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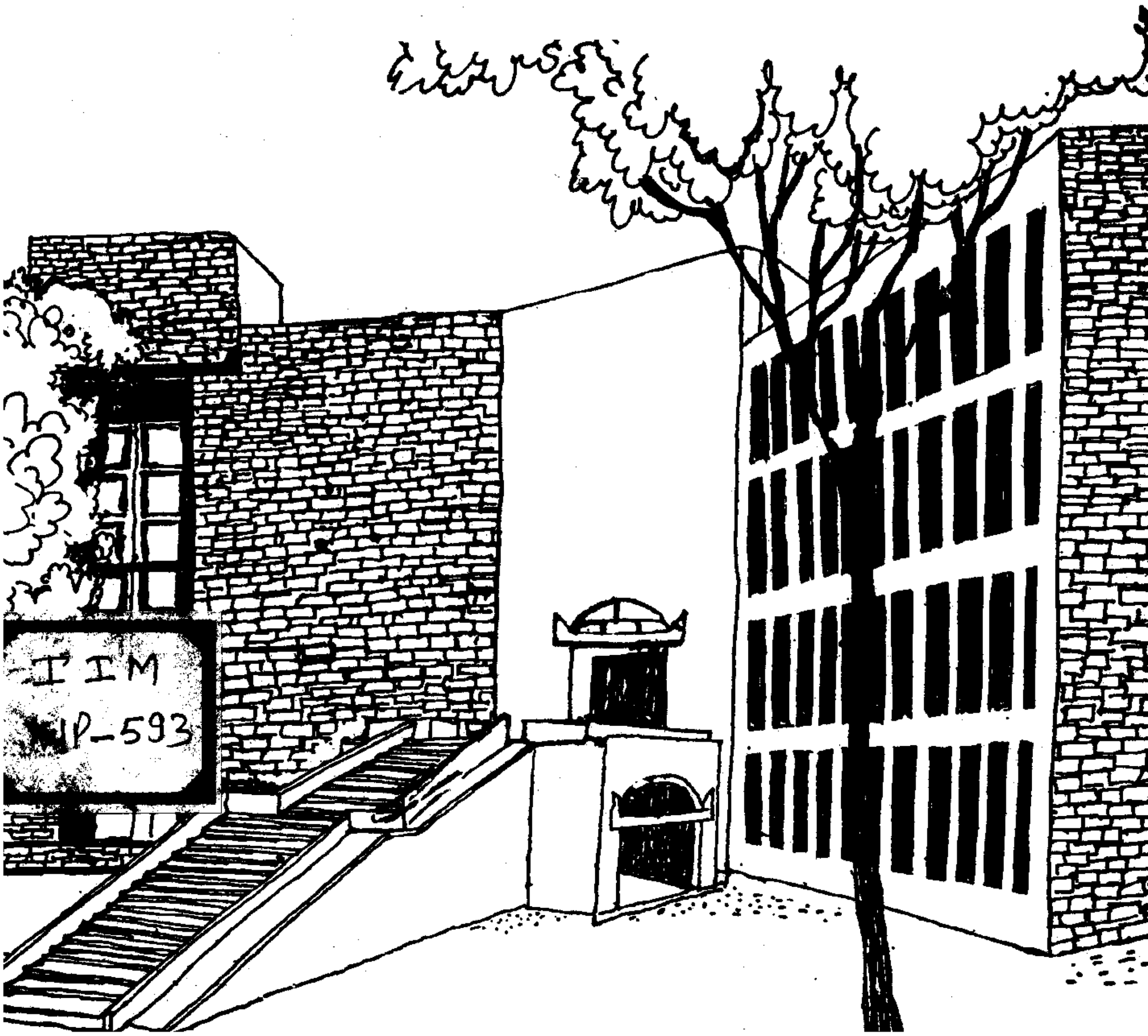

RESEARCH METHODS FOR HUMAN RESOURCES MANAGEMENT

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The environment within which human resources are to be managed is rapidly changing. Firstly, there is an increasing competition which organizations have to face in the markets. This implies that the human resources must be effectively managed to reduce cost and increase productivity. Secondly, labour legislation calls for careful thinking on the part of managements in relation to discipline, lay-off, retrenchment and closure. Thirdly, the inflationary conditions are creating intense dissatisfaction with the compensation practices in industry. Fourthly, technological and structural changes are occuring in industrial organizations. Such changes are a source for alienation and conflict. Finally, the background, attitudes and behaviour of the managers, supervisors and workers are rapidly changing in response to the environment, both internal and external, to the organizations.

In response to this increasingly complex situation, human resource managers must design innovative systems for planning, utilizing, and developing human resources. This is so because every organization is unique by itself

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and therefore there is a need for such systems to be designed within the framework of an organization's cultural reality. Personnel research contributes towards the designing of systems appropriate to an organization.

The objective of this paper is to indicate the methods of research which are relevant to the problems in managing human resources and to draw conclusions in respect of methodologies which could be experimented in individual organizations. The paper is thus divided into four parts. Part I deals with the possible hypotheses which can be evolved. Part II is concerned with the methods of collection and organization of data. Part III describes methods of statistical analysis. Part IV brings out theimplications of personnel research for the human resource managers in the organizations.

HYPOTHESES IN PERSONNEL RESEARCH

It is necessary for human resource managers to identify the alternative hypotheses which could be validated with a view to evolve justifiable personnel tools and techniques. In this context hypotheses are those statements which are drawn from either previous researches or from experience. In a specific situation these are then sought to be validated against the facts of the situation. Thus the problem is whether the assumed relationships between the dependent and independent variables exist in reality or they occur merely as a matter of chance. We distinguish between the <u>null hypothesis</u> and the <u>alternative hypothesis</u>. The null hypothesis(H_0) is usually formulated for the express purpose of being rejected. If it is rejected, the alternative hypothesis (H_1) may be accepted. The alternative hypothesis is the operational statement of the research hypothesis, which is the prediction derived from the theory under test. An illustrative list of research hypotheses is as follows:

(1) The forecasting of net human resources requirement in the organization is appropriate.

(2) The selection decisions are based on valid and reliable criteria and predictors, and appropriate combination of the predictors.

(3) The development of appraisal system is grounded in the cultural reality of the organization and it has achieved the objective of developing the potential of individual employees in the organization.

(4) The system of training and development takes into account the needs of the individual as well as of the organization and it is geared towards modifying skills, attitudes and behaviours of employees in the positive direction.

(5) The compensation system in the organization is not only adequate in terms of the relevant criteria of pay fixation but it also ensures distributive justice.

(6) The preceptions, attitudes and behaviours of both the management and the workers are structured in a manner that they lead to a problem-solving approach in the organization.

(7) The relationship between the union and the management is characterized by conflict of interests but these conflicts are managed in a constructive manner.

(8) The administrative decisions in placement, promotions, transfers, pay fixation are carried out in a fair and impartial manner in the organization.

(9) The human resources management function contributes to the viability of the organization by effective allocation, utilization and development of human resources.

These hypotheses may be further divided into sub-hypotheses for validating various systems, tools and techniques being practiced in the area of managing human resources. For instance let us take the effectiveness of human resources management function itself. We may ask the following questions:

1. To what extent the human resources policies are cost effective?

2. To what extent the human resources are available in the right numbers and of the right quality for critical jobs?

3. To what extent optimum levels of productivity have been achieved in the organization?

4. To what extent the human resources developmment activities have really modified the behaviour patterns in the organization?

Similar sub-hypotheses could be developed for the hypotheses enumerated above. Some of the hypotheses mentioned above have been tested in the context of their individual organization or cross-section of organizations. Although our emphasis should be on developing capabilities for conducting research within the organizational context, the cross-section studies are also useful in pointing out the relevance of research findings for similarly situated organizations.

RESEARCH METHODS

There are three aspects of research which must be kept in view: (1) collection of data, (2) organization of data and (3) inference from and interpretation of statistical analysis.

The data for case studies are generated by observation, by discussions or by review of company documents and information. We may however, distinguish a case, a case-study or experience-sharing. A case is a depiction of real life situation which lends itself to analysis, generation of alternatives, and the choice of the best alternative under given set of circumstances.

A case study represents not only the understanding of a situation but it also provides the interpretations of the researcher. On the contrary, the experience-sharing is not necessarily either a case or a case-study yet it has the possibilities of being converted into a case or a case-study. In all these three methods of research, the act of observation is implied in varying degrees.

The method of observation refers to gathering information from the activities which a researcher can observe either as a participant in a group or as an observer of behaviour patterns. Bales suggests certain well organized systems for observing and recording behaviour[1] Such systems relate to positive aspects of social and emotional behaviour both positively and negatively and systems relating to the task area. However, Kolasa cautions that the group behaviour may be influenced by the knowledge that the group is being observed[2]

A number of studies can be identified which have used the methods of case, case-study and experience-sharing. Let us consider the following situation:

> Ashok Corporation was faced with the question of implementing a job evaluation scheme, prepared by a joint committee of the management and the union. The scheme was largely unacceptable to the employees of the corporation. The Chief Engineer was therefore concerned with the reasons for the non-acceptance of the scheme.

Sheth[3] describes the various forms of relationship among the work people and the values and norms governing them. He begins with a description of the emergence and growth of the factory, a normal day's routine in it and the formal organization of its employees into groups and categories. An examination is then made of their social background and their obligations to local communities, caste, and kinship groups to see how far these influenced their work. The same linguistic, caste and kinship groups were continued within the factory, making up an institutional network of relationships. Relations between different groups and with the management are described and the points at which they touched the formal network suggested. The author concludes that the values of a pre-industrial society seem to co-exist with those of the industrial society, producing an intermixture of traditionalistic and rationalistic norms.

Dayal[4] shares his experience with regard to the role that a personnel manager can play in changing the culture of an organization. He concludes that success of organizational design, as suggested by him, depends on the degree of realization by managers that each role-incumbent has multiple role relationships in whatever role he occupies in the organization and he must develop accurate perspectives of multi-role relationships. He believes that this is an important feature of the work in the complex organizations of our age.

A number of researchers have undertaken sample surveys on various aspects of human resources management.

The survey method consists of the following procedures: (a) formulating the questions, (b) setting up the sample and (c) interviewing. The questions may be either open-ended or structured. Sometimes attitude scales are developed to generate data. Thurstone[5] developed a scale that contains 11 points along a continuum of favourable and unfavourableness. Likert[6] developed a five-point scale consisting of strongly approved, approved, undecided, disapproved, and strongly disapproved. Other means of measuring aptitudes consist of semi-projective and projective techniques. Samples of respondents can be drawn in a number of ways. The most common methods are random sample, stratified sample and area or block samples. These methods try to establish the representative character of the sample drawn from the given population. Interviewing is a difficult problem and therefore adequate training is necessary so that the interviewer does not introduce his own biases while recording the interview responses.

Gopalaji[7], who undertook a survey of personnel practices with specific reference to organization chart for the organization as a whole and the level of personnel functions and personnel ratios in 31 units spread over different parts of the country found that while 21 of the organizations (67.74%) had organization charts, only 16 (51.61%) had such charts for the personnel departments and 16(51.61%) of the organizations had organization charts for both the organization and personnel departments. Thus planning for personnel organization has not received due importance in Indian manufacturing industries, though there was growing realization of it on the part of top management.

Gokhale[8] analysed the test battery used by one of the largest nationalized banks for selecting probationary officers across 12 States. He concluded that such tests were inadequate in bringing out the innate intellectual potential of rural and lower class applicants. Hence they need to be revised if a fair selection method is to be ensured.

In his study of the Indian industrial worker, Sharma[9] had tried to examine two broad areas of his daily experience, one dealing with his work life and the other concerned with his experiences outside the plant. The phenomena examined include a few subjective dimensions, for example, commitment to industrial work, occupational aspirations, company satisfactions, and alienation as well as certain aspects of objective behaviour, for example, absenteeism, union involvement, and community involvement. The author concludes that the Indian worker has low level of commitment to work, occupational aspirations, and community involvement, and high level of alienation.

The experimental design consists of manipulation of the independent variable to observe its impact on the dependent variable[10]. Thus, it is possible to evaluate the change occuring in the dependent variable before and after the event. Another design consists of two groups: experimental group and the control group. The experimental group receives the treatment while the second group, the control group, does not. Any difference in the measured dependent variable is presumably the result of the action of the independent variable.

Dhingra, Pandey and Paliwal[11] have reported the progress in action research conducted in a textile mill.

This action research was undertaken to develop psychological tests for identifying potential weavers, and the relationships of test scores with criterian-scores. The authors found that scores on selection tests were not significantly related with certain scores except on two elemental tests. In their conclusion, they have suggested the need for improving selection tests and a criterion for validation.

The study by Saiyadain[12] was designed to test the hypothesis that the satisfaction based on supervisory practices was not randomly accepted by subordinates. It was suggested that the subordinates' level of social competence would mediate the satisfaction derived from the supervisory style. A group of 76 class III employees filled in several questionnaires designed to get measures of both independent and dependent variables. The results indicate that though high level of social competence and democratic style of supervision independently induce greater satisfaction, subordinates with high social competence experience greater satisfaction with authoritarian style of supervision. The findings are explained in terms of need to be controlled as well as dissonance model. The implications of the findings are highlighted.

A similar method but much more generalized is the method of action research. This method calls for diagnosis of the problem, application of appropriate intervention and evaluation of the impact of intervention in modifying the behaviour patterns in an organization. This method will thus call for an objective approach as the part of the manager.

Nitish R De[13] describes his experience of action research that he conducted in the shop floor of an organization. This was initiated in order to ascertain whether work commitment can be developed at different hierarchies of employees by bringing about a change in the work system. A detailed analysis of the unit was undertaken and workers in the unit were then involved in discussions which resulted in the setting up of the task force with the representatives of each category of workers and a supervisor. It was also decided that the membership of the task force would be rational and on a monthly basis and that a new work system would be evolved to take care of workers' motivation. As the system started working, a positive climate with increased efficiency was noted. Workers also became multi-skilled. The experiment, most importantly, helped in changing attitudes of employees in the organization.

Verma and Rao[14] describe action research carried out with a sample of welfare officers from the textile mills of Ahmedabad. This project was started with the objective of experimenting with the Welfare Officers as change agents in the organized sector. First, a survey was conducted through a mailed questionnaire in the current activities of welfare officers, their attitudes and motivations to family planning, and their eagerness to work as change-agents in this area. A random sample of 100 workers from 20 mills was also chosen and results of this survey indicated that the workers of these mills generally had a positive attitude towards a small family but had little knowledge about different family planning techniques.

After the survey, the 20 mills were divided into a group of 10 experimental mills and ten control mills. The experimental group of welfare officers was invited for a training programme on change-agents in family welfare, which helped them examine their own motives, attitudes and roles and discovered that they had ample scope to be change-agents in family welfare. They made a diagnosis of their own organization on the basis of the survey data collected in the project. They set future goals and worked out action steps individually for change in their mills. There action steps reflect different strategies depending upon individual mill situation.

During the period 1974-77 the welfare officers of the experimental group of mills carried out their own strategies to spread family planning among their mill workers and results indicated that atleast 8 out of 10 welfare officers in the experimental group were able to achieve varying degrees of success in such activities. But the welfare officers of the control group could not achieve as much success as those in the experimental group. The latter's success was largely due to perseverance of the welfare officers of this group.

The authors conclude by saying that the welfare officers can play very innovative and facilitative roles in contributing to the family welfare of the workers through some stimulation by an outside agency, group-support, provision of technical know-how, and support by top management.

M.S.S. Varadan[15] discusses the organizational development experiment initiated at HMT, in which organization, he was himself a senior manager. This experiment is a good example of action research, wherein problems were identified at various levels and action plans worked out.

In 1969-70, the new concept of process selling was introduced in place of mere product selling. The main area of thrust was sales and marketing and the following organizational problems were worked out: Indepth comparative study of HMT's products with competitors, process selling and total plant engineering service concept, newer marketing strategies and techniques, base for future-two year industrial marketing strategies for fresh engineers. Results indicated that sales turnover was Rs:204.3 millions in 1970-71 compared to Rs:166.7 millions in the previous year. In subsequent years, that is, 1971-75, among others the following organizational problems were worked at: Company objectives, Head office-unit Relationships, Utilization of Management Services, Resource-sharing for optimum utilization, speedy Introduction of new products, Improving Productivity and profitability, team building, maintenance management, Role of supervisors, Productivity problems, Financial Management for Technical Executives etc.

OD efforts to tackle the above problems were concentrated around laboratories and short term courses. Sophisticated techniques like PERT, Value Engineering Teams, and L.P intduction were used. The laboratories helped to identify action plans to be implemented by cooperation between various departments. The results indicated that rejections in finishing operations had come down, new systems were introduced in stores functioning, as also improvement in inter-personal relations. OD for workers at Kalamassery unit of HMT elicited positive response as far as constructive suggestions relating to direct production, working conditions, welfare measures and general policy measures were concerned. These were then taken up for implementation through action plans at various levels. In the author's own words "OD has become a way of life in HMT".

OD at Richardson Hindustan[16] is an example of how organizational development (OD) was implemented in a company which had a host of problems: cash poor, low morale, hostile labour, adversial labour management relations, and high managerial turnover. Organizational diagnosis revealed poor communication among departments due to the marketing orientation which was the main activity of this consumer-products company. An allied problem was poor man-management skills among highly competant and result oriented managers. There was a bureaucratic and procedure oriented management.

Gurcharan Das, who took over as Chief Executive of the company in 1981, changed the entire corporate culture of the company through organizational development.

A participative style of management, with emphasis on decision-making in the participative way and involvement of workers was evolved through workshops for managers at various levels. Managers were made to change their style of functioning through inputs learnt in those workshops. Other OD efforts included a ten day residential workshop for field sales supervisors and managers which focussed on people management and selling skills, a one-week residential programme for senior and middle managers with emphasis on developing general management skills and similar workshops for union leaders sales and marketing managers and other personnel. Workshop for union leaders - the company had only an in-company union - were organised on a special basis and inter-personal issues were resolved. Communications with workers was made more easier and direct.

All these efforts, coupled with appointment of key personnel like VP(Personnel), human resources development manager, etc. to continue and follow-up on each of these action plans helped the organization achieve major changes in work environment and worker commitment.

SECONDARY DATA

We have already indicated that company reports and documents could be useful sources for generating data. Very often the personnel managers have to generate data for purposes of comparing their own policies and practices with those prevalent in similar organizations in the same industry or region. For instance, while negotiating wages and fringe benefits or introducing changes in working conditions, the managers have to obtain relevant information from other organizations. Sometimes such data are published by employers federations or government agencies. The personnel managers may also benefit from the statistical studies conducted by academicians on specific aspects of personnel management, the data for which may be drawn from published sources. We quote three such studies here.

Monappa and Kamat[17] analysed data contained in annual reports of a sample of 150 companies, listed asset-wise in 1975 by the Economic Times, with special emphasis on statutory information provided under Section 217(2A) of the Company's Act in such reports. The purpose of this analysis was to find out the status of personnel managers in the corporate structure, focussing primarily on salary, designations and qualifications/experience.

The authors found that a significant majority of the companies had recognized the importance of the personnel function and relative importance had been given in the corporate structure.

Varde[18] talks about long-term forecasts of manpower requirements of the commercial banking industry in India. Her paper has two objectives (i) to discuss the credibilities of various approaches and techniques for forecasting long-term requirements of manpower of the commercial banking industry in India, and (ii) to present the forecasts of the annual requirements of this industry for a period of 15 years - from 1982 through 1982 - obtained by employing the most appropriate and reliable techniques. Analytical implications of these forecasts, such as net recruitment on each level of staff during the forecast period and the waiting period of clerks for promotion to the supervisory level are also discussed.

Verma[19] analysed the growth and compensation of salaried employees in manufacturing industries in the years 1950-64, using data contained in Census for Indian Manufacturers for the years 1950 to 1958 and Annual Survey of Industries for the years 1959 to 1964.

He found that theproportion of salaried staff employees was influenced by labour productivity, capital intensity and average salary. In turn, average salary was found to be highly correlated with productivity, capital intensity and the proportion of salaried staff to total employees. As regards policy implications of three propositions of the author, it should be recognised that labour productivity itself depends upon, among other things, the availability of efficient management. Any attempt to implement a policy of increasing productivity should therefore consider the contribution of salaried staff to production effort. Secondly, with the introduction of modern technology, an expansion of salaried staff could be expected. Consequently, the need for educational facilities to train managerial and technical personnel should be carefully considered. On the basis of data related to this third proposition, the author brings out the fact that while in 1950, production workers earned only 47% of staff salary, the proportion fell to about 45% in 1964, though they also earned substantial fringe benefits thus implying that in order to expand the employment opportunities for salaried staff, it may be necessary to reduce this differential.

METHODS OF DATA ANALYSIS

Broadly speaking, there are three major ways in which data can be analysed to test the hypotheses-and reach meaningful conclusions. These are content analysis, non-parametric methods and parametric statistical methods.

Content Analysis

The content analysis is defined by Berelson as "a research technique for the objective systematic and quantitative discription of the manifest content of the communication'.[20] He makes a distinction between "what is said" and "how it is said" - in other words, between substance and form.

Three typical studies, among others, are based on content analysis. Subramanian and Devi[21] analysed advertisements released in "THE HINDU". A total number of 496 advertisements - 125 belonging to the public sector and 371 belonging to the private sector-formed the sample for the study under taken to evaluate the adequacy of information provided through advertisements of public and private sector organizations. They concluded that public sector companies are more explicit about both job description and compensation details, than their counter-parts in private sector.

Monappa and Joshi,[22] based on information obtained from 186 managers who participated in Executive Development Programmes conducted at the Indian Institute of Management, attempt to present a managerial perspective of the Personnel function. Seven broad areas of concern to these participants are discussed. These are: (a) structure, location and autonomy of the personnel department in the organization. (b) Manpower planning and Recruitment/selection, (c) Performance appraisal, promotion and transfer, (d) Employee development and training, (e) Working conditions, welfare and reward systems, (f) Industrial relations and (g) Systems, procedures and standards.

The authors conclude that it is not merely the location that is important for the growth and contribution of the personnel function, but a combination of factors such as thetop management support, the career orientation of the Personnel Manager, his ability to prioritise sub-systems in terms of the organization needs, both short-run and long run and the implementation of policies and programmes as a result of prioritazion resulting in or moving towards enhanced viability of the corporation.

E.A. Ramaswamy[23] describes in detail, two major strikes in South India. He collected data as and when these strikes took place. Based on arguments drawn, derived from, and enriched by such data, the author attempts to explain his theory of the State, with focus on its role as an important party in the triangle of employers, trade unions and the government that together form the Industrial Relations System in India. In his conclusion, he points out that gain in a system of state regulation is a function of the quality of one's claim on the political executive. Secondly, labour can be reasonably certain that the state will protect its right employment whereas the management has the greater say with regard to economic compensation and production levels.

Non-Parametric Methods

The inter-group differences may be assessed through the certain tests such as the critical ratio, the chi-square and analysis of variance.[24] The critical ratio compares the difference between the means of the two groups with the standard deviation of that difference.

$$CR = \frac{D}{\sigma D}$$

A critical ratio higher than 3 gives a high probability f a real difference between the means, since the probability is light that a chance score would be found more than three sign as above or below the mean. The chi-square (X^2) tests may be used when there are many different outcomes possible. Thus

$$X^2 = \frac{(O-E)^2}{E}$$

Where 'O' is the observed figure and 'E' is the expected one.

The analysis of variance leads to the estimation of F-ratio. It is defined as the ratio of two estimates of variances being compared (the variance is the square of the sigma or standard deviation):

$$F = \frac{V_1}{V_2}$$

The F ratio thus predicts whether the differences between the two groups are significant or not.

Srinivasan,[25] using the Delphi technique - which is an extension of the systematic analysis into the areas of opinion and value judgements - attempts to forecast the status and content of Executive Development programmes in 1985.

The results of the study, in the form of forecasts, according to the author, have already started taking shape, atleast in an elementary form. An executive attending a development programme in 1985 would very likely be a management graduate possessing the basic skills and knowledge.

Saiyadain's[26] study examines the usefulness of a selection test by expanding the scope of validity design. In addition to correlating the test scores with the first year performance, it correlates them with the scores on subsequent performance measures.

Data for this study was collected from three private sector manufacturing organizations, which had the Wonderlic Personnel Test or on adapted version of it as the only common test among them, though they had other tests and personality inventories for selection.

Results indicated no relationship between test scores and first year performance appraisal scores. However, the relationship between the two for the second and third years turned out to be significant.

Baldev R. Sharma's[27] study is based on a random sample of 166 supervisors (of the rank of "Chargeman".

Data was collected on a specially designed structured questionnaire, which took about two years to develop. This revised questionnaire seeks information regarding employer-employee relations, which is the dependent variable, and nine aspects of organizational environment. Thus, these ten variables were: Employer-employee relations, Advancement, Grievance handling, Money, Participation, Objectivity, Recognition, Security, Training, and Welfare.

The findings of this study clearly show that an improvement in two areas will have a positive influence towards improving the climate of relationship between management and supervisors. These two areas are - scope for advancement and monetary benefits. Data on the remaining seven factors shows that when compared to the two factors mentioned above, these factors were relatively unimportant in the organization under study.

Parametric Methods

The extent to which two variables are associated with each other is denoted by the coefficient of correlation.[28] This coefficient varies between +1 to -1. The linear correlation is computed in the following manner:

$$r = \frac{\Sigma xy}{\sqrt{(\Sigma x^2 \Sigma y^2)}}$$

Where r is the coefficient of correlation, X is the deviation from the mean of one variable and Y is the deviation from the mean of the corresponding variable.

Sometimes it may be necessary to rank the variables in order of size instead of using the actual values of the two variables. In such a situation, we may compute the Spearman Rank Correlation coefficient. The formula for the Rank Correlation is the following:

$$R = 1 - \frac{6 \sum d^2}{n(n^2-1)}$$

Where d is the difference in ranks and n is the number of observations.

As it has been indicated, the coefficient of correlation merely indicates the degree of association between two variables. The coefficient of regression goes a step beyond this. It shows the extent to which a change in the independent variable brings about a change in the dependent variable. The linear regression equation is as follows:

$$y = a + bx$$

Where y refers to the dependent variable, x to the independent variable, a to the constant value, b to coefficient of regression and e to errata. In order to calculate the values of 'a' and 'b' it is necessary to use the following equations:

$$a = \frac{(\Sigma x)\ (\Sigma xy) - (\Sigma y)\ (\Sigma x^2)}{(\Sigma x)^2 - n(\Sigma x^2)}$$

$$b = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}$$

Where in addition to earlier notations, 'n' refers to the number of observations.

The preceding formulae referred to simple linear equations. It is possible to extend this analysis to multiple correlation coefficient, multiple linear regression and non-linear modes of correlation and regression.

Deb and Seshadri,[29] on the basis of data collected from four companies that recruited management trainees, sought to examine the ratings of the interviewees' traits as assessed by the interviewers so as to determine the extent of concord and unanimity among the raters.

After collecting the data and scoring the same, estimation of the reliability of the interviewers' rating was made by employing Ebel's method of computing inter-class correlation. The formula suggested by him to determine the reliability for mean ratings of k raters is

$$r_{kk} = \frac{V_p - V_e}{V}$$

Where r_{kk} is the reliability for mean ratings from k raters. V_p is variance for persons and V_e is variance for error

The sensitivity or the significance of reliability was then determined by Jackson's formula as follows:

r^2 (sensitivity of reliability)

$$= \frac{V_p - V_e}{V_e}$$

Where $_p$ is variance for persons and V_e is variance for error.

Results indicated that regarding the final assessment there is unanimity among raters (high, significant inter-rater reliability). Also, traits like leadership and initiative may be assessed correctly if they are well defined.

Johri and Agarwal[30] analyse the trends in the inter-industry wage structure during 1950-1961 and test some hypotheses pertaining to it. The purpose of their paper is to analyse the trends in the inter-industry wage strudture in India during a 12 year period, 1950-61. The study is based on the published data in twenty-nine industries included in the Census of Indian Manufacturer (CIM) and the Annual Survey of Industries (ASI).

The methodology of the paper consists of making a descriptive analysis of the data and reinforcing the same with a cross-sectional analysis for each of the four sub-periods - (i) 1950-1952; (ii) 1953-1955; (iii) 1956-1958; (iv) 1959-1961.

They find that the wage structure has gradually widened over the period and shown flexibility in both the upward and downward directions. They have appraised the hypothesis that in a growing economy, characterized by wage flexibility, the wage structure will widen in response to shifts in the composition of demand. In addition, they have tested the hypothesis that the variables measuring the expected ability to pay are significant determinants of the inter-industry wage structure. On the basis of this analysis, certain policy conclusions are drawn.

Verma[31] analysed Industrial Conflicts in India and attempted to explain the phenomenon through a statistical analysis. To analyse the trend of conflicts, time series data on the number of disputes, the number of workers involved, and mandays lost were collected from the Indian Labour Statistics. From this basic data, the number of mandays lost per dispute as well as the number of mandays lost per hundred employees were computed. It was found that inflationary conditions had significantly influenced the strike activity. The wage-productivity ratio had some influence. A cross-section analysis for inter-state and inter-industry various in strike activity was also a tempted by the author who found that employment, salaried staff-workers ratio and wage-productivity ratio accounted for dispersion in the strike activity. The explanatory model developed by the author could substantially explain strike-proneness in Indian industry.

CONCLUSIONS

The various methods of generating data and analysing them have been illustrated in the preceding discussion. It should be obvious that a personnel researcher has to follow a sequence of steps which are (i) identification of the problem, (ii) setting up the hypothesis, (iii) choosing the appropriate method of generating data, (iv) selecting statistical or non-statistical method to analyse the data and finally to draw inferences from the study. To undertake such an exercise a personnel manager will need skills to observe the changing environment, and its impact on personnel practices, to develop insights into the various research methods, and, to evolve an objective approach in his research studies. Thus, a personnel manager should combine the skills required for management and the competance for undertaking research efforts. In many ways, the role of a personnel researcher is complementary to that of a personnel manager. Nevertheless, the two sets of skills, those of a manager and of a researcher must be combined together to achieve effective management of human resources. In those situations were both skills are not available, it may be necessary to develop a team of managers and researchers who could complement the necessary skills for conducting personnel research in an organization.

In the earlier discussion, we have also referred to studies which illustrate the various aspects of personnel research. However, a survey of published literature indicates paucity of organization-based research conducted by personnel departments, on many aspects of human resources management. There is a possibility that such studies might have been conducted within the organizations but these are seldom reported in the technical journals. There is therefore a need for not only conducting such studies for developing appropriate tools and techniques of human resources management, but also reporting the findings of such studies that could help personnel professionals to develop appropriate frameworks for conducting similar studies in their own organizations.

To sum up then, the personnel departments must identify the basic problems of managing human resources in their organizations, select and apply the appropriate research methods, and, interpret the results in an objective manner. Such efforts must also be properly documented and reported so that this experience can be shared with the professionals in the area of human resources management.

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