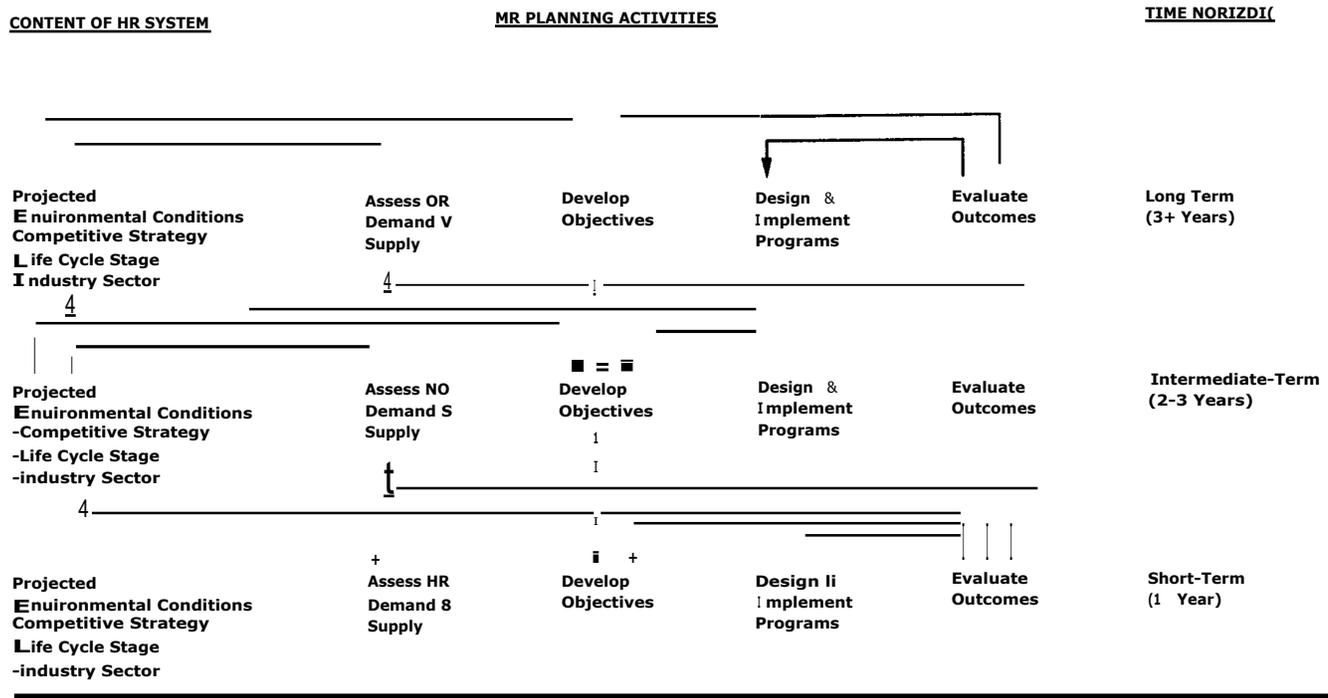
jections about the availability of human resources, which in turn may prompt adjustments in programs designed to meet longer term needs. The ideal is to have full integration among all types of human resource planning activities as well as integration between human resource and business planning (Walker, 1988).

Short-Term Human Resource Planning

Many I/O psychologists work on activities related to designing and implementing programs (e.g., recruitment, selection systems, and training programs) to meet short-term organizational needs. Such activities generally involve an element of planning in that they are future-oriented to some extent. Even projects for which objectives are expected to be achieved in as little time as a few months have, ideally, been designed with an understanding of how the short-term objectives are linked to the achievement of longer term objectives. For example, an aeronautics company engaged in a recruitment campaign to hire 100 engineers should have a clear understanding of how this hiring goal will help the company achieve long-term goals such as becoming the world's most innovative company in that industry. This hypothetical company also might have a college recruiting drive designed to find 75 college graduates to enter a training program in recognition of the fact that a growing company needs to prepare for the middle managers it will need 5 to 7 years hence, as well as the top level managers it will need in 10 to 15 years. As this hypothetical example highlights, in order for a clear linkage to exist between human resource planning and strategic business planning, it is essential that an organization's top executives have a fully articulated vision for the future, which has been communicated and accepted by managers throughout the organization.

Forecasting Demand and Supply

In a short-term time horizon, demand and supply of human resources can be predicted with some certainty. Human resource objectives follow logically from consideration of any discrepancies between demand and supply. *Demand* refers to the number and characteristics (e.g., skills, abilities, pay levels, or experience) of people needed for particular jobs at a given point in time and at a particular place. *Supply* refers to both the number and characteristics of people available for those particular jobs. Salient questions are "What jobs need to be filled (or vacated) during the next 12 months?" and "How and where will we get people to fill (or vacate) those jobs?"

What jobs need to be filled and vacated? Answering the demand question involves predicting who will leave jobs and create vacancies, which jobs will be eliminated, and which new jobs will be created. One method for predicting both vacancies and job growth is to project historical trends into the future. This is particularly relevant for organizations affected by regular, cyclical fluctuations in demand for their products or services. Behavioral theories of the causes of turnover (e.g., Mobley, Griffeth, Hand, & Meglino, 1979; Mowday, Porter, & Steers, 1982)

combined with employee surveys designed to assess attitudinal predictors of turnover (e.g., job satisfaction) also help I/O psychologists and human resource planners predict how many currently filled positions are likely to become vacant. Such information can produce useful predictions when the organizational unit of interest is large, although making predictions about precisely which positions are likely to become vacant is less precise. Predictions about how many and what types of jobs will be eliminated or created in the short term generally follow directly from business plans submitted by line managers.

How and where will we get people to fill and vacate jobs? The first step in answering this question-the supply question-involves determining the desired characteristics of employees who fill (or vacate) the jobs of interest. Then the availability of those characteristics in the organization's current work force and in the external labor market must be assessed. The particular characteristics of current and potential employees that are inventoried and tracked by human resource planners are influenced by the nature of the organization and the environment in which it operates. For example, for human resource planners in growing organizations, simply finding people with the needed skills and abilities is likely to be a top priority. For planners in mature and declining organizations, the costs (e.g., salary level) associated with employees become more salient, especially if work-force reductions are needed. Thus it is important for the human resource planner to know the business needs and characteristics of the organization. This knowledge is gained by human resource planners meeting with line managers to discuss their business plans as well as their human resource needs. The process of discussion increases the accuracy of supply and demand forecasts and facilitates the establishment of human resource objectives (see Schuler, 1988).

Establishing Objectives

With a short-time horizon, objectives are often easy to state in quantifiable terms. Examples of short-term human resource objectives include increasing the number of people who are attracted to the organization and apply for jobs (increase the applicant pool); attracting a different mix of applicants (with different skills, in different locations, etc.); improving the qualifications of new hires; increasing the length of time that desirable employees stay with the organization; decreasing the length of time that undesirable employees stay with the organization; and helping current and newly hired employees quickly develop the skills needed by the organization. Such objectives can generally be achieved in a straightforward way by applying state-of-the-art human resource management techniques and working with line managers to ensure agreement with and understanding of the program objectives.

Design and Implementation of Short-Term Programs

The technical skills of I/O psychologists are often applied to short-term program design and implementation. For

example, recruiting programs are used to influence the size and quality of the applicant pool. Selection programs are developed for making hiring decisions. Performance appraisal systems identify performance deficiencies to be corrected and competencies to be rewarded. Training programs emphasize developing skills for use in the near future. Compensation systems are designed to attract new employees, to motivate people to perform well, and to retain employees. Even when these activities are designed to achieve short-term objectives and are expected to have relatively immediate pay-offs, they can serve to help an organization achieve its longer term goals.

Donald K. Brush, vice-president and general manager of the Barden Corporation, described how short-term human resource planning efforts helped his organization achieve its strategic goals (Brush, personal communication, March 8, 1989): Barden realized it had an opportunity to significantly increase its business, but to do so would require them to increase their hourly work force by a net of about 125 employees in one year, at a time when the local unemployment rate was only 2.5%. Past experiences had taught Barden that foreign immigrants often became excellent employees. Although there were many immigrants from a variety of different countries who were interested in employment, a major hurdle to their immediate success was their lack of fluency in English. Brush described the problem and the solution, like this:

To begin to be functioning, qualified Barden employees, newcomers must not only master the basic "Garden" vocabulary, but they must be able to look up standard operating procedures, read Material Safety Data sheets, and they must also master basic shop mathematics, measurement processes and blueprint reading... . We asked Personnel to investigate how we might teach these people enough English *to* pay their way. The upshot was this: We retained Berlitz. A special intensive course was developed in cooperation with our training unit.... All students are on our payroll and meet with a Berlitz instructor four hours a day for 15 consecutive work days during working hours. The effect has been electric. The confidence level of the students has soared as they have tried out their new language ability. Supervisors are impressed. And the word is getting out to the community with positive results. (Brush, personal communication, March 8, 1989)

This example illustrates a problem that organizations will face increasingly in the near future, namely, a shortage of qualified entry-level job applicants (Johnston & Packer, 1987). This demographic change is likely to mean that organizations will begin to shift the focus of their short-term human resource programs. During the past 20 years, the combined forces of equal employment opportunity (EEO) legislation and the abundant supply of new entrants into the labor force were congruent with human resource activities aimed at improving the ability of organizations to select employees on the basis of their job-related skills and abilities. Organizations benefitted from investing in the design, validation, and use of selection "tests" of all sorts. This is because even tests with relatively low, but nonzero, validity can have economic utility when selection ratios are sufficiently low.

As the labor pool shrinks, however, selection ratios will tend to become larger. As a consequence, small marginal gains in test validity will have less economic utility, relative to the past. In order for investments in the development and use of sophisticated selection 'methods to yield economic returns, much more energy will have to be directed toward recruiting efforts to increase the number of job applicants because only by attracting a large pool of applicants can selection ratios be kept low. If small selection ratios cannot be maintained, organizations may conclude that their resources are better invested in training efforts designed to prepare those few who are available.

Examples of innovative' recruiting programs are already plentiful. Giant Food, Inc., has a mobile recruiting office-a Winnebago van that is a self-contained recruitment center that seeks out job applicants- by visiting schools, shopping centers, and so forth. Coopers & Lybrand employs successful minority business people in the community to help recruit minority applicants" and to serve as mentors. McDonald's Corporation has emerged as a leader in the recruitment of older employees, which it does by using television commercials and formal relationships with senior citizen organizations. It is important to note that such efforts to broaden the pool of applicants often' require coordinated,- intermediate term programs designed to ensure that nontraditional new hires are effective and can be retained.

Evaluating Short-Term Human Resource *Programs*

As is true for any type of program evaluation, this phase involves assessing how well objectives were achieved. Because short-term planning objectives are generally stated in terms that are relatively easy to quantify (e.g., numbers of applicants, numbers of hires, and performance levels of employees), systematic evaluation of human resource programs to meet short-term organizational needs is quite feasible, and some types of program evaluations are actually common in large organizations. For example, in part because numerous federal and state laws prohibit some forms of discrimination, selection programs in particular have been closely scrutinized to ensure that employers base their selection decisions on characteristics of applicants that are job related. Whether such scrutiny will continue is somewhat uncertain, however, given recent Supreme Court decisions (e.g., *Lorance v. AT&T 1989; Martin v. Wilks, 1989; Patterson v. McLean Credit Union, 1989; Wards Cove Packing Atonia, 1989).*

Legal regulations have prompted many organizations, especially large ones, to assess empirically the relationship between an applicant's characteristics (e.g., abilities) and job performance. Such evaluation studies (validity studies) benefit employers because they serve to monitor the objective of getting the right people in the right job. Validity studies also serve a scientific function by providing valuable data to researchers interested in improving our understanding of the factors that influence human performance.

Until very recently, when programs for selection, training, and motivation were evaluated by I/O psychol-

ogists, the effectiveness criteria were almost exclusively behavioral' (e.g., **performance** and turnover) or attitudinal (e.g., job satisfaction and commitment). Such criteria need no defense to be accepted by **psychologists,** but line management support for human resource programs can be difficult to achieve if the expected resultss of such programs are not translated into the language of business, that is, dollars. With continuing advancements in utility analysis techniques (e.g., Boudreau & Berger, 1985) and human resource cost assessment techniques (e.g., Cascio, 1986), it is becoming more feasible to build convincing economic arguments in **support** of human resource programs. Thus, rather than having to spend energy arguing for resources to conduct short-term programs, I/O psychologists in organizational settings are being freed to deal more extensively with intermediate-term and longer term human resource planning issues. ,

Intermediate-Term Human Resource **Planning**

As we have noted, planning is used by organizations to buffer production or service delivery processes from sources of uncertainty. Human resource programs for the recruitment, selection, training, and motivation of employees help reduce uncertainty byensuring that a sufficient number of people with the required characteristics and skills are available at all levels in the organizations. When the planning horizon is short, there is little uncertainty about which skills and how many people will be needed, and it is relatively easy to predict supply.

However, rapid and ongoing changes in today's business environment mean that the future cannot be easily anticipated by simply projecting past trends. As the focus ofplanning moves from short term to intermediate term, the question "What- will we need?" is less easily answered and so becomes more dominant. For intermediate-term planning, there is also more uncertainty related to the question, "What will be available?" Consequently, human resource planning for the more distant future quickly raises the question, "How can we determine what will be needed and what will be available?" In other words, more technical attention must be given to the problem of forecasting. As in short-term human resource planning, the twin problems, of forecasting, demand and forecasting supply both must be addressed before objectives can be established and programs developed. With increased uncertainty, interaction between the human resource planner and line managers iseven more critical for making accurate demand and supply forecasts.

Forecasting Intermediate-Term' Demand

In order to forecast the numbers and qualities of people who will be needed to perform the jobs that will exist in the organization's intermediate-term future (in two to three years), strategic planners, attempt to predict organizational outputs, such as expected production, volume, and sales levels. The outputs that an **organization intends** to produce or deliver, in combination with the technology that the organization intends to use to generate the outputs, dictate the human resource needs of the organza-

tion. **Predicting** outputs requires considering factors such as future demands from the marketplace for the products and services that the organization provides, the percentage of the market that the organization is likely to be able to serve, the availability and nature of new technologies that may affect the amounts and types of products or services that can be offered, and the different countries in which the organization expects to operate (Dumaine, 1989).

The task of formulating plans that specify the intended future outputs (in terms of quantity, type, and location) of the organization is usually the responsibility of middle-level line managers. Human resource planners must then translate these objectives for outputs into predictions about the amount and the nature of jobs that employees will need to perform in order to produce the desired outputs. Predicting future human resource demands requires (a) having an accurate model of the factors that will influence demand and (b) being able to predict the state of all the major variables in that model. Organizations operating in fairly stable environments may be able to construct models that include most of the major factors likely to determine demand for up to three years into the future. It is even possible for some organizations to quantify the expected values of variables in their models, which means they can use statistical forecasting techniques such as regression analysis, time-series analysis, and stochastic modeling to forecast human demand (e.g., see Charnes, Cooper, Lewis, & Niehaus, 1978). For firms operating in unstable environments, however, even three-year predictions' are likely to be highly uncertain because both the variables and their expected values are difficult to specify accurately by relying on historical data.

Given the complexity of statistical forecasting, it is understandable that judgmental techniques are more commonly used than statistical techniques (Kahales, Pazer, Hoagland, & Leavitt, 1980; Milkovich, Dyer, & Mahoney, 1983).-A simple type of judgmental forecasting is managerial estimation. Estimates of staffing needs are made by middle- and lower-level line managers who pass them up to top managers for further revisions to form an overall demand forecast (Walker, 1980). Increasingly, human resource planners are involved in these stages of estimation and revision to ensure an integrated approach to planning.

A moresophisticated method of judgmental forecasting is the Delphi technique, which is a decision-makg ing method designed to maximize the benefits and minimize the dysfunctional aspects of group decision making. In a Delphi "meeting" (which need not be face-to-face), several experts take turns presenting their- forecasts and assumptions. An intermediary passes each expert's forecast and assumptions to the others, who then make revisions in their own forecasts. This process continues until a viable composite forecast emerges. The composite may represent specific projections or a range of projections, depending on the experts' positions. The Delphi technique appears to be particularly useful for generating solutions to unstructured and complex questions, such as those that arise during human resource planning. It does have

limitations, however. For example, when experts disagree, integrating their opinions to yield a final solution that all participants accept can be difficult (see Delbecq, Van de Ven, & Gustafson, 1975; Milkovich, Annoni, & Mahoney, 1972). Nonetheless, the human resource planner must integrate diverse predictions in order to establish human resource objectives and design programs to achieve those objectives, and line managers must accept the predictions as reasonable if they are to provide their support during the implementation phases of human resource programs.

Both managerial estimates and the Delphi technique typically focus on forecasting the number of employees that is likely to be needed. Less attention is usually paid to the issue of the qualities (e.g., skills and abilities) that future employees will need, primarily because techniques have not been widely available for predicting these (Goodstein, personal communication, February 9, 1989). When psychologists engage in short-term planning, job analysis is used to determine the qualities that employees need in order to perform currently existing jobs. Rapid technological changes mean jobs in the future are sure to differ from jobs in the present (Zuboff, 1988), however. As an indication of the fact that I/O psychologists are now more often dealing with problems of intermediate-term planning, research efforts are underway to develop procedures for conducting future-oriented ("strategic") job analyses (Arvey, Salas, & Gialluca, 1989; Schneider & Konz, 1989) and for identifying the managerial competencies that are necessary for effective performance in the future (DeLuca, 1988; Goodstein, personal communication, February 9, 1989). Because job analysis results are the foundation on which most human resource programs are built (Page & Van De Vroot, 1989), the development of sound future-oriented job analysis methodologies is a challenge that I/O psychologists must meet before they can realize their potential as contributors to the long-term effectiveness of organizations.

Forecasting Intermediate-Term Supply

Supply forecasts can be derived from both internal and external sources of information, but internal sources are generally most crucial and most available (Bechet & Maki, 1987; Miller, 1980). As with forecasting demand, two basic techniques help forecast internal labor supply-judgmental and statistical. One judgmental technique used to forecast supply is replacement planning. Replacement charts show the names of current position occupants and the names of likely replacements, providing a rough estimate of the "bench strength" of the organization. On the replacement chart the incumbents are listed directly under the job title. Those individuals likely to fill the potential vacancies are listed directly under the incumbent. Such lists can provide an organization with reasonable estimates of which positions are likely to become vacant, and they can indicate whether someone will be ready to fill the vacancy (Walker & Armes, 1979). Present performance levels, ages, and information about the loyalty of current employees can be used to predict future vacancies caused by raids of top talent, involuntary turn-

over, retirement, and employee-initiated job changes. Consistent with the spirit of integration, increasingly line managers and human resource planners jointly establish replacement charts for middle- and upper-level positions.

Less common techniques to forecast supply are statistical techniques, which include simple inventory models, Markov analysis, simulation (based on Markov analysis), renewal analysis, and goal programming (Dyer, 1982; Niehaus, 1979, 1980, 1988; Piskor & Dudding, 1978). Use of statistical methods for forecasting human resource supply involves two steps, regardless of the particular model used. The first step is generating an inventory of current supply (the number of people and their skills and abilities). The second step involves predicting how the supply is likely to change over time. Ideally, both steps consider both internal and external supply sources, although in practice it is often more difficult to estimate labor supplies external to the organization.

I/O psychologists have been studying the nature of human abilities and the nature of jobs for most of this century. Consequently, sophisticated techniques are available for directly assessing employees' skills and abilities (e.g., see Arvey & Faley, 1988; Schneider & Schmitt, 1986), or the supply of skills and abilities available in the organization's work force can be inferred from job analyses of the jobs that current employees are performing (see American Telegraph & Telephone, 1980; Arvey et al., 1989; Fleishman & Quaintance, 1984; Levine, 1983; McCormick, Jeanneret, & Mecham, 1972; U.S. Air Force, 1981). By assessing the extent to which the current work force possesses skills and abilities that can be transferred to aid their performance in jobs predicted to exist in the future, I/O psychologists can help organizations assess how much of a discrepancy exists between their current skills profile and the profile required to meet their strategic plan. Thus research by I/O psychologists clearly has contributed greatly to making it possible to inventory and forecast human resource supplies. At the same time, computer technology has increased the feasibility of keeping information provided from such inventories up-to-date (Murdick & Schuster, 1983). Furthermore, EEO requirements have led many organizations to view such inventories as highly desirable and perhaps necessary, so statistical models have been developed to deal specifically with this aspect of human resource planning (Bres, Niehaus, Schinnar, & Steinbuch, 1983; Krzystofiak, 1982; Ledvinka & La Forge, 1978).

For statistical forecasting, current supply information serves as a starting point. Figures describing the current work force, both within the organization and externally, are then transformed through statistical models to predictions of future supply levels. Such models require the human resource planner to provide information about how employees are likely to flow through the organization. Annual hiring levels, turnover rates, promotions, and within-firm transfers typically are considered. The result is a quantitative prediction of what the future work force would probably be like absent the implementation of programs designed to change the projected supply.

The accuracy of statistical techniques for forecasting future supply levels depends entirely on the accuracy of **the-user-supplied figures** about how employees are likely to flow through the organization and the accuracy of the statistical **model** used to transform current supplies into predicted future supplies. Accurate estimates and accurate **models** of employee flows are most likely to be available **in** organizations that have extensive record keeping procedures because these can be used to identify the typical movement patterns of employees in the past. The U.S. military is one example of such an organization,' and much of the available research on statistical forecasting has been supported by the U.S. government. Extensive use has been made of a simple inventory model in the U.S. Navy's public shipyards in conjunction with the Naval Sea Systems Command' (NAVSEA) efficiency study (Niehaus, Schinnar, & Walter, 1987). The Navy used goal programming models extensively in its work on down-**sizing** the civilian work force after the Vietnam war and in incorporating EEO planning needs (Charnes, Cooper, Nelson, & Niehaus, 1982;;Charnes, Cooper, Lewis, & Niehaus, 1978). Other organizations that have successfully used statistical forecasting include IBM (Dyer & Heyer, 1984), Merck (Milkovich & Phillips, 1986) and Ontario Hydro (Rush & Borne, 1986).

Establishing **Intermediate-Term** *Objectives*

After projecting future human resource supplies and demands, mands, intermediate-term objectives are set **and action** plans are developed to meet' the objectives, **through** the joint efforts of the human resource planner and relevant managers throughout the organization. Differences in the types of objectives established` for the short and intermediate term reflect differences in the types of changes that are **feasible** with two or three additional years of time. Thus, whereas short-term objectives include attracting, accessing, and assigning employees to jobs, intermediate-term objectives are more likely to include **readjusting** employees' skills, attitudes, and behaviors to fit major changes in the needs of the business,' as well as adjusting human resource practices to fit changes in the needs of employees.'

Intermediate-Term Programs to Help Employees Adjust to Changing Organizations

Training and retraining' programs are often the method of choice for achieving intermediate-term objectives. The nature of training used to prepare for needs **that will** exist **in** two to three years can vary greatly. Programs include those designed to provide basic skills training to new hires, advanced education for existing employees, language training,' **internships** and work-study programs, and public school partnerships (see Bolick & Nestleroth, ,1988). The **forces** prompting organizations to develop such programs are many; they include changes in technology, a shift from a manufacturing-based to a **service-based economy,** and the failure of some **public** school systems **to produce** high; school graduates who are competent to join the work **force (Perry, 1988).**

C ging technology creates the need for training. U.S. manufacturers are experiencing a revolution in technology. A century ago, the concept of assembly-line production created an industrial revolution; today computers are contributing to an electronic revolution. Blue-collar employees who previously were expected to perform routinized tasks hundreds of times a day are now being expected to operate the sophisticated robots that perform the routine work (Johnston & Packer, 1987). In addition, they are expected to use computers to monitor and evaluate, using statistical analyses, the flow of work through the plant. Learning skills such as these often means employees first must be trained in basic math and computer use. In addition, they may be taught, in effect, the logic of experimental design as a means for diagnosing the causes of problems that arise. For example, at Frost Inc., a small manufacturing company in Michigan, employees were taught how to determine whether a quality problem was being caused by a particular operator or by

cular machine. Such determinations were possible because extensive data were stored for each item produced. The data included information about which particular machines were used in each step of the process, who was operating the machines, and whether the final product met various quality standards. Thus, by applying the principles of analysis of variance, the cause of quality problems could be detected and corrected (Frost, personal communication, May 23, 1986). The retraining needed to provide these skills took approximately three years and was accomplished mostly on-the-job.

Service-related jobs require new management styles. Change in manufacturing technologies is a major stimulus for intensifying training at work, but it is not the only important stimulus. Another fundamental shift is the changing balance between goods-producing and service-related activities. Even within organizations that are primarily goods-producing, the value of a service orientation is now being recognized by U.S. businesses. With more attention being directed toward service provision, the natural question that arises is whether different management practices are needed to manage service providers.

The delivery of services differs from the production of goods in three ways: products are intangible rather than tangible, customers are actively involved in the production of services, and the consumption of services occurs simultaneously with their production (Bowen Schneider, **1988). The** simultaneity of the production and **consumption processes means that** quality control cannot be achieved by the inspect-and-correct (or reject) method of performance monitoring traditionally used in manufacturing plants. Instead, quality control must occur at the point of service delivery. The service provider is responsible for ensuring the quality of service' during each and every interaction with a client. To maintain control over quality, service organizations need to control the process of service production rather than to monitor the quality of outputs (Mills & Moberg, **1982). In other words,** service providers must monitor and supervise their own behaviors.

Because employees who deliver services must engage in self-supervision, high levels of employee commitment and involvement are needed. Creating conditions supportive of such employee attitudes is complex; it requires careful planning and, in many cases, a willingness to change basic assumptions about how much power and information lower level employees should be given (see Hollander & Offermann, this issue; Lawler, 1986). I/O psychologists have already begun to study how various personnel practices affect the involvement and commitment levels of employees, so a foundation exists for experimenting with job redesign, use of participative management styles, and organizational structures built around small, stand-alone businesses instead of large hierarchical and bureaucratic enterprises.

Gaining cooperation with organizational changes such as those just noted is particularly challenging because managers' long-held beliefs about how to maximize employee performance are often brought into question. Creating attitudinal and behavioral change is difficult under most conditions, but it is particularly difficult when there is uncertainty about the pay-offs. Thus a significant task is convincing those top-level executives whose resources and support are needed that proposed human resource programs will be effective. This involves translating the scientific evidence into a form that is both understandable and convincing. Short of this, I/O psychologists can attempt to persuade organizational leaders to adopt the perspective that organizational learning is an objective worth pursuing in the interest of long-term survival (Guzzardi, 1989). Consistent with this perspective would be a willingness to implement programs on an experimental basis in anticipation of gaining knowledge that is valuable even if the program is ultimately not a complete success (see Staw, 1977).

A shortage of well-prepared new hires spurs outreach programs. In the past, employers generally relied on on-the-job training programs to teach new employees the specific job skills they needed, but a significant number of organizations now recognize that they can begin shaping their future work force while students are still in school. Time, Inc., brings disadvantaged students from nearby schools to their company headquarters in New York City weekly during the school year to receive tutoring in reading by employees in their offices. In 1982, American Express and Shearson Lehman Hutton began the Academy of Finance, which is a two-year program for juniors and seniors. In addition to their normal curriculum, Academy students take classes in economics and finance and attend seminars designed to socialize them into the culture of the financial services industry. Students then work as paid interns during the summer (Perry, 1988).

Honeywell, Inc., sponsors a summer Teacher Academy, where Minnesota high school math and science teachers team up with researchers to develop class projects (Ehrlich, 1988). General Electric invested $1 million in a program in a poor, Black, rural area of Lowndes County, Alabama. The program partly pays for tutoring sessions given by the faculty of Tuskegee Institute for students in secondary school (Teltsch, 1988). Arizona State University, armed with a $100,000 grant from AT&T, is trying to change the Hispanic cultural pattern that discourages college for women. Teams of mothers and their teenage daughters are brought to the college campus to impress them with the need for college training and to help the young women become eligible for entrance (Teltsch, 1988). Such educational programs are illustrative of a growing realization among employers that they must begin to attend to the general educational needs of the work force in order to ensure its future productivity. These programs are particularly striking because they represent large investments in people who are not yet, and may never be, employees of the sponsoring organizations.

Economic conditions force downsizing. A third major stimulus for intermediate-term human resource programs is organizational restructuring, including mergers and acquisitions and the work force reductions that often follow. From their experiences with massive lay-offs in the past few years, organizations have become increasingly sensitive to the importance of planning programs for dealing with the effects of lay-offs. Many organizations are trying to minimize the negative effects of lay-offs through redundancy planning, outplacement counseling, buy-outs, job skill retraining, creation of transfer opportunities, and promotion of early retirements ("Early Retirement," 1987).

Digital Equipment Corporation (DEC) is an example of one company that combined several of these activities with an intermediate-term planning horizon to effect a large-scale work force restructuring (see Kochan, MacDuffie, & Osterman, 1988). It is an excellent example of an integrated effort between human resource and line managers to solve an intermediate-term planning problem. During most of the 1970s and early 1980s, DEC grew rapidly, but a sudden and sharp stock price decline in October of 1983 dramatically signaled the beginning of a new era for the firm. DEC's senior line managers and the vice-president of human resources projected staffing needs for the next two years and determined they would need to go through a major transition (rapid lay-offs were viewed as inconsistent with the company's organizational values). Top management gave responsibility for effecting the change to line managers at the plant level. A task force of line managers and human resource staff developed a strategy and general guidelines for the process, which ensured some uniformity across different units within the corporation. The task force established performance as the primary criterion to be used when making cuts, intentionally choosing not to rely on seniority. The decision not to emphasize seniority was at odds with the importance given traditionally to seniority by most unionized and nonunionized manufacturing firms as they downsize (McCune, Beatty, & Montagno, 1988). At DEC, the evaluation data collected to monitor the downsizing process revealed that seniority was a major criterion used by managers, despite the policy to emphasize performance-based decisions.

The task force also developed several training programs. One program was for counseling employees and teaching them career planning skills. Managers were trained to be supportive during the job search process. Retraining was offered to employees who could be transferred within the company rather than laid off. Transfer opportunities could be identified by using a computerized system for matching one's skills to available jobs facilitating the reassignment of employees within the firm. (Interestingly, however, the system was underused because managers preferred to rely on their informal networks of contacts within the company.) In a two-year period, DEC's worldwide manufacturing work force was decreased by 5,598 employees.

Kochan et al.'s (1988) description of DEC's experiences with a work force reduction program raises a number of interesting issues for I/O psychologists. For example, DEC's experience with the computerized, but underused, job-matching system emphasizes the importance of developing technical supports that capitalize on, rather than ignore, interpersonal dynamics. Their experience with managers using seniority rather than performance as a criterion for targeting employees to be laid off emphasizes the importance of understanding perceptions of what constitutes "fair treatment." The DEC example illustrates that even the most conscientious planning does not guarantee that objectives will be met. Knowing this, experienced managers might be tempted to deemphasize the monitoring of outcomes in order to reduce the visibility of program failures. However, as the DEC example illustrates, by monitoring outcomes, significant opportunities are created for organizational learning.

Organizations must adapt to a diverse workforce. The radical demographic transformation of the work force means that organizations need to develop competence in managing a work force that is more diverse on many dimensions, including age, ethnicity, family situation, educational background, country of origin, and the attitudes and values associated with each of these factors. As a consequence, there are an increasing number of training programs designed to sensitize supervisors and managers to the wide range of individual differences represented in the organization and the implications of such differences for organizational functioning. For example, Hewlett-Packard conducts training sessions for managers to teach them about different cultures and races and about their own gender biases and training needs (Nelson-Horchler, 1988). Proctor & Gamble has implemented "valuing, diversity" programs throughout the company. One example is their mentor program, which was designed to retain Black and female managers (Copeland, 1988). Examples of other programs include Equitable Life Assurance Society's support groups for minorities and women, which periodically meet with the chief executive officer to discuss problems in the company pertaining to them, and Avon's employee councils representing various groups, which inform and advise top management (Copeland, 1988). Programs such as these show that many organizations acknowledge the negative consequences of many of the inaccurate stereotypes common in our, society. I/O psychologists working in such organizations now face the challenge of applying basic research findings on perception and attitude change to the design of interventions that will maximize the benefits of work-group diversity and minimize the conflicts that often; arise. Another major challenge facing employers is the provision of conditions that permit employees to be fully productive at work, while at the same time meeting the needs of their families, including their parents, spouses, and children. Many of the programs used by organizations to facilitate these needs are described by Zedeck and Mosier (this issue, pp. 240-251).

Programs such as these are designed to facilitate the organization's effective adaptation to the diverse needs of employees. They are particularly interesting because they run counter to the normal tendency of organizations to manage individual differences through means such as normative pressure and sanctions intended to reduce the variance in employees' behaviors (see Katz & Kahn, 1978). Organizational attempts to manage diversity by pressuring employees to conform can be effective when (a) employees are able and willing to meet organizational demands, even when these conflict with the behaviors required to perform other, nonwork roles satisfactorily, and (b) the supply of potential human resources is sufficiently large that employers can afford to retain only employees who do conform.

The first condition was more easily met when the typical employee was a man married to a nonworking spouse who could attend to family needs. As the work force swells with people who are members of dual-career families and people who are single heads of households, both the ability and the willingness of employees to conform to rigid organizational demands are likely to decline. If, in addition, the total labor supply is relatively low, organizations will find themselves in the unfamiliar situation of seeking ways to relax pressures to conform and to assist employees in meeting their nonwork obligations as a strategy for increasing the organization's attractiveness to the scarce supply of labor. This will represent a change from using behavior control mechanisms to manage the uncertainty diversity creates to managing uncertainty by predicting variations in behavior and adapting the organization to them.

Evaluating Intermediate-Term Programs

I/O psychologists have spent less time evaluating intermediate-term human resource programs than evaluating short-term programs, partly because the intermediate time horizon encompasses more uncertainties and contingencies, as is illustrated in the example of DEC. Also, because intermediate-term programs are often larger in scope, the appropriate unit of analysis for evaluation is often the productivity level of an entire department or business unit. Although psychologists have sophisticated measurement methods for assessing the, performance levels of individuals, our measurement techniques do not translate easily into measures of productivity (see Camp-

bell & Campbell, 1988). Only recently have I/O psychologists begun to apply aggressively their measurement skills to developing measures appropriate for larger aggregates of employees within organizations (e.g., see Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988). Progress on this task should be particularly valuable for intermediate-term and long-term human resource planning.

Long-Term Human Resource Planning

Increasingly, long-term human resource planning (for beyond three years) is becoming critical to the effective functioning of organizations. The rapidly changing and highly competitive worldwide marketplace is causing firms to turn to their human resources for survival and competitiveness. Because there is a greater understanding that an organization's work force cannot be turned around on a dime, long-term human resource planning is gaining currency. It is an activity that demands integration of the skills and knowledge of the human resource planner and all the other executives responsible for strategic planning. Although there are many types of long-term planning efforts, we use succession planning as our primary example of the process.

Forecasting Demand and Supply: The Challenge of Succession Planning

More than ever, a major long-term business concern in organizations is "What types of managers do we need running the business into the 21st century, and how do we make sure we have them?" (Cowherd, 1986; London, personal communication, February 7, 1986). Consider this example: "Exxon is so far ahead in the succession planning game that it has already hired its CEO for the year 2010. Although it is not public knowledge who that person is, he or she is already being challenged, assessed and groomed for the top spot" (McManis & Leibman, 1988, p. 24). In describing how succession planning efforts differ now from the past, Goodstein (personal communication, February 9, 1989) pointed out that the turbulence and unpredictability of the current business environment has resulted in "a discernible trend" of substituting efforts to define more generic competencies for efforts to identify specific knowledge and skills in the specification of position requirements. H. A. Goodstein (personal communication, February 9, 1989) contrasted this with

"the old" technology of management succession planning, which was largely an exercise in replacement planning. Organizations were planning within a model of minimal change in organization structure (internal environment) and a perceived static external environment. Position requirements could easily be extrapolated from the job descriptions of current incumbents-factoring into these requirements those skills and abilities that the current incumbent lacked. Since position requirements were relatively stable and career paths reasonably well-defined, an effective performance appraisal system coupled with opportunities for key executives to observe candidates adequately served the selection process for many companies.

Succession planning programs are complex systems designed to safeguard the long-term health of the organization. The key activities in succession planning are identifying high-potential employees, identifying needed competencies, and providing learning experiences to develop these competencies (DeLuca, 1988). Well-developed programs include a variety of components: selection procedures, development plans, mentorships, frequent and systematic performance reviews, and career planning activities that involve employees in planning and monitoring their own development (e.g., see Hall & Associates, 1986; Leibowitz, 1988). Those programs known for their excellence, such as those sponsored by **IBM,** Exxon, Squibb, and General Electric, represent large investments in integrated human resource management systems (see Mahler & Drotter, 1986; Vancil, 1987). Such programs are examples of what can be done with respect' to long-term human resource planning, given the state of our knowledge about human performance in organizational settings, a belief in the value of investing in human resources, and cooperation between the human resource planner and line management.

Staffing the upper echelons of organizations presents a number of unique challenges, particularly when a company practices a promotion-from-within policy. Because the planning horizon is so long, greater uncertainty exists when predicting both future demand and future supply. The uncertainty in predicting supply is compounded by the small numbers of people and jobs involved, which changes the prediction task from one of estimating the percentage of a pool of employees who are likely to be with the company x years into the future to one of estimating the probability that a few particular individuals will still be with the company x years into the future. Providing developmental experiences to a greater number of employees helps reduce the uncertainty of forecasted supply (Leibowitz, 1988), but orchestrating developmental experiences for large numbers of employees can be very difficult logistically because development is best accomplished by rotating employees through many key jobs throughout their careers (see McCall, 1988). Predicting who will be available and with what capabilities is only half of the problem, of course. Equally challenging is predicting the needs of the organization (DeLuca, 1988).

Organizations are dynamic systems embedded in dynamic environments. When planning for future needs, the only sure bet is that future -needs will be different from current needs. Popular wisdom has long held that different types of leaders are effective under different business conditions (Campbell & Moses, 1986; Gerstein & Reisman, 1983). For example, the personal characteristics of managers that lead to success during the start-up and early growth phases of an organization's life cycle may inhibit their performance when the organization reaches the phase of maturity and stability (Gupta & Govindarajan, 1984). For companies currently in the early growth stages, this makes succession planning particularly difficult. Because the needs of the future are inconsistent with current needs, the challenge is to find ways to maximize the effectiveness of managers in the current organizational environment of rapid growth while at the same

time providing experiences for these managers to help them develop the skills they will need in the mature-stage organizational environment of the future.

Another type of major change that an organization may experience during a several-year planning horizon is a modification of their competitive strategy. Like a change from rapid growth to mature stability, a change in competitive strategies may have significant implications for the types of managers needed. Competitive strategy refers to the means by which a firm competes for business in the marketplace (see Porter, 1985). Competitive strategies can differ along a number of dimensions, including the extent to which firms emphasize innovation, quality-enhancement, or cost reduction (Schuler & Jackson, 1987). Briefly, the innovation strategy is used to develop products or services different from those of competitors; the primary focus is on continually offering something new and different. Enhancing product or service quality is the primary focus of the quality-enhancement strategy. In the cost-reduction strategy, firms typically attempt to gain competitive advantage by being the lowest-cost goods producer or service provider. (Although these three competitive strategies are described as pure types, in practice some overlap often occurs.)

It is likely that successful pursuit of these three different strategies requires employees to adopt different patterns of behavior. For example, organizations that pursue innovation as a strategy are likely to experience uncertainty because. the path to innovation includes a mix of spurts in progress and unforeseen setbacks (Quinn, 1979). In addition, the innovation process depends heavily on individual expertise and creativity. Steep learning curves and the rapid speed at which knowledge is accumulated through experience make it difficult for organizations to codify procedures. This means that employee turnover can have disastrous consequences (Kanter, 1985). Furthermore, innovation often threatens the status quo, causing some natural resistance and a volatile political climate (Fast, 1976).

These organizational conditions suggest that the pursuit of innovation is likely to be successful only if employees behave in particular ways. A large literature on innovation suggests that some of the behaviors needed from employees in firms pursuing innovation include creativeness, cooperation, risk-taking, flexibility, a long-term focus, and willingness to assume responsibility for outcomes. Many of these behaviors are quite unlike those needed when cost reduction is emphasized in an organization. When cost reduction is the focus, predictability is valued over creativity, risk-taking is less appropriate, and a short-term focus usually predominates (see Schuler & Jackson, 1987).

The differences in needed employee behaviors associated with different strategies have significant implications for human resource planning. For example, a recent study compared firms pursuing an innovation strategy with firms for whom innovation was of little importance. Firms pursuing an innovation strategy were more likely than other firms to emphasize long-term needs

in their training programs for managers and to offer training to more employees throughout the organization. Supporting the notion that innovative organizations need to encourage flexibility and creativity, managers in innovative companies had jobs that required the use of more diverse skills (Jackson, Schuler, & Rivero, 1989). Results such as these suggest that when organizations change competitive strategies in response to a changing business environment, they may need to significantly alter broad patterns of employee attitudes and behaviors in order to be successful in implementing a new competitive strategy. To do so, they may implement major changes in various aspects of their personnel systems. The decision to change strategies requires a long-term perspective, and its success depends in part on changing the work environment in order to support needed changes in employee behaviors, which also requires a long-term perspective. Clearly, when organizations attempt to change their competitive strategies, business and human resource planning should be fully integrated.'

Program Design and Implementation

An early example of a company that used a psychological testing program to integrate its business needs and long-term human resource planning was Sears, Roebuck, & Company. In the early 1960s, Sears realized it, would need managers with unique abilities to guide the organization through a period of rapid expansion and growth. Based on careful evaluation of the available talent and anticipated future business conditions, Sears concluded that it should begin developing a talent pool that would include people who had greater mental ability, who were psychologically compatible with the company's need for innovation and change, who were skilled administrators and effective decision makers, and who were emotionally stable yet aggressive (Bentz, 1968, 1983). To ensure that such people would be available and could be identified, Sears developed a battery of psychological tests for use in their selection process, a process aided by the joint efforts of line management and human resource planners. Such tests are now a general component of the long-range planning efforts of many organizations because they help identify high-potential employees early in their careers (Bentz, 1983).

For many organizations, succession planning and career development are tools for integrating diverse subgroups within a corporation (see Campbell, in press). For example, Sara Lee Corporation has acquired more than 40 companies during the past several years. The company uses succession planning to move talented employees through the different subsidiaries in order to build a consistent corporate culture and a sense of corporate unity (McManis & Leibman, 1988). The challenge of integrating diversity is even greater for IBM, which has operations in 132 countries. According to Donald Laidlaw, director of IBM's executive resources, succession planning systems at IBM are designed to cover human resource needs in all 132 countries (Laidlaw, personal communi-

cation, February 7, 1989). The size of **IBM combined** with the tremendous diversity of environments with which it must cope make predicting specific needs in the long term more or less impossible. This means effective leaders will be people who can deal well with ambiguity and who are broadly trained in all aspects of running a business. Developing such leaders is the objective of IBM's extensive succession planning and management development efforts. IBM's commitment to a general manager model of development led them to design a series of planned development positions that are used to test high-potential managers. Performance appraisals serve to continually revalidate initial judgments of future potential (and reduce executive management uncertainty).

Another company that has learned the value of having employees who can cope with ambiguity is AT&T, whose world was turned upside down in the early 1980s. In 1982, AT&T agreed to divest itself of its operating telephone companies. By 1984, more than 11,000 employees had chosen to leave AT&T rather than live with the massive changes that were about to take place as this former monolith was broken into eight different organizational units (Campbell & Moses, 1986). A leader in the design and use of assessment centers as a method for selecting managers for promotions, AT&T realized the need to begin proactively using assessment centers for developmental purposes. In addition to using assessment centers to develop managers' ability to cope with ambiguity, AT&T is trying to ensure that the organization as a whole is prepared for the future by developing two very different types of leaders-those with high levels of functional expertise and those with the broad expertise needed to be successful general managers (M. London, personal communication, February 7, 1989).

Although we have focused on succession planning in this article, it is important to note that other types of long-term human resource planning efforts are equally important. Space limitations prohibit us from discussing other types of efforts at length, but we offer one example to illustrate what can be accomplished when long-term human resource planning is used to its fullest extent to link competitive strategy and human resource practices. The example is Ford Motor Company's massive quality improvement program (see Banas, 1988). In 1979, top management at Ford acknowledged the need to begin working to develop a new style of human resource management in order to achieve its goal of producing high-quality products at low cost ("At Ford, quality is job one"). Since 1979, Ford has actively and aggressively sought to increase employee involvement. Philip Caldwell, as president of the company in 1978, ushered in the new era at Ford when he announced to the top executives: "Our strategy for the years ahead will come to nothing unless we ask for greater participation of our workforce. Without motivated and concerned workers, we're not going to lower our costs as much as we need to-and we aren't going to get the quality product we need" (cited in Banas, 1988, p. 391). So began a major experiment in organizational change that included efforts to improve the quality of work life and the beginnings of an organizational restructuring. The experiment is revealing the limits of our knowledge about how to change an organization's approach to managing people, and at the same time it is contributing to our knowledge about how to manage change. It is also providing another excellent illustration of the integration of business needs and human resource planning. Most important, the description Banas has given of the change process is likely to serve as a stimulus to new research.

Evaluating Long-Term Programs

Presently most of our knowledge about how to develop and improve long-term human resource programs has been generated through trial-and-error rather than through systematic research. Nevertheless, much knowledge about individual behavior and development has been gained by analysis of the massive amounts of data generated by large-scale, ongoing management planning systems. The excellent studies conducted within AT&T are models for how the practice of I/O psychology can inform the science of psychology (Bray, Campbell, Grant, 1974; Howard & Bray, 1988). These studies shed light on the question of how ability and personality factors contribute to managerial career success, and they also informed us about patterns of change over the life span and between generations.

Understandably, what rigorous researchers engaged in the evaluation of succession planning programs have emphasized is the ability to predict individual outcomes, such as career progress and satisfaction. It is also now appropriate to evaluate long-term programs using corporate outcomes such as share price, market share, receipt of industry awards, and so on. In the spirit of integrating business needs and human resource planning, such corporate indicators are legitimate criteria for evaluating success, in addition to individual outcomes. Doubtless there are many difficulties that complex, multifaceted interventions and long-term time horizons pose in drawing conclusions about cause-and-effect relationships; nonetheless, there are great opportunities for the I/O psychologist who adopts a long-term view and for human resource planners and line managers who coordinate their efforts to assess the long-term effectiveness of human resource programs in corporate and individual terms.

Conclusions

Because the purpose of human resource planning is to ensure that the right people are in the right place at the right time, it must be linked with the plans of the total organization. Traditionally, there has been a weak one-way linkage between business planning and human resource planning. Business plans, where they exist, have defined human resource needs, thereby making human resource planning a reactive exercise. A description of conditions in the 1970s was provided by Walker (1978) in the opening article of the inaugural issue **of *Human Resource Planning:***

Companies often give lip service to the importance of human resources in achievement of business objectives, but rarely is detailed, thoughtful analysis performed.... Personnel professionals, even human resource planning specialists, often are not well informed regarding business planning processes (and rarely have any direct contact with business planners) and are thus ill-equipped to introduce linkages between human resource planning and business strategic planning. (p. 1)

This was the state of the art when the first professional association for human resource planners, the Human Resource Planning Society, was founded in 1977.

Many organizations now recognize that they can benefit from a two-way linkage between business and human resource planning. With a two-way linkage, business plans are considered somewhat malleable in that they are influenced by human resource considerations, such as the cost and availability of labor. Such organizations realize that profitability requires that business objectives be linked to people-planning activities. If the right people are unavailable, performance goals cannot be met. "A two-way linkage is evident when astute managers no longer assume that every plan is doable" (Mills, 1985a, p. 48).

Recently, some organizations have moved toward having a completely integrative linkage between business planning and human resource planning. In these organizations, organizational effectiveness is facilitated by a human resource executive who is a fully participating member of the top management team. In this case business plans can be substantially modified by the human resource executive, and business results can be substantially improved.. For example, Don Rush, vice-president and chief executive officer of Weyerhaeuser Forest Product Company's Washington division, believes that "by integrating HR and business planning, we have 500 salaried people doing more than 1,200 did; we have improved teamwork, morale, commitment, and profitability" ("The HR Edge," 1988, p. 1). Such integration is likely to spread among the most competitive U.S. organizations. As this happens, the relationships that were illustrated in Figure 1 among human resource planning activities and those between human resource and business planning should become more common. Unfortunately, it is beyond the scope of this article to include a description of the management processes that organizations are using to achieve complete integration between their human resource and business planning activities, but interested readers are encouraged to read the discussions provided by Golden and Ramanujam (1985), Dyer (1986), Mirvis (1985), and Schuler (1988).

Human resource planning becomes more complex as the time horizon for planning stretches further into the future, so it is not surprising that companies become involved in longer term planning activities only after becoming proficient in shorter term planning activities. Mills (1985b) found support for this pattern in his study of the planning practices of 291 organizations. An evolutionary pattern, going from mastery of techniques for short-term planning to development of long-term plan-

ring capabilities, is also evident in the related technical and scientific literatures on planning. Much of the research conducted by I/O psychologists has been directed at improving short-term outcomes such as attracting applicants, maximizing performance, and minimizing dissatisfaction and stress in order to retain valued employees. Currently, there is a growing awareness that these activities need to be clearly and explicitly linked to improving organizational productivity, quality, innovation, and employee satisfaction and involvement (see Campbell & Campbell, 1988).

It seems clear that human resource management in general, and human resource planning in particular, will become more closely tied to the needs and strategies of organizations. As this occurs, human resource planning will be the thread that ties together all other human resource activities and integrates these with the rest of the organization. With the growing recognition that different types of organizations require different human resource practices (see, e.g., Kerr, 1982; Miles & Snow, 1984; Schuler, 1987), human resource planners are being challenged to develop packages of practices that fit the unique needs of their organizations and contribute to effectiveness. Research that will _assist_ planners in the development and implementation of integrated human resource systems is urgently needed.

Also needed is research on the change process. Organizations of the future are likely to be in a state of continuous change and uncertainty. Human resource planning is likely to be seen not only as the thread that ties together all human resource practices, but also as the instrument for establishing and signaling when and how practices should change. In other words, human resource planners are likely to take on the role of organizational change agents (Beer & Walton, 1987). To be effective in this role, they will need to adopt a systems perspective for understanding how the behaviors of individuals influence and are influenced by the larger organizational context.

As organizations change more quickly, so will the knowledge, skills, and behaviors needed from employees. This means that people working in organizations will be asked continually to adjust to new circumstances. Assessing and facilitating peoples' capacity for change are two activities that psychologists are likely to be called on to do, yet there is very little research available to consult for guidance. Whereas organizations are seeking changes from employees, employees will be demanding that organizations change to meet the needs of the increasingly diverse work force. Research designed to help us understand how organizations can establish and maintain employee flexibility and adaptability is likely to make an important contribution.

Thus a final challenge in human resource planning is balancing current needs-of organizations and their employees-with those of the future. The criterion against which this balancing act is measured is whether employees are currently at the right place doing the right things but yet are ready to adapt appropriately to different activities

when organizational change is needed. Similarly, I/O psychologists involved in human resource planning can use the effectiveness of their current activities and their readiness to engage in the new activities needed to face the challenges of the future as the criteria against which they evaluate their own performance.

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