AN ALGORITHMIC PROCESS FOR CORPORATE HUMAN RESOURCE PLANNING

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Scope and Method of Study: The existing literature on human resource planning is voluminous and seemingly without direction. This lack of direction and organization has made it difficult for human resource planners to separate the relevant research from the irrelevant research. The purpose of this paper is to arrive at an algorithmic process that would help in resolving the corporate planners dilemma. The first step was to identify the major and relevant factors that have affected the process of human resource planning. This was done through a fairly elaborate literature search. From this wide array of factors, several key factors were identified. The criteria for selection was the perceived importance and recurrence of these factors in various firms. A principal consideration in designing the algorithm was, that it should be comprehensive for any individual firm while remaining flexible enough to serve a diverse array of firms. The algorithm may also facilitate a better compatability between academic dialectics and organizational needs in the area of human resource planning.

Findings and Conclusions: A composite matrix model was devised in which various human resource planning techniques are presented in juxtaposition with their impact on different organization relevant variables. The human resource planner establishes an order of priority among the variables, based on the internal and external characteristics of his firm. Once this process of prioritization has been accomplished, selecting the appropriate planning technique is easily done by referring to the model. The need to integrate human resource planning with other areas of corporate planning has been emphasized.

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PLANNING

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I would like to dedicate this paper to my mentor, Guru Raghavendra Swamy, whose grace and blessings have enriched my life and given it a whole new meaning.

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CHAPTER I

INTRODUCTION[1]

> The last quarter of this century is going to be one of primary emphasis on human resource management. The time is right for professional people to make the most significant contributions of their careers (Burdick, 1976, p. 21).

Planning efforts should normally assume a greater importance during times of economic volatility yet, it is a demonstrable fact that during the past decade, planning in general seemed to have become stagnant. This stagnation is particularly detrimental to human resource planning from the practitioners' point of view, because human resource planning has, typically, been relegated to a subservient role vis-a-vis other areas of planning.

Even from the academician's perspective, human resource planning as a discipline suffers from some major problems. In spite of the fact that there has been a sharp increase in the number of publications on human resource planning in recent years, there have been few substantive gains in the field. Many of these works have not seemed to advance the

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[1]This paper relies heavily on the findings of Greer and Armstrong (1980) and utilizes their terminology.

›oundaries of knowledge in the area of human resource plan-
ıing. Neither are they indicative of any real progress in
:he actual utilization of human resource planning techniques
'Burack and Gutteridge, 1978). Further, very little
›mpirical research is offered to substantiate some of the
ıuthor's opinions (Kahalas, et.al., 1980). The following
›bservation is an eloquent comment on the advancement of
ıuman resource planning in actual industrial practice.

> There does not seem to be much concern or recognition in the business community that manpower planning is not as effective as it is claimed to be. The prevailing view, as indicated by most articles on the subject, is that more sophisticated refinement is all that is needed to make the concept successfully applicable in all situations (Bennett, 1972, p. 61).

The genesis of this paper arises from a concern over
he absence of a theoretical foundation of human resource
lanning. Such a foundation is an essential aid for linking
uman resource planning with the organizational decision-
aking process (Craft, 1980). While there exists a strong
emptation for researchers to devise aggregate or micro
pproaches to human resource planning (Doeringer, Piore, and
coville, 1968), the fact remains that such planning activi-
ies have to be designed and implemented on a micro basis
Steiner, 1979; Walker, 1980). The central purpose of this
aper is to arrive at an algorithmic model for human resource
lanning which could serve as a decision aid for any given
irm, while retaining its applicability to a wide spectrum
f distinct firms.

CHAPTER II

SURVEY OF THE LITERATURE

oblems in Human Resource Planning

The term human resource planning has been used to cover e entire spectrum of activities from forecasting of per- nnel needs through the full range of traditional personnel nctions (Burack and Gutteridge, 1978). The emphasis in is paper is more on the forecasting aspect of human resource anning. The rationale for such an emphasis comes from the eponderance of forecasting related problems in human source planning. Human resource planning problems are esented in two different aspects--first, as problems with e literature and second, as problems with the process it- lf.

Some of the problems with the literature are a lack of andardized terminology, an absence of an integrated approach human resource planning, a failure to consider the costs volved, and attempts to generalize on the basis of a ngle-firm experience (Coleman, 1970). An integrated approach y be construed to mean the linking of human resource planning strategic planning (Walker, 1978). It could also mean integration of subjective and quantitative approaches to

orecasting (Drandell, 1975). Drandell's composite fore-
asting method uses exponential smoothing to analyze past
ata, subjective estimates to assess the future, and re-
ression analysis to combine both for making manpower esti-
ates. Typically, an integrated approach implies making
uman resource planning a component of strategic planning.

Problems with the process itself are; inadequacy of
ata bases, lower than desired degrees of accuracy of fore-
asts, and lack of acceptance of the process (Greer and
rmstrong, 1980). Acceptance of human resource planning is
necessary prelude to the development of an integrated
pproach. Other limitations of human resource planning
Fischer, 1972) include the inherent difficulty associated
ith long range planning. Obviously, accuracy of prediction
s a partial function of the range for which the predictions
re being made. As the time span increases, the possibility
f diminishing accuracy increases. Fischer (1972) has traced
ne over zealousness of planning staffs as being a contribut-
ng factor to the lack of acceptance of forecasts, by operat-
ng staffs. The over zealousness of planning staffs stems from
neir enthusiasm about projected plans and its impact on the
irm's future performance. The operating staffs, who tradi-
ionally view budgets and plans with suspicion, build up an
dverse reaction to this display of zeal by the planning staff.
onsequently, a conflict results. The greater the enthusiasm

hown by the planning staff, the more formidable and probable ill be the operating staff's resistance to it (Fischer, 1972). his conflict is treated again later on in this chapter.

eed for an Integrated Approach

The need for integration is a recurring theme in most f the literature (Bush, 1980; Craft, 1980; Doeringer, Piore, nd Scoville, 1968; Ettelstein, 1979; Fischer, 1972; Haire, 967; Hussey, 1971; Peterson, 1969; Walker, 1968, 1978, 1980). n integrated approach has a significant positive impact on firm's ability to achieve strategic objectives (Walker, 1980). t can generate costs economies, increase capacity to operate ffectively and facilitate the undertaking of new enterprises nd changing operations. As an example of each of these three actors, an integrated approach may be able to increase sales nd net earnings per employee, induce stability and motivate ne work force, and create receptiveness to change (Walker, 980). All this would be possible because the marketing lans, the financial plans, and other strategic plans would e coordinated with the human resource plans.

The problem is that planning for human resources has al- ays been viewed as a subordinate and indispensable component f the entire planning spectrum. In state of the art inves- igations of corporate planning models and their common uses erschefski, 1969, Naylor, Schauland, 1976) an interesting onclusion was reached. Human resource planning was seldom,

if ever, mentioned as a common use of a corporate planning model. Haire (1967) reached many of the same conclusions in his study. Based on his observations of top management planning meetings, Haire was struck by the total absence of any detailed plan to acquire the requisite human resources. These human resources would have been essential to operationalize other strategic plans.

Hollingsworth and Preston (1976) have indicated the useful role that human resource planning can play in providing the skilled employees for making technological changes. If a firm has an integrated approach to human resource planning then any imminent technological changes could be facilitated by the requisite types and numbers of skilled employees. According to Hollingsworth and Preston, personnel departments can play a crucial role in the successful operationalization of the strategic planning process in general. The traditional channels of communication and other intraorganizational forums may be used by the personnel department to transmit information about projected changes and organizational plans. This process of informing the employees in advance helps to break down resistance to operationalization of strategic plans (Hollingsworth and Preston, 1976).

For a positive interactive relationship between human resource planning and strategic planning, two methods might

be used (Craft, 1980). First, an environmental scanning program might be developed to identify environmental factors that might affect human resources and related organizational performance. Second, human resource impact statements should be developed and implemented (Craft, 1980). These statements indicate the impact on human resources of alternative strategic plans. As such they are a prelude to the strategic plan selection process (Boynton, 1979). The concept of human resource statements is gaining increasing recognition, especially in multinational corporations. Walker (1980) described one such resource statement being used in a major chemicals and plastics manufacturing company (Table I).

As Walker (1980) has described, the rationale for the human resource impact statement or planning guide is to identify those strategic plans that have human resource implications. The company's objective is to synchronize its personnel programs and the process of human resource planning into a strategic fit with the concurrent business and financial planning cycles. The guidebook is distributed to the various operating divisions as part of the overall strategic planning guidelines and instructions. The advantages of this step, according to Walker (1980) are twofold. It involves the divisional managers in the process of corporate planning while simultaneously gaining the benefit of

TABLE I

HUMAN RESOURCE PLANNING GUIDE

Identify below those strategic plans having *human resource implications.*	Possible areas for action. What *could* be done?
A. BUSINESS NEEDS	
1. Expansion of existing business activities?	☐ Recruitment ☐ Training/development ☐ Organization changes ☐
2. Addition of new capacity (new plants, distribution facilities, etc.)?	☐ Recruitment ☐ Training/development ☐ Organization changes ☐
3. Deemphasis or discontinuance of any business activities?	☐ Reassignments ☐ Terminations ☐ Retraining ☐
4. Ventures, acquisitions, or divestitures?	☐ Management reassignments ☐ Recruitment ☐ Organization/position changes ☐ Training/development ☐
5. New products or services?	☐ Training/development ☐ Recruitment ☐ Organization/position changes ☐
6. New technologies or applications?	☐ Training/development ☐ Recruitment ☐ New specializations ☐ Organization/position changes ☐
7. Changes in operating methods or productivity improvements?	☐ Organization/position changes ☐ Training/development ☐ Reassignments ☐
8. Changes in administrative, information, or control systems?	☐ Orientation/training ☐ Organization/position changes ☐ Staffing changes ☐

Source: Walker, 1980, pp 85-93.

Table 1 Continued

Identify below those strategic plans having *human resource implications.*	Possible areas for action. What *could* be done?
9. Changes in management or organizational structure (matrix management)?	☐ Reassignments ☐ Communications/training ☐ Staffing changes ☐ Recruitment ☐ Terminations ☐ Reassignments ☐
10. Other:	☐ ☐
B. EXTERNAL FACTORS	
1. Are qualified (competent) recruits available in the market?	☐ Modify recruitment approach ☐ Modify staffing requirements ☐ Develop more talent from within ☐
2. Are you able to recruit competitively the desired talent?	☐ Modify compensation/job evaluation ☐ Modify recruitment approach ☐ Modify job requirements ☐
3. Are there changes in the personnel relations climate?	☐ Employee communications ☐ Management orientation/ training ☐ Fact finding ☐
4. Are there new EEO/affirmative action requirements?	☐ Modify recruitment ☐ Training/development ☐ Modify job requirements ☐ Performance appraisals ☐
5. Are there new OSHA or other regulatory requirements affecting human resources?	☐ Management orientation/ training ☐ New systems/procedures ☐ Additional staffing ☐ Fact finding ☐
6. Are there new international business demands?	☐ Management orientation/ training ☐ Recruitment ☐ Adapt managment systems ☐ Fact finding ☐
7. Other:	☐ ☐

Source: Walker, 1980, pp 85-93.

Table 1 Continued

Identify below the *human resource issues* pertinent to the strategic plans.	Possible areas for action. What *could* be done?
C. INTERNAL ANALYSIS	
1. Do we have excessive turnover in any group?	☐ Modify recruitment/selection ☐ Accelerate career advancement ☐ Organization/position changes ☐ Reassignment/lateral moves ☐
2. Is there too little turnover or mobility in any group?	☐ Terminations ☐ Reassignment of work ☐ Organization/position changes ☐ Improved employee appraisals ☐
3. Are age patterns imbalanced in any group, suggesting high future attrition or career path blockage?	☐ Modify recruitment/selection ☐ Reassignments ☐ Accelerate career advancement ☐ Terminations ☐
4. Is there a proper balance (employee mix) of managerial, professional/technical, and supporting personnel in each group?	☐ Organization/position changes ☐ Reassignment of work ☐ Modify recruitment/selection ☐
5. Are there noteworthy performance problems in any group (or appraisal results signaling significant problems)?	☐ Organization/position changes ☐ Reassignments ☐ Improved employee appraisals ☐ Modify job requirements ☐
6. In what areas are levels of technical competency potential shortcomings?	☐ Modify recruitment/selection ☐ Reassignments ☐ Career counseling ☐ Training/development ☐
7. Is the employee mix desired for EEO/AA being achieved? (women and minorities)	☐ Modify recruitment/selection ☐ Modify job requirements ☐ Career counseling ☐ Training/development ☐
8. Other:	☐ ☐

Source: Walker, 1980, pp 85-93.

Table 1 Continued

Identify below the *human resource issues* pertinent to the strategic plans.	Possible areas for action. What *could* be done?
D. MANAGEMENT IMPLICATIONS	
1. Are there enough employees who could become general managers? (pool of successors)	☐ Modify recruitment/selection ☐ Improved employee evaluation ☐ Special career development plans ☐ Organization changes for future ☐
2. Do the present managers have adequate technical competence in the face of changing demands?	☐ Training/development ☐ Reassignments ☐ Specialized recruitment ☐ Specialization ☐ Career counseling ☐
3. Do they have adequate managerial skills to meet the changing demands of a growing company? (leading, planning, decision making, etc.)	☐ Training/development ☐ Organization/position changes ☐ Reassignments ☐ Recruitment of managerial talent ☐
4. Do key managers and successors have adequate management experience (multiple function exposure)?	☐ Training/development programs ☐ Job rotation among functions ☐ Recruitment of management talent ☐ Evaluation of successors ☐
5. Is the management structure and staffing appropriate for the achievement of our business objectives?	☐ Organization/position changes ☐ Reduce/increase staffing levels ☐ Accelerate management development ☐ Study of strategy implications ☐
6. Other:	☐ ☐

Source: Walker, 1980, pp 85-93.

Table 1 Continued

SUMMARY FORECAST OF EXEMPT STAFFING NEEDS
AS OF

	CURRENT	9/79	9/80	9/81	9/82	9/83	9/84
DEPARTMENTS							
TOTALS							
FUNCTIONS							
TOTALS							

Source: Walker, 1980, pp 85-93.

heir divisional expertise. Perceptions of human resource ssues increase among line managers and at the same time eflect favorably on top management's commitment to employee evelopment on a continual basis (Walker, 1980).

As Table I indicates, issues with human resource impli- ations have been categorized under four headings. They are usiness needs, external factors, internal analysis, and anagement implications. The issues include expansions, cquisitions, divestitures, governmental regulations, union ctivities, labor market conditions, performance patterns, id managerial skills and staffing needs. The questions e designed to reveal the presence of any or all of these ssues. The responses to these issues are intended to pro- .de the corporate planners with an idea of the operating :aff's views on planning issues. A consensus of opinion ıy facilitate the selection of a particular strategic al- ernative. Along with the guidebook, a format for forecast- ıg exempt staffing needs is also presented. The forecast ; used as a basis for planning any particular requirement ı the budget.

Another possible reason for the lack of an integrated proach to human resource planning may be because top .nagement has consistently overlooked it from an investment rspective (Blau, 1978; Bush, 1980; Flamholtz, 1974; perman and Martin, 1977; Rhode and Lawler, 1973; Taylor and

wers, 1972; Walker, 1968). According to these authors
has been difficult for management to consider a firm's
man resources as assets in the traditional accounting
nse. Consequently, no attempts have been made to analyze
e costs that may result from a lack of proper human
source planning. These costs are not directly evident as
ey are in the case of capital assets such as plant and
uipment. The concept of human resource accounting, which
gaining increasing momentum, considers human resources
assets employed by the firm. The costs of acquisition,
aining and development, and replacement of these human
sources are considered as investment costs. Once this
vestment perspective towards human resources is established
nagement can then transfer its expertise in financial
anning to human resource planning. An investment per-
ective, thus, facilitates the transition of human resource
anning to the status of strategic planning (Walker, 1968).

curacy in Forecasting

Lindon Saline, a professional manager of General
ectric, made the following observation about accuracy in
recasting during a conference sponsored by the Engineering
undation of New Hampshire in August, 1978.

> We engineers should be cautious lest our penchant for absolutes, causes and effects, analyses, predictability, and formulae and models leads us to believe that and/or to behave as if human resources

> individually or collectively are a well defined entity existing and functioning in a well behaved system, they are not (Saline, 1978).

Bennett (1972) in fact, has noted that an unwarranted rsuit of accuracy has been one of the factors that has rked to the detriment of human resource planning in neral. Much the same explanation is advanced by Walker 980) who felt that an excessive concern over accuracy d reduced the overall reliability of forecasting. A recasting technique designed for maximum accuracy has certain built-in rigidity. Consequently major changes the forecasting variables, or additions or deletions to e number of variables adversely affect the model's liability. Some of these accurate models may not be able handle recent changes in the variables that they con- der. Also, Walker (1980) has indicated that the solution management problems should be the prime purpose of the tire forecasting exercise. Instead, planning staffs equently tend to use the forecasting process for a display personnel research abilities.

The above point is not intended to belittle the need r a certain optimal level of accuracy in forecasting. sed on a survey of 84 firms, Wikstrom (1963, 1971) came the conclusion that a 20 percent margin of error is nerally acceptable to most organizations. Acceptable rgins of error may vary depending on organizational and

environmental characteristics. Firms encountering rapid technological changes, need for highly skilled employees, tight labor markets, and a high demographic variance in the labor force are bound to be more adversely affected by wider error margins in forecasting (Wikstrom, 1971). In a highly technology industry the composition of the labor usually involves highly skilled employees. Because of the high skills involved, the costs of acquisition and training are relatively higher. Consequently the cost of a unit percentage error is much higher in a high technology industry than in other industries. A similar argument may be used to explain why a lower margin of error in forecasting may be preferred in firms with highly skilled employees, tight labor markets, etc. For these organizations, manpower is a critical and costly resource that has to be closely monitored and judiciously used (Wikstrom, 1971). In economic terms, the higher the marginal utility or the marginal contribution rate of an individual employee to productivity and profitability, the lower will be the acceptable margin of error in forecasting for that firm.

Wikstrom (1963) has identified some of the factors that affect the levels of accuracy obtainable. They include the predictability of the industry, the time span for which the projections are being made, the quality of the data base, the level to which human resource planning is integrated into

the process of strategic planning, and the expertise that the company has with all types of planning .

The question of forecasting range has been raised by Craft (1980). Forecasting, according to Craft, has focused on short-term time horizons and has concentrated on projecting demand rather than supply. Craft points out that short-term forecasts may result in a sequence of disjointed sub-optimizations which might affect long-term organizational effectiveness. A bias towards short-term time horizons, in forecasting, may be explained by the fact that such forecasts are generally more accurate and short-term goals are more tangible and more easily implemented (Craft, 1980). Craft has also raised a point about the type of data currently being used in forecasting. He has cited evidence in pointing out possible inaccuracies and incompleteness of the data being used. According to Craft (1980) the personnel programs that exist in a firm have a definite impact on the quality of the data that are available for forecasting purposes. Craft has stressed this point with an example. Graphic rating scales, according to him, are subject to almost every type of rating error. Therefore, if a firm uses graphic rating scales for performance appraisal, then the data generated in that firm for forecasting purposes is of questionable reliability. Factors such as the perceived influence of the forecaster, and the extent to which the operating staff trusts the forecaster are other important

considerations affecting the quality of the data. According to Craft, the whole question about the quality of the data base needs to be given serious consideration in the forecasting process.

Degree of Sophistication

According to Walker (1980) researchers tend to get so fascinated with the intricacies of model building and functioning that they achieve results which lose their practicality. The operating staff tend to prima facie reject these models because of their excessive sophistication. Walker has dubbed this phenomenon as the "analysis paralysis" syndrome. Steiner (1979) has made a similiar observation. According to him, the computer based analytical models are out of step with the thought processes and decision problems of managers. Steiner's observation has been explained by Craft (1980) who noted that in human resource forecasting, the variables that are typically taken into consideration are variables such as output, sales, technological change, government policy, and skills inventories. These are variables that allow precise quantification. On the other hand, the operating staff's predominant concern is with behavioral variables such as employee attitudes toward the organization and work, employee loyalty, and motivation toward work (Craft, 1980). This explains why computer based analytical models, which neglect

ehavioral variables are out of step with the basic deci-ion problems of operating managers.

Drandell (1975), whose composite forecasting method as described earlier, is a proponent of a joint coordin-ted approach between the planning staff and the operating taff. Drandell has contended that if a planning process s too sophisticated for the operating staff's requirements hen it should not be implemented. Since the operating taff members in an organization, according to Drandell, re the ones who generate the data and are going to be the nes to use the results, then it is only natural for them o expect to be actively involved in the planning process.

Frantzreb (1979) has offered a different explanation or the conflict between the planners and operating managers. sing the concepts of organization theory, Frantzreb has iewed the planning and the operating staff as being mem-ers of two separate intraorganizational coalitions. These oalitions, which are political in nature, have conflicting bjectives and operative goals. All this leads to what rantzreb has termed as organizational "real politik" or he politicized environment within an organization. In uch cases, sophistication in modeling is useful only in o far as it can solve management problems in a manner com-atible with the operational objectives of all the dominant olitical coalitions in an organization.

Impact of Technology

A survey of 105 firms (Heneman and Seltzer, 1970) revealed that only 17 percent of such firms considered technology and administrative change as a factor in predicting human resource requirements. According to Heneman and Seltzer, the problem of predicting change and its impact is especially difficult if the firm is a leader in its product field or in developing technological and administrative innovations. The authors feel that in the case of such industry leaders a useful methodology for planners would be to work in close liason with their research and development departments. This would help in securing a better match between projected technological change and the desired human resources for such a technology. For firms which are not pioneers in their field Heneman and Seltzer (1970) recommended a closer interaction with appropriate research units outside the firm.

Technology increases the demand for high talent manpower while simultaneously making it more difficult for people to qualify for jobs (Casell, 1972). It also widens the spectrum of occupations in high talent industries. Some authors have stressed the need for more attention to be paid to the phenomenon of technological change in planning activities (Armstrong, 1979; Walker, 1968).

> Rapid technological changes will produce changes in job content and responsibilities. This will necessitate the development of more effective ways of planning for the creation and maintenance of a continuously qualified work force (Armstrong, 1979, p. 7).

The high technology orientation of the modern industrial world has been quoted as a factor responsible for he degree of uncertainty in the environment. Consequently he need for more sophisticated models has been expressed. ut, Fildes et.al. (1978) have disagreed. They have cited he example of the oil crisis of the seventies as a case n point. Fildes et.al. have stated that these sophisticated forecasting models neglected the impact of recent hanges. The economic projections for that period of oil risis were still stated to be favorable, even though all he environmental indicators were to the contrary. Fildes t.al. also showed that unexpected uncertainity, measured s a deviation from the forecastable trend has not changed uch from the earlier decades of the post-war era. This ismisses the idea that the modern environment is one of xceptional uncertainty. However, as stated earlier, apidly changing technology does impose certain constraints n the forecasting process. Changing technology results n changing skills com position which in turn necessitates highly flexible forecasting model. The model should be ble to accurately assess the impact of recent changes in he organizational environment (Fildes et.al.) and provide

stability in the workforce.

Lack of Evaluation

There has been a surprising lack of emphasis on this crucial aspect of human resource planning, both, in the literature as well as in practice (Craft, 1980; Milkovich and Mahoney, 1976; Walker, 1974). Walker (1974) has explained this lack of emphasis as being the result of a distorted focus on the other two aspects of human resource planning--forecasting and personnel programming. Gordon 1972) has pointed out that since most of the traditional personnel programs have been non-evaluative in nature, the evaluative aspect of human resource planning has been neglected. The fact that human resource planning is still relatively developing field explains the absence of an evaluation stage in the scheme of things (Craft, 1980).

It is important that increasing attention be paid towards developing an effective evaluation procedure in human resource planning activities (Craft, 1980; Walker, 974). Through evaluation (Walker, 1974) management can assess the effectiveness of the forecasting and programming aspects of human resource planning, in terms of both organizational and individual impact. After all, the bottom line of all human resource planning activities should be to achieve results from which both the organization and the individual may derive maximum long run benefits (Vetter, 1976)

ummary

The survey of the literature has revealed that the ntire gamut of human resource planning may be broadly lassified under two headings: forecasting and personnel rogramming. The need to include evaluation within the cheme of planning activities has been stressed. The reponderance of problems in the human resource planning rocess are related to forecasting. Problem areas are uality of data base, degree of forecasting accuracy re- uired, need for sophisticated techniques, impact of echnology and recent changes on forecasting, and acceptance y operating staffs. At the practitioner's level the need or integrating human resource planning with strategic lanning has been emphasized. It has also been revealed hat no attempts seem to have been made to integrate the xisting mass of literature and theory into a meaningful nd easily applicable tool for the practitioner's use. he purpose of this paper is to develop a tool which might nable the practitioners to more readily implement human esource planning.

CHAPTER III

THEORY AND RESEARCH DESIGN

This chapter confines itself to an explanation of he overall structural framework of the model that is eveloped and presented in this chapter. Some of the ssumptions underlying the model are also explained here. detailed explanation of the individual variables within he model is presented in the results chapter.

The first assumption is that every firm should make n ongoing effort towards linking its human resource plan- ing with its strategic planning. This linkage would help lleviate two major problems; an inadequate data base and low level of acceptance. The problems with currently sed data bases has already been dealt with in the previous hapter. The need for a good and extensive data base has een explained by Craft (1980). The quality and depth f the data, according to Craft, reveal the presence of ertain crucial factors in the firm that impinge on the uman resource planning process. These factors may affect he successful functioning of the planning process. Craft 1980) lists these factors as the effects of trust in the orecasting/planner, the perceived influence of the fore-

aster and the role of current personnel programming and olicy to name a few. These factors are responsible for he type of data base generated, which in turn affects the ccuracy and credibility of forecasting, which again ffects the overall human resource planning process Craft, 1980). Strategic planning, typically enjoys a ide degree of acceptance and is also fairly well developed. herefore, human resource planning by being linked to trategic planning can gain the benefit of refinement, aster development and wider acceptance that strategic lanning now enjoys.

The second assumption is concomitant with the first ne. The assumption is that the firm's human resource lanning effort should be geared towards the utilization f models that permit total entity simulations. The ationale for this assumption is easily explained. For ne thing, an integrated approach implies that all other reas of planning covering areas such as marketing, pro- uction, finance, etc. will be coordinated with human re- ource planning. This means that human resource planning an no longer be an isolated functional exercise but has to eal with a host of non-traditional variables that span the ntire organizational entity. Total entity simulations are herefore the ideal choice because they facilitate the con- ideration of a wider range of variables. The traditional

variables have already been discussed in the previous chapters. The non-traditional variables may include behavioral variables, such as employee attitudes towards the job and attitudes towards the organization which have been consistently neglected by human resource planners in the past.

The third assumption is that implementation of an integrated approach and total entity simulation models should be over a protracted time. Sudden transitions in planning processes carry with them an inherent risk of failure. Before making any substantive changes in planning techniques, factors such as top management's acceptance, resistance from operating staff, costs of implementation, and derivable benefits have to be considered. Tackling these factors is a time consuming and gradual process. Hence, human resource planners will have to draw up an operating timetable for incorporating an integrated approach. Some of the factors mentioned above are conflictive in nature. For instance, what is acceptable to top management may not always be acceptable to the operating managers. Again, a technique that is economical may not be reliable or suitable for the organization. In spite of the mutually conflictive nature of some of these factors, all of them have to be dealt with. Therefore, the human resource planner has to devise a multi-pronged approach, or an approach that can tackle all these factors simultaneously and in an appro-

priate manner. Any univariate approach, or an approach that deals with just one of the factors mentioned earlier will prove ineffective in the long run. Under a multi-pronged approach the planner might have to make a certain series of trade-offs among the operative factors. For instance, he may have to compromise accuracy in order to operate within a restricted budget, or else, he may have to adopt a relatively less sophisticated model so as to gain acceptance from the line managers. A starting point in making these trade-offs would be to restrict the horizons of the planning efforts to a small scale. Depending on the degree of success that the planner achieves at this initial stage, the scope of the effort may be gradually broadened. This concept of scale of planning horizon is dealt with, in greater detail, in the results chapter.

It would be worthwhile to recapitulate the assumptions made above. First, the long run objective of the human resource planner should be to devise an integrated approach to planning. Second, the utilization of total-entity simulation models should be a top priority. Third, there should be a phased-in approach to achieving the two objectives stated above, starting from a small scale planning horizon. Other noteworthy points are as follows; (1) there cannot be a normative rule-of-thumb for the trade-offs that the human resource planner has to make; (2) improved accuracy

s the starting point and not the end of improved fore-
asting; (3) there should be a systems orientation in data
ollection and human resource resource planning in general
Weihrich, 1980). According to Weihrich, such an orienta-
ion would help to integrate the different variables such
s enterprise plans, organization plans, management inven-
ories, the analysis of needs for managers, recruitment,
election, placement, promotion, training, and appraisal
nto a composite system. This will facilitate the adoption
f an integrated approach to human resource planning;
4) personnel information systems must be more proactive
f they are to play a useful role in human resource planning.
ypically, they have merely reported on current employment
haracteristics and configurations, and on past personnel
ovements. On the other hand, a proactive information
ystem would, for instance, generate reports that could be
sed in job candidate searches, compensation and benefits
dministration, forecasting staffing needs, and in budget
ontrol. The information system could be structured in a
odular form so that a single change on any given element
pdates the entire information model.

Having laid the groundwork of theoretical assumptions
stage by stage explanation of the development of the
lgorithmic model is presented now. Forecasting represents
he first major step in the entire human resource planning

rocess as defined in this paper. Forecasting refers not nly to the actual techniques but also to the associated ctivities of data collection, manpower inventories, etc. he literature review has revealed that a substantial roportion of problems in human resource planning are re- ated in some manner to forecasting. Consequently, the irst goal of this author was oriented towards redressing ome of the major problems in forecasting. A detailed eview of the literature was undertaken with this opera- ive goal in mind. Attention was also directed towards he state of the art literature to obtain a broad overall erspective of human resource planning activities. This aper has been influenced by three major publications; raft (1980), Greer and Armstrong (1980), and Walker (1980). he recency of the literature has also been one of the rincipal considerations in the literature review. One of he conclusions drawn from this effort is that there have een no broad-based guidelines for the selection of appro- riate forecasting techniques. While much has been written bout individual techniques no visible attempts were seem- ngly made to collate all these individual findings into a eaningful and composite entity.

The first stage in the development of the model, resented in Table 2 was to compile a list of principal fore- asting techniques based upon their recurrence in the litera-

1)RECASTING ECHNIQUES	2 CATEGORY	3 NATURE OF OPERATING ENVIRONMENT	4 REQUIRED LEVEL OF INTEGRATED APPROACH	5 TYPE OF DATA BASE	6 SET UP COSTS	7 ACCURACY/ FORECASTING RANGE	8 PROBABILITY OF INITIAL ACCEPTANCE
idgemental orecasts, ules of umb, staf- ng stand- rds, ratio end analy- s, time eries, delphi echnique	Simple forecasting models	Highly stable	Not Essential	Inventory Oriented	Relatively Lowest	Very Low/ Short (less than 2 years)	Highest
iccession nalysis, arkov/stoc- astic pro- esses, enewal odels, regres- ion analysis	Organiza- tional change models	Limited Probabil- istic Uncertain- ty	Minimal	Relative- ly detailed across a few vari- ables. Less inventory oriented	Low	Low/ Inter- mediate (2-5 yrs.)	Higher
inear Pro- ramming, on-linear rogramming, ynamic rogramming, oal program- ing, assign- nt models	Optimiza- tion models	Transience in environ- mental factors should be quantifi- able 2 relatively few in	Minimal	Relatively Extensive	High	Higher/ Inter- mediate (2-5 yrs.)	High

RECASTING CHNIQUES	CATEGORY	NATURE OF OPERATING ENVIRONMENT	REQUIRED LEVEL OF INTEGRATED APPROACH	TYPE OF DATA BASE	SET UP COSTS	ACCURACY/ FORECASTING RANGE	PROBABILITY OF INITIAL ACCEPTANCE
rporate dels: mbined chniques	Integrated simulation models	Greatest degree of instability permissible	Quintessen-tial	Systems oriented/ proactive	Highest	Highest/ Long over 5 years	Lowest

olumns 1 and 2 have been adapted from Walker (1980, p. 132). Columns 3 through 8 have been derived rom a review of the literature.

ure as well as in practice. The first column in the model s merely a delineation of these forecasting techniques. he second column is a categorization of the forecasting echniques presented in the first column. The categoriza- ion has been presented in the first column. The categori- ation has been done of the basis of each forecasting echnique's ability to handle a wide range of variables. he first two columns have been derived from Walker (1980, . 132). While it is possible to obtain substantive addi- ional information on the items presented in these two olumns, either through a literature review of through con- ultations with practitioners, brief explanations are resented here on each of the individual items.

Judgemental forecasting techniques, are techniques hich are essentially based on the judgement of a person or group of persons who are familiar with the organizational eeds in terms of human resources. A widely used procedure s supervisor estimates. This technique uses the intuitive kills and experience of the supervisor to make short run orecasts. Rules-of-thumb techniques utilize decision euristics in human resource forecasting. An example of a ecision heuristic may be the relationship between sales olume and personnel requirements. For a given change in ales volume a proportionate change may be needed in the equisite personnel based on past relationships between the

wo variables. Staffing standards and ratio trend analysis re variations of judgemental forecasts. Under staffing tandards, certain guidelines may have been established or particular types of positions or operations. Under atio trend analysis past experience is quantitatively epresented by indicators of outputs by means of a ratio elationship. For instance, productivity is the ratio of utput per labor input. Labor input may be expressed either s hours of work or number of persons.

Time series analysis is a quantitative technique that ses as its basic concept the projection of past trends nto the future. Since it is based on trend extrapolation he forecaster has to identify any underlying trends that ay exist in past human resource utilization data. This orm of analysis also considers business cycles and seasonal lements in the forecasting process.

The Delphi technique is a form of judgemental forecasting with a difference. Instead of basing the forecast n one person's opinion, the Delphi technique utilizes the ollective opinion of a group of experts. These expert stimates are collected by means of a sequential series of uestionnaires administered on an individual basis to each xpert, by an intermediary. The Delphi technique, unlike he others described above, may be used for long range forecasting quite successfully.

All the techniques mentioned so far may be categorized s simple forecasting models. In principle, these techni- ues provide judgemental estimates of available supply and emand of human resources in a given planning period, under table conditions.

Succession analysis is an example of an organizational hange model. It usually involves the use of replacement harts. A planner, using succession analysis, may analyze he movement of personnel and the related organizational hanges. This analysis may be done either manually or with he use of computerized models. Replacement charts present ata pertaining to prospective personnel changes; organi- ation structure and job relationships, age and promotability f present incumbents along with probable successors. Based n a historical analysis, replacement charts may be drawn or three to five years in the future.

A Markov model is a type of stochastic forecasting echnique. Stochastic processes, in general, are probability ased flow forecasts. Movement of employees among different lassifications or states in a model may be forecasted ased on past movement. Classifications may involve such actors as organizational level, functional responsibilities, ength of service, salary classes, job categories, and ocations. The stochastic process indicates the probability hat employees will remain in a given state or move to each f other possible states at some point in the near future.

Another stochastic model, not as widely applied as the arkov-type models, is the "renewal model." In the renewal odel personnel flow is considered as an outcome of vacancies in the organization. The attempt to fill vacancies eads to a chain effect. The movement of personnel is ependable on the number of vacancies created; while recruitent is assumed to be constant. The chain effect is created ecause as a person moves to fill a vacancy, he creates a acancy in his prior job.

Regression analysis may be used when there exists a uantifiable relationship between staffing needs and other actors such as output, revenues, and unit costs. When hese relationships are complex and multivariate, then a echnique known as multiple regression analysis may be used. he use of multiple regression analysis in human resource lanning has been very occassional (Walker, 1980).

Succession analysis, stochastic models, renewal models, nd regression analysis may be categorized as organizational hange models. These models usually project an organization's performance and needs under certain assumptions about he future. These assumptions may have been derived from ast experience or may just be theoretical propositions made y the modeler. These models provide forecasts for two or ore successive planning periods.

Optimization models go one step further than organization change models. They forecast the optimal future staf-

ing patterns necessary to meet organizational objectives. echniques under this category include linear and non-inear programming, dynamic programming, goal programming, nd assignment models.

Linear programming is useful when the relationships etween staffing needs and other variables can be expressed n the form of linear inequalities. Linear programming odels are usually used to project staffing levels neces-ary to meet organizational objectives under a number of perating constraints which may be mathematically expressed.

Non-linear programming may be utilized when the rela-ionships between staffing needs and other variables is on-linear. This may involve convex, concave, or quadratic rogramming.

Dynamic programming is a variation of the linear pro-ramming technique. The whole problem of projecting staf-ing requirements is viewed as a multistage problem. At very stage a series of decisions are possible. The ecision chain which contributes to an overall optimal olution is finally selected.

Goal programming uses linear programming in conjunction ith Markov analysis. It is applicable where several con-traints affect staffing, and where the problem affects everal time periods (Charnes, et.al., 1972). These models ermit the development of realistic goals and a comprehen-

ive analysis of the behavior of human resource systems Walker, 1980).

Assignment models process individual data and assign ndividuals to job vacancies simultaneously. These assign-ents may be based on preferences, time, or seniority. he purpose of these models is to optimize the overall tilization of talent. It also enables the greatest degree f precision in forecasting the specific shortages and urpluses of human resources.

Integrated simulation models are useful when fore-asting involves the simultaneous consideration of multiple, nd interactive tasks and objectives. The specialty of hese models lies in their ability to evaluate the effects f various sets of variables upon needs and vice versa.

The model has achieved certain basic purposes, so far. he human resource planner has a viable list of alternatives n terms of forecasting techniques. Their processing apabilities are also broadly known to the planner at this tage. Further, the planner knows what his progression of sage of forecasting techniques ought to be. For instance, f his firm is currently using simple forecasting techniques, he next logical step in the progression would be to try rganizational change models. Of course, this is not an bsolute rule. The exigencies of the situation may facili-ate the use of total entity simulation models.

The third and final stage in the construction of the lgorithm was also based on the literature survey. The actors that affected forecasting and the related problems ere identified. Past research evidence was used as a eardstick in selecting items for columns three through ight. The recurrent mention of these items was the prin-ipal criterion in selecting them. The reasoning for such criterion is simple. If these factors were recurrent, t implied that they were a major source of concern to the ractitioners, and, the avowed purpose of this paper is to olve practitioners' problems. As stated earlier, this aper relies heavily on the findings of Greer and Armstrong 1980) for its conceptualization. Items in columns three hrough eight are, in essence, based on their findings about reas in human resource planning that need future emphasis.

The construction of the model has been a three stage rocess. Stage one was a selectively extensive literature urvey based on certain operative goals. Stage two was the stablishment of an elaborate list of forecasting techniques ppropriately categorized into four groups. Finally, stage hree involved the selection of certain major factors that ffect any human resource planning activity. The effects of particular category of forecasting techniques on these actors is presented in the model. A detailed discussion of hese effects is presented in the next chapter.

CHAPTER IV

RESULTS

The conceptual nature of this paper makes it difficult o clearly demaracate the contents of the theory chapters rom the contents of the results chapter. There might be oticeable areas of overlap. This chapter deals with an xplanation of why the model was designed in its present orm with a limited number of variables. The chapter also oes into the reasons for selecting these particular vari- bles vis-a-vis others. It also explains the proposed ffects on these variables of the different categories of orecasting techniques. Finally it details a step-by-step rocedure for utilizing the model. A brief point may be ade at this stage. Notwithstanding the fact that the al- orithm proposed in this paper is designed to solve some of he practitioner's problems in human resource planning, it s by no means claimed to be highly refined. It is intended o be one of the first steps in a long awaited and much eeded procedure, that would give the entire gamut of human esource planning activities a sense of direction.

The reason for selecting just a few variables may now e examined. One of the keys to successful planning pro- esses is the ability to keep the entire operation under

ontrollable levels. In other words, this brings up the oncept of scale of planning horizons. If the planner can imit his planning horizons to a small and easily moni- orable level, then there is an increased probability of chieving success (Walker, 1980). Scale of planning orizon may be construed to mean a number of things. It ould imply starting off with a small forecasting range, r using techniques that are within the expertise of the irm. It could also mean that the cost factors are kept t a minimum. For the purpose of this paper, the author sed the concept of scale to select just a few principal ariables. Selection of these variables was based on the indings of Greer and Armstrong (1980) about future areas of mphasis in human resource planning as envisaged by prac- itioners. By limiting the size of the model for the onsideration of just a few variables, the planner may be ble to get a better grasp of its functioning. The idea s to make the model easily comprehensible while still eing a useful tool. The inclusion of any additional vari- bles would only serve to make the model unwieldy and there- y decrease the interest of its users (Mann, 1978).

Apart from the fact that the variable listed in the odel receive frequent mention (Craft, 1980; Greer and rmstrong, 1980; Walker, 1980) and are recognized as being rucial, there is also a certain logic to their inclusion

n the model. As Walker (1980) has noted, in applying nd constructing models, attention should be directed to he principal problem areas. These are the areas where he possible beneficial action is greatest. There is also nother noteworthy point about the variables mentioned in he model. Each of the variables includes a subset of ther variables. For instance consider the nature of the nvironment. The kind of technology used by the firm etermines to a certain extent the environmental charac- eristics. The nature of products manufactured, stability f market share, and suppliers are all different deter- inants of the firm's environment. Thus they have all been rouped together under one major variable. Another xample would be the nature of data base required. As raft (1980) pointed out, a good data base is dependent n other related factors; for instance, trust in the fore- aster/planner, and the perceived influence of the fore- aster. So, by inference, a good and well developed data ase may presuppose the existence of a high level of trust laced by the operating staff in the forecaster. It is bvious therefore that though the model is seemingly small n scope at first glance, a cursory examination reveals nat it has a greater depth. However, the model is not esigned to be a comprehensive itemization of all the or- anizational variables that affect human resource planning.

ome of these other variables are organizational structure, anagement philosophy and style, and planning process Naylor, 1975). A few questions that these variables raise re: (1) Is the company decentralized or highly centralized? 2) Is the management authoritarian, permissive, passive, ggressive or entrepreneural: (3) What has been the track ecord of planning in the company? As is evident, these eustions are quire crucial and relevant to the planning rocess. But any attempt to enlarge the model to include hese variables, is fraught with the risk of making it nwieldy. Besides, once the user of the model is familiar ith the basic concepts involved he can easily adapt the odel to include some of these excluded variables. The egislative influence on human resource planning is another xample of a variable that has not been included in the odel.

The characteristics of forecasting techniques presented n this model have been derived from existing literature Bryant et.al., 1973; Walker, 1980). As such, they are uite subjective in nature. Another point that needs to be ade at this juncture is with regard to the applicability f these characterizations within each category of forecast-ng models. Characterizing these models as having low ccuracy does not imply that all the techniques within this ategory have the same low levels of accuracy. The Delphi

echnique may yield comparatively better results than, ay, rules of thumb. The characteristics mentioned in the odel are just aggregate statements. Also, the character- stics of a particular category are described relative to ne other categories. For instance, the Delphi technique, nder simple forecasting models, may require costly execu- ive time. Yet when compared to integrated simulation odels they are substantially less costly. At least the mplementation costs of simulation models are much higher. n the long run, they might prove more economical.

The methodology in this paper has been to take a articular category of forecasting techniques and then ssess its impact on all the relevant variables included in ne model. The first category is simple forecasting models. xamples of such models are judgemental forecasts, rules of numb, staffing standards, ratio trend analysis, time series, nd the Delphi technique. It should be mentioned here that nlike the other techniques in its category time series is quantitative technique. Also, along with the Delphi tech- ique, it represents a marked refinement over the other imple forecasting models. All of these techniques function ffectively only under the assumption that the status quo, n terms of environmental trends will be maintained, i.e. ne trends are static rather than dynamic. This static ature explains the rest of the characteristics. Corporate lanning is essentially a dynamic exercise and as such has

ttle use for simple forecasting models that cannot ilize a wide range of variables. Furthermore, because ese models are so closely linked to the maintenance of e status quo, their results or projections are generally ceptable to operating staff who see no threats to their sitions. The data is usually inventory oriented. They rely report on current employment characteristics and nfigurations, and on past personnel movements. The im- ementation costs of these techniques is relatively lower. cause they are static in nature, their forecasting curacy is limited and the time span for which the fore- sts may be made is relatively short.

Organizational change models may include succession alysis, Markov/Stochastic processes, renewal models and gression analysis. The advantage of this category of chniques over the previous one lies in the fact that it nsiders a certain element of uncertainty in future events. e decision process under some of these techniques is sed on certain conditional probabilities. The decision also influenced by past experience or prior performance ich necessitates the existence of historical data. These dels may be used, therefore, under conditions of limited edictable instability. Depending on the areas of uncer- inty that these models deal with, a certain measure of tegrated approach might be needed. For instance, a certain

:obabilistic technique (Wadel and Bush, 1961) uses the
ıccess or failure of outstanding contract bids as the
ıctor of uncertainty for which probabilities are re-
ıired. Under such circumstances a certain level of
ıtegration with corporate planning is necessary. This
ıctor of uncertainty also introduces a measure of pro-
:tiveness into the data base which has to shed its inven-
›ry orientation. Because a certain measure of change in
ıe status quo is involved in these forecasting techniques,
ıe decisions based on these forecasts may evoke some
:sistance. This resistance may be offset to some extent
' the fact that the uncertainty dealt with is usually
ı the form of conditional probabilities. And these con-
.tional probabilities are essentially based on historical
ıta. The set up costs for these techniques are higher
ıan in the case of simple forecasting models. They may
›wever be utilized for comparatively longer range fore-
ısts and may yield relatively higher levels of accuracy.

Linear programming, non-linear programming, dynamic
·ogramming, goal programming and assignment models may all
: categorized as optimization models. As the very name
:self suggests, optimization models test for an optimal
›lution. In the context of human resources planning they
ıy project a mix of manpower resources necessary to attain
quantifiable objective under a given set of operating

nstraints. These models carry the concept of uncertainty stage further. These models deal with operating con-raints. For instance, a certain goal programming model harnes et.al., 1970) uses salary, budget data, and ceil-gs on manpower as the constraints. A point that must be membered about these models is that they can deal with latively few such constraints. Furthermore, these con-raints should be quantifiable. The characteristics of timization models are quite similar to those of organiza-onal change models except for the emphasis on quantifi-tion of variables and the increased levels of accuracy tainable. The consideration of operating constraints d the quantitative nature of these techniques may contri-te to a build-up of resistance from the operating staff.

The fourth category is integrated simulation models, e use of which this paper strongly recommends. They raise man resource planning from its isolated functioning to coordinated multi-disciplinary group exercise. Human sources are put on par with the traditional strategic anning areas like finance, production, and marketing. These dels deal with a much more diverse range of variables that e pertinent to the organization's functioning as an entity. e benefits of such an approach have already been reviewed the previous chapters. Factors external to the individual d the organization are considered in these models. This

rmits the greatest degree of instability in the environ-
ntal variables without affecting the accuracy of the
recasting techniques. Because environmental uncertainty
n be satisfactorily dealt with, the projections can be
de for longer durations. These models rely heavily on
mputers. They are also dependent on a high quality, and
tensive data base. This makes the set-up costs for
mulation models rather high. These models tend to gen-
ate results that are more oriented towards the academi-
an/planner. This may lead to some problems in getting
e operating staff's acceptance of the results. This
oblem may be dealt with through participative planning
involving the operating staff in the implementation
ocess. Gradually their resistance may be overcome.

The first step in the use of the algorithmic model
.lustrated in Table 2, is to prioritize the relevant
:riables that affect human resource planning. Depending
ı the firm's environmental and oprating characteristics,
ıe human resource planner may have to assign different
:ights to each of the variables. For instance, in a high
:chnology firm the environmental factor alone may be the
:y determinant of a particular forecasting technique.
ıere isn't much human resource planning literature avail-
)le that deals specifically with the process of prioriti-
ıtion mentioned earlier. However, the literature on
:rategic planning does provide a framework of guidelines

ɔve, 1979; Mills, 1979; Naylor, 1977; Quinn, 1977). cording to Love (1979), a planner should use the divi- ɔn principle to establish priorities. Under this inciple, priorities are established by a combination of rving the individual's purposes and the organization's iorities. Love (1979) also provided support to the multi- onged approach advocated in this paper. He has stated at a marginal effort on each alternative is better than ll effort on just one alternative. Quinn (1977) has bstantiated the contention of this author that there can no golden rule for the process of prioritization. cording to him, this process requires a subtle balance vision, entrepreneurship, and politics. It is a complex nsensus building process that does not seem to have any ecise beginning or end. The process of prioritization concomitant with a review of the planning environment ıich includes organizational structure, management philo- ɔphy and style, business environment, and planning process Naylor, 1977).

The second stage in the use of the algorithm is to valuate the prioritizations that have been made. At this ɔint the question that the planner needs to raise is nether these prioritizations were consonant with his es- imation of organizational needs. For instance, giving ndue weightage to the factor of operating staff's acceptance ay eventually lead to the selection of a relatively inferior

orecasting technique. The organizational "realpolitik" Frantzreb, 1975) may have necessitated a certain order f prioritizations that might not be conducive to human esource planning in the long run. The planner has to e-examine these prioritizations and initiate certain basic hanges that will facilitate more effective planning. He ay resort to a greater degree of interaction with the perating staff to break down their traditional resistance o planning activities.

The third stage in the use of the algorithm is the ctual selection of a forecasting technique. The process escribed so far may be better explained by means of an xample: take a firm involved in the manufacture of semi- onductor chips. Assume that human resource planning has ot yet been integrated with strategic planning. This is uite probable because, the high level of technology in- olved may have resulted in a lack of emphasis on human esources. Consequently budgets for human resource planning re restricted. Acceptance of sophisticated techniques may ot pose a major problem because the skill composition of the mployees is markedly high. This also makes high accuracy n forecasting a paramount consideration. Even though it s possible to find historical data, the relative recency f the semi-conductor industry is responsible for a less xtensive data base. Also, technology in this industry

changes almost once in three years. This means that the data has to be highly proactive and well developed if it is to be useful. In the case of the firm under consideration, the assumption is that the data base is relatively inadequate. The human resource planner may make the following prioritizations. The rapidity of technological fluctuations and impact of economic downturns on business make environment the most important variable. In fact, during the previous decade two major recessions have led to a sharp decline in the number of firms competing in the industry. High levels of accuracy in forecasting is the next important consideration. Based on the first two factors the appropriate technique might be an integrated simulation model. However, the cost restraint, the lack of an integrated approach, and the relative inadequacy of the data base may force the planner to settle for optimization models for the present. Within the category of optimization models, dynamic programming as described in the previous chapter seems to be an ideal choice. The example described above has been kept relatively simple. The rationale for this simplicity is that it is more important to understand the underlying concepts rather than just the mechanics of the procedure.

The fourth stage in the use of this algorithm is related to evaluation of human resource planning in general,

and the forecasting technique in particular. Evaluating a forecasting technique implies more than just measuring the levels of accuracy that may be obtained. The key criterion should be the ability of any given technique to achieve operating goals effectively while being cost efficient. If a particular forecasting technique fails to satisfy this criterion, then the planner may have to give serious consideration to other alternatives in forecasting techniques.

The fifth and final stage in the algorithm is the keynote theme of this paper. The planner's objective should be to eventually reach the point where the organizational variables permit the usage of integrated simulation models. Recalling the example of a firm in the semiconductor industry, the planner may have to develop a more systems oriented data base. To minimize the effects of technological changes, he may establish a closer liasion with the research and development department in his firm. This may permit a better match between staffing needs and the state of technology. Given the perceived levels of uncertainty in the enviornment, integrated simulation models are ideally equipped to deal with this uncertainty. The higher set-up costs are offsetby their successive utilization.

A few concluding remarks may be made at this stage. The process of prioritizing the variables is an organiza-

tion specific exercise and is dependent on the cognitive skills of the human resource planner. There are no normative rules for this process. The algorithm proposed in this paper is intended to familiarise the planner with some of the principal factors that affect human resource planning and methods to deal with them. These factors were elicited from the past experiences of practitioners in the field. Recognizing the presence of these factors and their relevance to the planning process in the firm is an exercise which the human resource planner has to complete without much assistance from the academicians.

CHAPTER V

CONCLUSIONS

Human resource planning, in its present state, lacks a strong theoretical foundation. Even though there has been a dramatic surge of interest in human resource planning, no major conceptual breakthroughs have resulted. There have been certain major problems both in theory and practice. However, it is time for academicians and practitioners to collaborate and revitalize the entire sphere of human resource planning activities. They need to develop valid theoretical contructs and an effective methodology for application purposes.

The model developed in this paper is a relatively uncomplicated attempt to channelize the mass of information on human resource planning into a meaningful and useful tool for solving the practitioner's problems. It is the sincere desire of this author that better trained and more experienced people take this model, in its relatively crude form, and develop it into a more refined model. There is also a need for human resource planners to work towards incorporating comprehensive and integrated simulation models (Beal, 1979). With this objective in mind, the planner has

:o initiate certain facilitative processes like, building
ıp a proactive personnel information system, and involving
:he operating staff in corporate planning exercises.

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