Productivity
1986, XXVII, 2, 107-112

"Organising for Productivity at Enterprise Level"

G.K. SURI

The Author in this paper focusses on the organisational pre-requisite, preparatory exercises, evaluation methods as a part of organising for productivity at the enterprise level. This article is an adaptation of the paper presented by the author, in the International Seminar on "Improvement in Productivity in Public Enterprises", 6th to 8th May, 1986 at New Delhi.

Dr. G.K. Suri is Director General, National Productivity Council, New Delhi.

Organising for productivity and formulating an action plan require as pre-requisites commitment to productivity at the highest level and creation of a climate for productivity and work culture in the enterprise. In this, the top management in general and the chief executive in particular have to play an integral and dynamic role as their/his attitude reflected in actions sets to tone for others in the organisation. The top management must ensure that productivity improvement finds a prominent place in the corporate goals and objectives of the enterprise. Further, specific productivity corporate plans will need to be formulated as an integral component of corporate planning linked with budgets on a short and long range basis.

Organisational Pre-requisites

Creating a climate for productivity and an appropriate work culture must be considered a pre-requisite for organising for productivity at the enterprise level. A study done in a public sector enterprise[1] indicated that sound organisational arrangements, policies and practices help in generating such a climate. These arrangements and policies, among others, included :—

(a) A participative culture as the key strategy for

1. The study was done in 1982 by the author as an external collaborator of ILO, Geneva.

securing the enterprise's basic objectives of development, growth and reasonable profitability.

(b) An open style of management with easy access for all employees to the highest authority in the organisation.

(c) A well-developed information sharing system which included :—

(i) joint consultative machinery at various level;

(ii) management-employee communication meetings;

(iii) formation of Quality Circles; and

(iv) enriched role for front-line supervisors.

(d) A rational personnel function with documentation of personnel rules and procedures and their uniform application.

(e) A soundly devised 3-tier grievance procedure for quick redressal of individual grievances.

(f) A matrix system of personnel management with emphasis on functional and task group-oriented reporting.

(g) Emphasis on leadership by competence and reliance on relationship based on trust and confidence.

(h) Communication of decisions to employees well in advance about matters pertaining to their work and organisation.

(i) A wide spectrum of off-job welfare and cultural activities based on the consideration that these influence on-the-job behaviour of the concerned employees.

Preparatory Exercises

Formulation of a productivity plan of an enterprise will call for a detailed analysis of potential contributions to productivity by studying different areas including machine utilisation, efficiency, quality of output, material productivity, delivery performance, etc., for different categories of employees—direct, indirect, maintenance and craft, clerical, supervisory and managerial.[2] In this analysis, a variety of techniques, tools and methods can be harnessed. These may, for instance, include :

(a) Work-related exercises such as review of standards, employee efficiency, job evaluation, job enrichment and enlargement, plant capacity/utilisation, methods evaluation, proportion of labour cost/unit cost, quality standard,.

(b) Workman-related exercises which may relate to attitude to work, productivity, absenteeism, late coming, overtime, employee turnover, difficulties of moving people to different jobs, manpower utilisation and training needs.

(c) Organisation-related which may include attitude and morale survey, survey of workers, perceptions and ideas on productivity improvement, etc.

In assessing potential contributions to productivity, seeking ideas from as wide a spectrum of employees as possible should be considered as important as relying on engineering and technical tools such as work study, job evaluation and value analysis.

The identification of potential contributions to productivity should be supplemented with an analysis of environmental constraints both exernal and internal and identification of the areas where maximum potential would be available. An understanding of the organisational strengths, weaknesses, constraints along with an assessment and location of the areas of maximum productivity potential would help in taking strategic decisions on determining the thrust areas and formulating a productivity plan integrated with the corporate planning process.

Implementation Strategy

Formulation of measures for implementing a productivity plan should be considered as important as its formulation. Communication, that is, sharing information, has a vital role in implementing a productivity plan. The management plays a key role in inducing

2. For an illustration see Annexure I.

acceptance of the concept and plan of productivity among the employees and unions. Unless these are clearly communicated and understood and the gains from productivity improvement to the enterprise and employees highlighted, the workers and unions are not likely to participate in plans for enhancing productivity. A strong commuication structure and reliance on the communication role of supervisors for providing an important link between the management and workers should be considered crucial in securing involvement and active participation of workers. Equally important will be intra-management communication, because the scope and span of managerial influence are wide and affect many employees and activities.

Education of union functionaries in the concept, techniques and related aspects of productivity including gains therefrom, analysing and understanding implications of the productivity plan for unions and their concerns arising out of these, providing safeguards and imparting relevant information with a view to overcoming resistance and inducing acceptance should be considered another important aspect of formulating an implementation plan or strategy.

Equally important will be the enrichment of the role of supervisors. He will need to be adequately equipped with detail of the productivity plan so that he can communicate these to the workers supervised by him and dispel fears and misgivings; if any. His skill in managing men should be viewed crucial to the success of a productivity plan. Skill development will essentially involve his orientation in the relevant concept and techniques of man-management such as motivation, communication, inter personal relationships, counselling, preventive and constructive discipline and problems-solving in the context of problems typical to his job situation.

Evaluation and Feed-back Methodology

Selection of parameters of productivity sought to be influence through the productivity plan and building data base or these parameters on an a-priori basis should enable comparison of norms with performance standards and timely availability of variances for course correction. The focus should be not just on measuring changes in the physical parameters of productivity but also on changes in organisational health. Such comparison will provide feed-back on the plan and should facilitate its correction in the next cycle period.

Implications of the Finding of a Survey

A survey[3] was undertaken to ascertain organisational plans and strategies for securing productivity improvements in public sector enterprises. 39 central public sector enterprises provided the information. Another 13 were unable to furnish information because they were either newly started or had not undertaken studies or had no specific plans. The picture emerging from the data (see Annexure II) shows that the responding organisations undertook a variety of exercises and studies relating to work, workman and organisation. These exercises illustratively included review of standard, job evaluation, manpower utilisation, capacity utilisation etc. However, these exercises were undertaken on a segmented and piecemeal basis and did not form a part of a comprehensive productivity improvement plan. These exercises were neither unified nor related to a corporate concept of a productivity plan. In the absence of an approach unified and integrated with the concept of corporate and budget planning, the efforts of productivity improvements will largely remain marginal and perhaps infructuous.

Role of the National Productivity Council

A brief reference to the efforts of the NPC in the above context may be in order. NPC has been propagating the need for adopting a systems approach for improving productivity.

The NPC services over a period of time have included :—

(i) Examination of the corporate strategy and dovetailing of corporate plans with productivity management at the enterprises level.

3. The survey was carried out under the direction of the author in 1986 under the joint auspices of the Bureau of Public Enterprises and the Shri Ram Centre for Industrial Relations and Human Resources.

(ii) Development of productivity information systems so as to enable monitoring of productivity performance on a continuous basis and integrating the same with the current planning and budgeting systems.

(iii) Identification by the scanning process of the external environmental parameters, having a bearing on productivity.

(iv) Dissemination of a range of tools and techniques of productivity among the managers and workers.

NPC has also developed specific training programmes in the productivity concepts and techniques at different levels of management. It has developed tailor-made packages programmes for workers, supervisors and managers for orienting them in mechanisms for creating a participative culture and environment. It has also developed trade union and worker productivity programmes with the objectives of (a) creating awareness of the concept and importance of productivity, and (b) creating a congenial organisational climate. Many organisations are taking advantage of the expertise and experience available at the NPC for spreading the message of productivity.

→

ANNEXURE -

COMPANY............................ DEPARTMENT ....

PROFILE OF CONTRIBUTIONS TO PRODUCTIVITY

SCORING: 1- INSIGNIFICANT, 2- SIGNIFICANT, 3- FAIRLY IMPORTANT, 4- IMPORTANT
5- VERY IMPORTANT

MARK ▽- PRESENT POSITION △-POTENTIAL POSITION

DATE ....

ASSESSOR..........................

TYPE OF CONTRIBUTION	HIGHER OUTPUT OF MACHINE OR SMALL GROUP			HIGHER LABOUR PRODUCTIVITY OF DEPARTMENT					GREATER PROSPERITY OPPORTUNITIES OF THE FIRM						
CATEGORY OF WORKER	INDIVIDUAL PERFORMANCE	MACHINE OR SMALL GROUP-OUTPUT/HOUR	QUALITY OF OUTPUT	LABOUR PRODUCTIVITY	MATERIAL PRODUCTIVITY	MACHINE PRODUCTIVITY	OUTPUT	DELIVERY PERFORMANCE	LABOUR PRODUCTIVITY	MATERIAL PRODUCTIVITY	MACHINE PRODUCTIVITY	CONSUMABLES PRODUCTIVITY	OUTPUT	DELIVERY PERFORMANCE	
· DIRECT PRODUCTION	2/5	2/5	4/5	2/4	2/2	2/5	1/1	1/3	1/2	1/1	1/3	1/3	1/3	2/3'	
· INDIRECT PRODUCTION	1/2	1/2	1/1	1/2	1/1	1/2	1/2	1/1	1/2	1/1	1/2	1/2	1/2	1/1	
· MAINTENANCE & CRAFT	2/4	2/5	2/5	2/4	1/2	2/4	1/2	2/3	1/2	1/1	2/3	1/3	1/3	2/3	
· CLERICAL	2/2	N/A	2/2	1/1	1/1	1/4	1/1	2/4	1/1	1/1	1/1	1/1	1/1	2/4	
· SUPERVISION	3/4	3/4	3/4	2/3	2/2	2/3	3/4	3/3	2/2	2/2	2/3	2/3	3/3	3/3	
· MIDDLE MANAGEMENT	2/2	2/2	1/3	2/2	2/3	2/2	2/3	2/3	4/5	3/4	4/5	2/3	4/5	4/5	

"Productivity Bargaining — a Practical Guide", London, Butterworths, 1970.

ANNEXURE II

EXERCISES/STUDIES UNDERTAKEN

☐Number of Respondents = 39

☐Number of Organisations unable to Furnish information = 13

	Public Sector
A. Work-Related:	
☐Review of Standards	20
☐Employee Potential/Efficiency	19
☐Job Evaluation/Job Rationalization	18
☐Job Enrichment/Enlargement	13
☐Plant Capacity/Utilization	28
☐Process/Utilization	17
☐Process/Methods Evaluation	17
☐Proportion of Labour Cost to Unit Cost	25
☐Determination of Rejection/Quality Standards	15
B. *Workman Related*	
☐Survey of Employee Attitude to Work/ Productivity	19
☐Absenteeism/Late Coming	29
☐Overtime	29
☐Employee Turnover	16
☐Difficulties of Moving People to Different Jobs	19
☐Night Shift Work Supervision etc.	11
☐Manpower Utilization	33
☐Output Per Man-Hour, Manshift	16
☐Experience on Manpower or Crew Reduction if Any	13
☐Training Needs Survey	30
C. *Organisation Related*	
☐Employee Attitudes/Morale Survey	11
☐Orientation Programme on Productivity Bargaining For Workers, Unions, Supervisors	18
☐Survey on Region-Cum-Industry Basis	18
☐Assessment of Capacity to Pay	24
☐Survey of Workers'/Employees' Perceptions for Improvements in Working Conditions	18
☐Survey of Employees' Perceptions Relating to Technological Changes	14
☐Survey on Experience of Organisation in Introducing Changes in Work Culture	10

Productivity
1986, XXVII, 2, 113-117

"Design of Jobs and Worker Productivity"

DAVID A. LEWIS

"*This paper presents techniques for companies to use in the design of jobs and work stations to obtain greater productivity.*

Four distinct areas are identified : Work station design, design of the man/computer interface, job structure and scheduling, and worker stress and fatigue".

David A. Lewis, University of Lowell, Lowell, Massachusetts.

Introduction

The information age is upon us. With the advent of the computer, staggering advances have been made in the speed and accuracy with which data and text are available. These advancements have been made while technology employed by the human operator using these systems has remained stagnant. Productivity of office workers has increased by only a fraction of the amount obtained by industrial workers.

Some of the reasons for this lower productivity are poor workstation design, poor lighting, and other unintentional disregards for the human user in the office. Research performed by Thomas Springer has shown that good work station design can lead to productivity increases of between 10 and 15 per cent. Ergonomically designed workstations would lead to lower worker fatigue and therefore high production and greater job satisfaction.

Improving the physical layout of the workstation is not the only way to increase worker production. Providing proper illumination and temperature control can also help. Proper illumination sounds simple, but actually has many different aspects. Video screen contrast, glare reduction, character size and legibility, and background lighting level all need to be considered when determining correct lighting in the office environment

It has shown that viewing video display monitors produces eye strain and fatigue. Regular rest breaks need to be allowed to remedy this situation. Eye strain and physical strain are not the only forms of strain that occure in the office. Mental strain is also encountered when sitting in front of video screen all day. A revaluation of the way that work is structured in the office will reduce this strain.

Gathering of employee opinions on management decisions is a way to help ensure that the system is satisfactory to the employees. One an automated system is put in place, a formal system fer gathering employee feedback must be maintained. In addition, employees must undergo an appropriate training programs to insure their acceptance of the automated system.

These, then, are the major issues which must be considered when introducing office automation. Recommendations for the design of workstations, the man/computer interface, job structure and seheduling, and methods of reducing worker stress and fatigue are covered in the rest of this paper.

Work Station Design

For the purposes of this paper, the work station is defined as the area an individual occupies to do his work. How well an individual performs a job, depends to a great extent on the comfort and "fit" of the facilities to the people. In a typical office today, when new automated equipment arrives, whether it is a keyboard or video screen, it is a simply placed on the nearest flat surface, be it a desk, table, or counter. The employee is then handed the nearest chair and told to go to work. This design is very inadequate. Psychological problems such as back strain from leaning over, fatigue in the hands and arms from being held in an ackward position, and eye fatigue from viewing the screen from an unacceptable distance are to be expected.

Two critical elements must be considered in designing work stations : clearances and reach envelopes. The minimum clearances should be determined by the taller portion of the user population or the 95th percentile, and the reach envelope by the shorter portion or the 5th percentile. Designing for the average person is not a good idea because by definition 50 per cent of the population would be unable to use the facilities. Recommended work station dimensions are given in Figure 1. (From Kroemmer, 1982). The recommended adjustments for video display terminal (VDT) work stations are shown in Figures 2 and 3.

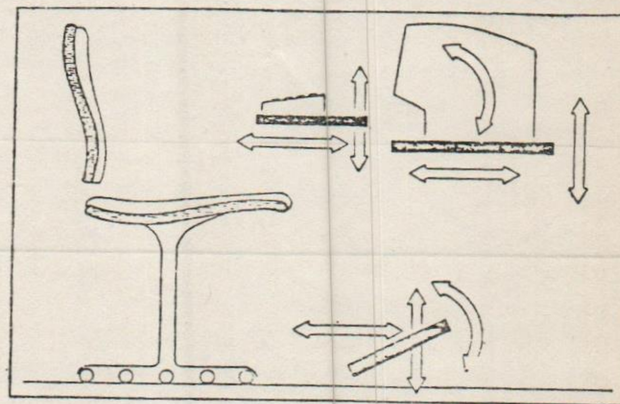


Fig. 1: Recommended Approximate Dimensions (in centimeters)

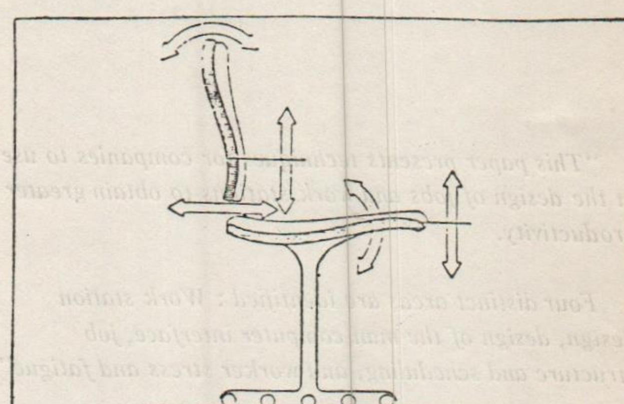


Fig. 2: Adjustment Features of an Ergonomic Work Seat

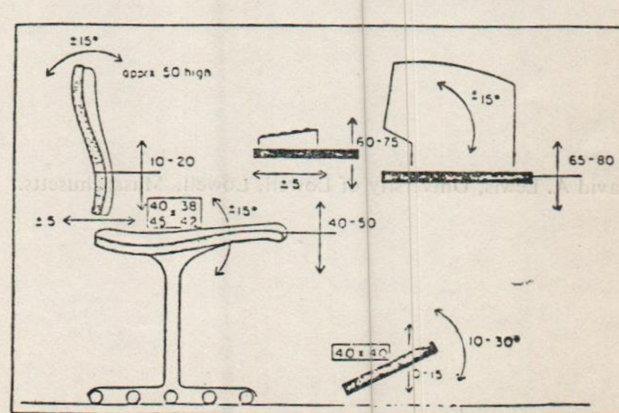


Fig. 3: Adjustment Features of an Ergonomic VDU Work Station

Seats, terminals, and screens should be free to move in all directions.

Studies performed in the laboratory and actual work settings indicate that providing an optimal work station can increase productivity significantly and lead to greater worker satisfaction. (Kroemer, 1982; Miller, 1981).

Design of the Man/Computer Interface

The man/computer interface has two basic aspects: data entry and data query. Research related to the performance of a data input task shows that adequate training is often not provided to perform the task successfully. Dainoff (1982) has identified aspects of the man/machine interface which have an impact on effect on the productivity of the users : the keyboard and screen layout and use, text presentation speeds, screen legibility, and screen colours. All of these factors should be investigated when choosing office equipment.

Design of keyboards has shown to have very little effect on worker performance given that the keyboard and screen are at the paper height. (Butterbaugh, 1982; McCormick, 1982; Norman, 1982.) Guidelines for data entry, data query, and menu screen design are given by Galit (1983).

Bevin, 1981, found that when understanding and comprehension of text are necessary, the text presentation speed should be in the range of 10-15 characters per second which coincides with normal reading speed. In addition, text should be presented in a word by word fashion since this is the technique most people use to read.

Many factors influence the readability of VDT screens. The most important factors and design recommendations appear in Table 1. (McCormick, 1980).

Job Structure and Schedules

Multiple studies have been performed which indicate that when change is introduced into the work invironment, worker stress may result. Very often the desired outcome may be the same, both steps necessary

TABLE 1

VDT Design Features

Feature	Recommendations
Optimal Character Size	.12 to .16 inches
Type of Letters	All Capitals
Width/height letter ratio	1 : 1
Minimum line separation	1/30 of line length
Colors	Color preferred to black and white; best to have light characters on dark background
Color combinations	Best : Yellow or green letters on black background

to perform the job change drastically. As an example, a secretary may be required to type both a draft and a final copy, but the procedures, skills, and time necessary are quite different when she has a word processor available in place of the standard typewriter.

Prolonged work at a VDT produces eye strain, requiring rest breaks to be scheduled (Ostberg, 1980; Dainoff, 1982). Recommendations related the length and frequency of rest breaks have been made by the National Institute of Occupational Safety and Health (NIOSH) and other groups. NIOSH recommends 15 minutes for every hour of heavy VDT use and 15 minutes for every two hours of moderate VDT use (NIOSH Report, 1983; NIOSH VDT Recommendations, 1982). With the introduction of electronic message handling and scheduling, the communication and social patterns within the office are also changing. Jobs should be analyzed to see if there are different ways of dividing them, or ways to enrich them.

Consideration should be made to whether the work should be done by professionals or clerical employees (Dainoff, 1982; Greico, 1981). Matching workers skills with task requirements is important for both worker satisfaction and full utilization of available resources. A required eye examination is recommended for screening workers to match worker skills with task duties. Consideration of the loss of visual acuity with increasing ages is important for matching worker skill and abilities to the task requirements (Dainoff, 1982).

Employee opinions about the introduction of office automation and the office environment in general are often neglected or ignored. Several surveys indicate that employees want to provide input to management decisions but are not given the opportunity (Kleeman, 1982; Cohen, 1981).

In general, when the new office equipment arrives in the office, every job should be re-examined and employee input should be encourages, so that the workers buy into the new job structure and become motivated to increase overall productivity.

Worker Stress and Fatigue

If the work station is designed carefully, the job is structured properly, and attention is given to computer interface considerations when purchasing equipment, worker stress and fatigue should be reduced to a minimum.

Task induced stress results mainly from worker dissatisfaction with the assigned task. It is recommended that an intensive reevaluation of employee needs be undertaken before office automation is completely implemented (Smith, 1981; Dainoff, 1982). Work environment induced stress can be caused by too much noise, uncomfortable temperatures, or improper lighting (Dainoff, 1982; Smith, 1981).

Fatigue results from many sources : work environment, work station design, task design, or job pressure (Happ, 1981). Probably the biggest problem is that of eye fatigue. Prolonged work at a video display terminal causes eye strain (Ostber, 1980; Dainoff, 1981-1982). Providing rest breaks, proper illumination, and glare reduction help to reduce eye stress and strain.

Summary

Technological advances have greatly increased the potential for productivity increases in the office and associated areas. The productivity capabilities of this new technology are not being realized partically because human engineering design principles are not being adhered to. If these principles, as outlined in this paper, were incorporated into any office automation project, workers will become more comfortable, their motivation will increase, with the result being higher worker productivity and more satisfied workers.

BIBLIOGRAPHY

Beven, Nigel "Is there an optimum speed for presenting text on a VDU ?", *International Journal of Man/Machine Studies* 1981, Volume 14, p. 59-76.

Butterbaugh, Larry "Evaluation of Alternative Alphanumeric Keying Logics, *Human Factors*, 1982, 24 (5), p. 521-533.

Cohen, B.G.F., M.J. Smith, and L.W. Stammerjoh, "Psychological factors contributing to job stress of clerical VDT operators", 1981, *NIOSH Report*.

Dainoff, M.J. "Visual fatigue and occupational stress VDT operators", *Human Factors*, August 1981, p. 421-431.

Dainoff, M.J., "Occupational stress factors in visual display terminal (VDT) operation : a review of empirical research", *Behariour and Information Technology*, 1982 1(2), p. 141-176.

Galitz, W. "Human Engineering in Screen Design". *Journal of System Management*, May 1983, p. 6-11.

Grieco, A., G. Molteni, and B. Piccoli, "Field study in newspaper printing : a systematic approach to VDU operators strain", in *Ergonomic Aspects of Visual Display Terminals*, E. Grandjean and E. Vigliani, ed., London, Taylor and Francis, 1980.

Haider, M., M. Kundi, M. Wesissenbock, "Worker strain related to VDU's with differently colored characters," in *Economic Aspects of Visual Display Terminals*, E. Grantjean and E. Vigliani, ed., London, Taylor and Francis, 1980.

Happ, Alan J., "Effects of Work at a VDT – intensive laboratory task on performance, mood, and fatigue," *Human Factors Proceeding 1981*, p, 142-144.

Keister, R. S., "Data entry performance on color versus monochromatic displays," *Human Foctors Proceedings 1981*, p. 736-740

Kleeman, W. B., Jr., "The need for ergonomic expertise in office design, *Applied Ergonomics*, June 1982, p. 125-127.

Kroemer, K. H., and D. L. Price, "Ergonomic in the office : comfortable work stations allow maximum productivity," *Industrial Engineering*, July, 1981, p. 24-32.

McCormick, E. J., *Human Factors in Engineering and Design*, McGraw-Hill Book Company, 1982.

Miller, Irwin, "Preferred height and angle settings of CRT and Keyboard for a display station input task," *Human Factors Proceedings* 1981, p. 491-496.

Mueller, R. B., "Automation and the Office Environment," *Information and Records Management*, May 1981, p. 14-18.

NIOSH Report, 1983 : *Health Hazard Evaluation Report*, HETA 82-329-1246.

Norman, D, and D. Fisher, "Why alphabetic keyboards are not easy to use : keyboards layout doesn't much matter," *Human Factors*, 1982, 24 (5), p 509-519.

Ostberg, O, "Accomodation and Visual fatigue in display work," *Displays*, July 1980.

Radl, G, W. "Experimental investigations for optimal presentation mode and colors of Symbols in the CRT-screen," in *Ergonomic Aspects of Visual Display Terminals*, E. Vigliani and E. Grandjean, editors.

Smith, M. B., Cohen, L, Stammerjoh. "An Investigation of Health Complaints and Job Stress in Video Display Operations," *Human Factors*, 1981, 23, (4), p- 387-400.

Stewar, T. F. M., "Experience in solving VDU ergonomics problems, in *Ergonomic Aspects of Visual Display Terminals*, E. Vigliani and E. Grandjean, ed.

Van Cott, H. and M. Kincade, *Human Engineering Guide to Equipment Design*, U. S. Government Printing Office, 1972., Chapter 2.

Productivity
1986, XXVII, 2, 119-122

"Efficiency of Production Systems —A Case Study"

J.C. NWACHUKWU

The case study of the production system relates to Nigeria. Lack of proper work planning, plant maintenance and complexity of machines inter alia were responsible for the low utilisation of machines and labour.

J.C. Nwachukwu is with Department of Production Engineering, Benin City, Nigeria.

Introduction

Making articles for sale is relatively new in Nigeria. Like all new endeavours it has encouraged several problems. These problems have been compounded by the dependence on imported technology and semi-finished raw materials whose sources the local manufacturers could neither control nor manipulate.

Manufacturing industry in Nigeria, despite these problems and its relatively short experience has forged ahead, although they have been accused of producing inferior and relatively more expensive articles than the imported ones. The relatively higher selling price of locally manufactured goods have attributed to among other things; inefficient management, inefficient production and a high cost of raw materials. All or some of these factors may be responsible for higher selling prices, since any one of these factors may affect unit production cost.

The primary objective of this study is to investigate the efficiency of production and thus identify factors contributing to its incidence.

Sample of Firms

The sample consist of twenty companies dealing in a variety of metal work which are machine paced. These companies do not constitute a representative sample of Nigerian metal working industries. Moreover, these companies were located only in the southern part of the country. Nevertheless most manufacturing firms in Nigeria tend to face similar problems. The size of the companies varied from 20-100 employees. Their products included such items as nails, roofing sheets, welding rods and cooking utensils etc.

Factors Affecting Efficiency in a Production system of Low Level Automation

These factors may include among others; the following :

—Work Planning and Organisational support to direct labour.

—Equipment and Machinery employed.

—Skill and Effectiveness of labour.

—Layout of facilities and Material handling system.

—Safety and working condition.

The quality of planning and organisational support of direct labour was deduced from the amount of time workers spent in carrying out work which should otherwise be done by other groups. The idle time of operators due to management failure to provide materials, tools and effect repairs were also attributed to weakness in organisation.

The quality of equipment was determined by measuring the percentage of time for which the machine was idle due to breakdowns and repairs. Age of machines were also investigated.

The quality of skill and effectiveness of labour were estimated be observing a number of operations and operatives at work.

The layout and handling facilities were analysed in all cases.

Safety and working conditions were investigated and their influence noted.

Activity Sampling

Activity sampling study were agreed upon with the Managers concerned. After consultation, six weeks period was eventually decided upon as the standard sampling period. The people chosen for the recording were recruited from a variety of sources, some companies chose workers normally directly involved in production activities (foremen and supervisors), while others preferred some higher technicians.

Tour schedules were prepared using random number tables for those whose normal activities did not regularly and randomly involve them in the production departments. All were told of the need for accuracy in recording and in the number of observations made. A total of 1,500 observations were recorded.

Results

The overall average findings for the five main categories of activity recorded during the sampling in respect of machines are shown in Table 1, while that of labour are recorded in Table 2.

Discussion

The salient point to note in these results was that production time was low while that of supporting activities were unnecessarily high. This situation infers lower efficiency in the overall organisation of production.

Work Planning and Organisation

The percentage of idle time due to management's

TABLE 1

Machines Utilization

		Range
Production Time	35 per cent	30—45 Per cent
Setting	30 ,,	20—40 ,,
Idle Time (caused by management)	5 ,,	3—10 ,,
Idle Time (breakdowns and repairs)	20 ,,	10—25 ,,
Personal care of Labour	10 ,,	5—10 ,,

TABLE 2

Average percentage time spent on six main activities of direct labour

		Range
Production Time	40 per cent	25—50 per cent
Attending	10 ,,	4—12 ,,
Handling	21 ,,	15—25 ,,
Miscellaneous work	10 ,,	5—11 ,,
Idle time (waiting)	9 ,,	7—13 ,,
Idle time (labour)	10 ,,	8—15 ,,

inaction, waiting and miscellaneous work, altogether accounted for 20 per cent of the operator's working day. Waiting for materials, tools, or orders to proceed with a certain job, can be adjudged to be the weakness of organisational support to direct labour. The miscellaneous work done by operators could have been done by other grade of workers. This also exposes the inadequacy of organisational support.

Equipment and Machinery Employed

None of the companies involved in the study had a system of preventive maintenance. This was reflected on the amount of time the machines were idle due to breakdown and repairs. On very careful investigation it was discovered that although the machines looked relatively new, they were actually refurnished machines whose edges could be anything up to twenty years, hence the frequent breakdowns. In many cases the spares for these machines were not easily available.

It was also observed that the production machines appeared on the average to be rather complex for the quality of labour and technicians available for its operation and maintenance respectively. Simplicity of machines (intermediate) appears to be a welcome situation in developing countries where skills requiring education and training tend to be scarce. Simplicity in this context can be interpreted in terms of educational and training requirement needed to operate and maintain the machines.

Skill and Effectiveness of Labour

Most of the work observed for this analysis were machines related production and as such what the operators needed most were thought to be experience and better dexterity since setting were done by other groups. Observations showed that they could perform better than what has been recorded. The operative appeared to have spent 10 per cent of their time attending to personal needs. This proportion of time is highly undesirable. This state of affair coluld mean that snpervision were either weak or non-existent.

Layout and Material Handling

The general opinion among the observers was that layout of machines did not allow much room for free movement of people and materials. Handling of materials and component were done by hand or by employing wheelbarrows. This did not allow for smooth flow of work in process.

Working Conditions

Working conditions were on the average good, although people still worked in hot humid atmosphere with little or no tea breaks in between the morning and lunch period. This condition apparently causes fatigue and may have been responsible for the amount of time spent in attending to personal needs.

Conclusion

It appears clear from the above analysis that production efficiency in a developing country such as Nigeria is affected by the lack of proper work planning, maintenance skill and outmoded complex machines. Decision makers in industry should concentrate in manpower training and careful selection of equipment for their production systems.

During the course of the study the reaction of managers to the information generated was closely watched. Without exception, the managers inter viewed considered the result to be of assistance in improving their efficiency by—

—Assisting in the development of strategies aimed at achieving an optimal balance between overtime and shift working.

—Emphasizing the need for careful machine maintenance and replacement strategies.

—Assisting in the planning of labour and machine utilisation.

—Identifying parts of the production system in which training needs existed.

If these results were to be used by the managers as indicated, then, the investigation may have contributed in a small way in improving production efficiency.

BIBLIOGRAPHY

1. Currie, R.M. (1963) "Work Study" Pitman Publishing/ Management Publications Ltd, London.
2. Whitmore, D.A. (1973). 'Work Study and Related Management Services.' Heinemann, London.
3. Stewart, F. (1977). Technology and Underdevelopment.' The McMillan Press Ltd., London.

Productivity
1986, XXVII, 2, 123-128

Waste Management : A Comprehensive Review

SUSHIL &
PREM VRAT

This paper presents a comprehensive review of literature on diverse aspects of waste management with particular reference to the literature in Indian context. Limitations of existing approaches are highlighted, and the need for further research is explored.

Sushil is with Centre for Management Studies, Indian Institute of Technology, New Delhi—110016.

Prem Vrat is with Department of Mechanical Engineering, Indian Institute of Technology, New Delhi—110016.

Introduction

It is somewhat paradoxical that despite the far reaching benefits of Waste Management (WM), the term 'Waste' still appears to be uninspiring. However, the severe resource and environmental crisis, of late, attracted the attention of professional talents from diverse fields including management, engineering, physical and social sciences etc. to give a serious thought to the problem or waste, and to devise ways and means to achieve higher productivity through effective WM. From systems' point of view any unnecessary input to or any undesirable output from the system is considered as Waste. (1). Since the breader perspective of waste and waste management covers a wide spectrum of areas, an attempt has been made to comprehensively review the literature encompassing various facets of WM and its interfaces including resource utilization, energy management, environment control, garbage disposal, man-power utilization, productivity, national economy modelling incorporating considerations of Waste environment, resource recovery, conservation etc.

The management of material wastes initiated the field of waste management, and even the thrust of latest research is towards the materials wastes. However, energy has also become a crucial areas in recent times, and the study related to the energy utilization, conservation etc. are also gaining momentum. Waste adversly affects the environment, thus making the management, control or conservation of environment an important interfaced of WM.

2. Basis of the Present Review

The present review (1) is an attempt to synthesize the previous work on different aspect of WM to understand and interpret the progress of individual aspects, as well as the subject as a whole. To attain this objective the literature on Waste Management is reviewed in a variety of ways including broad categories, the hierarchy of study, the resource under consideration, the sector of economy to which study is related, and the functional elements of WM. The categorisation of literature on WM is shown in Table 1.

TABLE 1

Categorization of Literature on Waste Management

A. Category of Research

1. Waste Engineering principles, scientific analysis, process design
2. Managerial aspects of waste
   —allocation
   —policy, planning
   —control conservation
   —collection, location, disposal
   —resource utilization recycling
   —environment, ecology
   —hazardous waste
   —forecasting
   —general
3. Reviews and Surveys
4. Case Studies
5. Interfaces
   —energy
   —pollution and environment control
6. Techniques, Modelling strategies
7. General or Miscellaneous

B. Categorisation According to Hierarchy of Research

1. Global
2. Multinational
3. National
4. Regional
5. Organisational—Individual plant
6. Not specific

C. Categorisation According to Resource under Consideration

1. Material
   —solid —Gas
   —liquid —Multi
2. Energy
3. Manpower—Bio resource
4. Space
5. Capital
6. Services
7. General
8. Multiresource

D. Categorisation According to Sector Investigated

1. Agriculture, Irrigation, Rural
2. Extraction
3. Power, Energy
4. Industry
5. Domestic (Municipal, Construction)
6. Environment
7. Transport
8. Miscellaneous
9. Multisector
10. No specific sector

E. Functional-Element Wise Categorisation

1. Generation, Flow
2. Reduction, Conservation, Allocation
3. Collection
4. Recycling, Reuse
5. Abatement
6. Disposal
7. General, Multi Function, Resource utilization.

3. Current State of the Research

A comprehensive review of the literature on the related aspects of WM gives an indication of the infancy of the subject with few categories at intermediate stages of development. No tradition of scholarly researeh has been evidenced in the field of WM. This vital problem area has been ignored most of the time. Only occasional articles appear in the literature which can at best be treated as reference points. However in some developed countries the problem has been taken seriously, and some handbooks are compiled on solid waste, environment oontrol, energy management etc. Still, there appears to be a lack of coordinated efforts leaving the field partially tapped. In view of the infancy of the subject a large number of limitations are bound to be associated with existing approaches. Macro-level studies are almost non-existent in this field.

According to a subjective analysis of the review the major categories are ranked in view of the research emphasis in a decreasing order as waste engineering, interfaces of WM, case stndies, managerial aspects of waste, general aspects, techniques, and reviews. It is important to note that a good deal of past work has been reported to develop waste engineering principles, new uses of waste materials, treatment and disposal techniques etc. Though the managerial aspects cover a wide spectrum of areas, particular emphasis has been given on the development of waste collection and disposal systems, and resource utilization. The thrust of the research is to study specific waste rather than the overall generalizations and the case studies reported are very specific: majority of which are not based on mathematical modelling. Delailed surveys have not been conducted to assess the nature and quantum of waste disposal practices, waste reduction measures, critical stages/causes of waste generation etc. The modelling strategies adopted are diversified owing to specificness including input-output modelling, optimization, simulation, economic modelling, network theory, algorithms' multi-objective, non-linear and stochastic analysis etc. There appears to be a strong bias towards the study ot material wastes; the next preference has been given to energy. The wastage of other resources like manpower, capital, services etc. received very little attention despite the vast potential and their need for economic development. Maximum interest has been evidenced in the industrial wastes with a growing trend. The waste in domestic sector has also received considerable attention followed by agriculture sector, environment, power etc. The waste in service sectors seems to be almost untouched. There is a heavy emphasis on the study of waste recycling, treatment and disposal, while very few studies have been reported that deal with the reduction of waste. This shows a vast potential for waste reduction in different fields.

The research efforts have been essentially concentrated to environment and energy management, which are the important interfaces of WM, particularly because of the growing crises in these areas and consideration of these as limiting factors to economic growth. To recapitulate, WM is an emerging field; theory of which is not yet fully developed. There is a pressing need for coordinated efforts from systems view point and to conduct WM studies in global and national perspectives unearthing its developmental prospects.

4. Limitations of the Existing Approaches

It is observed that most of the previous work is restricted to a limited number of areas and many more facets of WM havs been left untouchcd. Since the subject has not attained maturity, there is vast potential for research, and a large number of limitations are associated with the literature on WM. Some of the major limitations of the existing approaches towards management of waste are highlighted as follows :

(i) The excessive variety of wastes and lack of coordinated efforts are perhaps the big deterrents in the development of a generalized methodology of waste management. A standardized and well accepted definition of waste as well as WM is virtually non-existent.

(ii) There is a heavy emphasis on waste engineering principles, process for waste treatment, resource recovery techniques etc., while the managerial efforts have not been fully tapped.

(iii) There are not many surveys and reviews conducted in this area, which may be one of the major causes for the lack of appreciation of the status and potential of WM in diverse fields.

(iv) The application of mathematical modelling to individual cases in WM has been conceptualized in a limited manner. The implemeniation of systems analysis and O.R. technique to manage the wastes at micro as well as macro level are yet to be explored.

(v) The work in agriculture sector reveals a strong bias towards process oriented study of agricultural waste. The overall flow of agricultural wastes and WM policy analysis have rarely been modelled in the literature.

(vi) The thrust of research in domestic sector is mainly on collection, treatment and disposal of municipal wastes with consideration to environmental implication; while the WM in service sector is almost ignored.

(vii) In industrial sector the WM research has been essentially concentrated to deal with process scrap, effiuents etc. The interaction of different industries from the view point of WM and its consequences to economic development is yet to be introduced.

(viii) Lot of studies are evidenced in energy sector, but the majority deals with energy policies, financial aspects, alternative sources of energy, international trade etc. There exists inadequacies in the research on management of energy waste from systems point of view to integrate it to the waste of various resources.

(ix) Very little research efforts have been directed for the multi sector studies of WM aspects. The nature of waste generated in various sectors varies diversely. Almost all the approach ignore the fact that the basic characteristics of waste match to a great extent.

(x) The global studies on WM are almost non-existent and no attempts have been made to derive global perspectives of different WM policies; despite the severe resource crisis the word over.

(xi) Apart from some attempts there are hardly any studies conducted at national level that encompass different facets of WM. Most of the national level studies pertain to resource flows, with particular reference to energy, while the flows of wastes have rarely been modelled.

(xii) There is a lack of integration of economic growth with the WM. In almost all the approaches WM is treated to be a problem, while the developmental aspects of WM are completely ignored.

(xiii) The approaches to regional modelling mainly handles land use planning and environmental planning. The aspect of waste minimization for regional development is not adequetly covered.

(xiv) A large number of studies on environmental aspects have been evidenced which primarily deal with engineering modelling, pollutant charges etc. The interaction of systems and environment at input, output and waste interfaces highlighting the impact of WM on environmental parameters and its influences on the system in turn has been seldom accounted for.

(xv) In majority of the approaches waste recycling has been studied from engineering point of view, while the application of systems analysis techniques in this area is yet to be taken seriously.

(xvi) The studies on waste treatment and disposal have treated engineering as well as policy issues, but the integration of these functions to economic system is virtually non-existent.

(xvii) The intersectoral waste flow has not attracted most attention in past and no attempts have been made to optimise the flow of waste.

(xviii) There are no means or measures of the comparative analysis of various functions of WM.

(xix) There is no consideration of waste in determining the performance of various sub-systems and the system as a whole.

(xx) Practically all approaches suffer from the application of tailor made techniques to handle wastes of diverse characteristics which at times lead to confusion and may act as a deterrent to further research. The generalization is lacking in most of the papers.

(xxi) Since after deriving utility, ultimately every product is to be coverted into waste, it is not justified to develop a separate strategy for the management of waste of each product. One of the major limitations of many approaches is to deal with product or individual waste oriented techniques.

(xxii) The mathematical modelling of WM aspects has not been extensively treated in many papers. The input-output modelling does not give explicit consideration to waste parameters. The application of optimization techniques is very rare in this field; in particular the multiobjective optmization of wastage has been left untouched. The causal relationship between various system parameters and wastes indentifying possible feed-backs are also not examined.

Need for Further Research and Areas of Study

The current state of the research indicates that there is tremendous potential for research work in almost all the areas of WM as categorized in section 2. The most crucial research avenue is conceived to be the development of a general theory of WM to serve as a coordinating link and basis for further research. On the basis of the present review some of the priority areas of study desiring immediate research attention are high-lighted as follows :

(i) The first and foremost requirement is to clearly visualize the term waste in almost all possible systems by providing a most widely acceptable definition of waste to eliminate confusions, and to pave the path for well defined research on WM.

(ii) Another challenging research area is a clearly conceptualize 'what WM is ?' Since the development of the subject is in elementary stages, it needs to provide rational view regarding the boundries of the subject so as to motivate research efforts in proper direction. This may be followed by the development of an overall theory of WM.

(iii) The conventional narrow approach giving consideration to material wastes only needs a radical change to conceptualize the issue in a systems framework. This will promote the research on the waste of all types of resources including material, energy, manpower, capital, services etc.

(iv) The research efforts are required to develop suitable data structures, information flow systems etc. regarding WM aspects. In the absence of suitable data base the empirical real life case studies on WM cannot be conducted. Hence, for proper implementation of theoretical developments on this front, extensive research work should be conducted to design organised data base covering different levels of hierarchy.

(v) Since planning at lower levels is governed by national plans, there is a need to extensively examine the effect of WM on economic growth. The research efforts should be channelized to integrate the different facets of WM in overall national planning. This may be followed by international and global studies to explore the potential avenues of WM that can contribute to maximum intertemporal welfare of mankind by providing a sustainable growth pattern.

(vi) The modelling of WM issues with respect to individual organisations is equally important in view of the implementation of the overall WM policies. The categories of wastes may be standardized with respect to governing parameters like criticality of resource wasted, pollution intensiveness etc. and generalized methodologies may be developed, which can be appropriatly modified to suit particular situations.

(vii) The waste reduction function, that has received little attention in past, is identified as the most crucial and appropriate avenue for further WM research. A variety of techniques covering industrial engineering, systems analysis, optimization, etc. alongwith other scientific and engineering approaches may prove to be of great significance in analysing waste reduction measures, policies and systems.

(viii) Though the work, in past, has been essentially concentrated to investigate alternate uses of waste materials, choice of recycling technology etc., in view of the socio-economic-environmental constraints it should be taken up more seriously and systematically.

(ix) The thrust of current research an environmental modelling is a welcome feature.

However, the environmental implications of different facets of WM are yet to be investigated in view of maximizing overall utility.

(x) In view of the severe energy crises the WM of energy resources will continue to be a promising research area.

(xi) The manpower waste should receive immediate attention and unemployment or underemployment has to be minimized. In developed countries the manpower WM is important to obviate the shortage of manpower, while in developing countries its relevance is mainly to enhance the economic growth and welfare.

(xii) The capital and services waste, which is almost ignored in the literature as well as in practice, should receive attention on priority basis. A developing economy has to constantly face capital shortage, which may be relieved to some extent by channelizing WM efforts in this direction. The flow of services continuously increase with the growth of the economy, increasing the potential for the management of services waste.

Conclusions

In view of the diversified nature of the subject the literature has been reviewed under five major heads, viz. the category of research, i.e., waste engineering, managerial aspects etc., the hierarchy of research the resource under consideration, the sector investigated and the financial element of waste management. Since the categories are not mutually exclusive, there is bound to be a certain degree of overlap. The scheme of the review provides valuable information on the status, trends and growth of the subject. The coverage of all the facets is not proportionate in view of the objective of the study; the sub-category of managerial aspects dominates the review. It has been observed that lot of work on waste engineering has been reported, while the reviews and surveys are very little and case studies are specific. There is no evidence of research relating WM to national planning. The energy and environment inter-faces have received much attention recently. The research on WM has been essentially concentrated on material wastes in industrial, domestic and agricultural sectors in a decreasing order of preference. The manpower, capital and service waste have rarely been modelled. Heavy emphasis on waste recycling and disposal is observed, while waste reduction is yet to be taken seriously. The global and national level studies on WM lag for behind. It is felt that a large number of limitations are associated with existing approaches towards management of wastes.

REFERENCES

1. Agrawal S.K. (Sushil), (1984) Systems Modelling of Waste Management in National Planning, Ph.D. Thesis, IIT Delhi.

Productivity
1986, XXVII, 2, 129-132

"Harmony in Industrial Relations For Productivity"

NAVAL H. TATA

This paper dwells on the problem of industrial relations and recommends ways to improve the industrial relations environment in the country.

Naval H. Tata, President, Emeritus Employers' Federation of India.

Before one can discuss the various aspects of productivity, it is essential to have an overview of the system of industrial relations prevalent in the country. Because the success of productivity depends to a large extent on the labour-management relations obtaining at the plant level. As far as India is concerned, in dealing with management of industrial relations, we must remember that we are obliged to operate in an atmosphere built up over the years of past practices and precedents. Consequently, attitudes of both labour and management to that extent have stagnated and hardened during the period. We should not forget that there is also a third party in the dialogue namely the Government. Our history shows that in a mixed economy like ours, the third party has by right a bigger role to play on the plea of "public interest" or "industrial peace" or "uninterrupted production." Thus on such grounds government can justify intervention in industrial relations. That apart, Government, through legislative and administrative actions can always play a crucial if not a decisive role. More so, in a bipartite process like collective bargaining, to which our country is committed. Such third party intervention we must consider as inevitable lest we come to think that management or for that matter labour in our country are free from interference and can, at their discretion, conduct industrial relations, It is, therefore, not possible for them to adopt on their own initiative policies and practices, with the aim of improvement of of productivity or formulate their own guidelines in pursuit of industrial harmony. In other words, we are not able to adopt de novo, a code of conduct to guide labour and management to ensure industrial peace, ignoring all past decisions. Nor can we take for granted that we can do so, without Government intervention, on behalf of a trade union which refuses to fall in line with such a code even though a number of other trade unions opt for the code.

The Present Scenario

Hence the present scenario is such that industrial relations are governed by a single piece of legislation which is over thirty years old. True, it has been modified and amended from time to time but, on ad hoc considerations, to meet exigencies of circumstances as they arose. However, this was done largely to suit the Government's view point on them and more often to placate the trade unions' demand than out of employers' concern for industrial peace. The Industrial Disputes Act had no particular philosophy behind it excepts the war-time need to settle labour disputes by adjudication. Thus our main legislation is far more adjudication-oriented rather than out of considerations to ensure iudustrial harmony or for maximizing productivity.

Had our original legislation not been unduly influenced by war time needs, it would have been based on an orderly system of employer-employee relationship. It would have been inspired by a philosophy of bilateralism bearing in mind our commitment to collective bargaining. Being more adjudication-oriented our labour law has somehow encouraged a host of unfortunate features such as multiplicity of unions and inter-union rivalry, etc. In an endeavour to reconcile such rivalry between trade unions, it has unfortunately not been free from a political bias, in favour of the labour wings belonging to ruling parties in power, in the state concerned. This has often led to considerable misuse of legislative and administrative powers where collective bargaining has become a casualty through undue political intervention.

In such confrontation involving conflict of political ideologies, it is too much to expect that problems of productivity of participation of labour in management would be the prior objective for government intervention. No. wonder then, that in some states, legislations dealing with industrial relations, there is governmental intervention. For example, in the process of verification for identifying the bargaining agent the state government has a dominent role to play rather than let the issue be decided by a secret ballot or union check-off.

In this context, a few examples may be cited of deficiencies of our labour laws and administration. There is a need to point out certain basic laws in our system. For example, there are no "recognised" unions in our industries and what is more deplorable is the fact that there is no agreed system of recognising a union as the sole bargaining agent. A representative union is necessary pre-condition for establishing a relationship between workers and Management. Yet it is strange and curious that neither government, nor some important trade unions are at all anxious about making any provision for it in our labour laws to minimize rivalry between them. Hence one can not come to a sad conclusion that for decades so much has been said, so often, on this vexed issue to be of any value, in solving this basic problem.

What Scope for Union-Management Relations ?

It is worth considering whether the management has any scope for new ideas by way of contribution to healthy industrial relations practices. Particularly, when government has laid down the law through various enactment on all conceivable subjects from recruitment to closure, from health insurance to retirement benefits and bonus, through a code of over thirty laws. One has to admit that in such a situation, the only role that is left to the management to play is collective bargaining. There, if the employer refuses to concede to demands for higher allowances and fringe benefits, to buy peace from time to time, he would face threats of strikes and go-slow. On the other hand, he cannot offer any counter-threat of lay-off or lock-out, which are traditionally considered unfair practice on the part of the employer. Whereas, it is within the rights of the state government to come in with legislation without even prior consultation with management, to liberalise further the existing benefits or even add some additional benefits like the house-rent allowance as in the recent legislation in Maharashtra.

Thus, the scope for management-union dialogue initiative and opportunities for co-operation is almost nil. Consequently it looks as if there is nothing in the labour-management field for employers to contribute on their own initiative leaving the coast clear for the trade unions to make demands from time to time.

Lip Service to Productivity

On the issue of productivity, one must regretfully admit that most trade unions display a totally disinterested approach. Hence the year of Productivity 1982 came and passed uneventfully. It was true that some seminars were held. Lot of lip-service was paid to the benefits derived by labour, industry and country from higher productivity. However, there was no significant achievement arising out of the Prime Minister's well-intentioned call to industry and labour. In a number of collective agreements the trade unions did agree to a paragraph affirming the need of the hour to promote productivity through disciplined working and discouraging strikes/stoppages, etc. But this remained a mere pious wish on paper.

Perhaps, one reason for which workers need not worry about production and productivity, is because, we have not so far attempted to link wages to performance. On the other hand, they rise automatically every month with increase in the consumer price index. Almost 80% of an organised workers' remuneration in most industries happens to consist of dearness allowance and fringe benefits and is earned in any way by mere attendance and not on performance at the workplace. Thus our very wage system acts as a disincentive in the path of increased productivity. In addition, other benefits totally unrelated to performance like the profitsharing bonus which is payable even when there is a loss, takes a toll of any philosophy of productivity related to performance. In such situation, it is too much to expect a worker to think in terms of productivity, in his own interest.

A Silver Lining ?

The attempt is not to draw a bleak picture so far to suggest that there are no extenuating circumstances, in the field of industrial relations in our country. Far from it.

There are new industries which have adopted sophisticated technology with co-operation of the workers. Some collective agreements have established links between wages and productivity; a few have also done away with profit-based bonus and linked it with productivity. I am happy to note that the Banking Industry and the trade unions have at last agreed for the introduction of mini-computers for various operations. There are also shining examples of harmonious and constructive labour-management relations as in TISCO, Godrej, Escorts and many public sector undertakings, like HMT. In fact, there are numerous cases of efforts made by individual managements to develop mutual relations on sound and orderly lines despite constraints and irritants of law and the generally discouraging background circumstances. These examples should inspire both other employers and workers to emulate the example of such successes in the field. It should also encourage our government in changing its outlook and policy to maximise more bipartite approach and minimise government interference and intervention. Let the workers on their own come to terms with management, which would be far more lasting than agreement imposed against the will of the employer.

Urgency of Change

Much useful discussion was held at the last tripartite national labour conference held in September 1982 and important recommendations were made on a new framework of labour legislation including recognition of unions. It is surprising and sad that the Labour Ministry has not whole-heartedly accepted any of these suggestions arrived at through a process of a mutual dialogue between labour and management. Hence, the implementation of Sanat Mehta Committee proposals is overdue and should be given a chance to change the climate of chaos and conflict prevailing in the labour field. Some features of the wage system also need to be reviewed. The concept of bonus which is a source of perennial conflict needs to be re-thought and replaced by a rational mode of rewarding labour. Productivity should be the sheet-anchor for computing wage to avoid wage distortions between variety of wage and salary earners. Government's view on lay-off, lock-out and closure need rethinking with a more positive approach in favour of generating greater employment than a negative one, in merely protecting employment, at the cost of scores of industrial units going sick and ultimately closing down through insolvency regardless of labour laws prohibiting closure on grounds of "public interest". Judicious use of merger to prevent lame-duck units through take-over by affluent units would go a great way in preventing industrial sickness which is causing more less of employment than any other factor. The government likewise must adopt a policy based on fairness coupled with firmness in all labour matters. It is important for government to uphold their own laws to create a climate of stability. In permitting many state governments to flout the Bonus Act in pressurising employers to pay higher bonus, the central government imparted a spirit of disrespect for labour laws which has been responsible largely for instability in our industrial relations.

Lesson of Japan

Judging from the incredible success that Japan has attained today in the realm of productivity, one can say without hesitation that it was possible because of labour-management co-operation through a continuous dialogue which is essential for any scheme designed for accelerating economic development. We already know a few labour relations measures taken in Japan at plant level to enhance workers' commitment and motivation. In this connection, reference could be made to the formation of Quality Circles in Japan by small groups of workers to improve product quality. The practice is fast spreading not only in Japanese enterprises but also to large enterprises in other Asian countries and even in U.S.A. As far as our country is concerned, a few personnel from public sector enterprises have attained some success in promoting the experiment of quality circles as a device for improving workers' co-operation, involvement and also labour relations.

Apart from the great national character of the Japanese which is world-renowned, the pillars of the Japanese labour relations system are the two practices—(i) life-time employment, and (ii) seniority wages. The system is, however, suitable for workers who live and work in groups. Japanese workers' loyalty to their companies cannot be easily understood unless these two practices are carefully studied and examined. For example, the concept of strike in Japan may not always necessarily mean cessation of work by employees but it is resorted to register their protest against non-fulfilment of their demands.

If Japan has one single message to managements and trade unions in India, it is this: the prosperity of the nation depends on the health of a company and the standard of living and welfare of the workers is in turn predicated on the efficiency and profitable functioning of the enterprise. There is great validity in the old saying: "don't kill the goose which lays the golden egg".

Productivity
1986, XXVII, 2, 133-139

"Managing People for Productivity"

RABINDRA N. KANUNGO

The author in this article focuses on managing people for better results. According to the author the manager must first, diagnose ineffective employee behaviour through appraisal and measurement of such behaviour. Second, they must create conditions for replacing desirable behaviour linked with high performance in employees through appropriate changes in the work environment.

Rabindra N. Kanungo is with McGill University, Montreal.

Managers of any organization trying to improve productivity need to effectively utilize three types of resources: economic or monetary, physical or material, and social or human. When one considers how effectively these resources are utilized in Indian organizations, it is readily evident that it is the human resource that is most neglected and underutilized. As an Indian executive quipped in a discussion : "Human resources management is so important for our organization that the total investment for this function amounts to the cost of one name-plate: Manager, Human Resources Department". Although many organizations, both in the private and public sectors, have high level of capital and technological investments, yet they have failed to maximize their productivity—primarily due to a lack of managerial concern for the maximum utilization of the human resource potential. These organizations have many managers who admirably play the roles of bureaucrats and technocrats. They demonstrate very high levels of competency in planning, and a remarkable proficiency in sophisticated models and techniques in the management of eeonomic and material resources. But these managers are quite inept in managing the people resource within organizations. They show poor inter-personal skills while dealing with people and very often fail to see the obvious link between people and productivity. The major reason for their ineptitude in effective human resource utilization lies in the way they view both the organization and its employees.

Some Precondition to Effective Employee Management

Indian managers, as executives and administrators, view organizations as bloodless static systems of written rules and regulations, materials and machines. They do not view organizations as dynamic social systems of living human beings with specific aptitudes, abilities, intentions and motives that could be utilized for the mutual benefit of organizations and their employees. These managers are more concerned with developing hierarchical power structures with an endless array of committees, subcommittees, and titles; and drawing up legalistic policies and procedures for the deployment of materials and machines. They are much less concerned with employees as a part of a social system geared to achieve the production and service objectives of the organizations. Such myopic attitudes on the part of managers stem partly from their professional training and background. Most managers in Indian organizations are trained as engineers, lawyers or civil servants in central or provincial services with very little training in behavioural sciences such as psychology and sociology. Without an adequate exposure to behavioral disciplines, *it is* quite natural for them to overlook the human factors and behavioral problems of an organization that may affect productivity. Thus the first and foremost precondition for managing people for increased productivity is to recognize that employees are a vital resource and to understand how their varied talents and behavior affect productivity. This can be achieved through management training programs that would expose managers to principles of human behavior and social systems as they affect the workplace.

A second precondition to effective human resource management for increased productivity is a change in the way Indian managers perceive labour. In most Indian organizations, managers feel that labour is a necessary cost rather than an investment. This "cost" attitude toward labour makes the managers feel that once employees are hired at a price, their managerial responsibilities have ended. From then on, employees' efficiency (or productivity) is left to the employees themselves. If they perform poorly the cost tends to be high and the profit margin low; if they perform well the cost declines and the profit increases. However, such fluctuations in cost and profits as presented on a balance sheet or in an annual report are rationalized as being caused by factors other than the employees' work behavior (i.e. performance). Such rationalizations would seem to relieve them of any responsibility for the performance of their employees. If, however, the managers regard their employees as an "investment" they would then consider it their responsibility to get an adequate return from labour and consequently plan actions for motivating employees to perform better. They will then try to understand what conditions are conducive to or hinder the desired level of employee derformace and, accordingly, introduce or eliminate them at the work place. An "investment" attitude towards labour calls for giving greater importance to such activities as: sensible manpower planning according to the present needs and future growth prospects of the organization, proper recruitment practices which matches the individuals qualifications (commensurate) with the job requirements, adequate training to meet job objectives, motivating employees through valued and equitable rewards, and providing opportunities for employee skill development. A return on investment in labour in terms of employee productivity depends on executing these personnel functions adequately. Any organization that does not consider its human resources as an investment does very little to promote among its managers an interest in such personnel activities. If an organization wants effective management of its employees for improved productivity, its senior management should clearly spell out a policy which views its employees as the organization's most important resource-investment; management's strange committment to such a policy should be unequivocally communicated throughout the organization.

Distinguishing Productivity and Performance

When employees are viewed as a form of investment, it becomes necessary for the managers to utilize the employees' talents and develop their job skills. In other words, it becomes the responsibility of the managers to create the necessary conditions for improving employee performance. Before we discuss the necessary conditions for improving performance, we must first understand the difference between 'productivity' and 'performance'. 'Performance' refers to an employee's actual manifest behavior at work. 'Productivity', on the other hand, is the output of such behavior when the employee interacts with other resources of the organization. These may include co-workers, superiors, subordinates, and other material (tools, machines) and the environmental support system available in the organization. Thus, while performance is dependent on the employee's psychological make-up (ability, training, experience and motivation), productivity is dependent on the employee's dependence on or interaction with other people, administrative system, physical environment, technology, etc of the work place. For example, the total number of sales a salesperson accomplishes represents his productivity, but the salesperson's specific behaviors in terms of actual customer contacts methods of persuasion, listening and responding to customer complaints etc represent his performance. Desirable performance on the part of the salesperson may not always lead to high productivity, because the latter is dependent not only on the salesperson's behavior, but also on the other available resources both within and outside the organization. For example: Despite the salesperson's persistent efforts in closing a sale, he loses it to a competitor simply because his plant is unable to adhere to the delivery schedule. The environmental resources with which employees interact while doing their job may act as either facilitators or constraints. The manager must try to identify and remove the environmental constraints which will hinder or frustrate the best efforts of his employees. Removing the environmental constraints is just one aspect of the two-pronged approach to increased productivity; the other is to understand the why and how of performance in order to create favorable conditions for improved performance. What are these conditions? What can a manager do to ensure that these necessary conditions for improving performance do, in fact, exist in his organization? Answers to these questions will bring into focus the two critical tasks which some managers perform perfunctorily, and others try to avoid.

Two Critical Tasks for Managers

What employees do or do not do in the organizational context has significant influence on productivity. Employee behavior such as remaining absent from work, coming late to work, stopping work early, disorganized work habits, slowness at work, making errors in filing and reporting etc affects productivity and should be the concern of every manager. Besides, behavioral science theory and behavioral technology suggest that managers can influence and change employee behavior towards increasing productivity that would benefit both the employees themselves and the organization. To influence employee behavior, however, the manager must determine the nature of and reason for the ineffective job behavior; such a diagnosis highlights the importance of the first critical task of developing a sound Performance Appraisal Program. In addition to training in the appropriate job behavior, the manager should also provide employees with incentives to learn and demonstrate effective behavior at work; this gives rise to the second critical task of ensuring an equitable Compensation Program. Now let us examine these two tasks in some detail.

Performance Diagnosis Through Appraisal

The task of performance appraisal and measurement for the purpose of identifying ineffective employee behavior and substituting effective behavior is quite complex, but some simple guidelines outlined here may be useful for managers. First it is important to realize that the kind of performance an employee demonstrates is a function of his or her ability, training and motivation. When the employee is not performing adequately, the most sensible question should be; Is the employee capable of performing better? Is a person a low performer, because of a lack of ability or a lack of training, or both? If a person lacks the ability for the job, then it is the selection and/or placement error that needs to be corrected. The person may be transfered to another job where he or she can be better utilized because the ability of the person may better fit this other job. If the person has the ability but lacks training, then an appropriate training program should be initiated. Sometimes, the job holder may have both ability and training, but is performing inadequately because of "role ambiguity." The person simply lacks information on what he or she is expected to do on the job. This may require

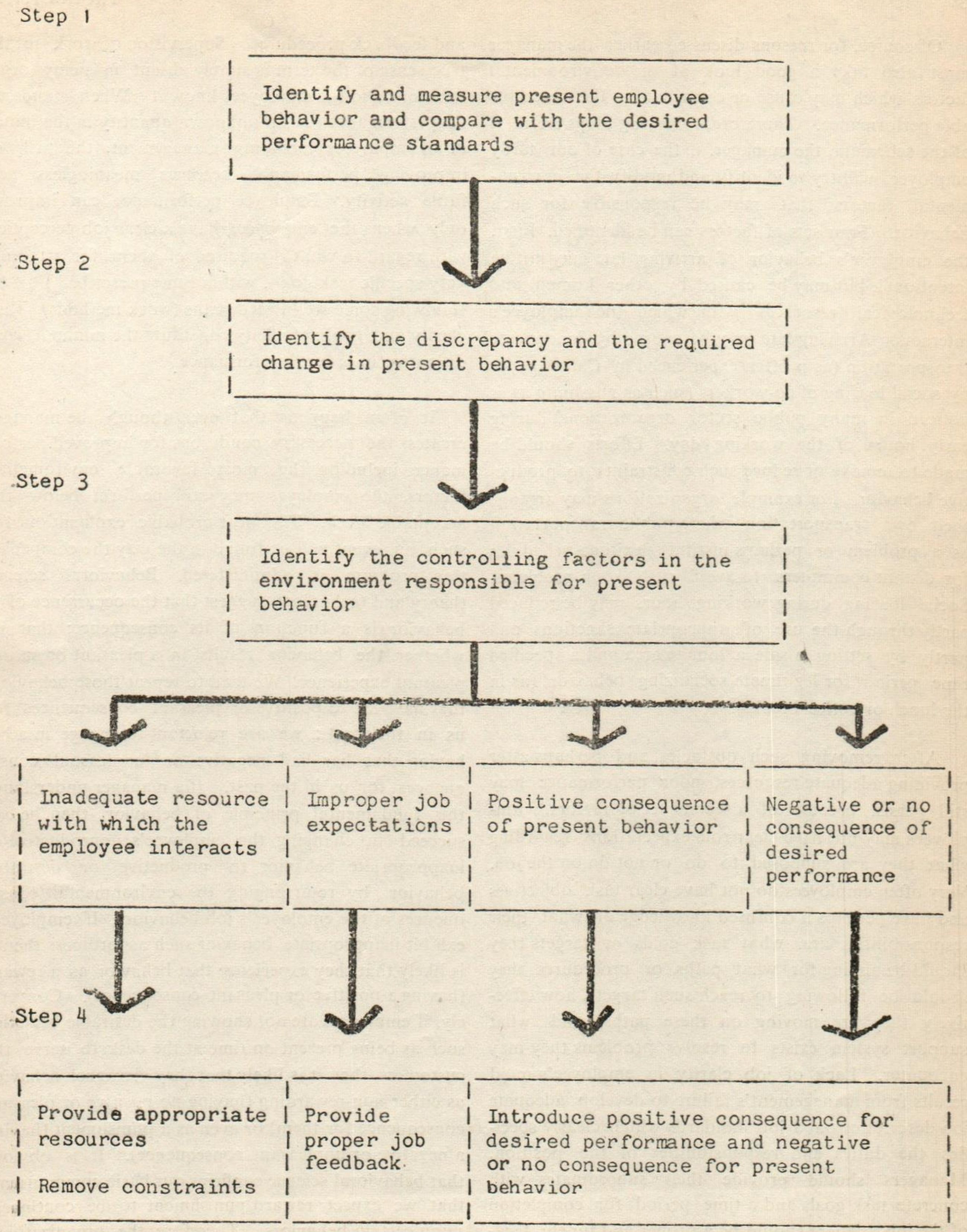


FIGURE 1. ACTION PLAN FOR IMPROVING EMPLOYEE PERFORMANCE

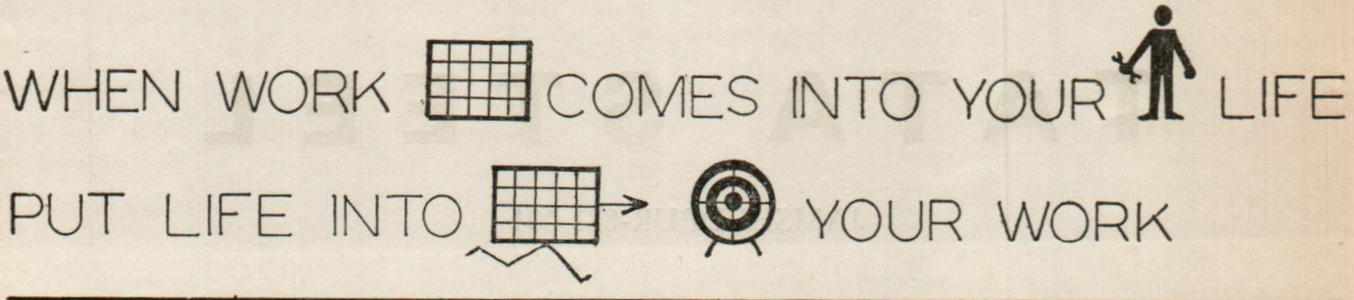
Of course, for reasons discussed earlier the manager must also take a good look at the environmental factors which may cause or contribute to the unacceptable performance. Therefore, following Steps 3 and 4 of the schemata, the manager, in the case of our tardy employee, will try to identify and modify the environmental factors that may be responsible for such behavior. Four sets of factors can be identified. First, the employee's behavior of arriving late may not be intentional, but may be caused by other human and technological resources with which the employee's interacts. Arriving late may be caused by inadequate transportation (as is often experienced in Calcutta) or by social loafing of co-workers (such as gossiping as is noticed in many public sector organizations) during early hours of the working day. Efforts should be made to remove or reduce such constraints to productive behavior. For example, organizations may arrange their own transportation where public transportation as a problem or perhaps institute flexitime schedules for distant commuters to avoid rush hour problems. Social loafing during working hours may be reduced partly through the use of appropriate sanctions and partly by setting a side a lounge area and a specified time period for legitimate socializing behavior (as in the lunch or coffee breaks).

After removing such obstacles and perhaps after providing adequate resources, poor performance may still persist because of a second set of factors, Employees may not have clear role expectations regarding what they are supposed to do or not do on the job. Very often employees do not have clear task objectives and have perhaps a confused knowledge of what their responsibilities are, what task goals or targets they should be aiming for what paths or procedures they should be following to reach such targets, how effectively they are moving on these paths, and what support system exists to resolve problems they may encounter. Lack of job clarity in employee's mind results from management's failure to develop adequate job descriptions and job standards which clearly specifies the duties and responsibilities of the position. Managers should provide their subordinates with concrete task goals and a time period for completion of the job. There should be a proper and timely feedback of work progress through systematic reporting and feedback procedures. Supervision of work in the true sense of the term is simply absent in many organizations and the employees know it. When 'standards of pesformance' is an unknown quantity in the minds of all employees including management, the task of improving performance becomes meaningless and futile activity. Employee performance can improve only when the employees have a clear job perception with regard to what is required of them for attaining very specific task goals, within some prescribed time by following some well tested paths (work methods). Task clarity and goal specificity constitute the minimal condition for improved performance.

It often happens that even though the manager creates the necessary conditions for improved performance including the most favorable enviromental factors, the employee may still perform below the acceptable level . The most probable explanation for such an event will be found in the way the compensation program is administered. Behavioral science theory and technology suggest that the occurrence of a behavior is a function of its consequence; that is, whether the behavior results in a pleasant or an unpleasant experience. We tend to repeat those behaviors that have led to positive or pleasant consequences for us in the past : we are reluctant to engage in a behavior that has had negative or unpleasant consequences for us in the past. If a manager understands this fundamental principle of behavior, then he can succeed in changing the employee's unproductive or inappropriate behavior to productive or desirable behavior by re-arranging the environmental consequences of the employee's job behavior. If employees exhibit inappropriate behavior such as tardiness then it is likely that they experience that behavior as a reward (having a positive or pleasant consequence). Conversely, if employees are not showing the desirable behavior such as being present on time at the desk to serve the customers, then it is likely that they view such behavior as either non-rewarding (having no positive or pleasant consequence for them) or even as a punishment (having a negative or unpleasant consequence). It is obvious that behavioral science confirms our basic commonsense that we expect reward/punishment to be contingent upon certain behaviors. Therefore, the organization's compensation program should incorporate the appropriate reward contingencies (i.e., performance-reward relationships) if the program is to become an effective instrument of achieving the objectives of the organization. Returning to our example : if negative consequences are attached to tardiness, then the tardy behavior is likely to become less attractive to the employee; at the same time, if positive consequences are attached to punctuality, then being punctual is likely to become more attractive to the employee. Reward that employees value (such as recognition, financial benefits etc.) should be made (bestowed on employees) contingent on acceptable (their desirable) behavior and any such reward should be withdrawn from employees engaged in unacceptable (undesirable) behavior. For example, in order to reduce tardiness, employees should be provided with immediate feedback regarding the frequency and duration of their undesirable behavior and simultaneously be encouraged to show desirable behavior by rewarding them through supervisory recognition, merit awards, overtime benefits etc.

To successfully accomplish the critical tasks outlined in this article, the manager must possess a fair degree of inter-personal and communication skills. The manager is not required to play the role of an amateur psychologist. However, he should have a "hand-on', experience of methodology and techniques involved in implementing the Performance Appraisal and Compensation programs. At the very core of these action programs, is the assumption that a climate of trust exists between the manager and the employees. The climate of trust and credibility of the programs are interdependent with one reinforcing the other. If employees perceive a program to be inequitable then, regardless of its sophisticated design and technology the effectiveness of that program will be seriously impaired: sometimes it might even be counter productive. Recently, a senior manager of the public sector organization observed : "In this organization, persons who do good work get more work; the rest get promotions".

Finally, the design and implementation of such action programs requires a constant monitoring and evaluation of the Performance Appraisal and Compensation program (performance appraisal and reward system) of the organization. It is not an easy task, but it is a vital task if management wants to maximize the potential of each employee within the organization.



Productivity
1986, XXVII, 2, 141-150

Work Democratisation Strategies

PRAYAG MEHTA

The author in this paper discusses the need for improving the quality of Working life through strategies of Democratisation, and thereby promote the performance of the people.

Prayag Mehta is with S.P. Jain Advanced Management Research Centre, Faculty of Management Studies, University of Delhi

The Indian labour force and nature of employees has been changing over the years. They are more youthful, more educated, more skilled and more aspiring. Having born in an independent democratic country, and brought up in the context of rising aspirations, they expect and crave for a better quality of life.

Research Findings

Rising expectations in life and changing labour profile are bound to be carried to the work place. Research studies conducted over the last decade in India show close relationship between life aspirations and satisfaction and work related aspirations, satisfaction and motivation. Some of the important findings are briefiy summarised below:

Work Related Satisfaction

a. *Economic Factors* : like salary, security and also sense of satisfaction with such economic factors emerge as the most important factors in life satisfaction. Conversely, employees in relatively lower income groups as well as those who perceived their income and economic conditions as not satisfactory, also showed low life-satisfaction.[1]

1. For example, see Ganguli, H.C. An enquiry into incentives for workers in an engineering factory. *Indian J. Soc. Work*, 1954, 5, 30-40; Lahari, D.K. Perceived importance of job factors by government and non-government employees. *Indian J. Psychology*. 1965, 40, 37-48 and Mehta, Prayag. Objectives and subjective factors in employees' satisfaction in life and work. *Indian J. Industrial Relations*, 1978, 2(3) 433-444.

Influence and Autonomy : At the *work place* the perceived availability of *influence* and *autonomy* emerge as the major source of satisfaction—dissatisfaction, both among the leading workers (Workers' representatives) and lower managerial and supervisory employees. It consists of their perceived over all influence in decision making in the organisation, autonomy in carrying out jobs, involvement in handling grievance control over work, responsibility and initiative. It was clear that the worker/employees craved for greater influence and autonomy at the work place.

Support and Care : They show concern for trust and cooperation with their peers and superiors, and for facilities like good canteen, drinking water and good medical care. They were dissatisfied with their superiors' behaviour and lack of meaningful leisure time activities after the day's work. Many of them expected their companies/organisations to provide them with such facilities.

Mutual Respect and Listening : Workers/employees representatives felt the need for better planning of day to day work and for appreciation of good work from their supervisors. They were particularly unhappy with their supervisors' lack of readiness to communicate and listen to them. They also expected more respectful treatment from them.[2]

Objective conditions and work satisfaction : Four economic indices of socio-economic conditions, namely level of education, salary, housing and the occupational status were important factors in varions aspects of work related satisfaction—suggesting significant link between objective conditions of life and happiness at the work place.

The younger Employees : The young entrants to work organisations showed greater work related dissatisfaction. They also showed greater aspirations and therefore expected more in life and from work. This was true also of the relatively slowly educated younger employees. They were probably more dissatisfied with their salary, amenities at work place and amount of influence, autonomy, responsibility available to them at the work place.

Unionisation : There was a growing tendency for unionisation not only among other employees including officers, managers and others.

Perceived Work climate : Workers/employees' rising expectations were reflected in their perception of *work climate* as of mis-trust, lack of mutual respect, and fault finding and delays in decision making. They also perceived lack of interest in work, an increase in absenteeism and wide spread fear of failure in the organisation. They perceived their officers as timid, easily provoked, closed to new ideas, and having a tendency to avoid taking decisions.[3]

Existing Organisations of Work

The existing work organisation tends to show some of the following characteristics.[4]

(a) Single task job is the basic element. Jobs are broken down to fit men, in simple division of work.

(b) Man becomes an extension of machine

(c) As men are glued to single jobs, supervisors keep a watch over them. Supervisors are supervised leading to hierarcy of positions.

(d) Compliance is enforced on the work force by various methods including manipulation and coercion.

(e) Job fragmentation is encouraged in order to reduce cost on training, skill upgradation. etc.

Organisations tend to greater centralisation and interest of the individual employees is subordinated to those of the organisations.

2. For data regarding influence and autonomy, support and care, mutual respect and listening, see Mehta, Prayag, From economising to democratic commitment : The role of Workers' participation. *Vikalpa*, 1976, 1(4), 39-46.

3. Mehta (1978), *op. cit.*, and Mehta, Prayag. Employee participation and development in a nationalised coal undertaking. *Abhigyan*, 1984, spring, 1-31.

4. Trist, Eric L. *Work improvement and industrial democracy* (mimeo), Philadelphia : Management and Behavioural Science Centre, University of Philadelphia.

In-congruence between Employee Needs and Existing Organisation

As the labour force changes and skills, needs and aspirations diversity, contradictions arise between them and the design of work, resulting in alienation, mental ill-health, demotivation, lack of interest in work etc. We can not operate as if workers are unchanging 'commodities'. Human dignity is asserting in life as a whole and therefore more sharply at work. Alongwith the need for better quality of life there is also a demand for better quality of working life. Work needs to be humanised and democratised in congruence with the changing social and human needs.

Emerging Movement for Quality of Working Life

Two basic principles seem to be guiding the emerging movement for quality of working life—also described by some as industrial democracy, (a) Everyone should have influence and be able to decide his own life situation and specially his work situation (b) labour is the main factor in creating capital. Therefore labour should have hand in deciding how capital should be used.

Criteria at Work Place

Four criteria seem to be important in shaping and promoting the movement. (i) *Security*: right to work and good working conditions. (ii) *Equity*: distributive justice, adequate and fair economic compensation. (iii) *Autonomy* and influence (Democracy at work place) and (iv) *Worth* of each individuals work as desirable and opportunities for his growth.[5]

As mentioned above, Indian workers, like workers any where else, have been changing—indicating new values and craving for changes both in life and at work. It is time to think about changes in design of jobs in the organisation of work.

Emerging Need for New Work/Organisation Design

In view of the changing nature of social and psychological needs of working people there is an increasing emphasis on the need for a proper balance between the social and economic aspects of development. In several developing countries of Asia and elsewhere, development plans stress not only economic growth, but also fair distribution of income, better employment opportunities, better educational and health facilities in other words, better quality of life, as important factors of development. The second United Nations Development Decade stressed that the ultimate goal of development is "to bring about sustained improvement in the well-being of the individual and bestow benefits to all." There is a definite trend to change the title of development plans from "National Economic Development Plan" to "National Economic and Social Development Plan."[6]

The changing concept of development is reflected in growing importance being attached to social planning at the enterprise level. It is now widely believed that an enterprises should at least serve two main purposes: (i) it should produce goods and services in most efficient and economic ways, and (ii) it should provide meaningful work situation to its employees for their personal growth and self fulfilment. With the growing importance of work satisfaction and personal growth accompanied by rising democratic values and growing aspirations, the movement for worker participation, industrial democracy and quality of working life has spread word wide.

Strategies and Methods

Improvement in the quality of working life and democracy at the work place, like other desirable changes, can not materialise automatically or by chance. Such changes have to be planned and implemented systematically. Various strategies and methods have been/are being tried out to promote this movement. Some such methods are discussed below.

Workers' Participation

The best known example of worker participation is

5. Maccoby, Michael. Changing work : The Bolivar project in *Working papers for a New Society*, 1975, summer.

6. For instance, see recent publication by International Labour Organisation for their Asian Regional Conference : Freedom of Association. Labour Relation and Development in Asia, Geneva, 1980, p. 4.

the *Yugoslav system of self-management.* Under this system, the management functions through self-management organs like Workers Assembly and Workers Council. Constitutional sanctions and principles governing this system have been incorporated in the new Federal Constitution of the Yugoslavia promulgated in the beginning of 1974 and in the "Law on associated labour" of 1976. While the autonomy of the undertaking has been reinforced, self management is being decentralised through the operation of self management organs at two, or in case of large enterprises, three different levels, namely, at the level of the undertaking as a whole, at the plant level and at the level of shops or departments, etc.[7] Since 1965, the Algerian Government have been pursuing the policy of promoting workers as producer managers. It adopted a charter and a code of socialist management of undertakings in 1971. Providing for Unit Assemblies for all non-agricultural public undertakings. Workers elect such assemblies for a period of three years. These assemblies act as trade union councils and in turn elect 7 to 25 member Undertaking Assembly.[8]

Other Devloping Countries

In several other developing countries, workers representatives have been included in management organs, at various levels and for varying lengths of time. This movement has been augmented by the growing importance of public sector in many developing countries. Such workers, representative may be directly nominated by the trade unions or by the Government in the proposal of the trade unions, or directly elected by the workers. Their number and influenee vary a great deal from one country to another from one government to another, according to the functions entrusted to them by law or in practice, and or because of workers' standard of education and training for this role.

The Indian Scene

India's Second Five Year Plan recommended the introduction of woakers' participation and involvement for "the purposeful implementation of the plan". It was visualised that such a measure would help promote productivity for the general benefit of the employees and the community and for satisfying the workers, desire for self-expression leading to better industrial relations and increased cooperation. A scheme of Joint Management Councils was introduced in 1958. It got a mixed reception from employers as well as trade unions. The scheme, however, did not prove successful. A survey showed that in 1968 it was functioning only in 131 out of about 18000 enterprises in the country.[9] Evaluation studies revealed that such councils did not produce any impact on the working of enterprises. The National Commission on Labour also found that there was not much support for the institution of Joint Management Councils in its current form.[10] Among other causes, the failure of Joint Management Councils was due to disinterest and opposition of the employers and apathy of workers. The same fate befell the Works Committees set up under the Industrial Disputes Act. The experience with regard to such Committees is unanimously discouraging. The workers are indifferent to them because functions assigned to the Works Committees are insignificant. Sometimes they also undermine the influence of the unions.[11]

Efforts for introducing workers' involvement in decision makIng has therefore a long history in India. We have statutory Work Committees, Joint Management Council, the Government-Scheme promulgated in 1975 and its extension to commercial and service

7. See Vojislav Stanvicic, The forms, character, and Development of self management in Yugoslavia in Workers Self-management and participation. Volume I, 1980. ICPE, L. jublijana.
8. Workers Participation and self-management in Algeria, see Issaka, Bagayoga : Worker Participation in Development —A survey of the development of Workers participation in French Speaking countries a paper presented at the Pan African Conference organised by OATUU/COTU May, 1982, Nairobi.
9. Such data have been published from time to time by the Labour Bureau, Ministry of Labour, Government of India, see the report on Functioning of Joint Councils, 1975.
10. Report of the National Commission on Labour, Ministry of Labour, Government of India, 1969.
11. For comparative data on this aspect, see ILO report op. cit.

organisations in 1977.[12] By amendment to the Constitution Workers' participation has been made a "Directive Principle of the State Policy". The latest in this series is the new scheme for employees' participation in Management issued by the Government Faculty.[13]

The New Scheme of Employee Participation

The latest Scheme of Employee Participation significantly enlarges the scope of participation both at shop floor and the plant level. Most of the fnnctions proposed for the shop level council are same as contained in 1975 and 1977, schemes. These relate to decision making about production and storage facilities safety; quality; monthly targets and production schedules. These functions have been the prerogatives of managers. It is proposed to provide workers through their representatives, scope to influence managerial decisions at higher level. This would therefore, form an ascending participation for workers. Such participation also seeks to integrate workers represetatives in managerial functions. However the Scheme also provides for (as different from the 1975 scheme) "formulation and implementation of work system, design group working" at the shop level.[14] The Scheme does not specify the content of this item. However it would mean participation in decision making about their own work a very significant departure from earlier schemes and needs to be fully understood by all parties concerned. If implemented properly, it would give power to worker to make decisions about their own work, thus allowing them considerable autonomy at the work place.

The functions ear marked for the plant level participation are more elaborate than those for the shop level. These include decision making regarding operational area; economic and financial areas; personnel areas; welfare areas and environmental areas. It provides for much large scope of participation, as compared to the earlier scheme. Financial matters have been included for the first time, within the scope of participation at this level. The scope for welfare matters like community development and pollution control extends the scope of participation beyond the plant.[15] These functions would provide for ascending and integrative participation, as fell as social and community participation. If properly implemented, plant level participation would therefore provide considerable power to the workers' representatives.

At the Board level, workers' representatives will participate in all functions of the Board. One of the special functions assigned here is the review of the work of the shop and plant level participatory formus.[16]

The Role of the State

The developing countries such as in India, public sector has come to occupy a dominant position in industrial and economic spheres. The state has become the most important employer. This is intimately linked with the all powerful role of the state in nation building efforts Through planned economic and social development efforts, the state tries to accelerate the tempo of development. Such efforts may not succeed due to faulty planning and development strategy, but the all powerful role of the state has become the most important factor. In the final analysis, whether the state is the principal employer or not, it occupies a central position in regulation and negotiation of labour conflicts in most developing countries despite their different political orientations.

Failure of Government Scheme

As mentioned above, institutional arrangements proposed by the Government, some by law, for promoting workers involvement in enterprise decision making have not succeeded. These have largely failed, promot-

12. The Government of India promulgated a scheme of workers participation on November 1, 1975 in Gazette of India (Extraordinary). This was extended to Commercial and Services Organisations vide Ministry of Labour Resolution No. L 560251/75-DK. I (B).
13. The latest scheme of the Government of India is published in Gazette of India (Extraordinary) Part I, Section-I December 30, 1983. It is entitled scheme for Employee Participation in Management.
14. Ibid, p. 4.
15. Ibid, p. 4.
16. Ibid, p. 4.

ing negative images of such schemes.[17] One of the frequent causes of failure of such arrangements is "the suspicion of trade unions that special bodies set up for workers participation may be used as a device to undermine the collective bargaining position of the trade unions as representatives of workers interests.[18] In a recent study of the functioning of the scheme of worker directors on boards of nationalised banks, the workers directors brought out this fear, rather strongly, as shown by their actual experience. Interestingly, some of the managing directors (of banks) perceived this (weakening of the trade union's bargaining power) as one of the goals of the scheme.[19] There are wide difference in perceptions about goals of such schemes.

The Role of Trade Unions

It is obvious that no scheme of workers' participation in management decision making can succeed without the active cooperation of workers employers and trade unions. Although the initiative has come from the Government, the workers' have to be made active and willing partners. The 1983 Indian scheme recognise this fact. Not only the representations of workers and managers on the various councils are equal, but the managements have been asked to consult respective trade union leaders in order to determine the exact number of such representations, Further, they "will also consult the concerned trade union leaders and evolve through consensus, the mode for representation of workers at all levels".[20]

Original Strategy and Methods

Policy interventions through government resolutions and legislative action are very important for giving a push and direction to the functioning of work organisations and for the quality of working life. However, mere laying down of procedures for participation would not make it work. Simultaneous actions would be required on various fronts for effective and successful implementation of employee participation in decision making. Some steps and requirements are discussed below :

(a) *Management Education and Rg-Training* : Management education, as it exists today, may not be suitable for developing participatory management. Such education, including curricula and methods, largely favours traditional form of management. Managers learn to mistrust trade unions, suspect workers and to acquire methods of controlling them. Managers therefore show "trained in-capacity" to change their perceptions in this regard.[21] Such a situation has to be changed if workers' partictpation has to succeed. This requires re-structuring of management schools and management education. It is also necessary to institute massive re-education and management training programmes designed to help managers acquire new perception, attitudes, motivation and skills. Such training efforts have themselves to be designed as participatory education. Traditional methods would not work.

(b) *Education and Training of Workers* : Massive workers' education is required to enable workers to acquire new knowledge and skills for participation. Traditional workers education programmes would need drastic changes in this respect. Like management education, workers' education also may not prepare the workers for their new role. Well planned training programmes are needed to equip the workers' representations to play their role effectively on the various participatory forums.

17. For a discussion of this situation, see Prayag Mehta, 'Impediments and problems in participative decision Making and democratisation of Management,' National Labour Institute Occasional Paper : 1979.
18. See ILO Report op. cit. p. 35.
19. National Labour Institute has been engaged in research on Functioning of Workers' Participation, see Meenakshi Nayar : Worker Directors in Nationalised Banks, memeographed 1982.
20. Government of India, 1983 Scheme of Employee Participation, op. cit. p. 4.
21. For a discussion of such and other related problems pertaining to workers participation, see Girad Kester and Henk Thomas "Strategies for socio-economic liberation of working men and women presented at the Pan African Conference of OATUU, May 1982, Nairobi.

Such educational process is vital not only for effective participation in all activities of the work organisation, but for the wider society itself.[22]

(c) *Training of Government Officials* : In most developing countries, initiative for introducing workers' participation comes from the government. The Officials are also responsible for implementing and monitoring such schemes. In the Indian scheme, the administrative ministries/departments of the concerned central public undertakings and the Department of Labour have a central role in coordinating and monitoring the programme. Such officials have generally gone through similar education process as managers and reflect managerial values and attitudes. They have not been exposed to practices and processes of participation. Bureaucratic administration with strong desire for rigid controls and orientation for paper work have their own "trained incapacity". Like managers, officials, also would need appropriate training. Particularly in development oriented administrative behaviour and in promoting support system for woskers' participation in decision making and in understanding, accepting and working with trade unions.

(d) *General Education for Participation* : School and College education generally do not include any exposure to concepts and techniques of participation. Citizens need to be educated to understand the importance of participation in civic activities. They also need experience of participating in school level decision making processes. Most persons leave schools without knowing anything about trade unions. On the contrary they may acquire negative attitudes to unionisation. There is a need therefore to include study of trade unions, work organisations, and participation in general curricula. This is particularly needed in vocational trade and engineering schools, from where young men and women are directly inducted into the work force.

(e) *Re-Organisations* : As mentioned above, organisation practices have to be matched with the procedures of participation. For instance mechanism is required for implementing decisions taken in the various participatory forums. Accountability needs to be defined. Personnel and reward policies have to be reshaped to reinforce cooperative and participative behaviour and to promote democracy at the work place. Trust and support systems need to be re-designed and new work-climate inculculated to foster employee involvement both in work and in other organisational matters.

Some Important Organisational Requirements

It is clear that organisational participation such as above can not be achieved without certain basic organisational changes. These involve certain crucial variables such as those mentioned below :

(i) *Degree of centralisation*, particularly in information, control and decision-making, has to be curtailed, bringing about decentralisation at all levels.

(ii) Degree of Structure : Organisations are over structured through rules, regulations, positions, instructions, etc. It is difficult to make changes in the organisation including government organisations and administration because of these restrictions leaving little room for employee participation as most of the behaviour in the organisation is decided by the regulations. Learning, also is difficult under such conditions, employees and managers are not accustomed to try out new ideas and to participate. Understanding is also harmful— as vagueness creates uncertainity and extreme caution. What is required is *openness to change* with minimum necessary structure.

(iii) *Degree of fragmentation* : Organisation is split

---

22. For discussion of the content and methodology of training for participation, see Prayag, Education for Workers' Participation, ASCI Journal of Management, 1977, Vol. 7 (1) 12-22 and Participatory Education for Rural Workers, memeographed, National Labour Institute, 1982.

up in specialised units, sub units, sub-sub units. This tendency goes with over structuring. This is carried to job fragmentation—often rendering learning unnecessary. Fragmentation limits the scope of the individual and his ability to see his own work as part of the whole.

The factors of centralisation, structuring and fragmentation are bound to be influenced by the process of democratisation. These changes are inevitable. It is therefore necessary that management (also administration in the government) takes lead toward such development. Schemes of employee participation represent government initiated efforts towards this direction. As seen above, such schemes do not yield desired results, primarily because these are not accompanied by the required organisational change.

Several other methods have been tried out to foster quality of working life. Some such efforts are described below :

1. Semi-Autonomous Groups

Powers are delegated to a group of employees in a department of a unit of the organisation, to constitute a *semi-autonomous group* within the organisation where the usual structure continues. Historically the method was developed in the context of British Coal Mines, where technology and productivity were the primary driving forces. Efforts were done to adjust technology to human needs in *Socio-technical system.*[23] At that time employees had low standard of living, low education. Their jobs, therefore were also simple, requiring some simple training, with simple division of jobs. Social responsibility of the eompany was also not so important. All this has been fast changing today with changing labour force. Now new form of work-Organisation is required and semi-autonomous group could be one way, where power is delegated to a group of people. One—man, one job ties are loosened, and the group assumes responsibility for an area or a department within the company. Jobs become more varied and meaningful. Workers' control and autonomy increase. Their income may increase with increased productivity.

Work done in India[24] has shown satisfactory results. However this new form of organisation remains an alien element in the old organisation structure. These remain little islands as long as nothing happens to the rest of the organisation. Such partly autonomous groups have difficulty in surviving.

2. Project Groups or Action Groups

Project or action groups are formed within the organisation to address to, and analyse and suggest action for solving some problem. Members are drawn from the various sections and levels such workers' representatives, supervisory staff and higher management. They work together on equal terms and the status structure is absent. They jump hierarchy and develop its own structure and norms and patterns of interaction which affect the entire organisation. Such groups tends to promote new problem solving climate and participation in the organisation. Such groups often become important inputs in total organisation development efforts. This has been tried out in several Indian Organisations with varying degree of satisfaction.[25] Such action have led to new learning opportunities and training programmes for ordinary employees drawing them out for active involvement in organisational problem solving. Such project groups therefore tend to affect the quality of working life of the entire organisation.

Project groups, however tend to be visualised as temporary systems and experimental in nature. Some times, action suggested by such groups are not implemented with great set back for their future functioning. Corresponding changes are required in the attitudes and policies and stability of the top management,

23. Emery Fred and Thorsrud, Einar. *Democracy at Work* Centre for continuing Education. Australian National University, 1970; Herbst, P.G. *Autonomous group Functioning* London : Tavistock Publications, 1962.

24. Kanawaty, G et al. Field experience with new forms of work organisation. *International Labour Review*, 1981, 120 (3) 263-277.

25. Mehta (1984) *op. cit.*

without which they may feel threatened by the forces released by the project groups. Under such condition the groups fade out and lose their importance.

3. *Peoples Self Action for Development*

Most of our working people belong to the rural unorganised sector. Most people here live below or around poverty line. India's huge rural development programmes aim at poverty alleviation of these people. The quality of life and working life of these people is extremely poor, degrading and de-humanising. Long period of exploitation and destitution have developed negative self image and an utter sense of powerlessness in them. The quality of working life movement cannot overlook the needs of such majority. In the recent years several projects and programmes have been initiated to help them attain awareness and skills, and initiate a process of their development. Such self action and participatory development widen their horizon, provide learning opportunities, enable them to organise for collective and cooperative action.

One such project at Singari[26] in Ranchi District of Bihar consisting of some 140 tribal households yielded good results, ushering in economic, social and educational development. By their own organised efforts, they were able to overcome excessive drinking, wipe out illiteracy, provide education to children and increase their income significantly. Development in this case, was people-development, resulting in very substantial improvement in both, their quality of life and working life. The key variables in the project were: *education, organisation* and *self action.* The outside agencies and workers facilitated the process by providing help in these processes.

Learning, Democratisation and Quality of Working Life

The nature of labour force in the organised industry sector as mentioned above has been changing. Therefore, there is a growing need to develop the organisation and the people in the organisation to cope with the emerging problems of today and tomorrow. The same thing is true of the people in the unorganised rural sector, who are to be prepared to cope with the tasks and problems of rural development. The process of democratisation is bound to affect the factors like centralisation, structure and fragmentation. It seems therefore that the process of organisational and development change would go hand in hand with the process of learning. It is necessary to realise the importance of planned and systematic learning and training activities and initiatives in this regard. The following points need to be kept in mind in this connection:

(i) The processes of democratisation, learning and education are inter-connected. Changes have to occur in the system of education in the methods of learning.

(ii) The world of work and school system cannot exist in isolation of each other. One group of people, with scholastic abilities go through school and university education without interfacing with the world of work. They enter it only as grown up people. On the other hand there are vast numbers of workers some of whom receive vocational training have no contact with each other at the work place and are not able to understand each other and work together. Such wide differences have to be overcome by training at the work place and by changes in educational policy.

(iii) Adult education is very important in this respect. It helps the process of democratisation and equalisation. Education is decisive for developing the ability to make use of opportunities and to learn at the work place.

(iv) Certain kinds of environment encourage and promote learning and mental abilities and some kinds of environment discourage learning. This is true of children in childhood, at schools and later for adults at work and in life. Education widens inequality by preparing some for higher jobs and down grading most others for lower jobs in the work hierarchy. Such job differences further widen the inequality: the highly educated work on jobs which equip

26. Chandra, Navin and Prayag Mehta *Peoples' Self-development action* : The case of Singari : New Delhi : National Labour Institute.

them further while others are dulled by their routine and simple jobs. This is much more true of companies marked by high degree of centralisation, structuring and fragementation. Here in lies the importance of in-company adult education, process of decentration and the quality of working life. This is true of development programmes some of which reinforce dependence in the people, while others encourage people-development. The crucial question, therefore is: how is the working environment? Is it conducive to learning? Does it help people to grow?

The work and its organisation need to be redesigned in order to improve the quality of life and to match it with democratic aspirations and needs of the working people. Education and learning strategies and methods are required to equip people including managers to cope with the new tasks. Working environment and work have to be re-created to help them to learn. Those who want to learn also like to create, innovate and try out new practices for continual improvement in the quality of life.

Productivity
1986, XXVII, 2, 151-157

Risk Taking and Performance

P. DEIVANSENAPATHY

The author in this article discusses the role of risk taking in the success of enterprises. The findings suggest that entrepreneurs of healthy units are moderate risk takers and those of sick units are having risk avoidance tendency.

P. Deivansenapathy is with Entrepreneurship Development Institute of India, 83/A, Swastik Society, Navrangpura, Ahmedabad.

Introduction

Human activities in all walks of life are preceded by decisions. The process of decision making involves exploration, analysis of situations, events and subsequently evaluation and discrimination. The issue concerning the avoidance of acceptance of risks in arriving at decisions, is an important ingredient of the decision making process, particularly at the entrepreneurial level. The major purpose of the present research is to determine whether entrepreneurs of successful units and sick units (failure in their ventures) differ in their risk taking propensities.

Risk taking behaviour has been found to be an important determinant of entrepreneurship (McClelland 1956a, 1961, Ziller, 1957, Palmer, 1971). To be personally responsible for the risks involved in the establishment of an enterprises, may be considered as one of the important dimensions of an entrepreneurial behaviour. The entrepreneurs bear the risk of launching a new business. They are motivated to respond to a variety of environmental stimuli to improve the performance of their firms by choosing among the various decision making alternatives. These alternatives are influenced by the owner manager's preception of the task environment. The decisions of the entrepreneurs certainly have substantial impact on the firm's subsequent performance. Sutton (1954), Kogan and Wallach (1964) have emphasised the risk taking behaviour in decision making.

The Achievement motivation theory developed by Atkinson (1957) accounts for risk taking behaviour and has been widely accepted. Atkinson model involves six variables: the subjective probability of success (Ps), the subjective probability of failure (Ps); the incentive value of success (IS); the incentive value of avoiding failure (−If), the motivation to success (Ms) and the motivation to avoid failure (Mf). The variables are combined and the resultant motivation is $= (Ms \times Ps \times Is) + (Mf \times Pf \times -If)$. The model suggests that individuals with stronger achievement motive are most likely to choose tasks of intermediate difficulty. This theory explains that an individual with motive to avoid failure is stronger, should avoid intermediate risk, preferring either very easy and safe undertakings or extremely difficult and speculative ones. Many researches (Litwin, 1958; McClelland, 1958, Atkinson and Litwin, 1960) have shown that high achievement motivated people are moderate risk takers. According to McClelland (1961) individuals need more than average ability to perform successfully the function that fall within the limits of the safe end of the continuum, but no amount of skill can help in chance or highly speculative situations.

Entrepreneurial Behaviour and Risk Taking

An entrepreneur takes a decision in a situation of uncertainty. Entrepreneurs are taking decisions not only with a desire for success but also with a realistic estimation of the probability of success. Success or failure when they have a 50 : 50 chance of reaching a goal they have set, depends on the maximum possible extent of their competence and expenditure of energy (Heckhausen, 1967). This calculated risk taking is characteristic of the successful entrepreneurial personality (McClelland 1961, Meyer et, al, 1961)—Brody's (1963) decision making experiments have shown that a success motivated person preferred moderate risks while failure motivated persons preferred extremely low or high risks and this was further supported by Weinstein (1969). Liles (1974) concluded that the decision depends to a great extent upon the potential entrepreneur's perception of the risk involved. Entrepreneurial risk can be divided into three components: the general risk taking propensity of the entrepreneur; the perceived probability of failure for a specific venture and the perceived consequences of failure.

Singh and Singh (1971) found that progressive agricultural as well as business entrepreneurs as a whole were having moderate risk-taking behaviour, whereas traditional groups recorded either low or too high risk-taking behaviour; and business entrepreneurs in general were having higher mean risk-taking scores than the agricultural entrepreneurs (Singh and Singh, 1972). Chaubey and Sinha (1972, 1974) found that the economically developed villagers have intermediate level of risk-taking tendency, whereas the undeveloped villagers prefer either too low or too high risk. Williams (1971) found that low risk-takers were concerned with the extrinsic characteristics of the work and those who took high risk were more concerned with the intrinsic characteristics which present a direct challenge to them. Singh and Indira (1977) reported that business success was associated with high scores on achievement motivation and moderate scores on risk-taking. They also found low scores on achievement motivation and high scores on risk-taking were associated with declining business. Singh (1978) observed that cautious decision-making was one of the qualities which differentiated the fast and slow progressive agricultural entrepreneurs in India.

Objectives of the Study

From the reviewing studies on risk-taking in the context of the theory of achievement motivation, and the nature of entrepreneurial role requirements, it can be assumed that the entrepreneurs of successful units and the entrepreneurs of sick units will differ in their risk taking propensity and the purpose of this investigation is to verify this assumption.

Measurement of Risk Taking

Risk taking is defined as an individual's tendency to accept or to avoid risk in arriving at a decision in a 'dilemma of choice', situation representing a risk at one end and a safe course of action on the other. There is a motivational involvment in one's acceptance of risks in arriving at a decision which in turn involves the weighing of alternatives in terms of their desirabilities and their likelihood. The entrepreneur has the triple functions of choosing, deciding and acting on the basis of the preceived probability of success or failure in every uncertain situation that confronts him in day-to-day operations.

Though various measures have been used to study risk taking behaviour (Slovic, 1962) the Choice Dilemma Questionnaire by Kogan and Wallach (1964) has been selected for the present study. Experimental measures of risk taking are not found to be feasible among entrepreneurs, because of the time taken in administering the test, especially when the investigator entirely depends upon the owner of the unit to spare his time according to his convenience. The items in the CDQ are relevant to the entrepreneurial population as they are concerned with hypothetical contructs and risk involved in decision making. The same questionnaire was validated (Deivesenapathy, 1977) and was used among entrepreneurial population by previous investigators (Singh and Singh, 1971 and Brochaus, 1980).

The twelve hypothetical situations of CDQ were presented to the respondents. Each item required the respondent to choose between a safe alternative to a risky alternative. The respondent was asked to indicate the probability level of success sufficient for him to select the risky alternatives. The probability level is the unit of measurement. The subject's score on each item is the level of probability chosen by him. The subject also had the option to refuse to choose the risky alternative to no matter whatever it may be. Lower scores are associated with low risk taking tendency whereas the highest scores represent the greater risk taking tendency.

Sample Selection and the Concept of Healthy (Successful) and Unsuccessful (Sick)

Entrepreneurs of Ambattur Industrial Estate, an industrial belt area near Madras were selected as respondents for the purpose of this study, based on the following criteria.

(a) The entrepreneurs should have established their units by themselves;

(b) The entrepreneurs should have only manufacturing units and should have minimum five years in their operation;

(c) The units should have been viable to be evaluated by the Government Officials and Bank Officials;

(d) The units should be owned only by a single person.

Identification of Successful Entrepreneurs

(i) They should have existed on a continuous basis for a minimum period of five years;

(ii) Annual turnover of the units should have shown increase year after year;

(iii) They should have shown increase in number of employees (this indication is taken with reservation);

(iv) Self-analysis of the entrepreneurs should fully confirm the evidence that their units are running successfully;

(v) Ratings by government officials (Deputy Tahsildar of the Industrial Estate Administration who is connected with land/shed revenue collection of the units) and the ratings by Bank officials should also confirm that the units are running successfully by repaying the taxes, loans etc. The performance of the enterprise was taken here to indicate enterpreneur's success.

Unsuccessful Entrepreneurs : (Sick Units)

To see the differences in risk taking—between enterpreneurs of successful and unsuccessful units, the following yardsticks were used to identify the entrepreneurs of unsuccessful units. The definition given by the Reserve Bank of India (RBI) is taken for granted to identify the sick units. (The sick unit is one which has incurred losses in the current as well as in the following year which has an imbalance in the financial structure, i.e. loss over a continuous stretch of three years could form a practical yardstick). Apart from this, the government officials identified the unsuccessful units on the basis of their (i) performance (ii) frequent closure of the units due to various reasons, mainly due to financial hardships and (iii) non-payment of loans regularly. The list given by the government officials was once again rated by the officers of the nationalised bank, based upon their financial performance. As both the ratings were highly similar, the researcher once again got a self-report from the entrepreneurs themselves about the failure of their units. The unsuccessful entrepreneurs were identified on the basis of the information provided by the officials (Government and the entrepreneurs themselves. On the basis of the above mentioned criteria 45 entrepreneurs of sick units and 53 entrepreneurs of successful units by systematic sampling) were selected. The description of the units were given in the tables I to IX.

TABLE I

Shows the various types of industries included for the study

Sr. No.	Type of Industries	No. of healthy units	No. of sick units
1.	Chemical units (including plastics)	3	5
2.	Electrical components	5	5
3.	Engineering and other components (including automobile ancillaries)	30	21
4.	Fabrication work	15	12
5.	Others	—	2
	Total	53	45

TABLE II

Shows the average turnover of both healthy and sick units

Sr. No.	Average annual turnover (range)	No. of healthy units	No. of sick units
1.	Below 2 Lakhs	4	5
2.	Between 2 to 3 Lakhs	10	16
3.	Between 3 to 4 Lakhs	10	14
4.	Between 4 to 5 Lakhs	10	6
5.	Above 5 Lakhs	19	4
	Total	53	45

TABLE III

Shows the number of employees working in healthy and sick units

Sr. No.	Number of Employees	No. of healthy units	No. of sick units
1.	Below 10	6	13
2.	Between 10 to 20	21	25
3.	Between 30 to 40	15	7
4.	Above 40	11	—
	Total	53	45

Risk Taking Behaviour among the Entrepreneurs of Healthy and Sick Units

The result of the present study shows that the entrepreneurs of healthy units have higher level of risk taking tendency and vice versa, and the difference between the two groups is statistically significant. In

TABLE IV

Shows the mean and S.D. of risk taking among the entrepreneurs of Healthy and sick units

Entrepreneurs	N	Mean	S.D.
Healthy Units	53	35.94	9.92
Sick Units	45	30.13	6.33

TABLE V

Shows the analysis of variance between entrepreneurs of Healthy and Sick Units in risk taking

Sources of Variation	d.f.	Sum of Squares	Mean sum of Squares	F ratio
Between means	1	821.53	821.53	25.507
Within groups	96	3092.04	32.04	
Total	97	3973.57		

Significant at 0.01 level.

entrepreneurial job one has to study the market situation, explore various probabilities alternative lines of business, mode of technology, and process of finance. This means indulgence in planning which involves decision making after evaluating the various alternatives. From the present study one may come to the conclusion that entrepreneurs of healthy units have taken calculated risks which yielded the expected results. In the case of sick units the entrepreneurs are afraid of taking risks due to fear of failure. They are unable to evaluate and take decisions at the right time resulting into sickness.

Risk taking within the Healthy and Sick Units

Classifying Highly Successful and Highly Sick Units

After the initial classification of the small scale units into sick and healthy units, the researcher made further classification of the sick units into sick and highly sick; the successful units were also classified into successful and highly successful. This was done on the basis of the increase on annual turnover of the units. In the present study the increase in annual turnover was calculated in the following manner. The entrepreneurs were requested to give their yearly turnover for a period of five years continuously after establishing their present enterprises. The turnover by using the following formula (Cited in Singh, 1978). Increase in the turnover $=(Y_2-Y_1)/Y_1\times 100$. The designate Y_1 refers to previous year turnover, Y_2 refers the turnover of the next year. In this way five years successive increase in yearly turnover value were calculated for each firm for five years. To control the market fluctuation and other environmental factors five years turnover was taken here. From the five years the average growth rate of each firm was again computed which gives the growth rate of a particular firm in that five years period. By using the median cut the successful units were grouped into highly successful, and successful, the sick units were grouped into sick and highly sick units.

While analysing the risk-taking tendency between the entrepreneurs of sick and highly sick units, there

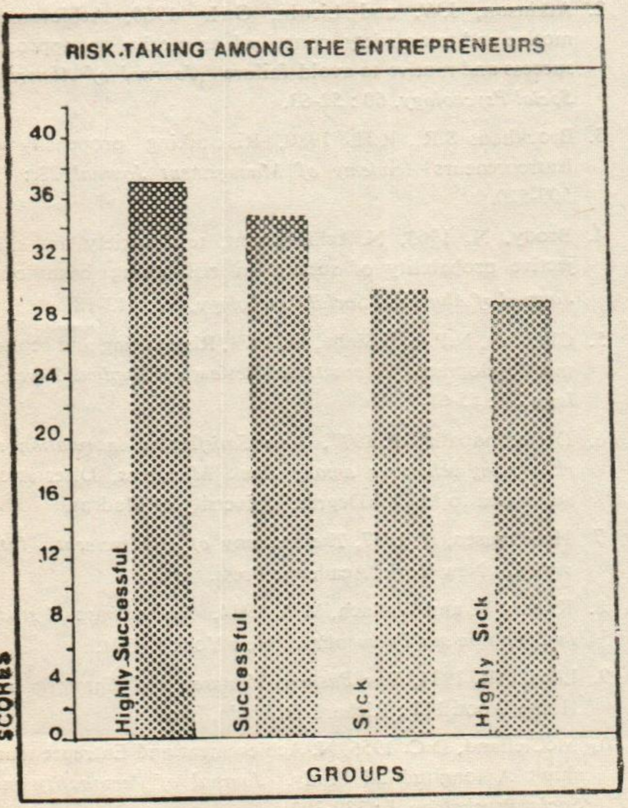


TABLE VI

Shows the Mean risk taking of Highly successful and successful group of entrepreneurs (Within Healthy Units)

Group	N	Mean	S.D.
Highly successful group	26	37.04	5.48
Successful group	27	34.88	4.058

TABLE VII

Shows the analysis of variance between entrepreneurs of successful and highly successful group in risk taking

Source of Variation	d.f.	Sum of squares	Mean sum of squares	F. ratio
Between groups	1	61.2	61.2	2.546
Within groups	51	1225.63	24.03	
Total	52	1286.83		

TABLE VIII

Shows the mean and S.D. in risk taking among the entrepreneurs of Sick and Highly Sick Units (Withing Sick Units)

Groups	N	Mean	S.D.
Entrepreneurs of Sick Units	22	30.72	7.13
Entrepreneurs of Highly Sick Units	23	29.56	5.39

TABLE IX

Shows the Analysis of variance between entrepreneurs Sick and Highly Sick Units risk taking

Sources of Variation	Off	Sum of squares	Mean sum of squares	F. ratio
Between groups	1	25.90	25.90	0.63
Within groups	43	1779.29	41.37	
Total	44	1805.2		

Not Significant.

is difference in mean level but it is not statistically significant. The mean of the entrepreneurs of highly successful and successful groups shows difference in their risk taking tendency but the difference is not significant. The entrepreneurs of sick units are found to hesitate in taking risks and in decision making. It may be due to their fear of failure. This risk avoidance may be due to the fact that in their past experience, their decisions and judgements have not yielded the expected results. This explains their failure to take the right kind of risks at the appropriate occasions. Failure to undertake risk is also not conducive to the growth of the firm. In many cases the sickness could have been avoided if adequate care had been exercised at different stages in the past.

The theory of achievement motivation asserts that achievement motive and expectancy of success produce positive interest and pursuit of success but the motive to avoid failure functions to steer an individual away from achievement related activities because they produce a tendency to avoid or inhibit actions which might lead to failure.

In entrepreneurial job one has to study the market situation, explore the competition, take appropriate decision after evaluating the various alternatives.

Conclusion

From the present study one may come to the conclusion that entrepreneurs of healthy units have taken calculated risks which yielded the expected positive results. In the case of Sick Units the entrepreneurs are afraid of taking risks due to fear of failure. They are unable to evaluate and take decisions at the appropriate time, resulting in sickness.

REFERENCES

1. Atkinson, J.W. 1957, Motivational Determinants of risk taking behaviour. *Psychological Review*, 64 : 359-72.
2. Atkinson, J.W. and Litwin, G.H. 1960, Achievement motive and test anxiety conceived as motive to approach success and motive to avoid failure. *Journal of Abnormal Social Psychology*, 60 : 52-63.
3. Brockhaus S.R., R.H. 1980, Risk taking propensity of Entrepreneurs *Academy of Management Journal*, 23 : (3) 509-520.
4. Brody, N. 1963, N. Achievement, test anxiety and subjective probability of success in risk-taking behaviour. *Journal of Abnormal Social Psychology*, 66 : 413-18.
5. Chaubey, N.P. and Sinha, D. 1974, Risk taking and economic development, *International Review of Applied Psychology* 23 : 55-61.
6. Deivasenapathy P. 1977, *Jobs Satisfaction in relation to risk-taking behaviour among Bank Managers*, Disertation submitted to M.Phil Degree, University of Madras.
7. Heckhausen, H. 1967, *The anatomy of Achievement Motivation*. New York, Academic Press.
8. Kogan, N. and Wallach, M.A. 1964, *Risktaking : A study in Cognition and Personality*. New York : Holt.
9. Liles, P.R. 1974, *New Business Ventures and Entrepreneur*. Home Wood 111 : Richard D. Irwin, Inc.
10. McClelland, D.C. 1956, N. Achievement and Entrepreneurship : A longitudinal Study. *Journal of Personality and Social Psychology*, I : 389-392.

11. McClelland, D.C. 1958, Risk-taking in children with high and low need for achievement. In Atkinson, J.W. (ed.) *Motives in Fantasy, Action and Society*. Princeton, N.J. Van Nostrand.

12. McClelland, D.C. 1961, *The Achieving Society*, New York, Van Nostrand.

13. Meyer, H.H., Walker, W.B. and Litwin, G.H. 1961, Motive patterns and risk performances associated with entrepreneurship. *Journal of Abnormal Social Psychology*, 63 : 570-574.

14. Palmer, M. 1971, The application of Psychological testing to entrepreneurial Potential. *California Management Review*, 1971, 13(3), 38.

15. Singh, N.P. and Singh, K. 1971, Motivational Components of Agricultural and Business Entrepreneurs in India. *Indian Journal of Industrial Relations* 7 : 31-52.

16. Singh, K. and Singh, N.P. 1972, Risk-taking among agricultural and Business Entrepreneurs of Delhi. *Psychologia*, 15 : 175-180.

17. Singh, S. and Indira, J. 1977, Achievement Motivation and risk-taking among small industrial entrepreneurs. *Asian Journal of Psychology and Education*, 2 : 14-17.

18. Singh, S. 1978, N. Achievement, Decision making orientations and work values of Fast and slow progressing Farmers in India. *The Journal of Psychology*, 106 : 153-160.

19. Slovic, P. 1962, Convergent Validation of risk-taking measures. *Journal of Abnormal and Social Psychology*, 65 : 68-71.

20. Sutton, F.X. 1974, Achievement norms and motivations of Entrepreneurs. In '*Entrepreneurship and Economic Growth*' Mimeographed : Cambridge. Mass. Social Science Research Council and Harvard University Research Centre in Entrepreneurial History.

21. Weinstein, M.S. 1969, Achievement Motivation and risk Preferences. *Journal of Personality and Social Psychology*, 13 : 153-172.

22. Williams, L.K. 1971, Some correlates of risk-taking *Personnel Psychology*, 24 : 291-310.

23. Ziller, R.C. 1957, Vocational Choice and utility for risk. *Journal of Consulting Psychology*, 4 : 61-64.

Productivity
1986, XXVII, 2, 159-168

Merit as Promotion Criterion for Performance

M. MUKERJEE &
S. CHATTERJI

The author in this paper discusses the effectiveness of merit as a factor for promotion. It was observed that seniority and departmental assessments failed to prove their effectiveness where other set of variables mentioned above served as significant predictors of future performance.

M. Mukerjee & S. Chatterji are with Indian Statistical Institute, 203, Barrackpur, Trunk Road, Calcutta.

Use of Objective tests and Psychometric methods for selection or for promotion of personnel in an organisation is a recent trend in India. Strictly speaking this has come out of mere necessity. What is observed in most selection situations is that the number of applicants far exceeds the number of vacant posts. To select the proper candidates out of this large number through personal interview alone is a difficult task specially when the time is limited. Hence, there is the need for use of a suitable screening device and the psychometric methods are being used mainly for this purpose at present.

Almost a similar situation is faced in an organisation when there are a large number of employees who are fit for promotion to higher grades so far as their length of service and paper qualifications etc., are concerned but for various reasons all of them cannot be promoted. Under such a situation the organisation has to try out other methods to handle the problem instead of relying completely on the traditional ones.

What is meant by Promotion?

By promotion we generally mean the advancement of an employee to a job carrying better terms and conditions and therefore high status. Whenever there is a vacancy for a post, it can be filled up by

(i) promoting suitable employees from lower grades, or by

(ii) recruiting suitable persons from outside.

If all such vacancies are filled in from outside, there will be no encouragement for the existing staff to improve their efficiency. The organisation that has no established promotion policy is likely to have a group of frustrated or discontented workers because when they find no prospect for themselves the only outlet for them is to demand constantly highly wages or increased amenities. So, there should be provision for promoting suitable ones from among the existing staff to higher grades, for filling in certain percentage of vacancies and the remaining posts may be filled up by fresh recruitment for fusing new blood in the stream.

Now, the question is what should be the criterion for promotion: (a) seniority, or (b) merit? There are certain advantages and also certain disadvantages in both the processes.

Promotion on the basis of seniority alone cannot increase the efficiency of the organisation to the expected level, whereas merit, if considered alone may create confusion and disorder among the workers. It may lead to formation of an unhealthy atmosphere within the organisation. Hence, a good promotion policy should be such that it ensures

(i) scope far promotion within the organisation to fill in vacant posts, and
(ii) that both seniority as well as merit will be considered in all such cases.

In most of the organisations it is observed that the main deciding factor for promotion is the confidential report i.e., C.R or appraisal. Personnel appraisal as we all know is supposed to be a mearure of the performance of the individual on an assignment and it provides indirectly an index of the effectiveness of the selection technique and procedure. It also provides some knowledge necessary for recommending the employee for promotion. But when the employee is appraised for promotion, it is to be decided whether he can be given more responsibility or more complicated work i.e., the projection of the performance of the employee in the higher grade, is of main importance.

So, it is generally observed that the task of assessing the employee at the time of promotion is rather difficult, and it is desirable to have more than one assessment under such a situation. In practice, it is observed, that it is difficult to have more than one assessment from the supervisor of the employee as mostly there is one man who is closely associated with the employee and who is really in a position to report on a subordinate's work.

To solve such problems, some of the organisation have set up the system of examination. It may be departmental affair or may not be so. On the basis of such a test the merit of the employee is evaluate and he is considered for promotion.

This study reports the results obtained by using objective methods in promoting employees from assistant to the rank of officers. There were about fifteen hundred employees working in the different stations of an organisation in the following three departments:

(a) Commercial
(b) Stores
(c) Accounts

They were all working in the organisation for five years or more than that and all were eligible for promotion to the next higter grade according to the rules of the organisation.

The Group: The employees under consideration were heterogenous in nature so far as their educational level, age and job experience were concerned. Educational level varied from non-matric to M.A./M.Sc. etc., whereas the age range was 28 years to 50 years and more. Minimum job experience was five years as already mentioned. They were stationed at different places and some were posted also in the Head Quarter.

Tools used: After a long discussion with the management and employees starting from managerial levels to the assistants level, the three areas were considered at the time of examination.

(A) *Aptitude*: The tests provided an idea about the potential ability of the employees necessary to handle the new responsibility and work assignment effectively. There were three parts, viz. (a) Verbal Reasoning, (b) English Knowledge & Comprehension, and (c) Quantitative Reasoning. These tests were developed by the authors. The relevant statistics of the items were available from prior administration of the test on similar groups. They were all satisfactory.

(B) *Job Knowledge*: These tests assessed how for the employee mastered his present job; this might be taken as an indication how quickly and efficiently he would be able to pick up his new job. Moreover, it was thought that if an individual working in a particular department for five years or more, was not able to pick up adequate knowledge about his department's work, he should not be considered for further promotion. There were two parts, viz , General Knowledge about the organisation and Specific Knowledge about each of the three departments viz., Commercial, Stores and Accounts. The first part was compulsory, the second part was optional. The employee might take one, or two or all the three as per his choice.

(c) *Personality*: Personality traits like initiative, leadership. co-operativeness, etc., which were thought to be essential for jobs of officers were measured through Group Task and Group Discussion.

Administration of these tests: These tests were administered in 18 different centre at the same time. After evaluation, the raw scores for each part of the aptitude test were converted into standard scores considering the performance of the group. The standard scores on three parts were added together to get a composite score for the aptitude test. The part scores of the Job knowledge tests were converted to standard scores and then added together to get a composite standard scores for the Job knowledge test. About 500 candidates passed through the written test and were called for further personality test

Group Task and Group Discussion: The usual inventory approach to measure personality traits like leadership, initiative, co-operativeness, was ruled out as that might result in considerable taking. These traits were measured through Group Task and Group Discussion. In Group Task, a group of ten candidates was given a suitable problem which would call for good planning and leadership, as well as co-operativeness from the members. The time allowed for completing the task was 60 minutes. Three independent raters observe the candidates when they were engaged in solving the problem and assessed their personality along different dimensions. The total of the ratings was converted into standard grade. Along with this, there was a session of group discussion where several other traits were assessed. Like Group Task the total of the ratings of the three raters for Group Discussion was converted into standard scores.

On the basis of the performance in the Group Task and Group Discussion the candidates were further screened out and some candidates from the top were sent for final interview.

Results

Instead of considering the entire group, 100 cases were selected at random, and the means, standard deviations, intercorrelations among the parts and tests werg computed. These were separately done for Commercial, Stores and Accounts groups. These values are presented in Table 1 and 2.

From the results, it is apparent that the aptitude parts were a bit difficult for the groups. Of the three groups, the performance of the accounts group was the best so far as the aptitude test was concerned. But, with respect to job knowledge test the commercial group topped the list. It is to be noted that for Stores and Accounts, specially for stores, the two parts of Job knowledge test were negatively correlated with those of the Aptitude test. Even the two parts of the Job Knowledge test, i.e., General and Stores or General and Accounts were negatively correlated. It indicates that those employees who had good knowledge about their present job could not do well in Aptitude test. But, as it was necessary to assess the potential ability and trainability of the candidates for promotion to higher post. Autitude test was a must. Again the organisation wanted that job knowledge should be one

TABLE 1

Means and Standard Deviations of the tests
(Using 100 cases selected at random)

Parts of Aptitude & Job Knowledge Test	Commercial (N=100) Mean	Commercial (N=100) Standard Deviation	Stores (N=100) Mean	Stores (N=100) Standard Deviation	Accounts (N=100) Mean	Accounts (N=100) Standard Deviation	Odd-even Reliability	Maximum possible score
Verbal Reasoning	13.55	3.20	16.26	4.20	17.19	4.20	.82	48
English Comprehension	4.90	1.60	5.72	1.80	6.05	2.00	.58	18
Quantitative Reasoning	10.23	2.50	13.04	3.80	14.27	4.30	.80	29
Total Comp. Aptitude	9.74	2.20	13.02	4.30	12.84	4.70	—	27
Job Knowledge General	20.77	3.00	21.16	3.80	21.01	3.70	.67	40
Job Knowledge Commer.	20.40	4.60	—	—	—	—	.78	40
Job Knowledge Stores	—	—	17.72	4.20	—	—	.73	40
Job Knowledge Accounts	—	—	—	—	17.34	4.50	.88	40
Job Knowledge Comp.	6.80	2.20	8.28	2.30	7.63	2.10	—	18

of the main criterion for promotion. Hence, both the dimensions were assessed and separate cutting points were suggested for selecting the candidates.

Odd-even reliabilities of different parts etc., presented in Table 1 indicate that most of the reliability indices were fairly high except one i.e., for English Comprehension part of the Aptitude test. The number of items for this part was only 18 which might have caused the low reliabilities value.

Validity of the Test

The final step of the analysis involved the validity of the tests. This is the most important index for the test; a test may be highly suitable for the group, it may have very highly reliability, but unless it is positively correlated with the specific criterion, which it is supposed to predict, it is of no use.

In order to establish the validity of the test the most important factor is the criterion. In this case, the criterion would be the job performance appraisal of the promoted subjects. But, the available job performance record was based on the performance of the employees at their present assignment. How well those employees would do in their new assignment was yet to be observed. Anyway, this confidential report was also important, as those enployees who did not have "outstanding" or "very good" remark in their confidential report were not promoted to the proposed higher rank even if they passed through Aptitude test and Group Task and Group Discussion. Hence, this assessment might be considered as the intermediate criterion of success and might de profitably used as criterion for validating the test.

The confidential report for the entire group of candidate was collected. It consisted of six categories, viz.

Categories		*Marks assigned*
(A) Outstanding	...	6
(B) Very good	...	5
(C) Good	...	4
(D) Average	...	3
(E) Below average	...	2
(F) Poor	...	1

TABLE 2

Significant correlation between different selection tests

Correlations between selection tests	Commercial N=100	Stores N=100	Accounts N=100
V. Reasoning X English Comp.	—	.26**	.37**
V. Reasoning X Q. Reasoning	—	.54**	.53**
Q. Reasoning X English Comp.	—	—	.30**
Total Aptitude X V. Reasoning	.55**	.74**	.79**
Total Aptitude X English Comp.	.48**	.56**	.61**
Total Aptitude X Q. Reasoning	.53**	.74**	.79**
Total Aptitude X Job Know. (Sp.)	—	—.32**	—
Job Know. (Gen.) X Job Know. (Sp.)	—	—	—.26**
Job Know. (SP) X V. Reasoning	—	—.29**	—
Job Know. (Sp.) X Q. Reasoning	—	—.27**	—
Total Job Know. X V. Reasoning	—	—.20*	—
Total Job Know. X Q. Reasoning	—	—.20*	—
Total Job Know. X Job Know. (Gen.)	·75**	.67**	.59**
Total Job Know. X Job Know. (Sp.)	.74**	.53**	.54**

* Significant at the % level

** Significant at the % level

It was however, observed, that none of the employees was put in the last two categories and hence the functionally this rating was only on a four point scale.

It should be remembered here that this quantification was done purely arbitrarily. It was further observed that

(a) the supervisor generally varied from one employee to another.

(b) the standard of rating also varied from supervisor to supervisor.

But, to start with, as no other better criterion was available, this was utilised. As the C.R. yielded only four or five categories, the Che-square values and the Coefficients of Contingency were caluculated instead of correlation coefficient to find out whether the two variables were related or not. Significant Chi-square values Indicated that the two variables were dependent and the coefficient of contingency denoted the degree of dependence. Instead of considering different parts of aptitude test or those of the knowledge test, the composite stanine grades were used to obtain the required Chi-square values. The values are presented in Table 3.

Along with these selection test scores, two other factors, viz. educational qualification and duration of the service of the subjects were taken into account. In order to utilise this information it was necessary to quantify them and so the following procedure was worked out. The educational quantification was divided into five categories and the points were assigned as follows :

Educational qualification		*Points assigned*
Non-matric	—	1
Matric	—	2
Inter./H.S./P.U.	—	3
Graduate	—	4
Post-graduate	—	5

The subject were divided into three categories on the basis of duration of service, viz.

(A) Short duration ! 61-94 months'

(B) Average duration : 95-201 months'

(C) Long duration : 202 months and above

The first and the last group accounts for 23 per cent of the entire group, while the average cotegory consists of the remaining 54 per cent. This division was done so as to match with the division done to obtain the stanine grade for the selection scores. As done with the selection test variables, Chi-square values were obtained with these two variables and the significant values are presented in Table 3.

TABLE 3

Chi-square values and corresponding coefficient of contingency indicating relation between the selection variables and the criterion i.e., Confidential Report (CR)

Selection variable X Confidential Report		Chi-square	d.f.	Coefficient of Contingency
1. Aptitude X CR (Total Group)	N=832	57.91**	24	.25
2. Job Knowledge X CR (Total Group)	N=828	60.61**	24	.26
3. Aptitude X CR —Commercial	N=657	119.57**	24	.39
4. Job Knowledge X CR —Stores	N=90	33.12*	24	.52
—Commercial	N=652	35.08*	24	.23

* Significant at the 10% level
** Significant at the 1% level

Only the selection test scores, neither the educational qualification nor the duration of service were significantly related with the confidential report. So far as the department of Stores was concerned, Job knowledge test was the most correlated one with the criterion whereas for the Commercial group, Aptitude was found to have better predictive efficiency. For the Accounts department, neither the Job Knowledge nor the Aptitude was found to have significant relation.

In order to probe into the nature of the other variables, the relations between Educational qualification, Aptitude, Job Knowledge and also Duration of the Service were studied and the corresponding Chi-square arc presented in Table 4.

TABLE 4

Chi-square values and the corresponding coefficient of contingency indicating relation between the Selection variables

Selection variables		Chi-square	d.f.	Coefficient of Contingency
1. Aptitude X Educational Qualification				
—Total	N=1072	45.99**	24	.20
—Commercial	N=834	143.11**	24	.38
2. Job Knowledge X Educational Qualification				
—Total	N=1070	39.27*	24	.06
—Stores	N=112	55.22**	24	.57
—Accounts	N=127	22.56**	24	.39
—Commercial	N=831	34.57*	24	.20
3. Aptitude X Duration of Service				
—Total	N=1092	35.38†	16	.18

* Significant at 5% level
** Significant at 1% level
† Significant at 10% level

Both Aptitude scores and Job Knowledge score were significantly related with the Educational Qualification, but not with the Duration of Service. The result is rather supervising because with the increase in service period it ts expected that the employee's Job Knowledge score would be higher. But, the present result did not support this fact.

Other Useful Criteria

So far the analysis was done with the entire group who took the selection tests. Now attention was focussed to those who passed through written test, Group Task and Group Discussion and were finally considered for promotion on the basis of interview.

The members of the interview board were high level officers from the organisation concerned and they were quite familiar with the interviews as well as their job performance quality. Interview ratings varied from 0 to 100. Reliability of the interview ratings was established by Ebel's (1) formula and the value thus obtained for the average of the ratings of the three interviewers was as high as .99.

This average rating was taken as the criterion of job performance. Another assessment from the relevant department was also available for each of the employees who appeared in the final interview. In order to find out its relation with the interview ratings, multiple correlations were calculated considering the interview marks as independent variables and departmental assessment as dependent variable. These values are .97 (N=146), .97 (N=45) and .93 (N=41) for Commercial, Accounts and Stores groups respectively.

As high degree of agreement was observed it was decided to add up the interview ratings and the departmental assessment together to find out its relation with the selection variables.

Relation between the Selection Variables and the Average of the Interview Rating and the Departmental Assessment

As four ratings were highly inter-related, their average was used as an index of appraisal of job performance, it is expected that more or less same result would be obtained if these were considered independently. Moreover, the average of these four ratings would have higher reliability than that of a single one.

For the three groups, three different regression equations were computed with the average rating as criterion and 17 selection scores as independent variables. Of these 17 variables three were aptitude scores, two job knowledge scores, six group task ratings and six group discussion ratings. Step down regression analysis was done and only those selection variables which were significantly contributing to the multiple correlation were presented in order of importance in Table 5-7.

From the result it follows that in the Commercial group the most important factor was "Communication skill" then "Address" followed by "Leadership" quality. It may happen that qualities affected the interview ratings most or it may be that these are essential qualities for an officer in the Commercial department. Job Knowledge and Quantitative Reasoning scores were also found to be of importance. Other variables had no contribution for predicting the criterion.

TABLE 5

Regression coefficients, multiple correlations of the selection variables against the average of the four ratings

(Commercial group N=146)

Variables	Regression Coefficient	Order of contribution
Quantitative Reasoning	−.31	6
General Knowldege about organisation	.43	5
Job Knowledge (Commercial)	.28	4
Co-operativeness	.66	7
Leadership	.12	3
Communication	−.36	1
Address	.20	2
Articulation	−.90	8
Multiple correlation	.35**	

** Significant at the 1% level

TABLE 6

Regression coefficients, multiple correlations of the selection variables against the average of the four ratings received by the candidates

(Sto-es group N=41)

Variables	Regression Coefficient	Order of contribution
Job Knowledge (Stores)	.62	1
Participation	.17	3
Co-operativeness	.16	4
Ability to plan	−.19	2
Multiple correlation	.52**	

** Significant at the 1% level

The first point to be marked from the result presented in Table 6 is that unlike the Commercial group, fewer selection variables had significant contribution towards predicting the criterion and the variables also were found to be different. For this group, Job Knowledge test had maximum contribution, followed by the rating obtained in "Participation" in Group Discussion. This means that a good job knowledge and sufficient energy to execute that knowledge, a feeilng of cooperativeness were considered necessary to perform the job of a Stores Officer successfully. Ability to plan the work was also of importance.

In this connection it may be pointed out once more that all the condidates considered here were above a certain level of aptitude test score and they were more or less homogeneous on this aspect. This might have some effect in reducing the importance of the contribution of aptitude scores in the regression analysis considered here though its actual contribution in predicting criterion might be quite high.

TABLE 7

Regression coefficients, multiple correlations of the selection variables against the average of four ratings

(Accounts group N=45)

Variables	Regression Coefficient	Order of contribution
Application	.16	3
Leadership	.33	5
Communication	—.52	4
Logical thinking	.34	1
Coordination	—.20	2
Multiple correlation	.54**	

** Significant at the 1% level

Result as presented in Table 7 reveals that for Accounts group, "logical thinking" was most important, then came the "ability to coordinate the work", "leadership" and "application". The personality factors were found to be of more importance than the Aptitude or Job Knowledge.

Long Term Validity of the Selection Variables

So far the selection variables were validated against two concurrent criteria :

(a) Performance appraisal obtained earlier in the original post.

(b) Assessment during interview.

But, the efficiency of the procedure has to be established through a long term validity study, i.e., by studying the relation between the selection variables and the performance of the promoted employees as officers. To get a reliable performance appraisal of the promoted individuals one has to wait for four to five years.

The promoted employees were followed and at the end of five years their performance appraisal records were collected. This appraisal was divided into two parts viz.,

(A) Performance

(B) Potential

Six traits viz., Job Knowledge, Quality of work, Decision Making, Dependability, Relationship with subordinate and Attitude towards others, were included in Peformance part. Assessment of potentiality consisted of four traits viz., Ability & initiative, Judgement & decision making, Perfessional Knowledge and Adaptability. Maximum mark to be allotted for each of the traits was 10. There were several ratings available for each employee by more than one supervisors given in different points of time. The ratings however, did not vary much and so the average of the ratings was used as criterion. Beside these ten ratings for ten different traits, three more ratings were obtained, adding the ratings of the traits under 'performance' and those under 'potential' and finally adding all the ratings together.

Altogether 57 employees were promoted to officer's grade of which 39, 11 and 7 were in Commercial, Accounts and Stores respectively.

First of all, the correlations between the selection variables and the appraisal variables were calculated by pooling all the cases. It was observed that Aptitude total was related with most of the Appraisal variables. The values which were found to be significant are presented in Table 8.

TABLE 8

Correlations between Aptitude Total and Appraisal Variables

Aptitude Total X Different Appraisal Variables	Correlation
1. Job Knowledge & Application	.28*
2. Quality of work & Cost consciousness	.27*
3. Decision Making	.27*
4. Dependability	.27*
5. Attitude towards others (other than subordinates)	.31*
6. Professional Knowledge	.26*
7. Performance	.29*
8. Potentiality	.26*
9. Total	.28*

* Significant at the 5% level

English Comprehension and Job Knowledge tests were significantly related with several appraisal variables which are presented in Table 9.

TABLE 9

Correlations between other selection variables and some significantly related appraisals variables

Selection variables X Appraisal variables	Correlation
1. English Comprehension X Quality of work	.26*
2. English Comprehension X Attitude towards others	.36**
3. English Comprehension X Adaptability	.26*
4. English Comprehension X Performance Appraisal	.27*
5. Job Knowledge X Quality of work	.32**
6. Job Knowledge X Attitude towards others	.29*

* Significant at the 5% level
** Significant at the 1% level

Correlation of Group Task total with "Attitude towards others" was .24 which was just below the 5 per cent level of significance. Educational Qualification was significantly (at 5% level) related with "Ability and Initiative".

Surprisingly, "Service period" was found to be negatively related with many of the appraisal variables. The significant correlations are presented in Table 10.

TABLE 10

Correlations between "Service period" and several Appraisal variables

Service period X Appraisal variables	Correlation
1. Quality of work	—.30*
2. Decision Making	—.29*
3. Dependability	—.27*
4. Relationship with and development of subordinates	—.31*
5. Professional Knowledge	—.28*
6. Total of the ratings	—.28*
7. Performance	—.28*
8. Potentiality	—.27*

* Significant at the 5% level

It indicates that those subjects who worked as Assistant for a longer period of time failed to do the job of officers efficiently than those whose service period was less. It may be concluded that it is better to promote the potential employees as quickly as possible, otherwise the qualities specifically required to porform the duty of an officer get rather blunt due to disuse. Now, the same set of correlations was obtained by segregating the subjects into three groups. As there were 11 and 7 cases in Accounts and Stores, rank order correlations were obtained instead of product moment correlation.

In Commercial group, Educational Qualification of the employees had maximum predictive efficiency and were significantly related with most of the appraisal variables. The values obtained are presented in Table 11.

TABLE 11

Correlation between Educational Qualification and Appraisal Variables

Educational Qualification X Appraisal Variables	Correlation
1. Job Knowledge	.38*
2. Decision Making	.40**
3. Relationship with others	.31*
4. Attitude towards others	.35*
5. Ability & Initiative	.54**
6. Judgement & Decision Making	.43**
7. Professional Knowledge	.32*
8. Adaptability	.38*
9. Total	.39*
10. Performance	.36*
11. Potential	.45**

* Significant at the 5% level
** Significant at the 1% level

Among other selection variables English Comprehension was significantly related with "Attitude towards others", Quantitative Reasoning was related with "Relationship with and development of subordinate", and Job Knowledge with "Attitude towards others". Service period was negatively correlated (−.32) with "Dependability".

Analysing the relation between the selection and appraisal variables separately for Accounts group, it was observed that except the negative correlation of "Service period" with (a) Total of appraisal ratings and those for (b) Performance and (c) Potential all other correlations were insignificant. In Stores group, however, Aptitude total and Internal assessment were significantly related with the same three composites.

Conclusion

It has been observed through this study that promotion by merit may yield better result that what may be obtained by considering seniority only. It is further revealed that the longer an employee remains in a particular post the less will be his effectiveness in higher post when promoted. Internal assessment by supervisor, which is the main determinant of promotion in most of the cases was found to have very little predictive efficiency in almost all the cases except one. It indicates that objectivity in assessment is much more important factor than the more knowledge of day to day facts by an assessor not serious about the consequences. Educational achievement in relevant field was found to be an effective determinant of future performance in some of the categories. Hence, it ts desirable to assign the importance to this variable at the time of promotion. It is necessary to identify those employees who have the require capacity as early as possible through objective procedures and to promote them to suitable posts.

Finally, it may be said that while promoting the employees, one should not depend solely upon the confidential report obtained from his superior. On the other hand, it is necessary to collect as much information as possible about the individual through objective and unbiased tools and decision should be based on these assessments, not on the basis of seniority which when considered singly, may lead to a negative result.

REFERENCE

Guilford, J.P.—(1954) Psychometric Methods. New York, McGraw Hill, pp. 395-397.

Productivity
1986 XXVII, 2, 169-173

Job Enrichment and Job Satisfaction

N. DAFTUAR &
H.N. PRASAD

The author in this article discusses the relation between the Job Enrichment and Job Satisfaction and brings out some factors which are crucial to job satisfaction and performance.

N. Daftuar is with Department of Psychology, M.S. University, Baroda. H.N. Prasad is with G. J. College, Patna, Bihar.

Introduction

Job enlargement (enrichment) or variety in jobs has received wide support as a way to create more meaningful work and, hence, induce more job satisfaction. Hulin and Blood (1968) reviewed the job enlargement thesis as : "One of the most pervasive and dominant themes which exists in the attempts of industrial psychologists to provide guidelines and framework for the motivation of industrial workers."

Herzberg (1966, 1969) stated that job enrichment seeks to improve both the task efficiency and human satisfaction and growth by enlarging peoples' jobs. Both McGregor (1966) and Herzberg (1969) proposed that when workers are given opportunities to increase the complexity and responsibility of their jobs, they will derive greater satisfaction from their work and will respond by increasing their performance levels.

On the other hand, Turner and Lawrence (1965) did not support the hypothesis that increasing the skill content of jobs will raise the workers' jobs satisfaction. They found that workers who belonged to small town responded differently from workers who came from larger cities. Hulin and Blood (1968) also found that increasing job size is not related to job satisfaction. They believed that the "case for job enlargement has been drastically overstated and over generalised...". They also added that the argument for larger job as a means of motivating workers, decreasing boredom and dissatisfaction, and increasing attendance and productivity is valid only when applied to certain segments of the workforce—white collar and supervisory workers and nonalienated blue collar workers. This thesis is supported by a large scale study of job enlargement practices in 276 companies by Schoderbeck and Reif (1969). That means, the general experience in numerous plants has been that the lower the skill levels, the lower the degree to which job enlargement can be established to be meaningful to the employee and management. Also, 80% of companies were not using any type of job enlargement.

Obviously, from the above discussion it appears that the first question is : Job enrichment for whom Katz and Kahn (1966) concluded that "the motive of self-expression depends primarily on objective attributes of job itself." Kornhauser's studies (1965) of the automobile workers in Detroit showed that though workers groused about their jobs as boring, lacking challenge and beneath their dignity, they are not likely to get satisfaction from job enrichment.

During the last three decades, we have witnessed a craze among Indian managers to go in for Western managerial system and management values. Since many in Indian management as well as among Indian experts are blindly advocating for job enrichment it would be interesting to study the relationship of variety in jobs and job satisfaction at different levels of management in public and private organizations.

AIMS, Purpose and Hypotheses

The main purpose of the study was to see the relationship of variety (enrichment) in job and job satisfaction.

This vexed problem is drawing attention of Indian managers, but the relationship does not appear to be a simple one. For example, further enriching the superior employee may produce undesired effects. It may increase the gulf between superior and junior workers and create new problems for managers. So, the second aim of this research was to see the differences, if any, between the relationships of the two variables at the different levels of employees.

Cultural backgrounds and attitudes towards work greatly affect how employee react to the work in the factory (Daftuar, 1982). This necessitated the third aim of studying the relationship of variety in jobs and job satisfaction among employees of two different set-ups (private and public belonging to a medium size city and a metropolitan city).

Hypotheses

Following the line of argument by Herzberg and others that job enrichment is more effective in case of white-collar employee. We hypothesized that (i) there would be positive significant correlations between job satisfaction and level (number) of variety for all levels of employees.

If we generalise the controversy regarding the blue—, versus white collar workers to the levels of management, we may hypothesise that (2) as we move from lower level supervisors/managers to a higher level, the strength of relationship between variety in jobs and job satisfaction will be higher.

The two groups of the sample belonged to two types of location. One belonged to middle-sized city while the other belonged to the cosmopolitan city of Calcutta. Hulin and Blood (1968) believed that workers from large cities could be considered to be alienated from the 'work' norms of the middle class (a belief in the intrinsic value, the Protestant ethics, of hard work). That means, the workers of large cities may not appreciate job enrichment programme.

Since we have generalised the above, the argument of Hulin and Blood to white-collar middle class employees (as our sample was) we have hypothesized that (3) the supervisor/managers, belonging to a private organization in the metropolitan city of Calcutta (O_2) would, in comparison to those belonging to the government secretariat located in a middle-class city, would show weaker relationships between job variety and job satisfaction.

Also, because the Government systems are more bureaucratic, we hypothesized (4) that personnel in private organization (O_2) would have more variety in their jobs. A related hypothesis (5) made us to expect that personnel in O_2 would be more job satisfied.

Methods

Research Sites

The study was conducted in two separate organizations (O_1 and O_2) located in two important states of Eastern India. The two organizations are quite different in their ownership and in their working systems.

Organization-1 (O_1)—It is a public organization—a state secretariat. There are more than 25 major departments employing about 5200 employees, Employees, here, do mostly file work. Administrative control is vested in the State Government.

Organization-2(O_2)—It is a privately managed multinational organisation which manufactures finished leather goods. It has five branches of manufacturing units, located in different parts of the country. The present research was conducted at its Indian headquarter at Calcutta. About 2000 employees are employed there. The administrative control is vested in the Board of Directors.

Sample

The employee were divided in three groups as the top, middle, and lower level managers and officers in two organizations. This was done on the basis of a preliminary opinion survey of the top executives of respective organizations. They were asked to group the employees in their respective organizations as belonging to top,–, middle–, and lower levels. It was a convenient sampling scheme. We covered as many people as were willing to cooperate.

We Covered groups of 25 (top), 40(middle) and 35(lower) from each organization. They represented about 12.44, 11.37 and 8.20 per cent. in 01, and 40.32, 42.55 and 23.82 per cent in 02 of their respective caders (top–, middle and lower levels).

While the N for each group in two organizations corresponded, it could be possible for us to cover larger proportions of the total population in 02 because this was smaller organization than 01.

Tools

The present work is a part of a much bigger project. Naturally, only a part of a bigger questionnaire was used for the present article.

Job satisfaction of the respondents was measured by a scale of job satisfaction (JSS) developed by Daftuar (1984). The scale has twenty one items. It measures job satisfaction in twenty areas. One additional item measures the overall job satisfaction level.

For measuring the 'variety' in jobs there was only one item in the questionnaire. It asked the respondents to give the number/types of work they perform on their job positions.

Procedure

As explained earlier, first of all top executives in two organizations were asked to classify their employees in three groups—top, middle, and lower levels.

After the initial selection of the subjects, respondents were approached individually by the junior researcher. All efforts were made to establish proper rapport. The questionnaire contained a standardised instruction. Respondents were assured of the anonymity of their responses.

The interview, for the entire questionnaire, lasted for about one-and-half hour in each case.

Results

The results have been summarised at three levels : (1) The levels of job satisfaction at various managerial categories; (2) Variety in job, experienced by various levels at their job positions; and (3) Relationships between the job satisfaction and job content (variety).

Analysis of variance for $2 \times 2 \times 3$ design (high and low variety and O_1 and O_2, 2×2 with three levels,

L_1, L_2 L_3 i.e., $2 \times 2 \times 3$) yielded a highly significant interaction affect ($F = 64.29$, P – L.01). That indicated significant differences accross organizations and levels vis a vis variety and job satisfaction. This necessiated further analysis of results as indicated above. The findings have been summerized in Tables 1 and 2.

Results related to variety in jobs and job satisfaction are given in Table 1.

TABLE 1

Means (=) of 'variety' and 'job satisfaction' at three levels in O_1 and O_2 and their respective t—values

Levels	Variety			Satisfaction		
	$\frac{O_1}{X}$	$\frac{O_2}{X}$	t	$\frac{O_1}{X}$	$\frac{O_2}{X}$	t
Top	8.32	9.00	4.83*	3.68	4.08	3.06*
Middle	9.10	8.92	1.44	3.73	3.45	3.97*
Bottom	7.74	7.96	5.50*	3.26	3.40	5.41*

$^*p = < .01$

The results in Table 1 suggest that except for the middle (L2) level, the Govrnment officers perform less job roles than their counterparts in private organisations (O_2). The differences in means are significant in case of the top—, and the low levels officers. The findings in Table 1 also indicated that all the categories of employees of both organizations are generally satisfied with their jobs. However, the top –, and the lower-level employees in the private organization (O_2) are significantly more satisfied than their counterparts in O_1. Reverse is the case with middle level officers.

TABLE 2

Biserial correlation ($\sqrt{bs}$) coefficient values between 'variety' and 'job satisfaction'

O_s	Top	Middle	Bottom	Three groups combined
O_1	.75	.69	.79	.74
O_2	—.48	—.67	.25*	—.46

* Only non-significant correlation value. All other values are significant < .05 — > .01 levels.

All the correlation ($\sqrt{bs}$) values, except one (L_3 of O_2), in Table 2 are (>0.05—<.01). That means, the satisfaction level and variety of job performed by the respondents seem to be correlated variables. However, the directions of correlations vary in two organizations. Whereas, all the $\sqrt{bs}$ values in O_1 are positive, in O_2, they are negative in all but one (L_3).

Discussion

In general, personnel at L_1 and L_3 levels in O_2 performed greater variety of work in their jobs than those of O_1. Though reverse is the case with L_2, the mean difference (O_1 and O_2) was not significant. Similarly, the same groups of respondents (O_2, L_1 and L_3) were more job satisfied than their counterparts. In Government system, employees serve a bureaucratic organization and are expected to functions in a routinized way. This may be the reason that they are not required to do as many jobs as those who work in private organizations.

The first hypothesis envisaged significant positive correlations between job satisfaction and variety in jobs at all levels of job roles. This X could be confirmed only in case of O_1, in O_2 we obtained significant negative correlations ($\sqrt{bs}$) at all levels except one (L_3). This is a curious but, interesting result. Though as a group they (O_2) have to perform more number of jobs and are more satisfied yet, perhaps, individually the relationship is inverse. This is further corroborated from the individual data sheet as well. Those who scored high on job satisfaction generally perceived doing less work than their friends, in the same group, who scored low on job satisfaction, but were high on variety scores.

This difference in the trend may be either because of the setup (private management) on because of location of the O_2—a metropolitan city. We had hypothesized that managers/officers belonging to metropolitan city would show a weaker relationship between the two variables. In other words, Hypothesis—3 is confirmed. Although, with the present state of data with us, and because of two possibilities (nature of management versus location) interesting, we are not in a position to take a definite stand at the moment. The reasons may be any one or both of them.

We had also hypothesized that as we move from lower level supervisors/managers to higher levels, the strength of relationship between variety and job satisfaction will be higher (Hypothesis – 2). Such a hypothesis could not be confirmed. In fact, we failed to get any definite trend in relationship across levels.

One reason for this type of uncertain results may be because of the fact that we measured 'variety' on the basis of the employees version. During data collection we often experienced that respondents were not certain about the types of job functions they do. Whenever we asked them, in most cases, they had to think, count and ponder before replying. In other words, our present result is based on the 'perception' of employees regarding the variety in their jobs. Data based on an O & M study might have given a definite trend in the results

We have got only two definite trends in our results. One, by and large, employees in O_2 have greater variety in their jobs as compared to their counterparts in O_1. This was expected (Hypothesis-4) because, as mentioned earlier the government systems in this country are more bureaucratic and, home, more routinised. Slight reversal in case of L_2 may be because under governmental system there is definitely greater degree of delegation at the middle echelon and several things are routinely decided at the middle level. On the other hand, in private organizations, generally, delegation is rather restricted and even where delegation is operative the managers prefer to seek advice of their superiors—written or verbal (Daftuar, 1985).

In case of satisfaction also, our hypothesis (Hypothesis-5) that personnel in O_2 will be more job satisfied has been generally confirmed. In private organizations, such things as pay structure, promotional avenue, etc., are better and more frequent. This might have caused this result.

Conclusions

On the basis of the results, we may make following conclusions :

(1) Personnel in private organization (O_2), with exception to middle level, are more satisfied then those working in Government secretariat (O_1).

(2) In O_2, personnel, again with exception to L_2, have greater variety in their jobs than their counterparts in O_1.

(3) Personnel belonging to privately managed organization based in a metropolitan city showed weaker and/or negative correlations between their levels of job satisfaction and variety in their jobs.

(4) No definite trend in relationship of the two variables was observed in relation to the hierarchy of the respondents.

(5) Positive and significant relationships between variety and job satisfacion at various levels was observed only in Government setup.

REFERENCES

Daftuar, C.N. : *Job Attitudes in Indian Management : A study in need deficiency and need importance,* New Delhi : Concept Publishing Co., 1982.

Daftuar, C.N. : Job satisfaction Scale. In D.M. Pestonjee Ahmedabad : (Ed). Secood Handbook & Psychological & Social Instruments, I.I.M., Mimeographed, 1984.

Daftuar, C.N. : Power Strategies : The game top people play in organizations. Mimeograph, Baroda University, Dept. of Psychology, 1985.

Herzberg, F. : *Work and Nature of Man.* Cleveland : World Publishing, 1966.

Herzberg, F. : Job enrichment pays off. *Harward Business Review,* 1969, 47 (March-April), 61-78.

Hulin, C.L. and Blood, M.R. : Job enlargement, individual differences and Worker responses. *Psychological Bulletin,* 1969, 1, 41-45.

Katz, D and Kahn, R.L., *The Social Psychology of Organization,* New York : Wiley, 1966.

Kornhauser, A. : *Mental Health in Industrial Workers,* New York, Wiley, 1965.

McGregor, D. : *Leadership and Motivation,* Cambridge, Mass. MIT Press, 1966.

Schoderbeck, P.P. and Reif, W.E. : *Job Enlargement : The Key to Improved Performance* Ann Arbor ; University of Michigan Press, 1969.

Turner, A.N. and Lawrence, P.R. : *Industrial Jobs and the Workers.* Cambridge : Harward University, Graduate School of Business Aaministration, 1965.

Productivity
1986, XXVII, 2, 175-179

EXECUTIVE READINGS

Agrarian Power and Agricultural Productivity in South Asia
(Edited by) Meghnad Desai, S.H. Rudolph and Ashok Rudra

Published by :
Oxford Uuiversity Press
Delhi, 1984
Rs. 160/-, PP. 384

Reviewed by :
Dr. H.S. Shergill
Rcader
Economics Department
Panjab University
Chandigarh

This volume consists of eight papers contributed by social scientists sharing a common methodological framework of political economy. The issue examined is the role of local power structures in agricultural development on the Indian sub-continent. The common thread in thier arguments is that the relationship between agrarian power structures and agricultural development on the sub-continent, is highly variable and does not lend itself to any sweeping generalizations. In a way, most of the papers rebut the definitive style in which Bhaduri. Prasad and others have been talking about the negative role of 'semi-feudal production relations' in the development of agriculture in Bihar and Bengal. The message of this volume is that one can not be dogmatic about the role of production relations in agricultural development. Different scenarios emerge depending on a number of other important factors like demographic changes, dynamics of market forces and role of trans-local power structures.

The paper in this volume that describe and discuss the interaction between agrarian power structures and agricultural development in specific historical settings and localities, are the more interesting and informative. D.W. Attmood discusses how the greater importance of human capital in sugarcane cultivation leads to the emergence of actual cultivators (rather than landlords or money-lenders) as the dominant group in Maharashtra sugar belt. B.B. Chaudhuri argues that the negative role of Zamindars and Jotedars in Bengal agriculture has been exaggerated and points out number of situations where they played a progressive role too. Ashok Rudra's analysis of wage rates and labour hiring practices in 39 Bengal villages leads him to believe that neither neo-classical economic theory, nor the traditional Marxian class framework are of much use in understanding the dynamics of Indian villages.

Rest of the papers do not offer anything new either in terms of empirical information or theoretical reasoning. Ronald Herring and Sukhmoy Chakravarty in their respective papers merely assert that 'semi-feudal relations of production' may or may not obstruct agriculture development, depending on numerous other factors. This assertion does not flow from any systematic analysis of empirical evidence or theoretical reasoning. The operational usefulness of Meganad Desai's concept of agrarian power in terms of landlord's ability to earn a higher rate of return compared to others, is doubtful, Rudolphs merely reassert the widely accepted view that objective factors do not automatically result in mobilization of exploited groups; capacity of leaders to translate these objective factors into political action is the more crucial variable. David Ludden's review of different methodologies for studying agrarian history is too sketchy to be useful and his comparison of wet-areas and dry-areas fails to provide any clues about the role of production relations in agricultural development.

Most of the authors of this volume merely assert the conclusions rather than drawing these from systematic analysis of empirical information or theoretical reasoning. A serious gap in the volume is the absence of any paper on the role of production relations in agricultural development of the green revolution areas of Punjab-Haryana. These weaknesses notwithstanding, the volume as a whole significantly advances the discussion on the role production relations in agricultural development on the sub-continent, by offering a viewpoint different from the more fashionable one propagated by Bhaduri, Prasad and others in recent years.

Operations Research for Management
M.P. Gupta &
J.K. Sharma

Published by :
National Publishing House
Rs. 55/-
pp. 528

Reviewed by :
Kuldip Chander &
Prof. P. Natarajan
Civil Engg. Department
Indian Institute of Technology
Hauz Khas
New Delhi

The book is written primarily for a course in Operations Research for students of management, commerce, economics and engineering. The book is divided into 17 chapters.

In the first Chapter, sufficient account of how operations research came into existence during World War-II and its applications to problems in business and industry were made later on has been given. In order to provide adequate foundation of formulation of linear programming problems, a large number of examples have been included in Chapter 2, 3 and 4.

The authors could have easily reduced the number of assignment problems considered in Chapter 6; and other topics could have been better substituted.

The authors have wished well by the readers by including a chapter on Goal Programming However, the maximum number of goals which could be considered and their grouping at same level, keepi ng in view their compatibility, does not find a place in the Chapter.

The Chapter on Network models —PERT and CPM—deals with very elementary aspects.

For a discerning reader, particularly an experienced teacher or deligent researcher, only the explanation and nomenclature given to the methods in the several steps may seem to mark the differences from problems or treatments given in standard references (like H.A. Tata "Integer Programming" when comparing problem 7.1, or S.M. Lee "Goal Programming" when comparing problem 8.3.7). It would have been certainly worthwhile to acknowledge such adoptions. Likewise to have added references for each Chapter would have served the readers' interests better than a consolidated list of references at the end.

No doubt several other methods or even topics seem to have been omitted within the broad spectrum of O.R. methodologies : but the authors could not be held responsible for choosing topics as they desire. However, the host of methods skipped out and topics not dwelt upon can be taken to be a confirmation of the intention of the authors to address the book to a wide net of more or less casual readers.

Keeping in view the binding, paper and material included in the book which cannot serve the purpose of a standard text or reference, the price is prohibitive.

Business Policy for
Indian Industries
BS KS Chopra

Published By :
The Times Research Foundation
Price : Rs. 75/-
pp. 164

Reviewed by :
R.M. Narchal
Chief Consultant
National Productivity Council

With the increase in dimension of environment and with the new technologies and complexities coming in, Corporate Planning and Business Policy are becoming an important aspect of the company planning. There are a number of very good books available in the area, however, most of these books are published by the international agencies and relate to application of the technique in US and European countries.

This book on Business Policy for Indian Industries written by Dr. BS KS Chopra, is a fairly good attempt to describe the dynamics of corporate planning in the Indian context supported by examples from the Indian Industries.

The book consists of seven chapters in all. The first three chapters of the book relate to the process of corporate planning and choice of strategy. The last two chapters are concentrated on implementing and evaluating the strategies.

In the first chapter the author discusses the various definitions of the Corporate Planning. The basic elements of Corporate Planning are presented by the author with the help of a corporate planning model explained diagramatically.

The author also reasons out the need for the Corporate Planning in a company and discusses various examples of the Corporate Planning under the Indian environment. The author also presents the broad strategies adopted by some of the Indian companies and the benefits derived out of these strategies. Finally chapter one is concluded by discussing the role of the Chief Executives, Top Managers and the Corporate Planning staff in developing Corporate plans.

The second chapter of the book relates to appraisal of the external environment to assess the opportunities and threats existing in the environment. The environment is grouped under seven heads such as economic, political, social, technological and regulatory environment. The environmental factors are grouped under three main heads namely market factors, supplier factors and general environmental factors for assessing the opportunities and threats.

Chapter three of the book discusses the corporate strengths and weaknesses of an organisation. The book presents a general philosophy and lists down the various functions where strength and weaknesses have to be assessed. The author also presents the financial and the non-financial criteria for judging the strengths and weaknesses and discusses the methodology for evaluation of a company based on the strength and weaknesses.

In chapter four various alternative strategies are discussed. The author groups the possible strategies in four areas namely suitability strategy, growth strategy, retrenchment strategy and combination strategy and discusses the situations under which a company may like to go for the above strategies.

In chapter five, the author describes that the choice of strategy for a company depends upon the corporate philosophy of the company and is also governed by four sets of factors related to external dependence, attitude towards risk, base strategies and power relationship existing in the company. The final choice, however, is worked out by matching the strengths and weakness with the opportunity of threats.

Chapter six and seven give the broad outlines on the strategy implementation and its evaluation. The author supports the Mckinsey 7 S framework for implementation. Various organisation structure for implementation are discussed in this chapter followed by check list for involvement of team and people in the Indian context. Various financial and non-financial yardsticks are also listed down for evaluation of the strategies.

The Book gives the broad outlines about the business policy and corporate planning and is good for having an overview of some of the sub-result areas of corporate planning. The book is meant for those executives and students who may like to understand the broad philosophy about the business policy and corporate strategies. The book has got limited use for those who may like to derive the process of corporate planning after its reading. At no place the author has tried to give a linkage between the corporate strategy and objective of the organisation. The methodology for carrying out SWOT analysis on quantitative basis is missing in the book. The author has no where discussed the use of computer based models in strategic evaluation. However, a large number of Indian examples and cases from the Indian companies supported by statistics presented in the book are highly useful for the Indian managers. The present book, therefore, will serve as another broad reading on business policy and corporate strategy under the Indian context.

Performance Appraisal : Theory & Practice
T.V. Rao

Published by :
AIMA—Vikas Management Series
New Delhi
Edition : 1984
Price : Rs. 50/-
pp : 278

Reviewed by :
V.V. Ramaiah
Senior Consultant
National Productivity Council
New Delhi

Any process of appraisal is one which involves judgement. Formal judgements of employees and their performance are both difficult to make and even more difficult to communicate. This book by an author with considerable academic and practical experience in the field, is, therefore, both timely and relevant.

Rao has made an attempt to describe the performance appraisal system the way it should work. It is based on the assumption that people are capable of self-direction and mature enough to supervise themselves. Further it assumes that if employees are allowed to participate in setting their performance goals they will have a clear idea of what is expected of them. Essentially, this book deals with the components of such a 'development oriented performance appraisal system.' It focusses on the appraisal system as an instrument of change—change in organisational culture, values and philosophy.

The appraisal format set out in the first nine chapters of the book has four major elements—(i) Identification of Key Performance Areas, (ii) Performance Analysis, (iii) Performance Discussion and (iv) Action Planning. In chapter Three, the author does a good job of delineating the performance planning process and provides helpful guidelines on how to plan, as well as criteria for setting effective performance goals. Defining and discussing the results expected and measurement criteria; increase the likelihood of a "job well done" as well as a surprise-free appraisal discussion later on.

Chapters Five and Six deal with Performance Analysis and ratings. Rao stresses the need for a thorough examination of factors reasonable for facilitating or inhibiting performance. BARS (Behaviorally Anchored Rating Scales) are discussed in some detail and the role of motivation and ability in rating is emphasised. Somewhat surprising, is the superficial discussion on biases and errors inherent in rating and suggestions to overcome them.

The final step of the process relates to the appraisal interview. The counselling technique is advocated for carrying out this activity which is usually fraught with strong emotions. This chapter is a Rao and Udai Pareek classic; it has been around for a few years and yet retains its usefulness. The cases provided could do with some improvement to make them more readable.

Chapters Ten to Thirteen present case studies of a few organisations that have introduced such development-oriented appraisal system. In the Voltas and Larsen & Toubro cases, appraisal formats and procedures have been discussed. The State Bank of India case evokes more interest since it captures the reactions involved in making the move away from the traditional confidential record system. More light should have been thrown on the long-term effects of these experiments—how successful have they been, do they continue to be effective, what are the obstacles etc.

The last two chapters review current appraisal practices in India and a few Asian countries. As Rao points our "performance appraisal systems are not going to be successful in our country for some time to come." In fact, with the exception of Japan, most of the countries studied appeared to be following a traditional, confidential, closed system of appraisal. However, change is in the air, Organisations are waking up to the necessity of creating a new culture of work—a culture that encourages openness, trust, mutuality, collaboration and team work. Appraisal systems have a major role to play in promoting such change.

Rao writes in a clear, lucid style with a minimum of jargon, making for easy reading. The get up of the book is adequate but not exceptional. A hard cover edition would be welcome. The price may be a trifle excessive for students. The book would be invaluable to managers and personnel practitioners, especially those attempting to create and install new appraisal systems.

Productivity
1986, XXVII, 2, 181-187

Select Bibliography on Strategic Planning for Human Resources

S.N. VIG

Alpander Guvenc : Human resources management planning. New York, American Management Associations, 1981.

Alphander, Guvenc G. & Botter, Constant H : An integrated model of strategic human resource planning and development. *Human Resource Planning*, 4(4), 1981, 189-208pp.

Atwater, DM & Sheridan, JA : Assessing the availability of non-workers for jobs. *Human Resource Planning*, 3(4), 1980, 211-218pp.

Atwater, Donald M. and others : An application of integrated human resource planning-supply-demand models. *Human Resource Planning*, 5(1), 1984, 1-14pp.

Baird, Lloyd and others : Meshing human resources planning with strategic business planning. A model approach. *Personnel*, 60(5), 1983, 14-25pp.

Bamberger, William : Understanding and applying demographic information and techniques. *Personnel Journal*, 62, Jan 1983, 65-70pp.

Baytos, Lawrence M : A no frills approach to human resource planning. *Human Resource Planning*, 7, 1986, 39-46pp.

Birch, William J : A human resources perspective on mergers. *Personnel Journal*, 62, March 1983, 244pp.

Bolt, James F : Management resource planning : Keys to success. *Human Resource Planning*, 5(4), 1982, 185-196pp.

Borucki, Chester C : The importance of strategic staffing as a component of human resource management. *Human Resource Management*, 22, Fall 1983, 307-312pp.

Bourdreau, John W : Decision theory contributions to HRM research and practice. *Industrial Relations*, 23, Spring 1984, 198-217pp.

Bourdreau, John W : Economic considerations in estimating the utility of human resource productivity programs. *Personnel Psychology*, 36, Summar 1983, 551-577pp.

Bright, William E : How one company manages its human resources. *In* The Challenge of Human Resource Planning : Selected Readings edited by

S.N. Vig is the Library & Documentation Officer, NPC, New Delhi.

James W. Walker, New York, Human Resource Planning Society 1982, 113-125pp.

Briscoe, Dennis and others : Strategic human resource decision-making : An economic lesson. *Human Resource Management*, 21, Summar 1982, 2-5pp.

Buller, Paul F & Maki, William R : A case history of a manpower planning model. *Human Resource Planning*, 4(3), 1981, 129-138pp.

Burack, Elmer H & Mathyas, Nicholas J : Human resource planning : Pragmatic approach to staffing and development. Lake Forest, Brace-Park Press 1980.

Butinsky, Carolef & Harari, Oren : Models vs reality : An analysis of twelve human resource planning systems. *Human Resource Planning*, 6(1), 1983, 11-24pp.

Cascio, Wayne F : Coating human resources : The financial impact of behaviour in Organizations. Boston, Kent Publishing Co., 1982.

Cashel, WS : Human resource planing in the Bell system. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W Walker. New York, Human Resource Planning Society, 1982, 25-31pp.

Christiansen E Tatum : Strategy, structure and labour relations performance. *Human Resource Management*, 22, Spring-Summer 1983, 155-168pp.

Cornwall, Deborah J : Human resource planning : Blue sky or operating priority ? *Business Horizons*, 23, April 1980, 49-55pp.

Craft, James A : A critical perspective on human resource planning. *In* The challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New

Davis, Stanley M : Corporate culture and human resource management : Two keys to implementing strategy. *Human Resource Planning*, 6(3), 1983, 159-168pp.

Deveanna, MA and others : Human resource management : A strategic approach. *Organizational Dynamics*, 10, Winter 1981, 64-73pp.

Deveanna, Mary Anne and others : Strategic planning and human resource management. *Human Resource Management*, 25, Spring 1982, 11-16pp.

Doeringer, Peter B : Work place perspectives on education and training. Boston Mortinus Nighoff, 1981.

Doeringer, Peter & Vermeulen, Bruce : Jobs and training in the 1980's. Boston, Mortinus Nighoff, 1981.

Dyer, Lee : Bringing human resources into the strategy formulation process. *Human Resource Management*, 22, Fall 1983, 257-271pp.

Dyer, Lee : Human resources planning. In Personnel Management edited by M. Rawland and Gerald R. Ferris. Boston Allyn and Bacon, 1982, 52-76pp.

Dyer, Lee : Linking human resource and business strategies. *Human Resource Planning*, 7(2), 1984, 79-84pp.

Dyer, Lee : Studying human resource strategy : An approach and an agenda. *Industrial Relations*, 23, Spring 1984, 156-169pp.

Dyer, Lee & Hyer, Nelson D : Human resource planning at I.B.M. *Human Resource Planning*, 7(3), 1984, 111-125pp.

Dyer, Lee and others : Human resource planning at Corning Glass Works : A field study. *Human Resource Planning*, 5(3), 1982, 115-184pp.

Dyo, Edward A & Keaveny, Timothy : Cost minimization in staffing. *Human Resource Planning*, 6(2), 1983, 103-113pp.

Edwards, John and others : Manpower planning : Strategy and techniques in organizational context. England, John Wiley, 1983.

Elbaum, Bernard : The making and shaping of job pay structures in the iron and steel industry. In Internal Labour Markets edited by Paul Osterman, Cambridge, MII Press, 1984, 71-107pp.

English, Jack : Human resource planning : The ideal versus the real. *Human Resource Planning*, 7(2), 1984, 67-72pp.

Fever, Michael J : From environmental scanning to human planning : A linkage model applied to universities. *Human Resource Planning*, 6(2), 1983, 69-82pp.

Fever, Michael J and others : Human resource forecasting : A survey of practice and potential. *Human Resource Planning*, 7(2), 1984, 85-98pp.

Fiorito, Jack : The rationale for human resource planning. *Human Resource Planning*, 5(2), 1982, 103-108pp.

Fiorito, Jack and others : Human resource planning techniques : A preliminary model of forecasting technique choice. Academy of Management Proceedings, Boston, Academy of Management, 1984.

Fitz-Enz, Jac : How to measure human resources management. New York, McGraw Hill, 1984.

Flamholtz, Eric G & Kaumeyer, Richard A : Human resource replacement cost information and personnel decision : A field study. *Human Resource Planning*, 3(3), 1980, 111-138pp.

Foltz, Roy : Senior management views the human resource function. *Personnel Administrator*, 27, Sept. 1982, 37-51pp.

Fombrun, Charles J : Corporate culture, environment and strategy. *Human Resource Management*, 22, Spring-Summer 1983, 139-154pp.

Fossum, Johnr & Parker, Donald F : Building state of the art human resource strategies. *Human Resource Management*, 22, Spring 1983, 97-110pp.

Frantzreb, Richard B : Replacement planning : Nuts and bolts. *In* The Challenge of Human Resource planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 127-130pp.

Galosy, Julia Reid : Meshing human resources planning : A Model approach. *Personnel*, 60, Sept-Oct. 1983, 26-35pp.

Gatewood, Robertd & Gatewood, Elizabeth J : The use of expert data in human resource planning : Guidelines from strategic planning. *Human Resource Planning*, 6(2), 1983, 83-94pp.

Gehrman, Douglas : Objective—based human resource planning. *The Personnel Administrator*, 17, Dec. 1982, 71p.

Gordon, Paul J & Meredith, Paul, H : Monitoring the flow of managerial talent : Creating and using a model. *Human Resource Planning*, 5(2), 1982, 69-82pp.

Gould, Richard : Gaining competitive edge through human resource strategies. *Human Resource Planning*, 7(1), 1984, 31-38pp.

Grinold, Richard C & Marshall, Kneale T : Manpower planning models. New York, North Holland, 1981.

Harvey, L. James : Effective planning for human resource development. *The Personnel Administrator*, 28, Oct 1983, 45-52pp.

Hinrichs, John R & Morrison, Robert F : Human resource planning in support of research and development. *Human Resource Planning*, 3(4), 1980, 201-210pp.

Hooper, J & Catalanello, R : Markov analysis applied to forecasting technical personnel. *Human Resource Planning*, 2(1), 1981, 41-53pp.

Houk, J : Human resource planning at Crocker National Bank. *Human Resource Planning*, 4(1), 1981, 37-46pp.

Human Resource Planning Society : Critical human resource issues of the 1980's. *Human Resource Planning*, 6(2), 1983, 63-68pp.

Kanter, Rosabeth Moss : Frontiers for strategic human resource planning and management. *Human Resource Management*, 22, Spring-Summer 1983, 9-21pp.

Kanter, Rosabeth Moss : Variations in managerial career structures in high-technology firms : The impact of organizational characteristics on internal labour market patterns. *In* Internal Labour Market, edited by Paul Osterman. Cambridge, MIT Press, 1984, 109-131pp.

Kearsley, Greg : Cost benefit and productivity in training systems. Moss, Addison Wesley, 1982.

Kelleher, Edward J & Cotter, Kayllig : An integrative model for human resource planning and strategic planning. *Human Resource Planning*, 5(1), 1982, 15-27pp.

Kelly, James : Management strategy and the reform of collective bargaining cases from British Steel Corporation, *British Journal of Industrial Relations*, 22, July 1984, 135-153pp.

Kochan, Thomas A Cappelli, Peter : The transformation of the industrial relations and personal function. *In* Internal Labour Markets edited by Paul Osterman. Cambridge, MIT Press, 133-161pp.

Koenig, Richard Jr. & Pierson, David : Human resource planning : Three configurations. *Human Resource Planning*, 5(4), 1982, 197-208pp.

Krietner, Robert : Identifying and managing the basics of individual productivity. *In* The challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 151-156pp.

Kulkarni, MN : Managing human development programmes : Challenges and opportunities. *Indian Management*, 24(12), Dec. 1985, 14-17pp.

Lapointe, Joel R : Human resource performance indexes. *Personnel Journal*, 62, July 1983, 545-553pp.

Lavin, Mary JO Hrdis : A computerised human resource development information system. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 227-237pp.

Le Hoczky, John : Approximations for interactive Markov chains in discrete and continuous time. *Journal of Mathematical Sociology*, 7, 1982, 139-157pp.

Lichten Berg, Warren and others : Workforce planning methodology for support of a high technology facility modernization program. *Human Resource Planning*, 5(2), 1982, 91-102pp.

Logan, John Allen : A structural model of the higher order. Markov Process incorporating revision effects. *Journal of Mathematical Sociology*, 8, 1981, 75-89pp.

Lopez, Rosalie & Alth Aus, M Clinton : Unlock the mysteries of the annual report. *Personnel Journal*, 63, Feb 1984, 38-47pp.

Lorange, Pater & Morphy, Declan C : Strategy and human resources concepts and practice. *Human Resource Management*, 22, Spring-Summer 1983, 111-135pp.

Lumley, Roger : Industrial relations aspects of manpower strategy. *In* Manpower Planning edited by John Edwards. New York, John Wiley, 1983, 177-196pp.

Mac Donald, Rod A : Productivity improvement through human resource systems. *Business Quarterly*. 48, Fall 1983, 32-34pp.

Malkiel, Burton G : The long-run economic and demographic outlook : Implications for government policy and for human resource planning. *Human Resource Planning*, 6(3), 1983, 143-152pp.

Manzini, Andrew O : Human resource planning : Observations on the state of the art and the state of the practice. *Human Resource Planning*, 7(2), 1984, 105-108pp.

Mc Fillen, James M & Decker, Patrick G : Building meaning into appraisal. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 157-162pp.

Mc Iver, Rhonda : Human resource planning for a major new project : A case study. *Work and People*, 9, 1983, 8-15pp.

Melhuish, T Duggan & Palmer, Mark : Human resource management and recession : What have we learned ? *Business Quarterly*, 48, Summer, 1983, 75-93pp.

Miles, Raymond E & Snow, Charles C : Designing strategic human resources systems. *Organizational Dynamics*, 13 Summer 1984, 36-52pp.

Milkovich, George : Introduction : Personnel strategy and evaluation. *Industrial Relations*, 23, Spring 1984, 151-154pp.

Milkovich, George T & Mahoney, Thoman A : Human resource planning models : A perspective. *In* The Challange of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 75-86pp.

Milkovich, George and others : HRM Planning. *In* Human Resource Management in the 1980's edited by Stephen J. Carroll. Washington, Bureau of National Affairs, 1983, 1-2, 29pp.

Miller, Edwin E : Identifying high potential management talent. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 143-147pp.

Miller, Guye : A method of forecasting human resources needs against internal and external labour markets. *Human Resource Planning*, 3(4), 1980, 189-200pp.

Misa, Kenneth F & Stein, Timothy : Strategic HRM and the bottom line. *Personnel Administrator*, 28, Oct 1983, 17-25pp.

Niehaus, Richard J : Human resource planning flow models. *In* The Challenge of Human Resources Planning : Selected Reading edited by James W. Walker. New York, Human Resource Planning Society, 1982, 87-97pp.

Odiorne, George S : Strategic management of human resources. San Francisco, Jossey-Bass, 1984.

Olian Judy D & Rynes, Sara L: Organisational staffing: Integrating practice with strategy. *Industrial Relation*, 23, Spring 1984, 170-183pp.

Osterman, Paul Internal labor markets. Cambridge, MIT Press, 1984.

Pakchar, Paul : Effective manpower planning. *Personnel Journal*, October 1983, 826-830pp.

Parker, Donald F and others : Human resource planning at American Hospital Supply. *Human Resource Planning*, 6(4), 1983, 207-218pp.

Portwood, James D : Organisational career management : The need for a system approach. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource planning Society, 1982, 187-199pp.

Reynierse, James H : A goal model of human resource planning. *Human Resource Planning*, 5(1), 1982, 29-34pp.

Roser, Sherman R : A practical approach to the use of human resource accounting. *Managerial Planning* 32, Sept-Oct 1983, 35pp.

Rothwell, Sheila : Manpower matters : Corporate training and development strategies. Journal of General Management, 8, Summer 1983, 83-90pp.

Rothwell, Shela & Davidson, David : Manpower matters : Technological change, company personnel Policies and skill development. *Journal of General Management*, 8, Winter 1982, 87-93pp.

Rush, Ian C : Strategic planning for human resources. *Business Quarterly*, 46, Summer 1981, 40-43pp.

Rush, James C & Borne, Laurie C : Human resource planning at Ontario Hydro. *Human Resource Planning*, 6(4), 1983, 193-206pp.

Schein, Edgar H : Increasing organizational effectiveness through better human resource planning and development. *In* Challange of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 210-220pp.

Schlesinger, Leonard A : The normative underprinnings of human resource strategy. *Human Resource Management*, 22, Spring-Summer 1983, 83-96pp.

Schmidt, Frank L and others : Assessing the economic impact of personnel programs on work force productivity. *Personnel Psychology*, 35, 1982, 333-347pp.

Scott, Don : A human resource planning approach for raducing the cost of absenteeism. *Human Resource Planning*, 5(4), 1982, 225-232pp.

Sheridan, James A : The relatedness of change : A comprehensive approach to human resource planning for the eighties. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 47-53pp.

Sheridan, James & Monaghan, John D : Environmental issues scanning : Starting a self sustaining research program. *Human Resource Planning*, 5(1), 1982, 57-68pp.

Smith, AR Ed. : Corporate manpower planning. England, Gower Press, 1980.

Smith, Eddie C : How to tie human resource planning to strategic business planning. *Managerial Planning*, 32, Sept-Oct 1983, 29p.

Smith, Eddie C : Strategic business planning and human resources. *Personnel Journal*, 60, Aug 1982, 606-610pp.

Smith, Eddie C : Strategic business planning and human resources. *Personnel Journal*, 61, Sept 1982, 680-682pp.

Stephenson. Blair Y & Franklin, Stephen G : Human resource accounting : Dollars and sense management. *Business and Society*, 23, Winter-Spring 1982, 46-51pp.

Stenman, Shelby : Markov and Renewal models for total manpower system. *OMEGA*, 6, 1978, 341-351pp.

Stokes, John & Stinson, John W : Breathing fresh air into performance appraisal system : The use of multiple raters. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 175-184pp.

Stybel, Laurence J : Linking strategic planning and management manpower planning. *California Management Review*, 25, Fall 1982, 48-56pp.

Tichy, Noel M : Managing organizational transformations. *Human Resource Management*, 22, Spring-Summer 1983, 45-60pp.

Tichy, Noel M and others : Strategic human resource management. *Sloan Management Review*, 23, Winter, 1982, 47-61pp.

Tung, Rosalie : Strategic management of human resources in the multinational enterprise. *Human Resource Management*, 23, Summer 1984, 129-143pp.

Ulrich, Dave and others : A strategy, structure, human resource database : OASIS. *Human Resource Management*, 23, Spring 1984, 77-87pp.

Varney, Glenn H : A comparative discussion of organizational development and human resource planning. *Human Resource Planning*, 6(3), 1983, 183-192pp.

Verhaeven, CJ : Techniques in corporate manpower planning. Boston, Khuwer-Nijhoff, 1982.

Walker, James W : Forecasting manpower needs. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 57-64pp.

Walker, James W : Human resource planning : An evaluation. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 3-10pp.

Walker, James W : Human resource planning. New York, McGraw Hill, 1980.

Walker, James W : Let's get realistic about career path. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society 1982, 221-226pp.

Walker, James W : Linking human resource planning with strategic planning. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 99-109pp.

Walker, James W & Armes Robert : Implementing management succession planning in diversified companies. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 131-141pp.

Walker, James W & Lupton, Daniel E : Performance appraisal programs and the descrimination law. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 163-173pp.

Walker, James W & Wolfe, Michael N : Patterns in human resource planning practices. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 33-46pp.

Wikstrom, Walter S : Projecting manpower supply and demand. *In* The Challenge of Human Resource Planning : Selected Readings edited by James W. Walker. New York, Human Resource Planning Society, 1982, 65-74pp.

Wils, Theirry & Dyer Lee : Relating business strategy to human resource strategy. Some Preliminary evidenee. Academy of Management Proceedings. Boston, Academy of Management, 1984.

Winer, Leon : Applying strategic planning in human resource development. *Training and development Journal*, 37(11), 1983, 81-84pp.

Yelsey, Alan Validity of human resource forecast designs, *Human Resource Planning*, 5(4), 1982, 217-224pp.

Zanakis, Stelios H & Maret, Martin W : A Markov chain application to manpower supply planning. *Journal of Operational Research Society*, 31, 1980, 1095-1102pp.

Letter From the Editor-in-Chief

The National Productivity Council can legitimately claim the pride of organising a series of events of national importance in the past few months. The National Workshop on Labour-Management Cooperation on Productivity and Technology Change held in September, the National Conference on Productivity through People in the Age of Changing Technology in October and the National Conference on Quality in November, 1986, not only attracted participation of a large number of senior representatives of employers, trade unions and the Government but also facilitated discussion of issues of national significance at macro and micro levels. The conclusions of the National Conference on Productivity through people were presented by the NPC Chairman at the APO sponsored International Conference on the same theme held at Kuala Lumpur in the first week of November, 1986. The APO member countries evinced great interest in the presentation.

One major issue that emerged during the deliberations in the National Workshop and the Conference related to promotion of acceptance of New Technology as a prime requirement to promote productivity and economic development. It was perhaps in this context that our Prime Minister while inaugurating the National Conference observed :

> "We have not just to look out for improvements in technology across the world, but we have to change over into pushing for new technology development on our own demand which we are not doing yet."

The problem of acceptance of new technology is not only connected with appreciation of its need, selection of appropriate technology and evaluation of its impact in terms of economic and social gains but also with the creation of an understanding between the employer and employees regarding several aspects referred to above and the way of its adoption. Despite positive directions of deliberations in the workshop and the conference, the gap between the management and the union representatives was quite perceptible and to some extent based on genuine apprehensions. The management after contemplating heavy investment in new technology claimed its prerogative to manage the implementation in such a way that it could ensure a reasonable return on investment through the growth and expansion of the business. The unions were also right in their stand that they could not appreciate change in technology without understanding its social gains reflected in generating employment opportunities and improving the quality of work-life. It may be observed that based on a logical thinking the concern for both these dimensions should be the concern of all the parties including the government. It was one of the main objectives behind the organisation of these events, that is, promoting understanding and facilitating technological change in an atmosphere of mutual good-will and trust.

The outcome of the deliberations need not be seen in the form of perfect understanding on various issues related to this problem. One point was, however, predominently clear, unless the cooperation of labour was sought through innovative measures by the management, the acceptance of new technology, which is vital for higher productivity and economic development will be a very difficult task.

It is only through a participative process of management that labour could be educated about the need of new technology and taken into confidence. This will call for more and more information sharing, consultation and even joint decision-making related to various issues.

(Dr. G.K. SURI)
Director General