
Productivity Agreements : An Action Plan

R.S. GUPTA

The author in this article discusses the need for productivity agreements and also presents a brief action plan for the same.

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The Concept

A productivity agreement seeks to replace Trial of Strength with Mutual Consent for Mutual Gains. What is therefore bargained and agreed upon in a productivity agreement is neither the charter of demands put up by the unions nor the wishes and expectations of the management. Instead, it is a joint endeavour : (a) to propose and discuss specific programmes and actions that would improve the techno-financial performance of the unit on the one hand, and improvements in working conditions and quality of work-life on the other : (b) to calculate the anticipated cost and benefits to the unit by implementing this mutually agreed Productivity Package : (c) to determine a mutually acceptable basis for sharing the gains of improved techno-financial performance : and (d) to enlist the commitment of both the management and workers for honouring their agreed role and responsibilities in implementing the productivity package.

Based on the concept as evolved in U.K. some of the characteristic features of a productivity agreement are summarised below :

- (i) It is local agreement relating to one enterprise in one location.
- (ii) it is usually comprehensive in scope, combining as far as possible, all that the management wants from its employees in return for all.

that the employees want from management. The intention is that it should be in the nature of a settlement of all outstanding grievances and difficulties faced by both the workers and management in order to eliminate most, if not all inhibitions and restrictions to increasing the productivity and prosperity of the firm, making higher compensation to its employees, an economically viable proposition.

- (iii) it is a bargain, i.e. a negotiated series of concessions and gains on the workers side set against concessions and gains on the management side fundamentally based on improvements in productivity.
- (iv) it is constructed in such a way that each part of the bargain is honoured by ensuring that gains and concessions are progressively linked with increases in productivity.

Criteria

It should be recalled that the concept of productivity agreements took birth in Great Britain during the wage-freeze period. It was natural, therefore, for the British NBPI to evolve certain criteria/guidelines for evaluating the agreements under which wage increases could be made on account of higher productivity.

The major points that emerge from these guidelines are summarised below :

- (i) workers should make a direct contribution.
- (ii) forecasts of productivity should be soundly based.
- (iii) total cost per unit of output should be reduced.
- (iv) extra payment should only be made for increased productivity.
- (v) the company should make a contribution to stable prices.
- (vi) the overall cost of productivity agreement (direct as well as indirect) should be taken into account while making the cost-benefit analysis.
- (vii) extravagant levels of pay which would provoke resentment elsewhere should be avoided.

It will, thus be seen that a productivity agreement is qualitatively different from the conventional collective agreement in its philosophy, its rationale, its process and above all its consequences. Similarly it also differs with such payments schemes as piece rate system, incentive schemes, production bonus, etc. The salient features which make them different are presented in the following matrix :

Difference Between Productivity & Collective Agreements

Productivity Agreement	Collective Agreement
1. Based on the philosophy of mutuality of interests	Based on the philosophy of Trial of Strength
2. A package deal between what the workers want from management and what the workers can give to management	A unilateral exercise on what the workers want from management with at best, a ritualistic promise to cooperate with management for higher productivity
3. Wage revisions are made on the basis of a predetermined linkage between the anticipated costs and benefits	No such rational basis exists
4. Improvements in wages and working conditions are not inflationary in nature.	Improvements in wages and working conditions add to inflationary forces
5. Creates mutual trust and cooperation	Breeds mutual distrust and confrontation

The Nature & Scope of Mutual Gains

Implicit in the productivity agreements is the increasing levels of productivity, on the one hand, and improvements in wages, fringe benefits, working conditions, quality of work-life commitment and involvement of workers and trade unions, etc. on the other. These are however only the targeted/planned benefits of the agreements. What is equally important if not more are the indirect gains which benefit both the management and unions alike. Let us first examine the nature of direct benefits that may accrue to the management and workers :

Direct Management Gains

Sources of gains	Nature of gains
Higher/Committed Efforts By workers	<ul style="list-style-type: none"> * Higher output-input ratio * Cost economies through waste reduction * Improvements in operating parameters like speeds, feeds, jigs and fixtures, etc.
Introduction/Review of work norms	<ul style="list-style-type: none"> * Fixation/review of production norms/time standards. * Rationalisation of wage differentials through job evaluation. * Changes in methods/technology * Work reorganisation * Reduction in overtime * Rationalisation of shift system
Improvements in working Practices	<ul style="list-style-type: none"> * Reduction/elimination of rest periods other than statutory. * Setting-up new work groups * Punctuality

Sources of gains	Nature of gains
Better Manpower Utilisation.	<ul style="list-style-type: none"> * Reduction in absenteeism * Reduction in manpower * Elimination of helpers/mates * Transfers/labour mobility * Job enlargement * Greater flexibility between crafts/interchangibility amongst jobs.

Direct Workers Gains

Areas of Gains	Nature of Gains
Earning	<ul style="list-style-type: none"> * Simplified wage structure * Improved wage/piece rate * Incentive payments * Up-gradations/promotions * Improved working conditions
Fringe Benefits	<ul style="list-style-type: none"> * Greater leisure * Better economic fringe benefits * Welfare activities/social benefits * More meaningful work/job enrichment
Other Rewards	<ul style="list-style-type: none"> * Greater participation and control over work process. * Job security * Retraining for higher skills

The Indirect Gains

The above listed gains are nothing but a consolidation of the contents of various productivity and collective agreements we have come across. You will, therefore, observe that the list represents the nature and scope of gains that may accrue to management and workers, on the one hand, and specific issues that may enter into a productivity agreement, on the other. The origin of indirect gains lies in the process of preparing for the productivity agreements. The indirect impact which such agreements have on management, unions and above all, on the organisation culture has been indicated below :

- (i) The rigorous productivity analysis exercise required to achieve effective productivity bargaining—identifying the productivity leakage areas, examining the procedures previously taken for granted, methodically assessing the costs and gains of each alternative analysing such matters as grading structure, hours of work and distribution of duties, etc.—contribute to the growth and maturity of both the management and the union and thus create an organisational culture which is much more conducive to productivity growth.
- (ii) Productivity bargaining and subsequent agreements provide stimulus to the introduction of modern management techniques/technology—the prospect of gains by both parties reduces the self-defensive resistance.
- (iii) Information sharing and involvement through participation at all the stages of planning and implementation of productivity agreements reduces feelings of alienation between management and workers and forestalls failure of management's plans.
- (iv) Productivity agreements bring the productivity drive down to earth—from general exhortations to shop-floor practicalities.
- (v) And finally, the mutuality of interest, sharing

of information on relevant aspects of organisational performance, greater communications and participation on matters of common interest help in creating a climate of mutual trust and cooperation—a necessary pre-requisite for creating and sustaining the much required industrial harmony.

Conviction must Precede Action

The starting note of this section, therefore, is a personal question addressed to the Indian managements and trade unions. The question deserves a frank and honest answer :

“Are you rationally convinced that in the Indian context, productivity agreement is a more economically sound basis of wage negotiations than the traditional collective agreements based on the concept of trial of strength”?

If your answer is ‘no’ then all what we can say is that “we are sorry for wasting your time as this document, perhaps, was not meant for you”. However, if your answer is in affirmative, then you are in for troubles at least, on two counts. Firstly, you have to answer a few more inconvenient questions and secondly, by saying yes you are asking for yourself to be on your toes. Are you ready to put-up with the both? Again yes! Okay, then answer the following (we are assuming that you can answer on behalf of your organisation) :

“Have you and your organisation reached the level of professional and emotional maturity to discuss around the table issues relating to improvements in the techno-financial performance of your company”?

Indeed the question is little complex. Let us help in answering it. Following are a few check points which would assist you in making an introspection which would be necessary to answer the above question :

Checkpoints exclusive for the Management	Checkpoints exclusive for the Trade Unions	Checkpoints common to both
<p>Does your organisational philosophy admit that :</p>	<p>Does your trade union philosophy admit that :</p>	
<p>1. productivity is the major determinant of corporate profits ?</p>	<p>1. in the ultimate analysis, the road to the more wages, better work-life conditions, improved quality of working and higher standard of living goes via higher productivity and profitability of an enterprise ?</p>	<p>1. In your organisation the management and trade unions have patiently strived to replace mutual distrust with mutual trust, inspite of the possibility of a rational disagreement over a few issues ?</p>
<p>2. trade unions, instead of being a necessary evil are an indispensable institution of industrial democracy ?</p>	<p>2. economic justice is achieved when employees are given equal pay for equal work : when employers are given equal work for equal pay ?</p>	<p>2. In your organisation settlement of industrial disputes and signing of the collective agreements have usually been achieved through bipartite peaceful negotiations without reference to third party intervention and/or adjudication ?</p>
<p>3. a strong and healthy union is better than a weak but convenient union ?</p>	<p>3. the quest for higher productivity would frequently demand from unions rational and justifiable decisions which may not always be popular ?</p>	
<p>4. consultation and involvement of workers and their representatives on matters concerning them, directly or indirectly helps speedier and smoother implementation of management plans ?</p>	<p>4. once the unions are party to such unpopular decisions, it is their moral responsibility to convince their workers rather than just raising their hands up and say "what can we do, our workers do not agree"? and</p>	
<p>5. irrespective of the nature and level of technology, workers have a definite role in increasing the productivity and prosperity of any organisation ?</p>	<p>5. for healthy trade unionism, it is necessary to have within their ranks, trained persons who can analyse and interpret objectively the result of such productivity studies as the : work norms, job evaluation manpower assessment, incentive schemes, etc together with the ability to read and interpret the various statements on financial performance of the company ?</p>	
<p>6. workers must get a fair share in the gains of increased productivity ? and;</p>		
<p>7. in determining the fair share, the management is willing to share with the workers/unions all relevant data/information on techno-financial performance of the company ?</p>		

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New Dimensions in Personnel Management

M.L. GUPTA

This paper focuses on the basic maladies of our industrial environment and suggests ways to overcome the maladies.

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Even if we skip the socio-economic and political crisis being faced by the country owing to poverty and unemployment the scenario in organised sector is none too comforting. We immediately notice a few basic maladies :—

- * Labour productivity is minimal. Even in best run organisations.
- * Commitment to work is missing and work values have changed.
- * Involvement of employees including managers in the growth and well-being of the institutions is conspicuous by absence.
- * Organisational in-effectiveness in harmonising its own interests with that of its employees.
- * Lack of mutual trust between the manager and the managed and predominance of belligerent feelings
- * Lack of national perspective towards the adoption of new technologies, resolutions of industrial conflicts, wage policies etc.
- * Ambiguity of concepts about the social obligations of business and industry and its acceptance have yet to be established.
- * Uncertainties about the state intervention in the industrial sector.

It is acknowledged the world over that the

dominant aspect of management is DEALING WITH PEOPLE. For Sir Trencle Lewin, British Chief of Defence Staff PEOPLE MATTER is cardinal. IBM's Chairman Thomas J Watson Jr takes pride in declaring that one of the three philosophies for his company's continued success is their Respect for the individual. So does Mark Shepherd, Chairman of the American giant Texas Instruments, when he talks every worker being "seen as a source of ideas, not just acting as a pair of hands."

These realisations are the extension of the important message that came loud and clear when Elton Mayo concluded his research in late thirties in the Western Electric's Hawthorne Plant. He tried to demonstrate that better working conditions and hygiene would have positive effect on productivity. So he improved lighting and productivity went up as predicted. But when he restored the old lighting pattern so as to study some other phenomenon, the productivity further went up. The conclusion, therefore, was that it is the "Attention to Employees" and not the work or working conditions that has dominant impact on productivity.

Productivity Through People

An extensive research to identify key ingredients to corporate excellence of 60 and odd best run companies of America was conducted by Thomas J Peters and Robert H Waterman Jr. The project was sponsored by the famous management consultant McKinsey & Co and the findings are now available to us through the best seller "In Search of Excellence". It is amazing to see how simple things contribute towards improving and maintaining productivity.

1. Work Boundaries

Productivity is optimum output conforming to given specifications by employees individually or in groups. But seldom an employee is clearly explained in detail as to the exact nature of his task. No one sets his goal. He is never told the extent of discretion that he can use to do or not to do a thing. The individual employee, therefore, performs the work in a very ambiguous condition and is forgotten until he makes the mistake of being a very poor performer in

terms of quantity or unless he is pinned down for quality. He quickly conforms to the standards informally set by his peers. Thus a potentially high performer becomes an average worker by managerial lapses. In contrast wherever the system of reward links the payment directly to the quantum or quality of output, the worker learns quickly. Higher outputs through piece-rate or over time and the excellent quality of handicrafts are common-day examples. MGR Sandberg, Chairman of Hongkong & Shanghai Banking Corporation observes "I tend to tell a man what I expect and let him sort out how he is going to approach the problem, If he needed help or further direction, it would be readily given."

Educating the employee on his role and relationship patterns with other workers, supervisors and with the Union will help the individual in making adult transactions from the start. Adequate pre-hand knowledge of the reward and punishment systems and career growth opportunities will provide right motivations. What is true of the employees at the shop-floor or the clerks in office is equally true of managers at all levels.

2. Opportunities for Development

Rene Mcpherson, Chairman of Dana Corporation points out "Until we believe that the expert in any particular job is most often the person performing it, we shall have for ever limit the potential of that person, in terms of both his contributions to the organisation and his own personnel development." On the other hand it emanates from Dana's philosophy that they have an obligation to provide training and opportunity for development to their productive people who want to improve their skills, expend their career growth or simply further their general education.

By contrast our manpower policy, due to easy availability of cheap labour, emphasises the philosophy to recruit and forget for any new job or additional work that comes up. This has led to over-staffing with its attendant consequences on the one hand and alienation of the worker from the work and the organisation on the other hand. Monotony and non-realisation of his full potential is a frustrating experience for the employee producing tension and distaste for

the work which he cannot leave because of economic compulsions. Adoption of new technologies and processes of production remains a continuous threat to his survival in the absence of a demonstrated policy of the company to be trained and re-trained for newer skills. The individual employee feels cheated by the society when he could not secure a job of his own choice and feels rotten if the organisation, which is unconsciously identified as benevolent parents also neglects him.

Training sessions in Japan are held every week in every organisation as fixed schedules which is run by the supervisors and those connected with the department. Even the sweepers participate. Focus is not on any particular operation. The programme is designed to give an understanding of the whole process and the entire activity of the department. Hence it creates attachment for the department or the job and strengthens the desire to learn and improve one's own performance. Extremely successful American companies run their own universities for their employees and famous ones are Dana University, Disney University, McDonald's Hamburger University etc. We too are making the same effort in this direction but it is for the Personnel Specialists to consider it as serious challenge before them.

3. *Treat Employees as Adults*

Employee is to be treated as the primary source of productivity gains. They have to be treated as partners, with dignity and with respect. I have already mentioned above IBM's Corporate belief about their respect for the individual. Another successful American Company, Delta Airlines believes in FAMILY FEELING, for nothing can be more motivating than the feeling of being needed. A worker involved in the process of setting targets and standards for himself individually or in group as an adult member of the "Family" would strive to keep his moral commitment. He would not like to fail himself. Collectively this will replace his over indulgent allegiance with the union which work on the same family feeling principle.

However, the genuineness in the beliefs as a company policy and aggressively cultivated orientation at all levels of supervision and management is very

important. Peters and Waterman have cautioned against Lip-Service disaster and Gimmicks disaster, too often seems to have produced permanent damage to the organisational culture. A carefully selected opportunity to begin work on this philosophy is at the time of changes in top managerial positions.

The present debate about Worker's participation in the management stems partly from the belief of treating employees as adults and partly from our anxiety to reduce resistance to management's authority.

4. *Share the Information*

More effective than any scheme for Worker's participation would be a system of sharing the information by the management with its manager and employees. Regularly and on vital issues. Ed Carlson, as President of the United Airlines observes "nothing is worse for morale than a lack of information down in the ranks". Dana Corporation and Blue Bell are similarly generous with its comparative productivity information. Individual team and unit results are available to every body. Peters and Waterman have analysed that the availability of information creates psychological pressure from fellow workers of groups where 'Superiors' are not telling 'Subordinate' what to do. The performance of another worker, another group in the same organisation is evaluated by individuals and teams and the comparison does the trick. In one of the plant of American Telephone & Telegraph Company, absenteeism was very high: Management had tried everything but failed. Finally they put up a huge sign-board with every workers name on it and posted a Gold star next to the name of the worker who turned late on duty. Absenteeism dropped dramatically. In another factory, one of the Foreman started writing production results of his shift by a chalk on the floor. Competition between the shifts started and became intense. The productivity leaped.

5. *Positive Reinforcements for Motivation*

Each individual likes to think of himself as a capable and good performer. Yet most organisations take negative view of their people. To quote from In Search of Excellence "They verbally berate particip-

ants for poor performance. They want innovations but kill the spirit of the champion. With their rationalist hats on, they design systems that seem calculated to tear down, their worker's self-image."

Why can't the reverse be done? Believing in BF Skinner's explanation that we are all simply a product of the stimuli we get from the external world, the good effort and acceptable behaviour of employees as individuals or members of the team needs constantly to be praised and complimented. It will not only shape his future behaviour but also enhance his own self-image. The existing Boss-Subordinate relationship emphasise the power of punishment instead of sustaining on the subordinate's need to get positive reinforcements from his boss. The competitive spirit generated to get compliments will be more healthy and bring in more discipline than negative reinforcements. However, for proper effect, the positive reinforcement or a pat on the back has to be for specific achievements and immediate. It should never become routine, otherwise it will loose the impact. Similar is the situation with negative reinforcements where reprimands should be for the specific behaviour of the person and not against the person himself. This is done immediately will let the individual know of the disapproval of his act yet give an impression that he is important enough to be noticed.

Harmony in Industrial Relations for Productivity

In 1768 Arkwright of Great Britain invented the Spinning machine and changed the whole system of production. He changed the conditions of labour as also the relationship between labour and capital. It was copied in Europe and then in America. He was also the first to taste the result of industrial strife as the angry mob of workers destroyed his machines—thinking that they were going to be displaced.

In India too, the import of technology and techniques of mass production created a new class of industrial labour. Hitherto in cottage industries, the relationship between the employer and employee was based on understanding and respect for mutual obligations. The worker took pride in his work and its excellence. Large scale employment under a single em-

ployer snapped the personal link and even the genuine grievances of employees went unnoticed in the absence of any structure for two way communication. This link was provided by the unions. NM Lokhande, himself a worker agitated in 1881 for the improvement of working conditions in the Bombay Mills but the first confrontation in the form of a strike which ended in failure, was staged in Ahmedabad in 1895.

Since the national movement was also gaining popular support around this time, the leadership for agitations slowly got passed on to political leaders. Subsequent developments in the country and failure of socio-economic system to distribute the growth in the national prosperity equitably has had deep psychological impact on the workers as a class.

1. *Giving-up Given-up Complex*

In the poor industrial relations climate characterised by high strike-proneness, intimidations and violence an atmosphere has been created which explains management's readiness to concede demands, reasonable or unreasonable. Those at higher levels of hierarchy do it in order to maintain the production to satisfy customers, shareholders and governments in case of public sector undertakings. While negotiations do take place at lower levels of management, it quickly gets passed up to a higher level, either to be dealt by the Personnel Department or the Chief Executive. Since most of the conflicts (demands) have economic outcomes and cost impacts, lower levels in the current organisational structure have no delegated authority to handle it. The personnel man's activity is seen largely as a vehicle for interaction between the Unions and the higher managements. But the net result with few exceptions, is that the unions get their demands conceded under the threat of production stoppages.

This structure and process repeated with regularity eventually produces stress reactions of disappointment, anger and helplessness. This is akin to the psychological stress symptoms described by George L Engel as 'Giving-up Given-up Complex'. Kets De Vries has listed the five factors which contribute in the manifestation of this Complex: (1) the Giving-up affects the helplessness or hopelessness, (2) a depreciated image

of oneself, (3) a loss of gratification from relationships or roles in life, (4) a disruption of the sense of continuity between past, present and the future, and (5) a re-activation of memories of earlier periods of Giving-up.

In the effort to eliminate the above the role of a personnel specialist is that of a catalyst to filter issues, interpret, evaluate and give professional advice to the management for conceding or not conceding and levels of negotiations. Harsh decisions may have to be taken and retaliatory behaviour of anger and hostilities to be countered with patience and fair play. Today's uncontrollable work environment is an example of killing through kindness.

2. *Structural Dilemma*

We are, keenly aware that the hierarchies, rules and regulations have not only become bottlenecks but a vehicle for abuse and repressive action.

The impredicability, duality and ambiguity in practice by the managers over the managed evokes distrust, resentment and prevents smoothness in relationship. The individual employee in this spiral of frustrating circumstances has only one way traffic: show it through collective strength viz the union.

The Personnel Specialists, organisational experts and behavioural scientists have a great challenge to redesign systems combining flexibility with fair play, structured decisions with adhocism, universality with discretion attached to authority, speed with uniqueness of individual problems. Systems and procedures so devised must have acceptance by those who are going to be governed about its appropriateness, workability, relevance etc. The best way to achieve it to involve unions.

3. *Restructure Management of Industrial Relations* *The Grievance*

The most effective way to achieve good industrial relations in the work-place and the organisation as a whole is to have a formal system of Grievance Resolving Machinery. It should react quickly and with results. The model three tier grievance handling

machinery has been a failure mainly because the onus has been on the individual to approach higher levels after anxiously waiting at each level to see if his complaint was removed.

If the system of grievance resolving machinery is such in which the onus from the worker is replaced by the initiative of the Personnel Deptt, it can work beautifully. A few things happen when officers visits the shop floors to collect the complaints and grievance at given regularity. It has been tried with a fair measure of success in the Naini Complex of Indian Telephone Industries Ltd under the Shop-floor Employee Service Scheme.

The Union

Very aggressive yet weak trade unionism in India is the result of (a) illiteracy and lack of objectivity by the rank and file members, (b) dependance of the Unions on political parties and outside leadership, (c) complicated legal support for collective bargaining, conciliation and adjudication and amongst many others, (d) multiplicity of trade unions.

The collective strength of employees gives them power. The power meant to be ever supportive of higher wages, more fringe benefits and total job security as upper level of standard of living has not yet been established anywhere in the world. Simultaneously the individual worker also trades a part of his traditional allegiance or commitment to organisation and shares it with the union. Each union therefore has to work on the one-up manship idea for popularity, support and show of strength. Coercion to secure support from the worker cannot be avoided either in inter-union rivalry or intra-union squabble. This further adds to the unpredictable dimensions of the union behaviour creating hopeless conditions for bargaining in an atmosphere of animosity and mistrust.

The political will to correct this critical posture is still not forthcoming. Untill then, the Personnel Specialist must educate the management and managers to regard trade unions as part of the total system. The management must not encourage any union over the other maintaining its objectivity. More so, if a union

has been recognised under the code of discipline. The institutionalisation of the accepted role of Trade Unions needs to be supplemented by continuous sharing of information on all vital matters as a voluntary process and consultation in matters affecting employees obviating the need for conflicts.

Attitudinal changes with persistent effort can be brought by subtle education of employees about the vested personal gains in store for dishonest union officials behind the agitation on issues with common appeal.

This effort can succeed through a continuous programme to develop and educate internal leadership, pursued vigorously. Power motivations of these internal leaders should not be viewed with antagonism as each medal has a reverse. It is imperative for them to have power to have control over their members.

Collective Bargaining

Conflicts in the form of union demands and collective issues have to be resolved meaningfully for both the parties not forgetting the environment and society. Each conflict situation, therefore, at once presents a threat and an opportunity. Organisation and the union both must gain. The Personnel Specialist must turn such win-lose confrontations into a win-win game through the process of collective bargaining.

The supportive conditions for smooth and constructive collective bargaining are :

- * Clarity of issues and objectives,
- * Centralisation of power in the union and authority in the management,
- * Mutual trust and symbolic gestures showing accommodation by both sides,

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- * Sharing of information and availability of communication links,
- * Realisation by both partners that collective bargaining is a two-way process and not one way route of securing concession.

Comments of Prof Ralf Dahrendorf, Director, London School of Economics & Political Science on Management of Industrial Relations are very interesting. He says "... if there is protest, say an industrial dispute, even a clash of personalities, it happens all too easily that the substantive conflict is turned into a question of saving face. In the end, it is no longer the attempt to find a solution that matters, but the image to show consistency and strength. Indeed, I venture to say that most vicious conflicts in organisations are made vicious by the concern of those involved about losing face.

Those who are dependent on management, on the powers that be, generally have a lot to lose. For them, losing face is adding insult to injury. It is all the more important for those in responsibility not to fall in to the same trap. They have much less to lose, and if they begin to worry about losing face, they have probably lost it already. In case of conflict, the best approach is always the straightforward one: to make sure at the beginning that one knows how far one can go and to go there. But if one is pressed a little further, no harm is done by giving graciously what one had to give any way. Indeed, no harm is done in allowing the other side to claim credit for some thing which one may have intended all along.

In any case, a manager who allows himself to be driven in to the corner of face saving struggle, has lost not only a battle but probably the war as well."

Personnel Management : Some Reflections

TERRY CASEY

The author begins the paper by presenting a pejorative view of the Personnel Management practices as were obtaining three decades ago and goes on to focus on the changing role of the personnel management in the changing context of the world marked by increased emphasis on human values such as quality of work life, participation in organisational decision making etc.

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About thirty years ago the practice of Personnel Management was subjected to stringent criticism from the pen of the famous management consultant Dr. Peter Drucker in his book "The Practice of Management" (1955). He wrote: "As personnel administration conceives the job of managing worker and work, it is partly a file clerk's job, partly a housekeeper's job, partly a social worker's job and partly "fire-fighting" to head off union trouble or to settle it. The things the personnel administrator is typically responsible for—safety and pension plans, the suggestion scheme, the employment office and union grievances—are necessary chores. They are mostly unpleasant chores. I doubt, though, that they should be put together in one department; for they are a hodgepodge, as one look at the organization chart of the typical personnel department, or at the table of contents of the typical textbook on personnel management, will show... . None of these activities is in itself of such a nature as to call for more than a moderate capacity in its management. None by itself has a major impact upon the business. Putting a great many of these activities together in one function does not produce a major function entitled to representation in top management or requiring the services of a top executive." Drucker went on to draw conclusions in response to the question as to whether Personnel Management is bankrupt: "No, it is not bankrupt. Its liabilities do not exceed its assets. But it is certainly, insolvent, certainly unable

to honour, with the ready cash of performance, the promises of managing workers and work it so liberally makes. Its assets are great—the fundamental insights of Human Relations, the equally fundamental insights of scientific Management. But these assets are frozen. There is also a lot of small stuff lying around in the form of Personnel Administration techniques and gadgets. But it does not help us too much in the big job of unfreezing the frozen assets, though it may produce enough saleable merchandise to pay the petty bills.” Drucker concludes on a more optimistic note: “The last twenty years were years of minor refinements rather than of vigorous growth, of intellectual stagnation rather than of basic thinking. But everything points to a different picture for the next twenty-five years. Technological changes will force new thinking, new experimentation, new methods. And there are signs that the process has already begun.”

At the time Drucker's words came as a painful shock to many young hopefuls in the fledgeling art of Personnel Management, who were anticipating the incorporation of their managerial practices into the highest levels in any organization. Perhaps then, as today, the reader might not agree with Drucker's sentiments, for the level and sophistication at which personnel management is practised between countries may vary enormously as it may do within organizations in any given country. The practice of Personnel Management had emerged in its formalised shape in a number of countries in the early part of this century out of the basic need to employ people on a consistent basis in organizations which were growing. It was also influenced by certain enlightened employers who were concerned about the social welfare of their employees and, whilst this influence has not disappeared, there is no doubt that a large degree of provision has been taken over today by the role of state legislation. So where does this leave the contribution of the Personnel Manager today? Was Drucker fair in his criticism at the time he made it? Were his briefly expressed hopes for brave new personnel management justified in the light of our experiences in the past thirty years.

No single description can hope to encompass the variety of developments which have affected Personnel

Management over this period. The basic perspective adopted in this paper is that personnel management is two dimensional: it contains certain “hard” techniques which are technically transferable from one organization to another (certain aspects of selection, training, job analysis and evaluation, its role in salaries administration): it also contains certain “soft” techniques, which are not soft in the sense of being insignificant, but rather that they are subject to local or cultural sensitivity. Techniques coming within this second category, would be the appraisal of performance, approaches to stress and motivation, organisational and management development, and industrial relations. Whilst the reader might not accept the details of this distinction, it is hoped to establish a central point which is absent in most of the written texts on personnel management: that certain practices can be transferred between organizations with minor adjustments, whereas others are culturally-sensitive and must be made to fit the special considerations of a country or locality. This dichotomy makes personnel management stand apart from other professional activity such as accounting, computers, and technical activity, which are largely concerned with “hard” phenomena. Multi-national business agencies and international agencies who employ people in different countries cannot avoid addressing the question of the standardisation or local cultural fit of their personnel policies in addition to what they may regard as acceptable international practice.

In many respects the standing of personnel management is very much greater than at the time Drucker wrote his book. It is not uncommon to see Directors of Personnel (or perhaps more fashionably, Human Resources) on the boards of the larger companies and holding high rank in the public sector. However, it is true that if an organization puts the personnel function in the hands of a person of modest rank it is likely to get the performance and level of authority that it pays for. Personnel specialists have inevitably become caught up in the larger economic and social phenomena of their times, with variations depending on the state of development in any given country. Occasionally this situation leads the personnel manager into undertaking tasks which ordinarily might be seen to be contrary to the true

spirit of the personnel function, such as mass lay-offs, out placement counselling, and the employment of people in work for which they are over-qualified. The broader phenomena have included :

- the problems of unemployment or, in some countries underemployment
- the rise of new technology industries.
- the stagnation or demise of traditional industries
- the growth and dominance of multi-national organizations
- automation and new technology improving work efficiencies and putting groups of people out of work
- pressure from governments and regional country groupings to bureaucratise the solution to employment problems
- implications of the world debt situation on investment patterns

In the face of these developments, we may ask what personnel specialists are doing which is new and relevant in their personnel policies. *RECRUITMENT AND SELECTION* has traditionally occupied a prime position in the practice of personnel management. A recent review of research in this area by Monohan and Muchinsky (1983) indicates that it has been in decline for the past thirty years although there is evidence of a recent upsurge in interest. Perhaps this has come about as a result of those being involved in selection feeling under siege : being inundated by countless applicants and being constantly reminded in some countries of the need to select legally and equitably. The days of the unchallenged right to select are being replaced by a requirement to demonstrate the ability to select. Some organisations also adopt the view that in a situation of fewer vacancies and many applicants it is permissible to reduce the selection resources. In doing so, they fail to recognise that shrinking organizations have less capacity to cope with the errors that may come with selection.

The question of over-supply has become something of a global problem affecting those who select for the public and private sector. In many cases it has become necessary to consider a form of pre-selection

techniques in order that large numbers of applicants can be quickly and cheaply screened out. The most ambitious of these developments have been in the area of the analysis of application form data in order to unearth the predictors of success. In so far as these predictors can be identified it is possible to incorporate them into a quick computer-scored format and thereby assist in the handling process of large numbers of applicants.

It would appear that the question of equitable selection—in other words the application of sex discrimination and of race relations in the legislation of the country is to date more relevant in the employment legislation of western countries, particularly the United States, than in most Asian countries. The frequently cited “rationale” for the first type of discrimination, namely that men and women seek different things from their work, has been challenged by Wheeler (1981). The evidence suggests that what people want from their job is not determined by sex. Certainly with large numbers of migrant workers becoming an important part of the international employment scene we may expect that personnel managers have not heard the full story of the racial implications of their recruitment.

The area of selection is dominated by the interview as the most favoured technique, supplemented by forms of testing and, in some large organizations, the emergence of the assessment centre. The interview is essentially a “work sample” based on such behaviour as sociability and verbal fluency. No one has ever proved that an interview is a truly “valid” technique, but certain practical considerations make it a popular choice, especially if the number of applicants is too small to justify more elaborate procedures. Interviews do not present realistic circumstances in which the candidate may be seen at work; nor do they present a good opportunity of “selling” the job to the candidate. Nevertheless, interviews remain popular, bolstered by the interviewer’s inevitable faith and confidence in their own judgement.

The testing of applicants for a job is perhaps more talked about than put into practice, except by the larger organizations. Testing for ability and aptitude has applicability over a wide range of jobs, although

also, we are witnessing the incorporation of the computer into a broader “systems approach” to instruction which endeavours to bridge both education and training. Pioneered in large scale military and educational organizations this approach aims to analyze all components of a developing situation and to develop a series of modules which require the trainee to think in terms of a “total systems solution”.

It is clear that training is changing as a consequence of the new problems that it has to solve, with evolving views about the learning process and new training techniques. Sadly, it seems that many training programmes are poorly evaluated, which is typically by means of trainee reaction rather than by objective performance measurement preferably in the job situation. There is a tendency for people and organizations to dislike evaluative methods but also the technical problems of designing studies which effectively measure change. It is too much to hope for

the idea of industrial democracy. The OD practitioner has therefore appeared in a number of different roles within the personnel function, such as adviser, consultant, facilitator, change agent, occupational psychologist, or simply behavioural scientist.

The central position adopted by OD practitioners is that the organization consists of a series of open systems which are to a degree interdependent when conducting exchanges with what is normally a changing environment. How can we describe these interdependent parts? They include :

- the goals and strategies of the organization.
- its primary tasks and the associated technology.
- the structure, systems and procedures.
- the people involved, their skills, experience and attitudes.
- the processes — communication, learning, job-

many would doubt whether it is appropriate for managerial positions. Personality testing has its devoted band of followers, dedicated to demonstrating that certain personality types can emerge from an individual's score and that these traits are relevant for performance in the job in question. A question which must perpetually dog those who profess the merits of personality tests is the distinction between "real" answers to the questions posed and the responses of perceptive individuals who may be able to see what is required of them in the circumstances and to work it to their advantage.

Assessment centres—the use of simulated work sampling as a method of measuring a range of candidates' abilities—have been around for some time and are increasingly being adopted by large organizations. Although such centres are undoubtedly expensive and therefore only within the grasp of sizeable corporations, few have doubted the quality of the selection decision that they produce. The most impressive feature of the assessment centre approach is the job-related set

accompanies an improvement in technology and the reduction of human skills.

An area of great potential in the training field is in the use of simulation techniques which are valuable not only as training aid but in the analysis of situations. It is possible to train people in difficult decision-making tasks with the use of simulators, which may have little physical similarity with the real equipment but faithfully represent the decisions to be made. Perhaps the greatest challenge lies in the use of simulated decision-making in management training.

Amongst the more advanced training departments it is clear that the traditional behavioural view of the learning process is being challenged. This view holds that correct behaviour can be "effected" through reinforcement procedures: that is, if training is properly organized, then learning inevitably follows; the learner is essentially passive. The alternative view is based on a recognition that people process information through stages corresponding to perception, memory, decision-

The model suggests that for organizations to be healthy and to survive in their changing environments, there need to be equilibrium and balance across the various boundaries. It is common for a process of diagnosis to take place using appropriate data collection and analysis, which may include structured questionnaires, interviews, observation and group discussions, so that conflicts and imbalances can be detected and action plans developed to move towards balance. All of this presupposes that :

- the organization is working on strategic planning and is prepared to share the detail within the organization as it evolves.
- the OD (or personnel) practitioner has access to these plans and has the authority to discuss them with groups of employees most affected by them.
- employees individually and in groups are receptive to being consulted in this manner and are prepared to contribute to the improvement of work systems.
- the most senior management in the organization is committed to seek improvements and revised work arrangements through the OD process.

In their early days it was not uncommon for OD practitioners to concentrate on one or two elements of organizational improvement alone, such as team building. Now the climate of thinking in this field is such as to encourage consideration of the widest range of factors. OD contributions have been seen to be particularly relevant in helping technically dominated and high task-centred project personnel to increase their awareness and their ability to manage the interaction and interdependencies between the technical and social systems in their work. Additionally, OD has in a number of organizations show itself capable of moving away from the basis of problem-solving to become closely linked with strategic planning. This will mean not only examining the present state of affairs, but looking at possible future environments, choices about future likely goals in these kinds of environment and the capacities and steps needed to be

and Harris' book "Organization Transitions—Managing Complex Change" (1977). They took an illustrated model of organizational diagnosis and described the clear, practical ways of working through the steps of looking at possible future states of an organization and the mechanisms for moving from the present to the desired future. It is not only a one-way change. The organisation may need to learn ways of reacting to externally-induced change. All of this does not take it for granted that techniques of OD can be described as "hard" or culturally-insensitive. Two authors, Deal and Kennedy (1982) and Tichy (1983) have made out strong cases for the observance of the manner of OD applications as being extremely susceptible to the style and culture of the society in which they are practised.

This sociotechnical work associated with the Tavistock Institute of Human Relations in Europe and India with regard to the design and redesign of machines and plant can also be viewed as one of the earlier applications of OD. Technical design has long been a justification into itself, fitting the human and organizational aspects around itself. When a socio-technical approach is adopted, the OD practitioner will typically become involved with engineers, designers, those involved in operating the design and union representatives. Details of the steps involved and the benefits of the approach are to be found in monographs by Trist (1981) and Taylor (1975). Three of the largest organizations which have experimented with OD based on working groups—Volvo, Bethlehem Steel and Shell—have attested to the advantages, which include not only participative management, quality and productivity improvements but a striking form of industrial democracy.

It would require a book to examine the advances which have been made in the techniques and policies which are available to the modern personnel specialist. Instead three aspects have been reviewed—the traditional areas of recruitment and training, and the more recent innovations in organizational development. The personnel function in these and the numerous

from resting content with the "bits and pieces" referred to by Drucker, the personnel manager can today embrace broad policies and numerous advanced techniques which can match the criticism made so long ago. In the early days of personnel management, recognition of the human factor in organizations emerged from humane considerations allied to the practical necessity to recruit employees. In the larger organizations of today, the humane considerations should still be to the forefront in terms of the motives of any personnel specialist, despite the fact that increasing size brings with it a force which tends to de-personalise the handling of people in groups. However, a re-awakening to the human considerations involved with people in groups, together with moves to emphasize quality, productivity, participation as well as the quality of working life, are just beginning to give us a clue as to the larger and exciting role which the personnel manager is capable of playing.

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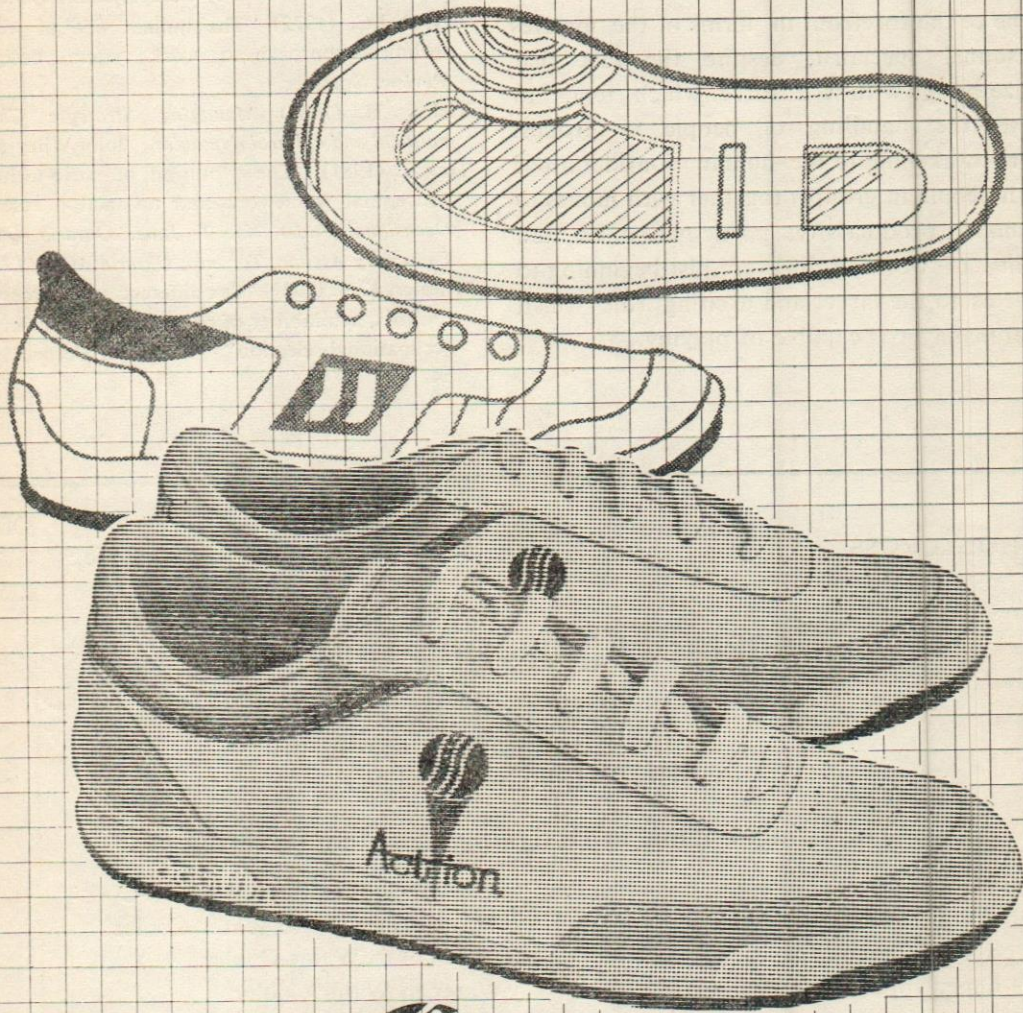
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THE TOUGH ONE WITH GENTLE GRIP

Personnel Functions : New Dimensions

D.P. UPADHYAY

The author in this paper discusses the various personnel functions and their increasing importance in the organisation.

D.P. Upadhyay is Director, National Productivity Council New Delhi.

“Every aspect of a firms’ activities is determined by the competence, motivation and general effectiveness of its human organisation. Of all the tasks of management, managing the human component is the central and most important task, because all else depends upon how well it is done.”¹

—Rensis Likert

“Personnel Management is a method of developing potentialities of employees so that they get maximum satisfaction out of their work and give their best efforts to the organisation.”²

—Pigors & Myres

While the first quotation reveals the significance of personnel management, the second one very clearly indicates what it aims for? In all organisations people are expected to contribute towards the pre-determined objectives of that organisation. Personnel management is related to that aspect of functions which on one side ensures proper utilisation of manpower, on the other side creates an environment where people have the ability, skill and willingness to contribute. Although both these areas are interrelated and dependent on each other, it is felt that the first one

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1. The Human organisation. It's Management & value written by Rensis Likert; published by McGraw Hill.
 2. 'Personnel Administration' written by Pigors P & Myres, published by McGraw Hill.

refers to the technicalities, system, planning, etc. the other area relates to development of human resources for not only optimum utilisation but also maximisation of satisfaction and motivation of people. The observations of Michael Armstrong, an eminent expert on this subject deserve attention in this context :

“Personnel Management is concerned with obtaining, organising and motivating human resources required by the enterprise, with developing an organisation climate and management style which will promote effective effort and cooperation and trust between all the people working in it, and with helping the enterprise to meet its legal obligations and its social responsibilities towards its employees with regard to the conditions of work and quality of life provided for them.”³

Personnel Management and human Resource Development

The personnel function in past few decades has undergone several changes revealing new dimensions. There was a time when it was confined to recruitment and service records of employees besides fulfilment of certain legal obligations in terms of wages, service conditions and welfare activities. Another stage in the development of the concept and approaches of personnel management was related to the influence of industrial engineering techniques initiated by Fredrick W. Taylor. The management under this influence thought that personnel management should attach greater importance to selection and training of workers as the best way of doing a job must be assigned to the most suitable person for the job and the jobs must be sub-divided for efficient operations. In this process management thought that in bringing methods and people together workers would exhibit least resistance to a change and will only be interested in increasing their earnings. This led to designing of incentives and use of psychological tests in recruitment. Then came the era of human relations movement when management was trying to understand the motivation factors and advocated for treating workers as human

beings. The major influence in this era was of the contribution of Elton Mayo through famous Hawthorne experiments. It was the beginning of understanding human productivity in the context of social and psychological phenomena instead of engineering alternatives.

It was only after the contribution of behavioural scientists that full implications of human side of the organisational working was recognised and consequently personnel management was looked upon more as a function of human resources development. The concept of human resources development is distinct from usual personnel functions concept as it emphasises not only individuals but also groups of people like :

- formal human system as departments,
- groups of informal nature, and
- inter-group and intragroup processes.

According to human resources development concept, human resources are available in the form of individual persons as well as in the form of collectivities of such individuals. While individuals are important sources, the various groups and teams functioning in an organisation are qualitatively different from the individual persons and deserve attention in their own right. An organisation may have excellent individuals, well trained and competent in their own fields and capable of handling all kinds of problems and yet, if the groups and teams do not function effectively, the organisational effectiveness will be low. The human resources in poor teams get wasted. The focus in human resources development, therefore, is on both individual persons as well as groups of various types and sizes functioning in the organisation.

While personnel management is primarily concerned with maintenance functions of administering the various matters relating to personnel in an organisation, human resources management or development is primarily concerned with increasing enabling capability of an organisation.

3. 'Personnel Management Practice' written by Michael Armstrong; published by Kogan Page Ltd.

Looked from the above point of view, the personnel functions could have two different components :

- (i) Personnel Administration
- (ii) Human resource Development

A third component may relate to industrial relations. While personnel administration functions may be guided by principles and practices in manpower assessment, selection, placement, transfers, employee records, safety, administration, etc., human resource development proceeds and develops along the basic philosophy that people are primarily motivated by changes, opportunity for development and creativity. It also calls for greater concern for shaping desirable values in the organisation. Personnel functions may be "Value Free" but human resource development approach cannot be thought of as "Value Free". In fact, no system should be value free but in following technicalities and procedure, it may some time ignore values. Human resources development approach emphasises such values that will in the long run humanise the organisation. Exercises of organisational development and action research aimed at promoting openness, trust, exploration and collaboration are all directed towards organisational effectiveness through shaping values.

Basic Characteristics

Based on the concepts and approaches of human resources management and development, certain basic characteristics of personnel management could be identified. These are :

- (i) Personnel management is concerned with employees both as individuals and as in groups which aims at getting better results with their collaborative efforts.
- (ii) The word employee does not mean labour or workers only. It includes all levels of personnel of an organisation.
- (iii) It is not only related to procurement and placement of people to do certain assigned jobs. It is also concerned with development of their potentialities so that they derive greater

satisfaction from their work and look for a better future in the organisation.

- (iv) Personnel management is not only a matter of contractual relationship or legal obligations. It is much more than that touching human side of an enterprise or organisation centring around social responsibilities, human relations and quality of work-life.
- (v) Lastly, but not least important is the fact that personnel management is an area which calls for attention and action by both staff and line executives and supervisors. In other words, it is not an exclusive domain of personnel managers but also of others dealing with production, services, marketing etc.

Objectives

Discussion of objectives of personnel management may bring in repetition of certain ideas but the conceptual framework must have specific objectives to sharpen the focus. The overall aim of personnel management should be to make an effective contribution to achievement of the objectives of the organisation and to the fulfilment of its social responsibilities. However, this overall aim could be set in certain basic headings and guidelines which provide a framework within which the organisation does what it needs to do in the way which best suits itself. These could be in the following areas :

- (i) To design and develop an effective organisation which will respond appropriately to change.
- (ii) To obtain and develop human resources required by the organisation and to use and motivate them effectively.
- (iii) To create and maintain a cooperative climate of relationships within the organisation.
- (iv) To meet the organisations' social and legal responsibilities.

Above objectives could be set out in the form of a hierarchy as given in Fig 1. This states the overall and the main objectives concerned with organisation, manpower, relationships and responsibilities with

SOURCE : PERSONNEL MANAGEMENT PRACTICES

- BY **Micheal Armstrong**

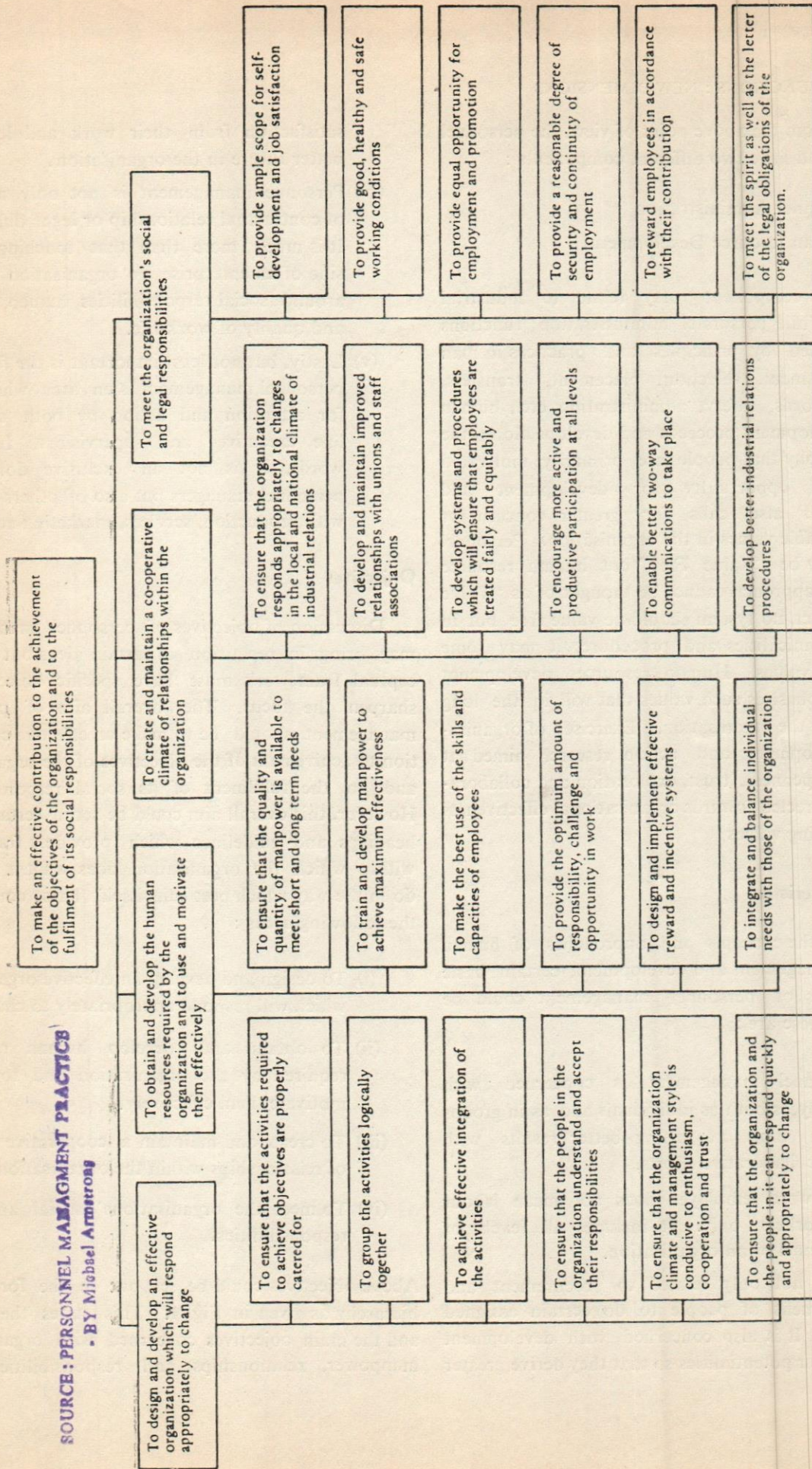


Fig. 1

listing of sub-objectives beneath each of these main objectives.

Personnel Functions

The functions of personnel management like any management function could be grouped under the five basic steps involving planning, organising, staffing, motivating and controlling. Listing of these functions can be of help only in identification of areas. What is more important is the comprehension of the roles. There may be certain functions which come under the exclusive domain of a personnel executive, there may be certain functions which may come under the domain of line executives. For practical purposes line executives mean all others not working in the personnel management department. There may be areas of overlapping nature or joint responsibilities. While each organisation will have to sort out these matters in the context of its organisational structure and nature of business, certain guidelines related to the role to be played by personnel and line executives may be relevant.

The basic principle which must be kept in view is that management is a team work and segregation of responsibilities from the point of view of the customer, community or employees is not of much significance. For all these people, management is one. Internal arrangement of functions have relevance only for the sake of demarcation of accountability and role clarity. At the same time coordination among them is a must because they are part of the same system required to contribute towards the organisational objectives. As such the relationship between line & personnel departments has significance in the context of internal working only.

Some experts & executives have been over enthusiastic in defining the personnel manager as the conscience of management. To state this may be to adopt the arrogant posture that only personnel managers have social conscience which is not true. This statement in spirit intends to clarify that personnel managers have a duty to alert the line managers to the human implications of what is happening to the organisation and of what they are doing. They do this not because they are inherently more aware of

these implications, but because it is their job to use their time and analytical skills to consider all aspects of utilization of human resources, while it is the job of the line managers to be concerned about their own functions as well as the people in it.

It must be emphasised, however that all managers are concerned about human resources, not just personnel managers. The role of the personnel department is to help management to do this part of their job better and to provide services which are more economical to group together under a functional head, where expertise is required which is unlikely to be shared equally amongst line managers. The role of personnel department could be mostly of advisory nature on personnel policies, strategies and procedures, and methods as indicated below :

Areas for Advice on Policy

Social responsibility, employment, pay, career & promotion, training and development, industrial relations, participation of employees in management, legal matters.

Areas for Advice on Strategies

Manpower, industrial relations, organisation development, motivation, communication, etc.

Areas for Advice on Procedures & System

Manpower planning, recruitment, employment, training, performance-appraisal, wages and payment by result, salary administration, employee benefits, communication, joint consultation & participation, health & safety, welfare services.

It may be added here that advice on procedural aspects should be undertaken with caution. One of the most dangerous traps in which a personnel manager can fall into is that of developing a massive bureaucratic machine which is resented by line management and ultimately defeats its own purpose by being ignored or bypassed. This tendency has been observed in many organisations. Personnel Managers have been dismissed as "do gooders" by line managers losing respect. In such circumstances some personnel

managers commit another mistake by exhibiting a tendency to leap on to the latest personnel & behavioural science bandwagon without properly evaluating the practical use of various concepts and approaches through the eyes of line management.

Functional Guidance Role

The functional guidance role of the personnel department is to interpret and help to communicate personnel policies and procedures approved by top management, and on behalf of top managements, to provide guidance to managers which will ensure that policies & procedures are implemented and maintained. This is the most difficult and delicate of all the roles that the personnel department carries out. It is expected that the top management will delegate some of its control duties to the personnel department particularly the implementation of policies & procedures in order to ensure that they are consistently applied throughout the organisation. The principal matters upon which the personnel function might exercise control may include :

- Application of contractual conditions of employment;
- Alterations to rates of pay & pay structures;
- the implementation of agreed procedures. negotiating, grievance, discipline, redundancy, promotion and transfer;
- expenditure on recruitment and training;

- the quality & style of recruitment and advertisements;
- the fulfilment of legal requirement concerning employment, health and safety.

Evaluating the Personnel Function

Personnel functions could be broadly evaluated on the basis of its contribution in achievement of overall objectives of the organisation. It has been observed that top management usually states that people are the most important resource in an enterprise and therefore the department that specialises in human resources management is most important but this importance is dependent on the position given to personnel departments in reality (not a lip service) and the status that the personnel department gains because of its effective functioning. There is a tendency to evaluate personnel functions in the context of priority fixed by the top management in a particular situation. To some extent this cannot be avoided. For example if the organisation is facing the crisis of strike situation averting it or resolving the conflict for its end may have the priority but because of the top management adhocism some time the personnel department also adopts the line of adhocism. It is, therefore, essential that we have a positive system of evaluation of personnel functions based on proactive actions. Its role is to make a positive contribution to organisational health and effectiveness through various activities.

Personnel Management in Malaysia

FRANCIS ARUL & DZULKIFLI SIPON

The authors in this paper present a view of personnel management practices as obtaining in Malaysia and also point out areas where there is scope for increased activity.

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Introduction

The total population of Malaysia according to the Population and Housing Census 1980 was 13.7 million. Between 1970 and 1980 the population grew from 10.4 million to 13.7 million or 2.3% per annum and is expected to grow at an average rate of 2.5% during 1981-1985. Table I below shows the population, labour force and employment status 1980 of Malaysia.

TABLE I
Malaysia : Population, Labour Force, and Employment
Status 1980

	Peninsular Malaysia	Sabah	Sarawak	Malaysia
Total Population (000)	11,426.2	955.7	1,307.5	13,689.4
Working Age Population (000)	6,556.7	527.1	717.8	7,801.6
Labour Force (000)	4,259.7	306.8	497.6	5,064.1
Employment (000)	4,023.0	287.9	476.4	4,787.3
Unemployment (000)	236.7	18.9	21.2	276.8
Labour force Participation rate (%)	65.0	58.2	69.3	64.2
Unemployment rate (%)	5.6	6.2	4.3	5.3

Source : Labour Force Survey 1980

The labour force of Malaysia was estimated at 5.1 million in 1980. The labour force of Malaysia is still young with about 60% in the age of 15-34 years. About 53% of the new labour market of entrants during 1981-1985 will be in the age group of 20-34 years. New entrants into the labour market aged 15-19 years are expected to grow at a relatively slow rate of 0.6% per annum and their share in total labour force is expected to decline from 13.2% per annum to 11.7%. This is largely due to an increased retention of youth aged 15-19 years within the school systems.

Female labour force participation rates

With higher educational attainment, participation rates of females are expected to rise especially in the age group of 20-24 years. It is estimated that while the aggregate female labour force participation rate (LFPR) is expected to rise from 45.2% in 1980 to 45.8% in 1985. The LFPR for females aged 20-24 years is expected to increase from 56.6% to 59%. As for males, the aggregate LFPR is expected to increase from 85.4% to 85.6%. Table 2 shows the distribution of labour force population by age group and sex—Malaysia 1980.

TABLE 2
Distribution of Labour Force Population by Age Group and Sex—Malaysia 1980

Age Group	Total (000)	Male (000)	Female (000)
15-64	5064.1	3339.5	1724.6
15-19	664.1	395.0	269.1
20-24	978.2	602.2	376.0
25-29	791.1	536.6	254.5
30-34	651.2	455.1	196.1
35-39	510.1	350.1	160.0
40-44	480.1	325.4	154.7
45-49	356.7	237.6	119.1
50-54	299.2	205.0	94.2
55-59	192.2	132.7	60.2
60-64	140.5	99.8	40.7

Source : The Labour Force Survey 1980

Employment Growth 1981-1983

The slow down in economic growth has resulted in a declination in labour demand and the overall employment situation weakened. Table 3 shows the employment estimates by major occupational group 1980-1985.

Organisation and Function of Personnel Department

Personnel Management is a responsibility of all those who manage people as well as being a description of the work of those who are employed as Specialists. It is that part of Management which is concerned with people at work and with those relationships within an enterprise. It applies not only to industry and commerce but all fields of employment. Its aims is to bring together and develop into an effective organisation, the men and women, who compose an enterprise and having regard for the well-being of the individual and working groups. Personnel Management is also concerned with the human and social aspect of change in internal organisations and methods of working and of economic and social change in the community.

The internal organisation of the Personnel Department includes :—

A. Employment

The recruitment, interviewing, promotions, transfers, termination, records of workers etc.

B. Training and education

The training programmes, apprentices, operators, supervisors, managers, instructors, facilities etc.

C. Wages and Salary

This includes Job Analysis, Job Evaluation, work standards, wage surveys, incentives, merit rating and employee classification.

D. Labour Relations

Collective Bargaining, Grievance procedures, consultations, contracts, arbitration, legal aspects etc.

E. Medical and Welfare Services

TABLE 3
Malaysia : Employment Estimates by Major Occupation Group, 1980-1985

Occupational group	1980*		Share of employment		1985	
	(000)	(%)	(000)	(%)	(000)	(%)
Professional and technical workers	290.6	6.0	341.4	6.5	367.9	6.6
Administrative and managerial workers	48.0	1.0	53.5	1.0	58.0	1.0
Clerical workers	338.4	7.0	379.1	7.2	405.3	7.3
Sales workers	419.6	8.7	457.3	8.7	491.5	8.8
Service workers	488.2	10.1	569.1	10.9	618.2	11.1
Agricultural workers	1,868.5	38.8	1,900.1	36.2	1,939.7	34.8
Production workers	1,363.6	28.4	1,544.3	29.5	1,695.4	30.4
Total	4,816.9	100.0	1,244.8	100.0	5,575.9	100.0

Note : *Estimates are derived on the basis of data from the Population and Housing Census, 1980.

Source : Mid-term review of the fourth Malaysia Plan.

F. Personnel Research.

The Personnel Department is an interlink between line and staff functions. The line functions are those which have direct responsibility for accomplishing the objectives of the enterprise. Production, sales and finance are usually classified as line function. The staff functions refer to those elements of the organisation. That help the line to work most effectively in accomplishing the primary objectives of the enterprise, purchasing, accounting, personnel, plant maintenance and staff functions.

The role of personnel management in the private/public sector enterprise include the planning; organising, directing and controlling of the procurement, development, compensation, integration, maintenance and separation of human resources to the end that individual, organisational and social objectives are accomplished.

The management functions are :—

Planning : The determination in advance of a

personnel programme that will contribute to goals established for the enterprise; *Organising* : The designing of the structure of relationship among jobs, personal and physical factors; *Directing*; Getting people to go to work willingly and effectively; *Controlling* : Regulating activities in accordance with personal plan which in turn was formulated on the basis of an analysis of fundamental organisation goals.

The operative functions are :—

*Procurement

—Obtaining the proper kind and number of personnel.

* Development

—the increasing of skill through training.

* Compensation

* Integration

—the attempt to effect a reasonable reconciliation of individual and organisational interests.

* Maintenance

* Separation

The external influence of operating on the personnel department are the sociological—cultural constraints and the economic constraints. In the Malaysian context on important external influence includes the New Economic Policy. This policy seeks to reduce and eventually eliminate the identification of race with economic functions. In the process of restructuring employment, government policy emphasises the need to increase the representation of Malays and other indigenous population in the modern sector in line with the racial composition of population at all levels, especially at the upper levels of the job hierarchy where they are seriously underrepresented. Among the more important internal influence is the management philosophy of a firm.

Recruitment and Selection

The Recruitment and Selection process in many organisations in Malaysia has undergone significant changes in recent times. Organisations are now in a competitive situation never seen before. They are paying greater attention as well as spending more time in the selection of their staff. Personnel Managers and others in charge of the selection process are slowly regarding it as a systematic step by step procedure since it is growing steadily and the technique needed to carry on an effective selection process is scientific. Numerous techniques are used. The interview which appears to be most commonly used technique is made more objective.

Basically, most organisations follow certain distinct steps ie.

- (i) To state the purpose of the job including the factors that affect it ie. The job Description.
- (ii) To understand the type of person required for the particular job ie The Job Specification.
- (iii) To know where the persons are to be found ie. The Source of Recruitment.
- (iv) To contact them in an economical but effective way ie. The Advertisement.
- (v) To be able to identify the person when they apply for the job ie. The Selection.

The various steps in the Selection Process is frequ-

ently reviewed to determine if the expected results are being achieved. In most organisations it is the Personnel Department that completes most of the steps in the selection process. The line Managers also plays an equally important role in the selection process. In organisations where no specific department undertakes this function, the Manager will have to do it himself.

In Malaysia, the methods of advertising for job vacancies is varied. Some of the methods include :

- (i) Company notice boards and newsletters. In this case, the advertisement is directed to the employees and their friends and relatives.
- (ii) Contacts with Institutions of Higher learning such as University Employment Bureau etc.
- (iii) Employment Agencies (mainly for junior level staff) and Selection Consultant (for senior and top level staff).
- (iv) Government employment Exchange is a good source for industrial workers.
- (v) Professional and Trade Journals Presently this method is being used to a very limited extent.
- (vi) Newspaper Advertisement—this is one of the most commonly used method.

This is followed with the short-listing of candidates who are informed of the interview. The interview can take the form of a Panel interview or a person to person interview. Normally, if a person is selected, a letter of offer will be sent to the successful candidate giving details and the terms and conditions of service. It would also state when and where to report for duty and to confirm acceptance.

Performance Appraisal

Traditionally, in Malaysia, Performance Appraisal has not been considered one of the more enjoyable, motivating and challenging aspects of being a Manager, Supervisor or an employee. Managers and Supervisors dread appraisals, viewing them as time consuming, difficult and draining. At the same time, employees dread being the subjects of appraisals in which they are criticized, unheard and unrewarded. Performance

Appraisal has been a losing not only for the participants but for the organisations—as indicated by higher turnover, job satisfaction and lower productivity. Many organisations have not updated their approaches to the Appraisal process to suit Management—Labour relations. They have postponed using employee participation that can link performance Appraisal to the overall Management philosophy of an organisation. Participation—the full training of employees for the Appraisal experience is the element that transforms an Appraisal from an Administrative exercise to an experience that is worthwhile to Managers, Supervisors, employees and the organisation.

Some organisations have set up elaborate Appraisal systems that emphasise the goal setting component. MBO has become part of Management jargon, especially in the Electronic Companies in Malaysia. However, they have not been successful because mutual goal setting and using the attainment of specified objectives as the barometer for evaluating performance is not enough to make the system work. The most blatantly absent component is the informal coaching of employee performance on a day to day basis. Without feedback counsel or direction employees cannot be expected to stay within the framework of the guide lines for performance.

Employee Development

In the Malaysian context, the organisational entry of an employee to an organisation will be determined by selecting the suitable and qualified candidate according to the job description and employee specification. Before embarking on a recruitment programme it is essential to establish what human qualities will mean success or failure in the job to be filled. In essence recruitment is a matching process, the capacities and inclinations of the candidate have to be matched against the demands and rewards inherent in the given job or career pattern.

Induction

The orientation and socialization of the employee is an important process. It is part of the employee development. A newly selected employee will be given a formal induction/orientation programme. This is

the role of the Personnel/Training department. There are a few important things pertaining to this induction/orientation programme. In any organisation the contents of an induction programme will cover the history of the organisation, the product, industrial relations policies, employee activities, job routine and the organisation policies and regulation.

The socialization pattern involves introducing the new employee to his co-workers and in some situations it may be absolutely essential for the Personnel Manager to tell the employee the duties of his co-worker due to the inter-relationships of the job. It may be helpful to name the persons who will help or instruct the new employee.

The induction programme will include explaining the duties and the functions of the new employee. In Malaysia, training has become an important activity to be emphasised especially for the big organisation. This is true for upgrading the abilities and the skills of the employee. Training is part of the employee development and done mostly by the personnel involved or with the help of outside consultants. There are many Management Training Institutes in Malaysia, eg. National Productivity Centre (NPC) and Malaysia Institute of Management (MIM).

Training includes the formal and informal ones. The formal training usually are in a formal session and the methods are lectures, group discussions, case studies, role-plays, films, course evaluation etc. Training aids are generally used to increase the effectiveness of a training programme. Such aids include the blackboard, white board, flip charts, overhead projector, films, video tape recorders, films etc.

It is difficult to precisely evaluate the impact of training and development activities in an organisation. This is due to the fact that many organisations send their employees to other training organisation for their training. Lack in identification and assessment of training needs and lack of professionalism in assessing training is the cause of the ineffectiveness of the impact of training within an organisation.

Wage and Salary Administration

Unlike other countries, there is no National

Minimum Wage in the country. However, there is the Wages Council Ordinance 1947 meant for the protection of workers who do not have adequate machinery and bargaining power to obtain fair remuneration from their employers. Under this Act, the Minister can establish Wages Councils for fixing remuneration and other conditions for specified groups of workers. There are presently 4 Wages Councils in Malaysia covering Shop Assistants Hotel and Catering workers, Cinema workers and Stevedores and Cargo handlers employed by private employers in the Port of Penang. In 1982 there were 123, 542 workers covered by the Wages Councils.

Before the Minister makes an order for the establishment of a Wages Council he must decide whether adequate machinery for regulating the remuneration and conditions of employment to the workers concerned does not exist or may cease to exist or is not adequate for the purpose. He must also decide whether a reasonable standard of remuneration exists or is likely to be maintained for the workers concerned. The Wages Councils consists of employers and employees representatives and independent members from whom one shall be appointed Chairman. The Council has power to submit to the Minister proposals for fixing the remuneration to be paid generally or for any particular work by the employers to the workers in relation to whom the Council operates and for fixing holiday and holiday pay.

The Minimum Wage provided by the various orders are still low and near poverty level. For example the Minimum Wage for the Hotel and Catering worker is only \$185.00 per month and is hardly sufficient to provide the most basic needs for his family.

Regarding the payment of bonus, there is no legislation and thus the practices vary from organisation to organisation from no bonus to even 12 months bonus. Sometimes bonus is paid upon productivity or profits whereas in other instances it is contractual embodied in Collective Agreements. Standards of Wages are also paid industry-wise and the higher level of wages are paid in industries such as Petroleum and chemical Banking and Commercial sectors.

The mandatory benefits are provided for under Part XII of the Employment Act 1955 which pertains to Rest Days, Hours of Work, Overtime, Public Holidays, etc. Anything over and above could be considered as voluntary benefits provided by employers on their own initiative or obtained through Collective Bargaining by Trade Unions.

Discipline and Grievance Management

In Malaysia, Discipline takes an important significance, in that much attention has been paid to it due to the high incidence of disciplinary problems in the country. Very often, too employers are ignorant of the requirements and formalities that need to be adhered too in the handling of discipline. Thus, through the awards and pronouncement of the Industrial Court, there has evolved a system and guidelines for the maintenance of discipline within industries at the National and Unit levels. These Industrial Court awards form the basic upon which procedures have evolved. It requires employers to conduct Domestic Inquiry. The Employment Act of 1955, Section 14(1) specifies that an employer may after "Due Inquiry"

- (i) Dismiss
- (ii) Demote or
- (iii) Suspend a workman for a misconduct not consistent with his terms and conditions of employment. However, it makes no mention of the procedure. 'So it is through the Industrial Court guidelines that requires employers to conduct inquiries that are considered "Fair and Proper". This necessarily means that they should follow the Principles of Natural Justice i.e.
 - (a) Impartiality on the part of the employer
 - (b) Opportunity to defend oneself.

Regarding impartiality, practices vary. Large Multi-National Companies normally set up inquiry panels constituted of 3-5 personnel whereas smaller organisations prefer to have one-man inquiries. Both are considered acceptable, so long as the parties are not involved in the case or have an interest in the case.

Pertaining to "Opportunity to defend Oneself", the procedure requires an employee to conform to i.e. :

- (i) Issue Letters of Charge
- (ii) Explanation of the Delinquent Workman
- (iii) Notice of Inquiry
- (iv) Inquiry Proper
- (v) Report of Inquiry Officer/Panel
- (vi) Order of Punishment.

It can be considered that such practices have worked reasonably well in Malaysia except for certain cases of errant employers who choose to be vindictive or malicious in their attitudes. Such employers are invariably pulled up for their unfair practices either by the Ministry of Labour or the Industrial Court.

There is also in existence the *Code of Conduct for Industrial Harmony* whereby the Code establishes certain responsibilities and obligations on the part of the employer and Trade Unions. These obligations on the parties has helped in maintaining a sense of goodwill and greatly enhanced the relationship between employers and Trade Unions at the Unit and National levels.

Another practice which had evolved is the "Hot Line" procedure Promulgated by one of the past Ministers of Labour. This basically means that the Minister of Labour is on "call". In matters of dispute if either party is frustrated and rather than take industrial action refer the matter to the Minister directly for urgent action.

It must be mentioned that all these practices and procedures have worked well in the Malaysian context; and has accounted for a harmonious relationship of industrial relations in the private sector.

Regarding Grievance Management, there are not legislation which requires organisations to compulsorily practice this highly invaluable method of reducing frustration and improving industrial relations. However, Malaysia is one of the countries which has ratified the ILO Conventions on this matter. Consequently, through training and consultancy by various authorities

including the NPC this concept has been highly advocated and publicised. In this matter, too, practices vary. By and large most organisations practice Grievance Management in varying degrees, in the sense that smaller organisations have simple set-ups while larger organisations have them on a more formalised basis.

In organisations with Trade Union representative generally the Grievance procedures come under the item for negotiations and form part of the Collective Agreement and consequently deposited in the Industrial Court and becomes an award binding on both parties.

It must also be expressed that the Trade Unions in the country take a keen interest and active role on all matters pertaining to Discipline and grievance of the workers. The effectiveness, of course depends on their strength and merits of the case.

Labour-Management Relations

The Industrial Relations process in Malaysia evolves round three major labour legislations in the country. They are :

- (i) The Trade Union Ordinance of 1959
- (ii) The Employment Act 1955
- (iii) The Industrial Relations Act 1967

The Trade Union Ordinance 1959 is the piece of legislation that provide for the framework of the Trade Union movement in the country which date back to the early 1900's. The provisions of the Act include the :

- (i) Definition of Trade Union
- (ii) Registration of Trade Union
- (iii) Powers of the Registrar of Trade Unions
- (iv) Cancellation of Trade Unions
- (v) The Qualification of Trade Union Officers
- (vi) The Affiliation of Trade Unions to Outside-Bodies.

Criticism has often been levelled against the government for the restrictive nature of the provisions which

have been considered anti Union in nature. This, however may not be considered a fair comment if one considers the background of the Union movement in the country. Especially [during the 1930's and the period after the Second World War 1946—1948 Malaysia was vexed with Communist activities, whereby the Malayan Communist Party had infiltrated into the Trade Union movement and politicians were using the movement towards their own selfish ends. This resulted in large scale strikes in the 1930's and mid 1940's largely intended to embarrass the Government and extend the Communist movement. Since the Communist threat is ever-present these "restrictive" provisions are intended to take care of such eventualities.

The Employment Act 1955

This Act provides for the mandatory provisions or minimum terms and conditions all employers must provide their employees yearly \$750 and less. This pertains to matters such as :

- (i) Rest days, (ii) Hours of work, (iii) Overtime,
- (iv) Annual leave, (v) Public Holidays,
- (vi) Medical Leave.

In addition, this Act also provides guidelines for matters related to Contracts of Service and termination and Lay-off Benefits.

Generally speaking this Act is beneficial to all employees who are non-Unionised employee through Collective Bargaining would enjoy a higher standard of terms and conditions of employment.

Industrial Relations Act 1967

This Act is to provide for the regulations of relations between employers and workmen and their trade unions and the prevention and settlement of the differences or disputes arising from their relationship and generally to deal with trade disputes and matters arising therefrom.

The Industrial Relations Act also contains provisions regarding :—

- (i) Rights and obligations of employers and Trade Unions

- (ii) Recognition of Trade Unions
- (iii) Collective Bargaining and Collective Agreements
- (iv) Dispute settlement methods
- (v) Law pertaining to strikes and Lock-Outs.

It is interesting to note that the Industrial Relations Act is based on voluntary System of Industrial Relations with Compulsory Arbitration only on matters which cannot be resolved amicably or where it is expedient in public interest or in matters of economic considerations that a more speedy settlement is achieved. In such an instances the Minister of Labour has the discretion to refer such a dispute or disagreement to the Industrial Court for Arbitration. In matters of a unique nature there are also provisions to set up a Committee of Investigation or Board of Inquiry to investigate and make recommendations which have to be tabled in Parliament for discussion. So far, however there has been no instance to warrant such a move.

Behavioural Aspects

Better organisational networks and structures are essential to provide for better communication, motivation and work team functioning. In the Malaysian context, the emphasis is to create a more open democratic organisation networks and structures in which there is participation in decision making process by all members. This is being done by creating a more open relationship between the top management and the worker. More efforts are being made through learning process and training to make the employee grows and develops within an organisation.

This shifting in emphasis became more important in the efforts to create and maintain an appropriate work ethic. In the Malaysian context, the 'Look East Policy', a policy made popular by the Prime Minister have become an important policy. These policy refer to the good characteristics and positive attitudes and the work ethics of the Japanese and the Koreans than can be emulated by the Malaysian workers. These characteristic include the spirit of teamwork, positive attitude, loyalty to the company, industriousness and hard working, self discipline and others.

Workers are now encouraged to make constructive suggestions through the suggestions schemes and reward are being given to the worker for their suggestion. Apart from the benefits of useful suggestions, suggestion scheme increase the workers' involvement in the affairs of the organisation/company. More efforts by providing better work condition and involvement of workers are being done to create a positive work ethics. Quality control circle (QCC) is a way to encourage participation from the worker and to create quality consciousness. Although QCC is quite a new phenomenon in the Malaysian context, QCC is being accepted by many organisations. These also emphasise on productivity and quality, training and development of workers. Top management are becoming aware that they play an important role in creating these appropriate work ethics. Efforts are being made to become more receptive of ideas from the workers. Two way communication can encourage effectiveness and the top management and worker are being geared to work together as a family through collaboration and mutual respect. In these respect the efforts to create an appropriate work ethics can be possible by the changing attitude of the workers to improve the efficiency and the productivity of the organisation.

Management and Organisational Development (OD)

In an organisation, management development (MD) and organisation development are strategies for change. That is when an organisation sets out to train managers so they can function effectively in management positions to which they may be assigned in the future. It is attempt to change these managers so their behavior will fit the desired behavior pattern for optimal results at that future level in their career so both MD and OD imply a systematic way of changing the functioning of an individual and therefore the functioning and ultimately the effectiveness of the organisation.

The objectives of management development are :—

- * to increase ability to plan, coordinate, measure and control
- * efforts of company units.
- * to teach company values and philosophy

- * to provide practice in management skills which lead to be improved
- * organisational effectiveness.

to gain a better understanding of how the company functions to accomplish its goal.

The methods and process involve in MD includes :—

- * to send manager to some educational programme
- * job rotation of managers
- * specialized training "packages"
- * courses and/or conferences
- * involved in counselling
- * reading books and articles

With reference to the role of management education institutions, I will refer to the National Productivity Centre (NPC) of Malaysia. The National Productivity Centre was established in 1962 as a joint project by the United Nations Special Fund and the Federal Government with the ILO as the executing agency. According to the plan of operation of the project, the Centre would ultimately become autonomous. In March 1, 1966 it became an autonomous body. NPC is a non-procedure Management Training Centre serving both the public and private sections. Among its role are :—

- * raising the standard of management including supervision at all level in commerce and industry in Malaysia
- * improving the efficiency of industrial operations, sales and marketing, with particular reference to methods of increasing productivity, of improving quality, of output of lowering costs and giving training and advice on labour management relations.
- * Initiating training and other programmes that would best serve specific and local requirements of the country as a whole.
- * Undertaking and performing consultancy services.

* Establishing and maintaining contacts with similar or other agencies both national and international.

In NPC, because of the importance of standard procedures and controlled organisation, there has been a tendency to extend the function of financial auditing, whether they are responsible to the management services function or not, to cover the checking of many aspects which are neither strictly financial nor connected with the assets of the company in the accounting sense. Management Services Department are also often required to carry out audits in this wider sense, either as a prelude to formulating a case for reorganisation or post reorganisation to test its effectiveness. The total examination of organisation or parts of it include checks on the effectiveness of trainers, their compliance with company or professional standards; the quality of performance of duties and recommendations for improvement.

In NPC, with reference to the procedure used in organisation and management audits pertaining to personal, two procedures are usually been followed.

They are :—

* The training methods to ensure the continuity and upgrading of NPC and its cover the lowest to the senior management.

* Appraisals.

The performance appraisals are being done by the employee's superior. This is done twice yearly.

In the Malaysian context with the exception of big multinational organisations, the field of organisation development is still a new area to be explored. Comparatively, the big multinational organisations such as IBM, Petronas, Shell have developed this area much more effectively compared with the other smaller organisation. As such the acceptance and utility of OD activities such as team building, sensitivity training and grid training is greater in these organisation. The field of OD has tend to focus on six major fields of activity :—

- (1) individual skills training, both on and off the job
- (2) interpersonal skills training including T. group training
- (3) management effectiveness training including team building
- (4) intergroup change
- (5) total systems change and
- (6) environment change

Research on Corporate Social Responsibility

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In this article, the various contributions of researchers in the field of corporate social responsibility are schematically presented. The conclusions drawn are indicative of the direction in which further research should take place in this field.

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Introduction

Corporate Social Responsibility has been a topic of greater interest to almost all types of people in developing nations. Consequently the literature in this field has burgeoned by the contributions of business-society analysis. In this paper an attempt is made to present a brief survey of research works.

Acceptance

Various surveys have established that the managers, particularly of large corporations, accept a responsibility for establishing social policies for their corporations.

Louis¹ was one of the first to survey managers with regard to social problems. His survey of 350 executives polled by Fortune magazine showed that 10 per cent felt that the sole business of business was to make a profit. At the end of spectrum were 17 per cent who said that business should assume social responsibilities even at the cost of reduced profits. In this same poll, 95 per cent of the respondents said their companies were involved in the social programme.

In 1971, the Harvard Business Review² surveyed 3,453 of its subscribers and asked them how valid they thought, each of the following observations were:

(1) "A Corporation's duty is primarily to its owners and only to its owners" (2) "A Corporation's duty is primarily to its owners and secondarily to employees, customers, and public" (3) "A Corporation's duty is to serve as fairly and equitably as it can the interests of four, sometimes competing, groups—owners, employees, and the public" (4) "The Primary duty of the enterprise is to itself—to ensure its future growth and continued functioning as a profit-making supplier of goods and services". Seventy four per cent responded that the first statement was the least valid of the four. Only 2 per cent said it was the most valid. Sixty-one per cent said that the third statement was the most valid.

Holmes³ conducted a similar survey among the Fortune 500 in 1976 and concluded that the trend toward greater acceptance of social responsibilities was continuing.

The survey of Hammaker, Norniman and Radar⁴ and Bowman⁵ reported that more managers were concerned with establishing stronger ethical and moral policies to govern the actions of managers in their operations.

John Steiner⁶ conducted direct interviews with top executives about their beliefs. He made videotapes of approximately 15 chief executive officers of major corporations, in a continuing services, concerned with their social attitudes.

Gill and Leinbach⁷ studied the attitudes concerning social responsibility by taking a sample of 83 companies in Hongkong. They found that there is an understanding and appreciation to corporate social responsibility. However, they opined that it will not become a reality (before Great Britain's lease from China expires). under the present politico-economic conditions.

Abdul Farooq Khan⁸ made an investigation into the perceptions of corporate social responsibility among 41 Senior Executives of companies in Delhi and Ghaziabad district in U.P. in India. He found that 98% of respondents agreed that social responsibility was relevant to business. They considered profit an equally important goal.

He conducted another survey of executive perceptions in England adopting mail questionnaires and interview method. From a sample of 46 respondents, he found that almost all managers were in favour of corporate social responsibility.⁹

Webley¹⁰ reported in his survey that over 90% of the 130 U.K. Chief Executives questioned agreed with the statement that the company has functions and obligations beyond the pursuit of profit.

Harmon and Humble¹¹ found in a survey of opinions in Britain for the Management Centre Europe, that there seems to be an increase, in general, in the awareness and acceptance of social responsibility in business.

Social Areas of Concern

Considerable research has taken place in recent years with respect to specific social policies of corporations. Coppock, Dierkes, Snowball and Thomas,¹² studied 300 randomly selected issues of Newsweek, Time, and Business Week and 285 annual reports of 57 corporations for the years 1965, 1967, and 1971. This study showed a substantial increase in pressures upon business to undertake social programmes, a growing awareness by business of these social pressures, and an increasing response by business to them. The business response with respect to particular types of programmes, varied somewhat with the social pressures for action. During the years surveyed, a total of 1,963 different issues were reported. The reporting of self-defined fields of social action showed a very large increase during the period surveyed.

Corson and Steiner¹³ sent a questionnaire to 750 companies concerning their social programmes and received responses from 284 of them. In this survey respondents were asked whether they had made any significant commitments of money and or personal time in 58 activities covering ten fields of social responsibility. The results showed a surprisingly large commitment to most programmes. The two programmes receiving the most attention were, first, "ensuring employment and advancement opportunities for minorities", (244 responses), and second "direct

of companies in Germany, France and Canada as revealed in three separate major studies, with results of the Corson and Steiner study for the United States. They concluded that there were some important similarities among the three countries and with the United States but there were also important differences.

A study by Collins and Ganotis⁵⁹ in 1972 noted that within the single-company studies (\$1 billion in sales) older, upper-level executives were in general more prone than their younger, junior executives to see that 'corporate commitment is necessary to solve social problems'. Specifically two areas—pollution controls and minority hiring exhibit the same pattern of attitudes toward corporate commitment, with the junior executives being less enthusiastic.

Lyaman E. Ostuland⁶⁰ in his study, taking a sample of 458 top managers and 557 middle level managers established that both groups are more or less equally interested in social responsibilities.

Size

Eilbirt and Parket⁶¹ found a positive relationship between size and socially responsible behaviours. Size was measured by dollar volumes of sales. Large firms were defined as those having \$1 billion and above in sales small firms as those having \$250 million and below in sales.

Gomolka⁶² measured size by the number of employees. Four categories were used in this study 1-10 employees, 11-25 employees, 26-75 employees, 76-500 employees. He found that 'Companies with 1-10 or 11-25 employees engage in fewer social responsibility activities than companies with 26-75 or 76-500 employees'. These studies related organisational size to the total number of social activities of the firms involved in. They, however, did not measure the actual degree of involvement in socially responsive behaviour.

The council on Financial Aid to Education⁶³ (1972), studied the relationship between organizational size and a particularly socially responsive behaviour,

charitable donations. A negative relationship was found between organisational size and charitable donations.

Other Areas

Business and political activity has become one of the attractive fields of exploration for business-society scholars.

Salamon and Siegfried⁶⁴ examined the variations among industries in securing favourable public policies systematically related to economic structure of industries. They concluded that large firms yield greater political power. Larger industries are less successful politically than large firms. Also, industries which are most visible and fearful of government intervention are more inclined to avoid political influence efforts aimed at reducing their tax burdens.

Pitman⁶⁵ examined the relationship between an industry's sensitivity to governmental action as measured by various characteristics of the industry and propensity of firms in that industry to generate campaign contributions to candidates for federal office. He found that the extent of the attempt to influence political process and campaign contribution depend on the extent the firms is affected by government.

Karen Orren⁶⁶ examined the industry involvement in the development of Key aspects of public policy pertaining to the control of credit in the state of Illinois. She concluded that by its control over substantial credit sources in the U.S. the life insurance industry had accumulated significant social power.

Steven N. Brenner⁶⁷ explored corporate political activity taking computer time-sharing firms, and found that high corporate political action diversity is related to dependency on the regulated common barrier, awareness of processes, and political process experience.

Sethi⁶⁸ made a useful contribution to the business and political literature by examining the methods, objectives and effectiveness of business sponsored political (often in the guise of 'Public Service) advertising.

Udell, Laczniak and Lusch⁶⁹ surveyed high level executives in the Fortune 500 industrial corporations in order to forecast the business environment of 1985. Based on the responses of 147 executives, they concluded :

- (i) Social responsibility issues will continue to be important, with consumerism being an even stronger pressure;
- (ii) Environmental protection will continue to be a significant policy issue;
- (iii) the regulatory environment will grow increasingly complex; and
- (iv) Scarcities of natural resources, and inflation will continue and technological developments may not solve these problems.

Daune Windsor and George Gracenas⁷⁰ studied the planning systems in five companies in U.S.A. and found that politicalisation imposes additional burdens on strategy formulation and implementation. A pre-requisite for formulation of an operation corporate social policy is a fundamental reform of the strategic planning process so as to integrate social responsibility and economic performance.

The Public Affairs Research Group⁷¹ conducted in 1978 a large scale research on the working of public affairs departments and noted that increased size of staff involved, complex political and social surroundings and large budget commitments were factors responsible for the creation of the public affairs department.

Aldag and Jackson⁷² developed a 55-item social Attitude questionnaire and administered it on a sample of 254 business executives from a large number of industries. It is found that firms' size indices are positively correlated to traditional orientation (profit maximisation and efficient production). Sturdivant and Ginter⁷³ secured responses from 130 top executives in 67 companies to 65 statements dealing with business, education and social order etc. They identified 13 factors explaining 43% of total variance.

England⁷⁴ developed the most widely used measure

of managerial values in literature with direct relevance to social responsibility. The Personal Values Questionnaire is based on 66 concepts dealing with goals of business organisations, personal goals of individuals, groups of people, ideas of associations with people and ideas about general topics.

Another interesting area of study is executive liability. National Institute of Law Enforcement Assistance Administration (LEAA study)⁷⁵ analysed data for 582 largest publicly owned corporations for "initiation of enforcement action" for law violation by twenty-four federal agencies during the years 1975-76. It found that sixty percent of the corporations studied had at least one action for violation initiated against them.

Sethi⁷⁶ provided a vivid picture of the increasing risk of exposure of a corporate executive to criminal prosecution in the course of managing the day-to-day affairs of his company by making four case studies from U.S., France, and Great Britain.

From the survey of literature the following conclusions can be stated :

- (i) Research in business-society field is increasing quantitatively as well as qualitatively. Growing interest in the field among scholars and relentless efforts of prominent business-society analysts are responsible for this outcome.
- (ii) There is an increasing awareness and acceptance of social responsibility among managers. The areas of social concern are wide ranging, and include: equal employment opportunities, philanthropy, pollution control, consumerism, protection of minority interests, community development etc.
- (iii) The response pattern is of varied types : resistance, adaptive, proactive and interactive. The response process is time taking and requires organisational learning. It is similar to responsiveness to traditional issues in functional areas but with some notable differences. Response to social issues requires structural arrangements and environmental scanning systems.

- (iv) Top management, is chiefly responsible for initiation and successful implementation of programmes. The difference between the perceptions of top and middle level managers on social issues are not conclusively established.
- (v) Large enterprises regardless of industry classification undertake more social activities and structural changes than do smaller companies.
- (vi) Social auditing as a means of assessment of social performance is helpful to identify social issues, evaluate performance and to inject social view into the thinking of managers. But, it suffers from the lack of acceptable measures for making proper/evaluation.
- (vii) The casual relationship between profit and social responsibility is not firmly established but profit is perceived as a precondition and one of the most important goals of business.

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financial aid to schools, including scholarships, grants, and tuition refunds" (238 responses). Even the programmes receiving the least attention were far from neglected. The lowest was: "designing programmes to enhance the effectiveness of the Civil service", (22 responses). The next was "encouraging adopting of open-housing ordinances (31 responses)".

Another broad comparative survey is that of Buchler and Shetty.¹⁴ They studied 232 major corporations, from among the Fortune 500, to determine how and to what extent they were involved in social programmes. This research indicated that the greatest involvement in social programmes concerned quality control to meet consumer expectations, anti-pollution activities, and employment and training. Motivation for social programmes were probed and the conclusion was that enlightened self-interest was the most important motive for social action in urban and consumer affairs.

The Council on Economic Priorities¹⁵ has prepared indepth analyses of experience of paper companies pollution programmes (1972); safety, efficacy, and research productivity in the pharmaceutical industry (1973); anti-pollution programmes in the steel industry (1973); product safety and the cost of credit in the retail industry (1974).

Henry¹⁶ examined the policies of 49 companies and found that 38 had a formal written policy on environmental protection (1972).

Corwin¹⁷ and Thieblot¹⁸ have addressed themselves to case analysis of the employment and promotion of minorities in specific banks.

Sethi¹⁹ has made extensive library research analyses of social programmes of companies such as the Pacific Gas and Electric Company's (San Francisco), problems with the construction of a nuclear power plant at Bodega Bay; the Eastman Kodak's conflicts with minority groups; and Crown Sellacbach corporations' policy with respect to equal employment opportunity regulations under the Civil Rights Act of 1964.

Cohn²⁰ in a survey of 247 major corporations

carried out in the U.S. found that 201 companies have same sort of urban affairs programme underway.

Mc Guire and Parish²¹ studied the rapidly accelerating corporate involvement in urban problems of the United States and reported that nine out of every ten executives said that the recent increased involvement in business in urban affairs is likely to be permanent.

Webster²² found in a research survey of 157 companies in the U.S. that business responses to consumerism pressures has been more in the form of token response and isolated action than a coordinated programme of positive planned action.

Moss²³ reported in his study of consumer affairs programmes of Fortune's largest 300 industrials, that the companies accorded major importance to quality control, design improvement and bettering customer service.

Newmann²⁴ conducted a study on social issues of transnational enterprises and concluded that profit-sharing, local employment and local ownership are major areas of social concern and that managements of transnationals are considering more delegations of authority, local autonomy and employment of higher percentage of nationals in managerial positions as appropriate moves to reduce local tension.

Abdul Farooq Khan²⁵ in his study of 41 British Companies found that medicare, quality control, employment and training contributions to education, air and water pollution are receiving greater attention.

In yet another study of perceptions of 41 senior executives in India, Abdul Farooq Khan²⁶ found that control and product design improvements received priority than urban renewal and development, cultural activities and environmental affairs.

Implementation

Ian Wilson²⁷ of General Electric, made a pioneering work in the area of identifying constituent interest which ought to be considered in setting social policy. His research was based upon in-depth interviews with

various constituents, analysis of general, evolving, social trends and attitudes, reading the works of opinion leaders, and cross-impact analysis.

Corson and Steiner²⁸ in their survey found that a number of companies (15 out of 254) undertook a social audit "to identify those social programmes which the company feels it out to be pursuing".

On the overall process of institutionalizing social policy in the decision making process, one of the valuable contributions is that of Blake²⁹ who, on the basis of emotional observation, set forth guidelines for managing the corporate social policy process.

Elbirt and Parket³⁰ sent questionnaires to 400 firms randomly selected from 798 in Forbes' roster of the country's largest corporations. From the responses they found that the position of an officer responsible for corporate social responsibility, first generally established in 1968, had by 1973 ranked high in standing in the company and that the person holding the position usually report directly to the chief executive officer.

Lovdal, Bauer, and Treverton³¹ found that many major corporations have public responsibility committees. They believe the ideas of such a committee is sound but that most companies are surviving without such a committee. They believe also that such committees are today in a formative state and that, because of their potential values they will grow in usage.

Ackerman³² examined the problem of policy formulation in great depth in two large companies in connection with policies in two areas, namely, environmental pollution controls and equal employment opportunity. He conducted interviews over a number of years with managers, paying special attention to specialists who were responsible for implementing policies, and examined all pertinent documentation in the companies. Ackerman concluded that the implementation process covers through distinct stages and can take from 6 to 8 years for full and satisfactory implementation (1975).

In a field study of two commercial banks, Murray³³

corroborated Ackerman's major conclusions about the problem of implementation. Both studies assume a reactive action model and a management which has ample opportunity to exercise discretion in the selection of a pattern of adaptive action.

Post and Mellis³⁴ made an in-depth examination of the interaction between the management at Polaroid Corporation and coalition of women's groups within the company from 1958 to 1972 on the issue of equal employment opportunity. The study found that corporate responsiveness to social issue, passes through the three stages of general responsiveness—cognisance of the issue, commitment to response and implementation of action but cannot be categorically classified as fitting either the business policy or the pressure—response model. A second conclusion is that management commitment involves organisational learning.

James E. Post³⁵ examined response pattern of insurance industry to social and issues found that adaptive and proactive models are insufficient to explain. He articulated a third new conceptual model—interactive model.

James E. Post³⁶ and Edward Saer investigated the complex policy problems in social performance of International Infant Formula Industry and came to the conclusion that public issues evolve through a life cycle consisting of predictable stages. The study identified the convergence between public policy and corporate policy and also the influence of factors like orientation toward the industry, basic business strategy stake in maintaining status quo in the LDCs, and management perception of validity to critic's claims.

Abdul Farooq Khan, in his study of perceptions of 46 British companies in England found that implementation is made difficult by factors like rising prices and legal requirements. A similar finding be obtained in his survey of 41 senior executives in India.³⁷

Social Responsibility and Economic Performance

The actual relationship between social responsibility and profit is not conclusively established.

Malkiel and Quandt³⁸ (1971) and Shapiro³⁹ (1973) studied the performance of the "clean" mutual funds, these purchasing securities only of corporations they consider to be socially responsible. If social responsibility is a good business, their performance is to be attractive. They found a negative association between economic performance and social responsibility.

Bragdon and Marlin⁴¹ found a significant, though modest positive relationship between return on equity of 17 firms in paper and pulp industry and Council on Economic Priorities rating of their behaviour in pollution control.

Reimann⁴¹ found that favourability of attitudes of top managers toward a variety of societal elements (community, suppliers, customers, government and so on) was generally significantly positively related to company performance rating and negatively related to executive turnover.

Bowman and Haire⁴² reported a significant positive relationship between return on equity and their social responsibility measure, the proportion of lines of prose in the annual report devoted to social responsibility. Further, they found that performance was highest for the medium-responsibility group, next highest for the high responsibility group and lowest for the low-responsibility group. Their reanalysis of the Bragdon and Marlin data yielded a similar curvilinear relationship. A similar pattern was reported by Sturdivant and Ginter.

Parket and Eilbirt⁴³ collected data from 96 major companies concerning social issues. They found that, in terms of a number of economic indices, respondents to their survey outperformed the remainder of the Fortune 500 list. They concluded that, since their respondents were likely to be more socially responsible than were nonrespondents, these findings provided evidence of a favourable relationship between social responsibility and economic performance.

Milton Moskowitz,⁴⁴ former editor of *Business and Society*, developed portfolios of "responsible" and "irresponsible" companies (1974, 1975). The Moskowitz ratings were a function of many factors

such as pollution control, equal employment opportunity, community relations, plant safety, and responsibility of advertising. In 1972, share value of his "responsible" companies rose 16.9% as compared to between 14% and 15.6% for major market indices. However, in 1973, his portfolio of responsible companies declined 26.3% versus 20.5% for the "irresponsible" companies and Bauer (1976) noted that, while Moskowitz did not continue the news letter in 1975, if he had 1973 portfolio of "responsible" companies, would have declined by 46% in 1974 versus about 30% for each of the major indices and only 13% for the "socially irresponsible" companies.

A study by Fogler and Nutt⁴⁵ of investors' evaluations of paper companies after substantial publicity was released about their pollution tendencies established positive relationship between social responsibility and economic performance. They found there was no unfavourable reaction to publicity about pollution in terms of changes in price/earnings ratios, mutual fund purchases or short-run price changes.

Sturdivant and Ginter⁴⁶ developed a 65-item instrument to determine the profile of a top management group's attitudes on socially sensitive issues. Items on the instrument concerned attitudes about a variety of issues, including business, education, and social order. One hundred thirty key decision makers in 67 companies responded to the questionnaire. Further Sturdivant and Ginter classified firms as "best", "worst" or "honorable mention" in terms of social performance on the basis of ratings developed by Milton Moskowitz. Finally, data concerning ten-year (1964-1974) growth in earnings per share were obtained for each firm. A factor analysis yielded 13 factors. Responses of managers from "best" firms were significantly more liberal along several dimensions, especially concerning racial attitudes and perceptions of the poor and other nonmainstream citizens, than were responses of managers from "worst" firms. Further in terms of the relative economic performance of firms, the "honorable mention" firms were found to outperform the "best" firms, which in turn, outperformed "worst" firms, Sturdivant and Ginter interpreted these results as "good news to advocates of greater corporate social responsiveness". While the

findings might suggest that liberal social attitudes on the part of key corporate division makers lead to socially responsible corporate actions that result in good economic performance.

Buchler and Shetty,⁴⁷ using average return on total assets as the measure of organisations' income, found no significant relationship between organisation income and degree of involvement in social action programmes.

Holmes⁴⁸ in a survey of 192 executives found that 92% of them felt that the firm's level of social involvement was at least, partially related to economic conditions.

Ferdinand and Shatto⁴⁹ examined the philanthropic programmes of the United States' fifty-five largest investor owned electric utilities. The study confirmed that philanthropy is predictable from standard economic variables, and also that the breakdown among various gifts is fairly uniform across the United States.

Social Reporting

Report M. Hagner⁵⁰ made a study of U. S. Steel Corporation's complete set of annual reports covering the period 1901-1980 and found that social accounting is not a new technique, but was practised, albeit in sometime redimentary fashion, as early as the first decade of this century.

Bouma and Feenstra⁵¹ analysed the external reporting of forty large Dutch firms, including their personnel, the annual social report, and the annual financial reports. While noting the significant increase in reporting they are skeptical of the content, describing the information presented as selective, presenting predominantly a favourable view of the firm.

Hoorn and Dekker⁵² came to a similar conclusion in their analysis of sixty four reports. They remarked that, "the information provided in the annual social report is mainly of a qualitative, non-accounting nature, whilst data regarding financial aspects of the social policy are seldom reported".

John Corson and George Steiner⁵³ found that 76%

companies in the U.S. have made attempts within the period since Jan 1, 1972 to report on social activities. They further reported that purposes of social audit are related to the examination, identification, and appraisal of corporate social activities. They found that lack of measures to evaluate and lack of consensus among executives on areas to be evaluated as the main obstacles.

Ernst and Ernst⁵⁴ studied social measurement disclosure in the annual reports of Fortune 500 companies for three years 1971-73 and found that the number of companies making such disclosures increased from 51% in 1971 to 58% in 1972, with marginal increase to 60% in 1973.

A study by Sidney Jones⁵⁵ of annual reports issued by 55 of the larger companies in the Fortune 500 covered the period 1960 to 1970 and found that roughly 25% of the 1970 reports contained a special section devoted to company social responsibility. Also it showed that the dominant concerns in 1960 were : support of education, employee education and safety. By 1970 the emphasis had shifted to pollution control, and hiring of the disadvantaged.

Comparative Research

Sethi,⁵⁶ developed a framework that facilitates cross cultural comparisons of business responses to social issues and compared the performance of Japanese and American business within the framework. The classificatory scheme consists of four stages: the preproblem stage, the identification stage, the relief and remedy stage and the preventive stage. He found that the practices of Japanese and American businesses are to a large extent similar though there are some noteworthy differences.

Baker⁵⁷ examined management strategies and policies relating to social responsibilities and company identify among six large companies all the which were highly oriented to consumer products. He found that each differed from the others but a comparison of them provided guidelines for other companies.

Preston, Rey and Dierkes⁵⁸ compared social policies

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ERRATA

VOL. XXVI NO. 4, JANUARY-MARCH 1986

On page 384 of this issue of Productivity, at about the middle of the left hand column, after the line reading in part "lower limit of fund allotted in j-th year" and before the next line starting to read "In reading these inequalities"

(1) Please read the following as included :

f_{uj} = Upper limit of funds admissible in j-th year

L_{i-n} = Land required in hectares per unit of i-th type of building having n storeys

L = Total land available

C_j = Cost index in the j-th year

P_i = %age of expenditure likely to be incurred on i-th type of building in j-th year

In explanation, typically j will be over 1, 2, 3, 4 for the years; i over 1, 2, 3, 4, 5 for the respective types of buildings/utility as indicated; and n over 1, 2, 3 for the number of storeys.

(2) In addition please read the following as included after 5.2.

5.3 Constraints

1. Number of buildings required in each year

$$X_{ij} \leq a_{ij}$$

2. Land constraints for each type of buildings.

$$\sum X_{ij} \cdot L_{i-n} \leq X_{L-i}$$

3. Total requirement of land

$$\sum X_{L-i} \leq L$$

4. Requirements of funds

(a) Lower limit

$$\sum C_j \cdot P_{ij} \cdot X_{ij} \geq f_{ij}$$

(b) Upper Limit

$$\sum C_j \cdot P_{ij} \cdot X_{ij} \leq f_{uj}$$

(3) On page 404, please read as included the name of Shri Kuldeep Chander as co-author of Shri P. Natarajan at Sr. no. 27.

(4) Please read the 24th line on the left hand column on page 384 as follows :

Change \leq to \geq

The error is regretted.

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Mr. T.V. Baler, Director, ACC, receiving the Best Productivity Award, from Prime Minister Rajiv Gandhi.

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Economies of Scale and Technical Change

LAKHWINDER SINGH &
K.C. SINGHAL

The purpose of this paper is to investigate the presence of economies of scale and technical change and also to locate the sources of growth of the manufacturing sector of Punjab.

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Industrialisation in modern times is considered to be the most important device by which developing countries can make their growth rapid and reliable. Its expansion is known to be vital for overall economic development. The process of industrial development depends considerably upon the growth in employment, increase in capital stock, economies of scale and technical progress. The intensity of these sources of growth, however, varies across the industries.

In the present paper an attempt has been made to identify the main sources of growth of the manufacturing sector of Punjab and also five select individual industries of the state viz. food products, cotton textile, basic metal and alloys, transport equipment and parts and electricity. The estimates of the elasticities of output with respect to various inputs, returns to scale and technological progress provide the basis for drawing inferences regarding the nature of the growth of industries.

Earlier studies which have been attempted at the All India level based on cross section data^{1, 2} and others relying on time series data³⁻⁵ have found that constant returns to scale are prevailing in manufacturing industries. However, contrary to these results,

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some other studies⁶⁻¹⁰ have observed the presence of increasing returns to scale in the Indian manufacturing sector. In case of individual industries a study¹¹ has found evidence of increasing returns to scale in 17 industries, constant in 2 industries and diminishing returns to scale in 10 industries. Similar variations in economies of scale were observed by some more studies^{12, 13}. On the contrary a recent study¹⁴ has found that constant returns to scale are present in most of the cases.

Methodology

For the underlying purpose we have used the available family of Cobb-Douglas the Constant Elasticity of Substitution (CES), production functions which satisfy the minimum neo-classical criteria.¹⁵ The widely used Cobb-Douglas production function with neutral technical progress¹⁶ and random error term is written as :

$$V = A e^{gt+u} L^\alpha K^\beta \quad \dots(I)$$

$\alpha + \beta$ gives the returns to scale.

Where V is output and K and L are Labour and capital respectively. A is efficiency parameter, α , and β are the elasticities of output with respect to labour and capital respectively. g and u are the rate of neutral technological progress and random error term respectively. The Cobb-Douglas production function represented by (I) is not a convenient form for direct estimation by ordinary least squares method and is usually converted into a logarithmic form :

$$\log V = \log A + \alpha \log L + \beta \log K + g t + u \quad \dots(I)$$

$\alpha + \beta$ gives the degree of returns to scale. But the form represented by (I) suffers from the problem of multicollinearity between independent variable $\log K$ and $\log L$. As a consequence of this problem, ordinary least squares estimate becomes less precise because their standard errors become unduly large. The usually estimated form of Cobb-Douglas production function which takes care of the problem of multicollinearity between $\log K$ and $\log L$ and also reduces heteroscedasticity of the variance of u is correlated with $\log L$ is :

$$\log (V/L) = \log A + \beta \log (K/L) + g t + u \quad \dots(2)$$

However, equation (2) assumes constant returns to scale. For allowing changing returns to scale, the coefficient of $\log (L)$ can be included in the function :
 $\log (V/L) = \log A + \beta \log (K/L) + m \log L + g t + u \quad \dots(3)$
 where $m = \alpha + \beta - 1$.

A positive value of m indicates increasing returns to scale, while a negative value of m indicates decreasing returns to scale. The Cobb-Douglas production function is based on the most restrictive assumption of unitary elasticity of substitution which may not be a realistic one. This assumption is relaxed in the case of CES production function which can be written as :

$$V = \gamma \left[\delta K^{-\rho} + (1-\delta) L^{-\rho} \right]^{-\frac{\nu}{\rho}} \quad \dots(II)$$

where V is output, K and L are capital stock and labour respectively, and γ , δ , ρ and ν refer to efficiency, distribution, substitution and returns to scale parameters. A major problem with the CES production function is that, unlike Cobb-Douglas production function we cannot transform it into linear form through operations such as by taking logarithms. Therefore, the estimates of equation (II) shall have to be obtained by other methods. One of the methods usually applied involves specifying the side relations which can be obtained through marginal conditions and taking logarithms, we have :

$$\log (V/L) = \beta_0 + \beta_1 \log w + \beta_2 \log L + u \quad \dots(4)$$

where

$$\beta_0 = -\frac{\nu}{\nu+\rho} \log (\delta \nu), \beta_1 = \frac{\nu}{\nu+\rho} \text{ and } \beta_2 = \frac{\rho(\nu-1)}{\nu+\rho}$$

In the equation (4), β_2 can be used to find out returns to scale. When the coefficient of $\log L$, is zero, then $\rho(\nu-1)=0$, for $\rho > 0$, which means $(\nu-1)=0$ and hence $\nu=1$. One may adopt the following two stage estimation procedures. First, we can test the hypothesis $\beta_2=0$. If this is not so, then $\rho=0$ and $\nu \neq 1$. If, however, $\beta_2=0$ is true then we can test for $\beta_1=1$. If this is not true then $\rho \neq 0$ and hence $\nu=1$. If $\beta_1=1$ is not true, then $\rho=0$ and hence ν could take any value.

Data Base

The paper is concerned with the present Punjab reorganised on linguistic basis in November 1966. The main source of data used in this work for the period 1967-68 to 1979-80 is the Annual Survey of Industries (ASI). For the subsequent two years 1980-81 and 1981-82, we took recourse to unpublished data made available by the Economic and Statistical Organisation, Punjab. The analysis here is concerned with the large manufacturing industry, that is, census sector as is defined in the ASI.

The variable output (V) has been defined as gross value added. Net value added figures have not been taken since depreciation figures are not reliable. These figures, unfortunately, do not reflect the actual capital consumption and its accounting entity governed by the tax law and other practices. Labour (L) has been represented by the number of employees consisting of the supervisory staff and the workers. The data on man hours could not be availed of since these were available only for workers. Gross fixed assets have been used as the measure of capital (K) rather than net fixed assets because of the reasons specified. V/L

is the labour productivity and K/L is the capital intensity. Wage rate (w) is wage bill of employees divided by their numbers. The data on various variables have been adjusted for price changes with suitable indices.

Empirical Results and Discussion

The estimates based on logarithmic regression of value added per unit of labour on capital-labour ratio, without time variable, is given in Table 1. This formulation assumes constant returns to scale. The elasticity of output with respect to capital is given by the coefficient β . $1-\beta$ gives the implied elasticity of output with respect to labour. The value of coefficient β is quite small and is not significant for the large manufacturing sector. This does mean that the main source of growth in output is labour and not capital. Among the individual industries, basic metal and alloys industry registered a highly significant value of the elasticity of output with respect to capital. The electricity industry observed the negative value of the coefficient of capital but the remaining industries observed the positive but insignificant values. On the whole, the fit as given by \bar{R}^2 is not good.

TABLE 1

Estimates of the Cobb-Douglas production function (logarithmic regression of value added per unit of labour on capital-labour ratio), 1967-68 to 1981-82

Sector/Industry	Constant	β	R^2	F(1, 13)
Manufacturing Sector	1.4529** (3.0438)	0.1426 (1.1520)	0.0197	0.2625
Food products Industry	1.0782 (0.8747)	0.4505 (1.0544)	0.0063	0.0826
Cotton Textile Industry	1.1357** (3.7268)	0.2291 (1.6990)	0.1186	1.7508
Basic metal and alloys industry	0.3107 (1.0361)	0.6007** (5.1731)	0.6478	23.9182**
Transport equipment and parts industry	1.6364** (4.5024)	0.1517 (1.0486)	0.0059	0.0782
Electricity industry	2.3747 (1.0323)	-0.0637 (0.1350)	—	—

Figures in parentheses are 't' values.

* Statistically significant at 5 per cent level.

** Statistically significant 1 per cent level.

In order to capture the technical progress, a time trend variable has been included in equation (2) and the results are given in Table 2. Introduction of the time variable leads to rather implausible estimates. The coefficient of capital turns out to be negative and is insignificant for the large manufacturing sector. The coefficient of time is positive in three cases viz. large manufacturing sector, cotton textile industry and electricity industry. It is only significant in the case of large manufacturing sector. In the case of food products and basic metal and alloys industries the coefficient of time is negative and significant. It is also negative but insignificant in the case of transport equipment and parts industry. In nutshell, the coefficient of neutral technical progress does not seem to be an important variable and hence has been dropped in subsequent models.

Table 3 gives the estimates of the returns to scale derived from equation (3). The estimates clearly show the presence of increasing returns to scale in the Punjab large manufacturing sector. Among the individual industries only electricity industry has a positive but insignificant value of the coefficient of labour.

The coefficient of labour is negative and significant in the case of food products which clearly shows decreasing returns to scale. In the other three industries, namely cotton textile, basic metal and alloys, and transport equipment and parts the coefficient is negative but insignificant. Thus, we can conclude that the four individual industries namely cotton textile, basic metal and alloys, transport equipment and parts, and electricity are enjoying constant returns to scale.

The estimates of returns to scale derived from the side relations of the CES production are given in Table 4. Through this, the scale parameter is identified in all the cases. Constant returns to scale prevails in the manufacturing sector as also in electricity and cotton textile industries. The basic metal and alloys industry show increasing returns to scale. While the remaining two industries, namely food products, and transport equipment and parts, shows decreasing returns to scale.

Conclusions

The main findings of the study may now be briefly enumerated :

TABLE 2
Estimates of the Cobb-Douglas production function (logarithmic regression of value added per unit of labour on capital-labour ratio and time), 1967-68 to 1981-82

Sector/Industry	Constant	β	g	R^{-2}	F(2.12)
Manufacturing sector	3.5740** (3.4753)	-0.4970 (1.6376)	0.0424* (2.2535)	0.2606	2.1157
Food products industry	1.5487* (2.2380)	0.4502 (2.0264)	-0.0587** (6.0060)	0.7313*	16.3319**
Cotton textile industry	2.1830* (2.4141)	-0.3443 (0.7046)	0.0303 (1.2301)	0.1192	0.8124
Basic metal and alloys industry	-1.4079 (2.1127)	1.5231** (4.4022)	-0.0799* (2.7707)	0.7677	19.8314**
Transport equipment and industry	0.7328 (1.3274)	0.5976* (2.3402)	-0.0264 (2.0256)	0.2039	1.5374
Electricity industry	4.0876 (1.3505)	-0.4601 (0.7025)	0.0271 (0.8810)	—	—

Figures in parentheses are 't' values.

* statistically significant at 5 per cent level.

** statistically significant at 1 per cent level.

TABLE 3

Estimates of Cobb-Douglas production function (logarithmic regression of value added per unit of labour on capital-labour ratio and labour, 1967-68 to 1981-82)

Sector/Industry	Constant	β	m	R ²	F(2,12)
Manufacturing sector	-1.7521 (1.1916)	-0.2576 (1.2438)	0.4080* (2.2670)	0.2604	2.1133
Food production industry	6.5275** (5.9438)	0.0432 (0.1883)	-0.4606** (6.0804)	0.7363	16.7534*
Cotton textiles industry	1.1372 (0.7549)	0.2421 (1.1975)	-0.0029 (0.0170)	0.0422	
Basic metal and alloys industry	1.9091 (2.0585)	0.8629** (4.7896)	-0.2559 (1.8055)	0.7017	14.1183*
Transport equipment parts industry	3.0543** (3.7446)	0.3301 (2.0549)	-0.2059 (1.9046)	0.1829	1.8437
Electricity industry	1.7394 (0.6031)	-0.1481 (0.2748)	0.1020 (0.3796)	—	—

Figures in parentheses are 't' values.

* statistically significant at 5 per cent level.

** statistically significant at 1 per cent level.

TABLE 4

Estimates of CES production function (logarithmic regression of value added per unit of labour on wage rate and labour) 1967-68 to 1981-82

Sector/Industry	β_0	β_1	β_2	R ²	F(2, 12)
Manufacturing sector	-0.4766 (0.5910)	0.9133** (3.5573)	0.1337 (1.8286)	0.5908	8.6638**
Food production industry	5.9906** (7.2811)	0.3011 (1.3198)	-0.4229** (6.5622)	0.7703	20.1290**
Cotton textile industry	-0.6522 (0.5577)	0.4928* (2.1819)	0.1819 (1.6709)	0.2217	1.7098
Basic metal and alloys industry	-1.4813 (1.2133)	0.6771 (1.7258)	0.3015* (2.3429)	0.3024	2.6009
Transport equipment and parts industry	2.9566** (4.9735)	1.1452** (4.1566)	-0.2262** (3.0372)	0.5519	7.3920**
Electricity industry	1.0845 (0.5406)	1.0803* (2.5856)	-0.0174 (0.0880)	0.2559	2.0634

Figures in parenthesis are 't' values.

* statistically significant at 5 per cent level.

** statistically significant at 1 per cent level.

The contribution of capital to output growth is quite low. The sign of this coefficient is even negative in most of the cases except basic metal and alloys industry. Thus the labour factor is mainly responsible for the growth of output in the industrial sector. The neutral technological progress does not seem to be an important contributing factor rather it was negative in most of the cases. These results are in conformity with the total factor productivity of Punjab manufacturing sector.¹⁷ The large manufacturing sector as a whole shows clear evidence of constant returns to scale. Among the five individual industries, the cotton textile and electricity industry also show constant returns to scale and is in accord with the large manufacturing sector. While the other two industries, food products and transport equipment and parts show decreasing returns to scale. The only industry which is enjoying increasing returns to scale is basic metal and alloys.

The results of the study, in general, suggest that the output growth in this sector has been achieved through the increased factor inputs and not through the technological progress and economies of scale. If this pattern remains unaltered, then every increase in output would mean a greater strain on the economy, that is, a proportionately higher dose of investment would be required for every additional unit of output. The overall result can be a low rate of growth and high costs of industrial production which cannot be without an unfavourable effect in the long run. In the planned development economies the production structure ought to be so which will increase the efficiency of input use and returns to scale and not that of capital intensity.

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Financial Incentives—A Managerial Tool

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This is a study of financial Incentives as a management tool and their impact on labour performance in six industrial units.

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Introduction

The subject of work motivation has gained a lot of importance among organizational researchers because as Streers and Porter observe 'organizational effectiveness becomes to some degree a question of management's to motivate its employees to direct at least a reasonable effort toward the goals of the organization' (Streers and Porter, 1979). There are a number of factors affecting work motivation. Organizational reward practice is just one of these variables and incentive-system or pay-based on performance is one of the extrinsic rewards the organization can offer. The role of financial incentives in employee motivation has been an issue of much debate and discussion among organizational specialists. There have been a number of views ranging from money is the most important motivator to money is no motivator at all. After a period of prolonged apathy the interest on money as a motivating factor revived during the late sixties and early seventies. Some of the excellent works on this topic were produced during this period. (Andrews (ed.) 1965, Dunnette, 1967, Haire et al. 1967, Lawler, (1971). One of the recent works of Lawler elaborates on the role of compensation practices in organization development. (Lawler 1981). Some of these books and articles aroused our interest in this field and we conducted a study to find the motivating role of financial incentives. (Muthukrishnan, 1981). The first objective of this study is to find the impact of

incentives on labour performance. Is there any impact or no impact? If there is any impact, is it positive or negative? Secondly this study aims at finding the consistency of the impact of incentives on labour performance. Does the incentive system of payment have a uniform effect on labour performance in various industrial units, where this study would be conducted? Finally, this study aims at identifying the situational variables which account for the success or failure of the incentive schemes. What are the organizational variables which affect the relationship between incentives and labour performance? With these aims, we made all the possible attempts to include most of the variables which theoretically affect this relationship.

Conceptual Framework and Methodology

During the first phase of the study attempts were made to isolate the impact of financial incentives alone on labour performance over a period of time. So data were collected for the dependant variable i.e., labour performance, the major independent variable i.e., financial incentives and some of the other independent variables which could be measured over time. Labour performance is defined as that part of productivity which can be attributed to incremental labour effort. The major assumption made here is that labour is more productive when the ratio time required to time spent in producing a unit of output is higher than in a situation where the ratio is lower. The following is the index of labor performance.

$$\frac{\text{Actual production in a particular month.}}{\text{Standard production for that month.}}$$

Or in cases where output is measured in man hours, it is

$$\frac{\text{Standard time required to complete the jobs done in a particular month.}}{\text{Actual time taken to complete those jobs.}}$$

In case of units having various sections and departments, the average was taken.

Our major independent variable is financial incentives, since this term is not used in any standard

sense, there is a need to define it operationally. The definition will be governed by two considerations— (i) A specific standard of performance for each job or task is determined as objectively as possible with the help of time study, methods study and other industrial engineering practices like synthetic data, predetermined time and motion data, etc. (ii) Workers' incentive earnings are computed by a pre-determined formula. The formula specifically relates actual performance of a worker or a group of workers to a predetermined standard of performance. Hence financial incentives can be defined operationally as that part of compensation package based on performance. Defined this way the term financial incentives include piece-work system, other individual incentive schemes, group incentive schemes and plant-wide schemes like Scanlon Plan based on certain criteria of performance. However it does not include profit sharing or festival bonus payments.

The index for measuring the incentive strength of a plant during a particular month is.

$$\frac{\text{The amount spent toward financial incentives in a particular month.}}{\text{The amount spent on the total compensation package of the workers during that month.}}$$

Higher this index higher would be the incentive strength.

As productivity is the result of a number of factors it was decided to use some of the other variables as correlates. These variables can be classified under two broad categories—viz.—the variables which could be measured over time and those which could not be measured over time. For the first category of variables monthly data were available and these variables were easily quantifiable. In all seven variables were included in this category. They are (i) job security (ii) sundry fringe benefits (iii) the ratio of first line supervisors to the total number of employees (iv) labour turnover (v) man days lost due to industrial unrest (vi) man days lost due to industrial unrest, and (vii) Training.

The indices for these variables are given in Appendix—I.

The study was conducted in six industrial units situated in and around the city of Madras. The following were the criteria for selecting the factories :

- (1) The factory had an incentive scheme in operation based on performance.
- (2) The standard of performance has been established through one of the several known methods such as the historical average, the standard data or the pre-determined motion times.
- (3) There had been no considerable changes in the production process and the organization and management during the reference period.
- (4) There had been no revision of incentive standards during the reference years.
- (5) There had not been any work stoppage during the reference period owing to extraneous factors such as non-availability of raw material, power shortage, market conditions, etc.

These were ascertained through a mailed request letter. Out of forty two factories approached, twelve units gave their consent. Out of these twelve, six factories were selected on the basis of their near

homogeneity in terms of average wages paid to the workers.

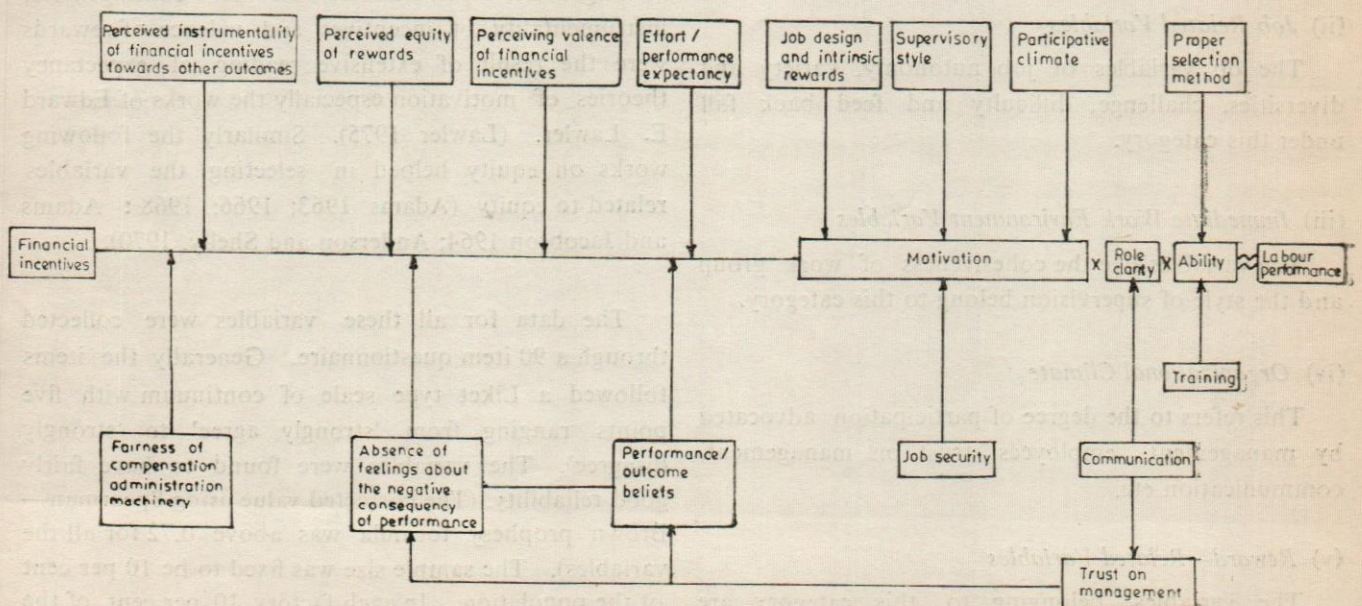
For the variables which could be measured over time data were collected for 48 months. These data were collected through secondary sources i.e. company files and records. Labour performance figures were regressed over incentives strength and other variables in each unit individually. Multiple regression technique was used as the tool of data analysis. One of the purposes of multiple regression technique as stated by Tull and Hawkins is.

‘to determine the relationship between the criterion variable and one predictor variable while the effects of other predictor variables are held constant’ (Tull and Hawkins, 1976, p. 537).

So the purpose of including the independent variables measured overtime other than financial incentives was to control the effect of those variables on labour performance and to determine the effect of financial incentives alone on labour performance. Each month’s data represent a case and thereby we have 48 cases for each unit.

Analysis was performed for each factory separately

FIG. THEORETICAL MODEL FOR FINANCIAL INCENTIVES LABOUR PERFORMANCE RELATIONSHIP



and the Gauss—Markov assumptions were followed. The specification was assumed to be linear in parameter, linear or log-linear in variables and constant throughout the reference period. The relationship in this time series analysis may be specified algebraically as under.

$$Y = B_0 + \sum_{i=1}^8 B_i X_i + e$$

where Y = labour performance

B_0 = constant

e = error term, and

X_i = particular independent variable.

The pattern of analysis suggested above is for the variables which could be measured over time. As mentioned earlier there is another category of variables which could affect labour performance one way or other and which could be measured at a point of time rather than over time. We classified these variables under six groups.

(i) *Individual Characteristics*

The variables like job satisfaction and attitude toward supervisors, promotion, pay and job itself come under this category.

(ii) *Job Related Variables*

The job variables of job autonomy, variety and diversities, challenge, difficulty and feed back fall under this category.

(iii) *Immediate Work Environment Variables*

The variables like the cohesiveness of work group and the style of supervision belong to this category.

(iv) *Organizational Climate*

This refers to the degree of participation advocated by management, employees trust on management, communication etc.

(v) *Reward—Related Variables*

The variables belonging to this category are

employee perception of equity of rewards, perception that effort leads to performance, perception that performance leads to outcome, valence of financial rewards, perception on reward administration, negative consequences of incentive schemes etc.

(vi) *Industrial Relations Related Variables*

Variables like job security, satisfaction with grievance handling machinery etc. were included in this category.

Each of these variables was measured over several dimensions. Standard models were adopted in selecting the dimensions. For example, for the variable of job design the core job dimensions of skill variety, task identity, task significance, autonomy and feed back were adopted from Hackman and Oldham (1976) model. Similarly based on the job descriptive index (Smith, Kendall and Hulin, 1969) and Minnesota satisfaction Questionnaire (Weiss, Davis, England and Lofquist, 1967) our job satisfaction inventory consisted of nine factors, namely the satisfaction with the training facilities, the satisfaction with co-workers, satisfaction with supervisors, satisfaction with promotion opportunities, satisfaction with the pay, satisfaction with welfare facilities, likeness for the job, satisfaction out of the job and the intention to stay on in the job. The variables of effort/performance contingencies, performance/outcome contingencies, instrumentality of incentives and valence of rewards were the result of extensive reading of expectancy theories of motivation especially the works of Edward E. Lawler. (Lawler 1975). Similarly the following works on equity helped in selecting the variables related to equity (Adams 1963; 1966; 1968 : Adams and Jacobson 1964; Anderson and Shelly, 1970).

The data for all these variables were collected through a 90 item questionnaire. Generally the items followed a Likert type scale of continuum with five points ranging from 'strongly agree' to 'strongly disagree'. The variables were found to have fairly good reliability. (The corrected value using Spearman—Brown prophesy formula was above 0.72 for all the variables). The sample size was fixed to be 10 per cent of the population. In each factory 10 per cent of the

workers were supplied with questionnaires. Proportional representation was given to each department. The average rate of return was 81.39%.

Data were processed through I.C. 1030 computer using the S.P.S.S. routine (Nie, Hull et al 1975, 1977). The S.P.S.S. subprogram 'SCATTER GRAM' was used to test the linearity of relationship between the variables and the subprogram 'REGRESSION' was used to perform multiple regression analysis. The subprogram 'CONDESCRIPTIVE' was used to calculate the group mean scores and the standard deviation scores of the variables and the subprogram 'RELIABILITY' was used to find the reliability measures.

Results and Discussion

(1) While the impact of financial incentives on

labour performance was positive in all units, it was not uniformly significant; while the impact was significant in four units, it was not significant in two units. The results of some of the regression runs are presented in Table-1. (There are altogether thirty-six runs—six runs for each of the six industrial units. The runs were performed by including several combinations of independent variables. Because of our intention to keep the length of this paper as short as possible, we are presenting the results of only one run for each unit). On the basis of these results we classified the units into two groups, viz., significant impact units—the units where the incentive systems had a significant effect on labour performance and no significant impact units—the units where incentive systems did not have a significant effect on labour performance. Hereafter we would refer them as S.I. units (significant impact) and N.S.I. units (no significant impact).

TABLE 1
Results of Regression Analysis of Labour Performance Figures over Financial Incentives and other Variables

Unit	Constant	Financial Incentives	Industrial Disputes	Supervisory Control	Labour Turnover	Training	Sundry Fringe Benefits	Job Security	Adjusted R ²	'F'
Unit 1	-0.152	0.018 S.E.=0.019 t=0.947 (N.S.)	0.355	8.747	-8.203	19.030	-0.277	-0.017	0.687	15.7
Unit 2	-3.289	0.085 S.E.=0.242 t=0.349 (N.S.)	1.270	19.937	0.765	11.295	-0.150	0.075	0.532	8.6
Unit 3	-4.294	0.703 S.E.=0.104 t=6.752*	3.775	-6.271	1.590	3.653	6.546	0.001	0.742	20.2
Unit 4	-1.049	0.837 S.E.=0.111 t=7.525*	1.278	3.680	-4.341	-4.911	-0.004	0.017	0.654	13.6
Unit 5	-0.473	0.715 S.E.=0.202 t=3.545*	0.493	0.393	-0.187	-0.719	2.705	-0.001	0.701	16.2
Unit 6	-1.534	1.344 S.E.=0.354 t=3.794	1.167	-4.365	1.620	-9.495	3.217	0.005	0.520	8.2

N.S. = Not Significant
* = Significant at 0.01 level.

(2) The S.I. group of units and the N.S.I. group of units, differed significantly in the employees' perception of their job design and the participative climate of the organization. The composite mean scores were significantly higher for the S.I. group than for the N.S.I. group.

(2) The two groups of units differed significantly in supervisory style as perceived by employees. The workers belonging to S.I. units felt that the style of their supervisors was almost consultative while the workers belonging to N.S.I. units felt that the style of their supervisors was near benevolent authoritarian.

(4) The two groups of units did not differ significantly with respect to work-group cohesion; in fact the composite mean score of N.S.I. group was slightly higher than that of S.I. group. Similarly the two groups did not differ significantly in the employees' satisfaction with the facilities and the job and with pay; in both the groups the employee satisfaction with job and pay was less than average.

(5) Incentive system had a better impact on labor performance in units where a good number of employees perceived that they received equitable or more than equitable rewards than in the units where a good number of employees felt that they received less than equitable rewards.

(6) The two groups of units differed significantly in the employees' belief that their effort leads to better performance and the belief that performance on their part leads to rewards. These beliefs were better in the S.I. units than in the N.S.I. units.

(7) The two groups differed significantly with respect to the job security as perceived by the employees, the employees beliefs about the fairness of compensation machinery, the efficiency of communication practices and employees' trust on management. The composite mean scores of the S.I. unit were higher than those of the N.S.I. units.

The composite mean scores of several of these variables for the S.I. units and N.S.I. units and the level of significance in their difference are given in Table-2.

Based on these results and also based on some of the earlier works on motivation, we have formulated a theoretical model giving the relationship between financial incentives and labour performance.

The model follows the hybrid variety of expectancy theory approach. (Campbell et al 1970). Labour performance has been stated as the function of motivation, ability and role clarity. The first relationship in this model is that financial incentives leads to motivation on part of employees. This relationship is affected by seven variables. The first of these variables is perceived equity of rewards. As our findings suggest, the effect of financial incentives on employee motivation would be higher in the instances where the employees perceived that he receives equitable or more than equitable rewards than in the instances where he felt that he receives less than equitable rewards. Another variable affecting the relationship between financial incentives and employee motivation is the perceived valence or attractiveness of financial incentives. Even though there is no ambiguous support for this proposition in our study, previous research works in this area suggest that this is a crucial variable in the relationship. Our findings strongly support that the employee belief that effort on his part will lead to performance is an important variable affecting incentive—motivation link up. Higher this belief, higher would be the effect of financial incentives on motivation. Similarly the employee belief that performance would lead to desired outcome influences the relationship between financial incentives and motivation. The impact of incentives on motivation would be better if the performance/outcome expectancy is high.

Another variable which affects the impact of incentives on motivation is the employee perception of the fairness of compensation administration. The incentive systems would not arouse motivation if the employees feel that the compensation administration is unfair one. Still another variable in this context is the absence of feelings about the negative consequences of performance. The presence of such feelings would minimize the employee belief that performance leads to desired outcomes and hence would adversely affect financial incentives—employee motivation association. Finally there is a variable which was not tested in our

TABLE 2

The difference in weighted composite mean scores between S.I. units and N.S.I. units with respect to the independent variables not measured overtime

S. No.	Variable	S.I. Units		N.S.I. Units		't'
		Weighted composite mean	S.D. combined	Weighted composite mean	S.D. combined	
1.	Job Design	3.04	1.06	2.73	1.12	2.36 (p < 0.02)
2.	Employee satisfaction	2.78	1.16	2.69	1.21	0.63 (N-S)
3.	Work group cohesion	3.25	1.14	3.29	1.09	0.30 (N-S)
4.	Supervisory support	3.08	1.14	2.54	1.09	4.09 (p < 0.01)
5.	Supervisory goal emphasis	3.01	1.00	2.46	1.03	4.40 (p < 0.01)
6.	Supervisory work facilitation	3.06	1.02	2.46	1.08	4.90 (p < 0.01)
7.	Supervisory team building	3.08	1.20	2.63	1.00	3.52 (p < 0.01)
8.	Other supervisory traits	3.18	1.17	2.71	1.10	3.51 (p < 0.01)
9.	Participation climate	3.07	1.10	2.35	0.98	5.60 (p < 0.01)
10.	Equity of rewards	3.00	0.99	2.45	1.00	4.45 (p < 0.01)
11.	Valence of monetary incentives	4.14	1.16	3.94	1.14	1.47 (N-S)
12.	Effort/Performance Expectancy	3.13	1.14	2.75	1.09	2.88 (p < 0.01)
13.	Performance/outcome expectancy	3.11	1.09	2.76	1.08	2.87 (p < 0.01)
14.	Compensation Administration	3.31	1.09	2.69	1.07	4.82 (p < 0.01)

study but still is important in this relationship. This variable is the perceived instrumentality of financial incentives toward other outcomes. These outcomes are known as second order outcomes. An example would be giving good education to one's children. If the value toward this outcome is high and if financial incentives is believed to be instrumental for achieving this outcome, then financial incentives would arouse a high amount of motivation. If an organization has financial incentive system of payment and if it is high on all the seven variables mentioned in the model, then the power of the incentive system to galvanize motivation would be high.

There are a second set of variables which affect motivation direct. These variables are job design and intrinsic rewards, style of supervision, participative

climate in the organization and job security. Of course variables like supervision and job security were classified by Herzberg as maintenance factors. But a number of subsequent research studies have established these variables to be motivators.

The variables, apart from motivation, affecting labor performance are role clarity and ability. Proper selection, methods and proper administration of training programs would ensure the ability of employees. The term ability refers to knowledge, skills, personality etc. A good communication program facilitates role perception and clarity. Communication influences the employees' trust on management, performance/outcome expectancies and the feelings about the negative consequences of performance. The wavy lines indicate that there are other variables like

technological and market conditions which might affect labour performance. Except the 'ability' related variables we have included most of the other variables in our study. But one of the limitations of the study is the number of units studied is very few i.e., only six. The other limitation is that we have not used techniques like 'path—analysis' to determine cause-effect relationship. Hence we are not in a position to generalize these findings. This model, it is hoped, would be useful for further research in this field.

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The indices for the independent variables which were measured over time

1. Job Security = $\frac{\text{Number of temporary workers}}{\text{Total Strength of the work force}}$
2. Supervisory Control = $\frac{\text{Number of first line supervisors}}{\text{Total number of people in the work force}}$
3. Sundry Fringe Benefits = $\frac{\text{Total money spent on welfare measures and fringe benefits for the worker}}{\text{Total wages paid to the work force}}$
4. Labour Turnover = $\frac{\text{Total Accession during a month} + \text{Total separation during that month}}{\text{Total number of workmen on the first day of that month}}$
5. Mandays lost due to accidents = $\frac{\text{Mandays lost due to major/minor accident}}{\text{Total mandays available}}$
6. Industrial Disputes = $\frac{\text{Mandays lost due to major/minor industrial disputes}}{\text{Total mandays available}}$
7. Training = $\frac{\text{Number of workers attended training program during the previous quarter of the year}}{\text{Total number of workers}}$

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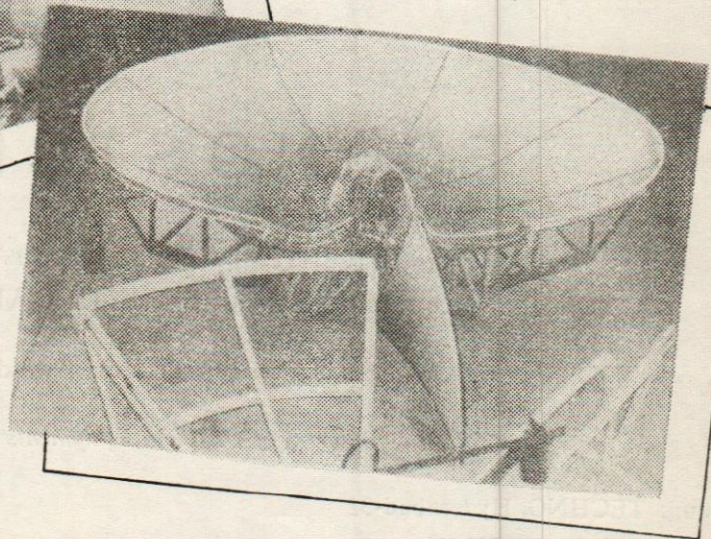
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Waiting Line Models for Wage Negotiations

S.K. GOYAL

In this paper, it is suggested that the management should make effective use of waiting line models in wage negotiations with labour unions. An example has been presented for illustrating the use of a waiting line model in wage negotiations involving repairmen in a production shop.

Every year the management of companies are faced with the demand for higher wages from labour unions. Very often the negotiations end up in strikes, lockouts and ill feelings between labour and the management. The management accuse the labour unions of demanding unjustified high demands and the unions accuse the management of exploitation of the working class. In the end the more powerful among the two rival groups, management and the union, wins the battle of wage negotiations. If the union has its upper hand then the company is bound to loose which may result in lower profits and hence less available for future expansion and/or investment. On the other hand if the management wins then they have less satisfied work force which is unlikely to contribute its full share for the welfare of the organization.

With ever increasing inflation, the demand for higher wages is justified. However, if wages keep up with inflation without any improvement in productivity, the costs of goods produced increases which further fuels the fire of inflation. To keep inflation within manageable limits and to ensure that the standard of living of workmen does not drop with increased inflation, it is imperative that the wage increase should consist of two components :

1. some increase which is dependent on the rate of inflation and

2. Increase due to higher productivity

many Western countries, in years of higher inflation governments forced the management and labour unions to tie up some part of the annual increase in wages with higher productivity. It is this sustained effort of many Western Nations that inflation of the late 70s and early 80s has been checked. On the other hand countries like Brazil where wages automatically increase with rate of inflation, rate of over 100% inflation in a year has become a way of life.

In wage negotiations between the management and the labour unions, it is of utmost importance that an atmosphere of mutual trust is created between the two parties is created from the very start. Under these is a trust between the two parties, it is impossible to achieve an equitable agreement which will ensure a fair deal for both the workmen and the management representing the shareholders of the company.

Every one knows, that higher productivity leads to higher prosperity. The question is who becomes prosperous due to higher productivity. If workers do not get their fair share of the property than they are unlikely to be a willing partner. The key word is sharing the benefits of higher productivity fairly between the workers and the management.

Work study techniques have been used with considerable success for improving the productivity. However, there is a limit to what method study and work measurement can achieve in increased productivity. During the last 40 years Operational Research techniques have been developed and successfully used in solving a variety of managerial problems. The distinctive approach involved in operational Research Approach is the construction of a mathematical model of the problem under consideration and then the model is used to determine and evaluate alternative policies thereby the best decision for the problem is obtained.

Let us consider the case of a production shop. The production shop has 400 identical machines and employs 4 repairmen in each shift. The breakdown of machines has a Poisson distribution with an average of 60 machines per hour.

The current agreement with the workmen requires that each workman be allocated 100 machines and be responsible for the repairs of the machines allocated to him. The time required to repair a machine follows an exponential distribution with mean repair time of 2.5 minutes (or on an average a workman can repair 20 machines per hour). When a machine breaks down, the company loses Rs. 20 per machine hour. The current wage rate of a repairman is Rs. 10.

The repairmen are currently demanding an increase of Rs. 1.160 per hour in their wage rate. The objective is to determine the effect of improved productivity of repairmen will have on the reduced machine break down cost of the production shop.

The machine repair system of the production can be graphically represented as follows :

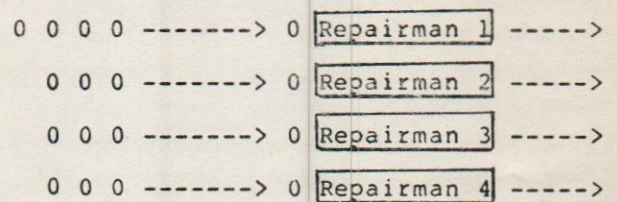


Fig. 1

The repairmen-machine system represented by Figure 1 is a typical waiting line problem where the machines which break down wait for the repairman for repairs. The system consists of 4 parallel waiting lines. The repairmen must be repairing the machines on the first come first served basis otherwise the production workmen will object if he does not maintain this discipline on the waiting line.

In the operational Research literature such a waiting line is given considerable prominence. All the characteristics of such a waiting line can be obtained from any one of the textbooks in Operational Research (some of them are listed at the end of the paper).

For a waiting line system with

K parallel waiting lines

B average rate of breakdowns for the entire production shop

T repair time of one machine

P loss due to one hour of machine idle time

As there are K parallel waiting lines, so the average number of machine breakdowns for which a repairman is responsible must be B/K. The average time required to repair a machine equals T, so for the system to function $T < K/B$. Note that K/B is the average time interval between two successive machine breakdowns for a repairman.

The following characteristics of a single waiting line with rate of machine breakdowns per parallel waiting line (repairman) equal to B/K and rate of repair as 1/T are widely available in the Operation Research literature :

(1) L_g = average length of waiting line in each waiting line

$$= \frac{B^2 T^2}{K(K - BT)}$$

(2) L = average number of idle machines in each waiting line

$$= \frac{BT}{(K - BT)}$$

(3) W_g = average waiting time of a machine

$$= \frac{BT^2}{(K - BT)}$$

(4) W = average idle time of a machine

$$= \frac{KT}{(K - BT)}$$

Note that the above models for the waiting line characteristics may not be similar in form. They have been modified to suit the problem under consideration.

Among the waiting line characteristics given above the most important characteristic is the average idle time of a machine which break down. The idle time of a machine consists of the time a machine needing repairs has to wait because the repairman is repairing another machine and the time taken by the repairman for repairing it.

As each machine which breaks down is idle for W unit of time, so the hourly idle time due to all the

B machine break downs is equal to

$$BW.T$$

On substituting the value of W, we get total machine hours lost due to breakdowns in one hour

$$= \frac{BKT}{(K - BT)} \text{ hours}$$

Therefore, the hourly loss due to machine idle time =

$$L = \frac{PBKT}{(K - BT)}$$

For the given problem situation :

B = 60 per hour

K = 4 repairmen

T = 2.5 minutes = $\frac{2.5}{60}$ hours

P = Rs. 20 per machine hour

Therefore the currently hourly loss due to the machine idle time is equal to =

$$\frac{20 \times 60 \times 4 \times 2.5}{60(4 - 60 \times \frac{2.5}{60})} = \text{Rs } 133.3 \text{ per hour}$$

Now let us determine the total cost due to the machine idle time if the average time to repair a machine is reduced. We can determine the reduction in loss due to the idle time and the maximum permissible increase in the hourly wage rate of each repairman as a result of improvement in the productivity.

In the above analysis it was assumed that improvement in the performance is achieved as a result of reduced average time for repair of a machine. Under the present system each repairman is allocated an equal number of machines to look after. However, if all the four repairmen can be pooled together in such a way that machine breakdown form a single waiting line while waiting for repairs. As soon as a repairman is free to repair a machine, the machine which has waited longest is attended by him. Such a system can be represented as follows :

Such a waiting line system where the machines

TABLE 1

Average Repair Time for One Machine T (in minutes)	Total Hourly Loss $L = \frac{PBKT}{(K-BT)}$	Reduction in Loss Due to Idle Time = $L - 133.3$	Maximum Permissible Increase in the Hourly Wage = $\frac{(L-133.3)}{4}$ Rs/hr
2.5	133.3	0	0
2.4	120	13.3	3.32
2.3	108.2	25.1	6.27
2.2	97.8	35.5	8.87
2.1	88.4	44.9	11.22
2.0	80.0	53.3	13.2
1.9	72.4	60.9	15.22
1.8	65.5	67.8	16.95

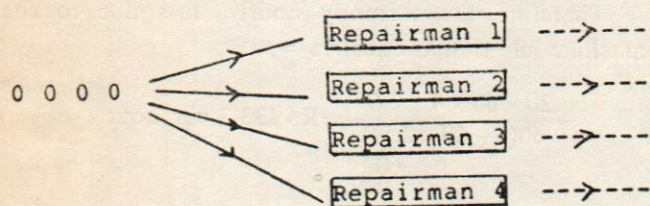


Fig. 2

wait in a single waiting line for multiple servers is also very widely dealt in Operational Research textbook. The more interested readers are referred to any of the book given in the reference section.

Using the waiting line model having,

$$B = 60/\text{hour}$$

$$K = 4 \text{ repairman}$$

$$T = 2.5 \text{ minutes}$$

$$P = \text{Rs } 20 \text{ per minute}$$

Where the machine needing repairs wait in a single waiting line, the idle time of a machine which breaks

down was found to be 0.051 hours. Hence, the hourly cost due to machine idle time equals.

$$= B \times 0.051 \times P$$

$$= 60 \times 0.051 \times 20$$

$$= \text{Rs. } 61.2 \text{ per hour}$$

As can be seen very significant reduction in the loss of production can be achieved simply by changing the waiting line system applicable to the machine repair system.

It may be pointed out that as a result of increased productivity the wages of the repairman can be increased significantly without endangering the profitability of a company. It is not being suggested that all benefits as a result of increased productivity should be given to the workmen achieving them. It is possible that the levels of productivity may not be maintained for any significant length of period. Therefore, the management and the labour unions will have to set up a review panel to ensure that level of increased productivity will be maintained in future. In practice, the management and the labour unions will have to come to an agreement as regards to the proportion in which the benefits of increased productivity will be shared between the union members and the company's shareholders represented by the management team.

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Optimising Raw Material Mix

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This is a case study illustrating the use of computer oriented Linear programming method for optimising of raw material mix for a cupola furnace.

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Introduction and Problem

One of the most crucial problems faced by the foundries is the determination of optimum and metallurgically correct mixture of raw materials charge in to cupola furnace, in order to produce castings of required specifications and chemical composition with minimum cost. A cupola furnace is most commonly employed for melting and refining of pig iron along with scrap and additives in the production of iron castings. This furnace has many distinct advantages over other furnaces like simplicity of operation, continuity of production, economy of working and increased output coupled with a relatively high degree of efficiency and flexibility of changing the metallurgical and chemical composition of molten metal without any difficulty. In order to control the specifications of the cast iron produced by the cupola, it is necessary to estimate the proportion and the contents of the charge particularly that of pig iron and scrap. Usually, several grades of pig iron and scrap are available to the foundryman. To achieve a desired composition of the cast metal, these grades have to be suitably combined in a most economical manner. Since the various impurities in metal undergo chemical change during the remelting operation, allowances have to be made for their loss or gain while making up the change. The important constituents for whose loss or gain allowance is provided in the computation are, Carbon, Silicon, Sulfur, Manganese, Phosphorus and Iron.

In most of the foundries the method adopted for computing the charge mixture is based on trial and error. From experience, certain mixture is arbitrarily chosen and considering the loss and gain of various constituents, the cast metal is analysed. If it does not conform to the desired specifications, necessary changes are made in the mixture and again the cast metal is analysed. This procedure is repeated till the desired composition of the cast metal is achieved.

It could be seen from the preceding discussion that this problem is of complex nature and involves a number of factors which need to be optimized for best results. It is obvious that any trial and error approach, normally results in sub optimization and tries to maximize the overall cost instead of minimizing the cost and not only that, there is also no guarantee of optimum results at the end.

It is in this context, the most widely used optimization technique Linear programming comes to the rescue of foundryman to optimize the raw material mix for cupola furnace and minimize the total cost. In many foundries, large tonnages of castings usually of single chemical and metallurgical composition are produced. Application of linear programming technique to this problem involving a number of constraints results in substantial savings with in short period of time.

Background of the Case

The present study was undertaken in a medium scale foundry manufacturing ferrous castings with an annual capacity of around 750 tonnes. The installed capacity is around 1200 tonnes. In this unit there are totally 3 nos. of cupola furnaces; two are of 1.2 tonnes per hour capacity and the other of 3.0 tonnes per hour capacity. There is one heat treatment furnace and facilities also exist for Hydraulic testing and analysis of chemical composition of castings. Maximum weight of a casting that can be produced at present is 7 tonnes. In addition to the above facilities a fairly big machine shop consisting of Lathes, Planning m/c, Shaping machines, Radial drilling machines, Bench Grinders, Power Hacksaws is also available. In addition there is also a good welding shop and sand testing laboratory

etc. This is one of the highly reputed foundries in the state, receiving orders for castings from the firms spread all over the country which include both Private and Public undertakings.

Regarding the melting practice for the cupola, present approach is a trial and error method which is cumbersome, time consuming and involves wastage of a few tonnes of precious molten metal which cost quite a lot over the time period. Also since trial and error approach mostly results in sub optimization, there is a possibility of rejection of castings by the customer based on wrong specifications.

In order to rationalize the procedure and to get optimum results, the linear programming technique has been applied to this problem.

Formulation of Linear Programing Model

Linear Programming model involves a linear function of several variables to be optimized (maximized or minimized) subject to a set of linear constraints and non-negativity restrictions on the variables.

The general form of the model is :

$$\text{Optimize } Z = c_1x_1 + c_2x_2 + \dots + c_kx_k$$

$$\text{subject to : } a_{11}x_1 + a_{12}x_2 + \dots + a_{1k}x_k \leq b_1$$

$$a_{21}x_1 + a_{22}x_2 + \dots + a_{2k}x_k \leq b_2$$

$$a_{m1}x_1 + a_{m2}x_2 + \dots + a_{mk}x_k \leq b_m$$

and all $x_i \geq 0$

Where C_j is a profit coefficient of X_j which is an unknown variable, a_{ij} is a known constant, b_j is a known constant.

The study was concentrated on Grade-20 castings which form the majority produced.

Data Collection : The following data was collected in consultation with the engineers concerned. Charge specifications for the Grade 20 castings are given below :

TABLE 1

Carbon	3.2%	to	3.4%
Silicon	1.2%	to	1.5%
Chromium	0.7%	to	1.0%
Sulfur		>	0.05%
Phosphorus		>	0.1%

Various charge materials, their cost in Rs. per Kg. and their chemical composition are given below :

TABLE 2

S. No.	Material	Cost Rs/Kg	% C	% Si	% M	% Cr	% Su	% P
1.	Pig Iron (LMr)	1.75	3.75	1.25	0.8		0.03	0.12
2.	Pig Iron (Kalinga)	2.15	3.75	0.9	0.8		0.05	0.12
4.	Foundry Returns	2.25	3.50	1.2	0.6		0.03	0.12
4.	C.I. Scrap	2.25	3.75	1.25	0.8		0.03	0.12
5.	M.S. Scrap	1.80	0.25	0.19	0.35		0.03	0.04
6.	Ferro Chro- mium	8.75	7.0	8.5		72,00		
7.	Ferro Silicon	9.50		78.05				

Each charge weigh 300 Kgs. Therefore the range of various elements works out to be :

TABLE 3

Carbon	9.6 Kg to 10.2 Kg
Silicon	3.0 Kg to 4.5 Kg
Chromium	2.1 Kg to 3.0 Kg
Sulphur	0 Kg to 0.15 Kg
Phosphorous	0 Kg to 0.3 Kg

The above figure are obtained by multiplying 300Kg with range of percentages given in Table I.

Model Building

Let $x_1, x_2, x_3, x_4, x_5, x_6$ and x_7 respectively be the quantities of charge contents mentioned in Table 2.

Objective Function : Referring to table 2

Minimize the cost function

$$1.75x_1 + 2.15x_2 + 2.25x_3 + 2.25x_4 + 1.80x_5 + 8.75x_6 + 9.50x_7$$

Subject to : Ref. (Tables 2 & 3)

A. Metallurgical Constraints

1. Minimum requirement of carbon.

$$1/100 (3.75x_1 + 3.75x_2 + 3.5x_3 + 3.75x_4 + 0.25x_5 + 7x_6) \geq 9.6$$

2. Max. requirement of carbon

$$1/100 (3.75x_1 + 3.75x_2 + 3.5x_3 + 3.75x_4 + 0.25x_5 + 7x_6) \leq 10.2$$

3. Minimum requirement of silicon

$$1/100 (1.25x_1 + 0.9x_2 + 1.2x_3 + 1.25x_4 + 0.19x_5 + 8.5x_6 + 78.05x_7) \geq 3$$

4. Maximum requirement of silicon

$$1/100 (1.25x_1 + 0.9x_2 + 1.2x_3 + 1.25x_4 + 0.19x_5 + 8.5x_6 + 78.05x_7) \leq 4.5$$

5. Minimum requirement of chromium

$$72/100x_6 \geq 2.1$$

6. Maximum requirement of chromium.

$$72/100x_6 \leq 3.0$$

7. Maximum requirement of sulfur

$$1/100 (0.03x_1 + 0.05x_2 + 0.03x_3 + 0.05x_4 + 0.03x_5) \leq 0.15$$

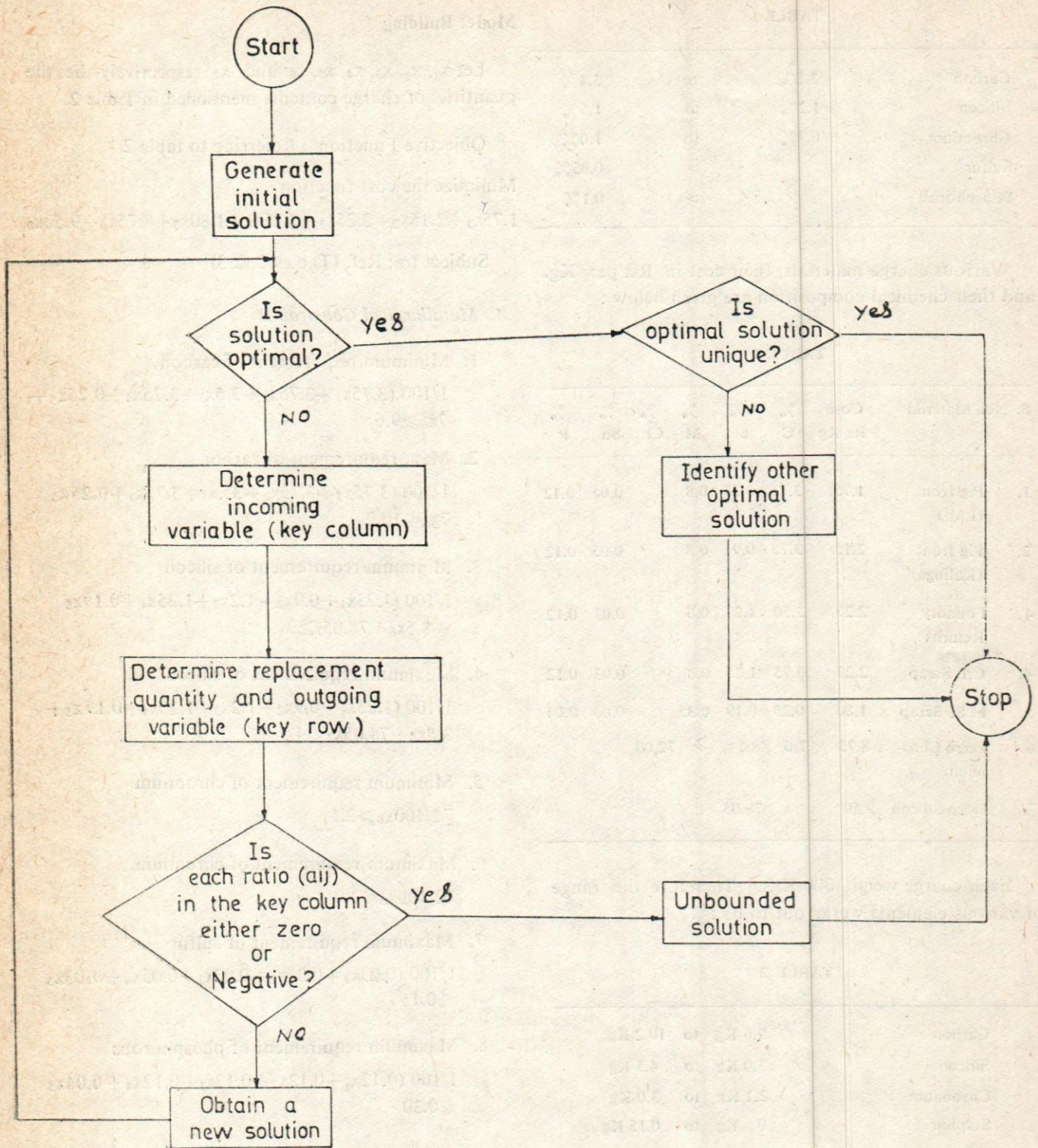
8. Maximum requirement of phosphorous

$$1/100 (0.12x_1 + 0.12x_2 + 0.12x_3 + 0.12x_4 + 0.04x_5) \leq 0.30$$

B. Availability Constraints

9. Pig Iron (IM_4) supply is restricted to 22% (approx.) of the total metal charge.

$$x_1 \leq 65$$



A SCHEMATIC OF THE SIMPLEX METHOD

10. Kalinga Pig Iron supply is restricted to 15% of the total metal charge.

$$x_2 \leq 45$$

C. Usage Constraints

11. Cast Iron scrap can be used to a maximum extent of 60% of total charge.

$$x_4 \leq 180$$

12. Foundry returns can be used in the metal charge to a maximum extent of 40% of total charge.

$$x_3 \leq 120$$

13. Foundry returns+scrap can be there to a maximum extent of 60% of total charge.

$$x_3 + x_4 \leq 180$$

14. The upper control limit on the usage of mild steel scrap is 40% of metal charge.

$$x_5 \leq 120$$

15. Total charge constraint

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 = 300$$

And non Negativity Constraints

$$x_1, x_2, x_3, x_4, x_5, x_6, x_7 \geq 0$$

Solution

This linear programming model was solved using simplex algorithm for which flow chart is given below. Computer Program in FORTRAN IV was developed for simplex algorithm and fed to HCL-1800, Computer in our college. The computer solution is also given here.

COMPUTER SOLUTION

(Fertran—IV System VER. 1.0 (01-Jan-81) Hindustan Computers Limited)

Unit ? 6

The Original Coefficients of the Constraints

CODE0 == > < OR = Constraint

CODE1 == > > OR = Constraint

== > > OR = Constraint

CODE2 == > = Constraint

I	Code	Constant	A(I.1)	A(I.2)	A(I.3)	A(I.4)	A(I.5)	A(I.6)	A(I.7)	A(I.8)
1.	1	96.000	.0375	.0375	.0350	.0375	.0025	.0700	0.0000	
2.	0	10.200	.0375	.0375	.0350	.0375	.0025	.0700	0.0000	
3.	1	3.000	.0125	.0090	.0120	.0125	.0019	.0850	.7805	
4.	0	4.500	.0125	.0090	.0120	.0125	.0019	.0850	.7805	
5.	1	2.100	0.0000	0.0000	0.0000	0.0000	0.0000	.7200	0.0000	
6.	0	3.000	0.0000	0.0000	0.0000	0.0000	0.0000	.7200	0.0000	
7.	0	.150	.0003	.0005	.0003	.0005	.0003	0.0000	0.0000	
8.	0	.300	.0012	.0012	.0012	.0012	.0004	0.0000	0.0000	
9.	0	65.000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
10.	0	45.000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
11.	0	180.000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	
12.	0	120.000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	
13.	0	180.000	0.0000	0.0000	1.0000	1.0000	0.0000	0.0000	0.0000	
14.	0	120.000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	
15.	2	300.000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

The coefficients in the original objective function to be minimized are :

1.7500 2.1500 2.2500 2.2500 1.8000 8.7500 9.5000

Optimal Solution of Cupola Raw Mix Problem

$XB(1) = X(2) =$	45.00
$XB(2) = X(11) =$	3.08
$XB(3) = X(7) =$.61
$XB(4) = X(12) =$	1.50
$XB(5) = X(6) =$	2.92
$XB(6) = X(13) =$.90
$XB(7) = X(14) =$.04
$XB(8) = X(15) =$.04
$XB(9) = X(19) =$	120.00
$XB(10) = X(8) =$	3.09
$XB(11) = X(18) =$	113.53
$XB(12) = X(4) =$	66.47
$XB(13) = X(20) =$	113.53
$XB(14) = X(5) =$	120.00
$XB(15) = X(1) =$	65.00

Optimal value of the original objective function is *Rs. 607.38*

Results obtained are as follows**Optimum mix of raw materials.**

1. Pig Iron (Kalinga)	45.00Kg
2. Pig Iron (IM ₄)	=65.00Kg
3. Cast Iron scrap	=66.47Kg
4. Mild steel scrap	=120.00Kg
5. Ferrochromium	= 2.92Kg
6. Ferro Silicon	= 0.61Kg
Weight of Total Charge	300.00Kg

Optimal value of the objective function i.e. Minimum
Total Cost=Rs. 607.38.

Conclusion

Linear Programming is one of most widely used decisions making models in operations research today. Application of OR models to industrial situations like these will result in optimization of the decision variables and objective function which in this case is minimization of Total Cost of the mix of raw materials amounting to Rs. 607.38. Management of the firm under study has been advised to consistently use this optimum mix of raw material for cupola charge which results in substantial savings over a long period, at the same time producing castings of required chemical and metallurgical properties. To sum up the following are the advantages of using Linear Programming to the Cupola raw mix problem.

1. Minimizing the total cost by saving precious molten metal which would have been otherwise wasted in trial and error approach.
2. Produce castings of exact specifications in chemical and metallurgical composition.
3. Reduction of rejections by customers on the basis of composition specifications.
4. Optimum use of various raw materials like Pig iron, Steel scrap, Foundry returns, Ferrow-silicon, Ferrow-Cromium etc.

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EXECUTIVE READINGS

Management of Safety : Concepts and Task

Shri N.S. Sreenivasan

Published by :
IDL Chemicals Ltd.,
Hyderabad

Reviewed by :
Shri S.N. Nandi,
Director (IE), NPC, New Delhi.

Thanks to Bhopal Gas tragedy which is the worst industrial accident in modern civilized world. This tragedy has drawn the attention of all from policy makers through industrial managements, not to talk of common people. But mere talk does not solve the problem of recurrence of similar kinds of accidents in future. It needs actions at all levels. Policy makers should review existing safety laws & regulations and functioning of advisory & enforcing organisations in the country. Company managements have to reassess its priority in giving importance to activities related to safety. It has to regard safety not

as a part of its benevolent acts but an important economic activity closely related to production and Quality control. This seems to be the most difficult task. Meeting only statutory requirements is not enough. Management actions, of course, have to be supplemented by demonstrating consciousness on the part of working groups to ensure safety. Now is the most opportune time to act in this line.

Enough literature and trained personnel are available in our country to guide us how to take appropriate steps to prevent accident in specific situations. But an integrated approach outlining unified procedure and managerial actions to be taken up at top and operational management levels have been wanting in most of the organisations. Mr. N.S. Sreenivasan's book on "Management of Safety-Concepts and Tasks" partly fills up this void. Mr. N.S. Sreenivasan who him-self is now Works Manager and has been instrumental to organise safety in correct perspective in one of the Indian multi-plant companies has crystallised his thoughts and exper-

ience in spelling out management policy & tasks to be adopted for proper institutionalisation of safety. According to him, this would help generate effective thrust to render practice of safety in industrial organisations more meaningful, purposeful and beneficial to work men, customers, and society at large.

This book has total 10 chapters—nine on concepts and managerial actions required to be taken up on safety and one chapter on case illustration. The first nine chapters have dealt with basic and fundamental issues like management policy on safety; objectives of a safety programme; organisation for safety; function of safety; systems, methods and procedures for safety; assurance of safety etc. In most of those chapters, author has provided checklists spelling out points to be considered for organising safety function in an integrated manner. Most of those do's and don'ts though in quite generalised terms are excellent for practising manager.

The author has stressed upon

following few basic concepts throughout the book : —

- (i) Preventive steps are far more important than otherwise.
- (ii) Need for unique and specialised group of activities related to safety.
- (iii) Intelligent and systematic procedure for hazard prediction
- (iv) Avoidance of undue stress given to rectify die-hard unsafe habits of workmen.

In a chapter titled "Maturity Evaluation in Management of Safety" author has explained in detail various parameters to be used for assessing company efforts towards safety. This is the jobs of "Safety Audit". This book is therefore quite useful for management personnel to provide guidance towards effective & efficient safety programme.

Though the book has explained concepts in quite a lucid manner, many of the issues & concepts have not been illustrated with detailed case illustrations available in different situations. Many of the points mentioned are in too generalised terms. These may have limited effects in creating strong convictions with readers. Addition of some more specific cases/examples could have enhanced the value of this book. The only case illustration provided in this book is related to an explosive company where the author is employed. This illustration, though for obvious reasons, has been too sketchy in many points. But nevertheless readers

will definitely find this book useful in implementing safety programmes in their respective organisations.

Organisational Behaviour in a Changing Environment
R.D. Pathak

Published by
Himalaya Publishing House
'Ramdoot', Dr. Bhalerao Marg
Bombay-400004.
Edition : 1983
pp : 342
Price : Rs- 125.00

Reviewed by
Dr (Mrs.) Poornima Mathur
Head, Department of Humanities &
Social Sciences
Indian Institute of Technology
New Delhi

The book has a basic discussion of important organisational behaviour ideas such as motivation, participation, leadership, group dynamics and a few others like creativity. It draws upon the research that has been done so far, all the world over and reads like an average Indian textbook.

The author says that organisational behaviour is a function of individual characteristics, group characteristics and environmental characteristics, which is not saying anything new.

The book presents the theories of Galen, Carl Jung, Maslow, Herzberg and Maslow in some detail but without much critical evaluation.

Discussing motivation, the author takes a stand that while in

USA, white and blue collar workers prefer intrinsic factors of motivation in India, the blue collar workers prefer factors extrinsic in nature. We need more investigation in this area.

On the whole, the effect on the reader is that the book 'is not very neat and well rounded' as the author himself admits. There is scope for better organisation. The spelling and other mistakes (like the figures for Johari window) leave you wondering how much of the book can you take for granted as sound and correct.

One good point is that the references at the end of chapters are meticulous. Priced too high.

**Human Resource Development :
A Study of the Airlines in Asian
Countries**
R.P. Billimoria and N.K. Singh

Published by :
Vikas Publishing House Pvt. Ltd., 1984
Rs. 95
pp. 128

Reviewed by :
Dr. V. Ramchandran
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In spite of the fact that the International Air Transport Association puts out considerable information on the industry, there is paucity of it in the area of human resource development. Training in a big way goes on in the airlines, whether these relate to pilots, flight attendants, maintenance staff, personnel

working in the commercial department or in any other area. The industry is complex and dynamic and hence calls for training on a systematic and continuing basis. The bigger airlines have sophisticated training set-ups. In recent years, IATA has been conducting programmes under its scheme of training for developing nations airlines to assist those that have yet to develop viable training units. But training is just one aspect of human resource development. The effectiveness of individuals depends on the organisational climate, manpower planning, career planning, the several personnel policies, leadership and a host of other factors.

The book under review is the outcome of a workshop organised at Kathmandu from 9 to 12 Dec.' 83. The participants were from ten Asian airlines, the background to the discussions being provided by a research paper prepared by N.K. Singh on behalf of the Foundation for Organisational Research (FORE). The workshop comprised of three modules, excluding the formalities involved by way of inauguration and valediction. The first module consists of four presentations, two speakers being from the Asian region and two from the western world. Prof. Malla of the Planning Commission, Nepal, spoke on the development of human resources as being crucial for the success of any corporate body, touching on different aspects of the subject. M.M. Kohli, the then Secretary of the Ministry of Civil Aviation, Government of India stressed the dangers of entropy in

an organisation, and therefore the need for training for skills and attitudinal changes on a systematic and continuing basis: David G. Bowers of the Institute of Social Research, University of Michigan, U.S.A., discussed technological change and its impact on human resource in the air system, illustrating his talk with examples from the U.S. scene. David Shroyer, Training Instructor, United Airlines elaborated on the importance of training for cockpit management, which has been pioneered by his organisation through a Grid programme evolved with the help of Blake and Moutin, the grid management system mandarins.

The second module includes papers on the state of the situation in H.R.D. in Air-India, Air Mauritius, Ariane Afghan airlines; Bangladesh Biman, Indian airlines, Kuwait airways, Pakistan International airlines, Royal Nepal airlines, Singapore airlines and Thai Airways International.

The third module incorporate the reports of the three task groups which discussed in depth one of the following themes: Motivation in the face of constraints; Participative Management: Manpower planning. The themes chosen for discussion were evolved by the participants themselves from a listing of 17 key issues prepared by the organisers. The 'Nominal Group Technique' was used for consensus building to prioritize the most important three key issues, which became the subjects for detailed discussion by sub-groups. The reports indicate that the discussions were free and

frank; the problems in the different airlines were brought up in the open, even though quite a few of them defied easy solution. What the discussions achieved was the mutual exchange of information of the practices followed by the airlines participating, some of which could be followed by others; some of course, would be difficult to adopt because of cultural differences, societal problems and governmental policies.

R P. Billimoria has given an able summary of the workshop and also his thoughts on 'aberration of power'. Lord Action said long time ago that power corrupts and absolute power corrupts absolutely. Billimoria warns that those in authority should beware of the insidious tendencies that have a way of sneaking into the thinking and behaviour pattern of individuals in positions of authority, illustrating his thesis with examples. He has cautioned that people in leadership position should be alert and watchful, lest they become victims of these forces and fail in their allotted role.

The workshop decided to have periodically such meetings and one such was organised at Pattayya in Thailand recently.

The book is a very useful contribution to the scanty literature on H.R.D. in airlines. It is hoped that the work shops projected in future would go into other areas of H.R.D. and their proceedings would be published in as professional a way as the book under review has been.

8. The book though relating to practices in airlines would be useful to any one in the field of H.R.D. in any area of activity.

Industrial Growth in India—Stagnation Since the Mid-Sixties
by Isher Judge Ahluwalia

Published by :
Oxford University Press, Delhi-1985;
Pages 235+XXII

Received by :
Shri M.V.V. Raman,
Regional Director,
National Productivity Council,
Bangalore

The book starting with an introduction, while recognising the achievements of industrialisation in the country, states that these achievements, however, cannot blind us to the fact that the potential has been far from fully exploited and that performance with respect to the core indicator, that is, the rate of growth of industry, has been very disappointing indeed. A number of hypothesis that have been put forth to explain the slow down in industrial growth after mid-sixties have been enumerated. It points out that the story of growth is very different when told with the National Accounts/ASI data rather than the industrial production data.

The analysis points to four factors which contribute to industrial stagnation :

(a) Slow growth of agricultural

incomes and their effect in limiting the demand for industrial goods;

(b) Slowdown in public investment after mid-sixties with its particular impact on infrastructural investments;

(c) Poor management of the infrastructure sectors leading to severe infrastructural constrains and

(d) The Industrial Policy framework, including both domestic industrial policies and trade policy and their effect in creating a high cost industrial structure in the economy.

Another interesting observation made in the book is that some of the popular explanations of industrial stagnation advanced fail to stand the test of empirical scrutiny. For instance, it was found that wage goods constraints hypothesis is not substantiated nor there is any conclusive evidence favouring agricultural raw material shortage hypothesis. Available evidence does not also support the hypothesis of worsening income distribution. In fact the slowdown in growth was concentrated in heavy industries, while consumer goods suffered slow growth throughout. The association of industrial stagnation with import substitution has not been conclusively established.

The analysis shows a slowdown in public investments after the mid-sixties leading to a direct set back in the demand for certain heavy goods industries (eg. wagon) but does not

suggest any deficiency in overall capital formation. The analysis points out under investment in the infrastructure sectors resulting in bottleneck adversely affecting not only the industrial sector but economy as a whole. In addition this sector suffered from gross-mismanagement and planning. This coupled with inefficient import substitution and a policy framework which did not provide for any domestic competitions, incentive for increasing efficiency, reducing cost or improving quality, led to the evolution of a high cost industrial structure. The overall impact was to improve the growth of productivity or the efficiency in the use of factors and retard industrial growth. The contribution of the total factor productivity growth was negligible or negative in most industry groups. The author recommends a strong need for continued efforts to raise the rate of growth of agriculture, improvement in the performance of the infrastructural sectors and an overhaul of the industrial policy framework so as to inject a sense of cost and quality consciousness in industry.

While concluding it should be pointed out that there was a radical change in the policy framework recently after the publication of the book. The book is well produced and has a foreword by L.K. Jha. The book should prove useful to planners, Bureaucrats, Managers and others interested in economic growth, productivity and management.

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on

Personnel Management in India

S.N. VIG

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REGISTRAR

Letter from the Editor-in-Chief

Although system, resources and technology play significant roles in promoting productivity, nothing could be achieved without the motivation, commitment and active involvement of people. People conceive the planning of productivity and implement plans of improvement. People are the driving force. This has been fully recognised and appreciated by the Fifth World Productivity Congress held at Jakarta this year and the Asian Productivity Organisation.

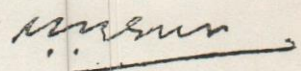
Management's goal in any organisation is essentially to bring about the optimum utilisation of human resources to see that employees work as effectively as possible. This calls for a firm faith in the capabilities and creativity of human beings. That managers with a team of selected people can bring about improvements in productivity in an organisation and ask others to implement their plans and instructions is an obsolete approach. The emphasis at present is on 'Productivity through people', i.e. involvement of all employees at each stage in promotion of productivity. However, this depends on a number of tasks and activities to be accomplished. Besides creating proper organisational climate and providing better work conditions, we have to think about an organised approach to increasing productivity, developing effective human resources, information system, curbing unproductive practices, extending support of the resources and promoting motivation and commitment of the people.

It is observed that even in organisations where wages and salary are fairly satisfactory and working conditions have also been considerably improved, the motivation of people to work continues to remain low. One could understand the cause of low productivity on account of defective work system or lack of resources. These can perhaps be rectified. But one cannot easily obtain individual commitment towards fulfilment of organisational needs and work in hand. The latter is vital for productivity improvement.

Literature is available in plenty on motivation and promotion of commitment of people for higher productivity. A lot of time has been spent on prescribing normative patterns of behaviour and what people should do. The crux of the problem is why people do not act in that way. An analytical approach is required to understand this problem. This is a phenomenon visible in most of our organisations particularly in many government offices and public sector units. Is it a managerial problem or a problem of the individual employee? Is there something wrong in the social and political environment of an organisation or only in the internal system? What efforts can be made to overcome the

difficulties to promote productivity through the involvement of people ? These are some of the questions which have to be examined.

The current issue of 'Productivity' contains several articles to indicate fresh areas of thinking and action for utilising the best that is in people. It is high time to think in terms of a corporate strategy and approach in respect of promoting effectiveness of the people if we want to promote productivity through people.



(DR. G.K. SURI)