

Periodic Research

Effective Man Power Planning for improving The Productivity in a Organization

Abstract

Human being is the most active and living factors of production. One may go for highly-tech machines, raw materials and other inputs but due to lack of trained and skilled human resource, they are all in vain. Only efficient human beings can convert the inputs into finished quality product.

Keywords: Man Power Planning , Methodology, Hungarian Method, Computer Programming

Introduction To Man Power

The success of Man power planning process not only helps the organization itself but also helps the society's property. The firm may incur heavy losses due to faulty planning.

These losses are the losses to the nation and ultimately affect the economy as a whole. The system of manpower of the adjustment at different levels of the organization. It comprises of:

1. Determination of Manpower requirements for the entire organization taking into consideration the need for renovations, modernization, expansion and growth programmers.
2. Secondly, making adjustments which are called replacement planning, the factors may include labor turnover, absenteeism separations, accidents, retirements, resignations job-movements etc.
3. Assessment and creation of manpower inventory.
4. Calculation of actual Net manpower requirements.
5. Developing the required talents among the employees selected for advancements. In the last we will be getting the final figure of Manpower requirements.

Planning

Planning is the first and foremost function of Management of any organization. By planning, we mean a future course of action regarding what, when ,who, why where and how. T tells us where we are to where we want to go .

It is the most pervasive function of Management. Planning is related and focused on all the functional areas of Management like finance, marketing, purchase Quality Control, Personnel, Production. Manpower planning has been recognized only recently as an integrals part of overall planning. Without the procurement and maintenance of adequate number of personnel, it is not possible to realize the goals of the organization. Manpower Planning is most-required steps to put the plans and policies of the organization into action for the achievement of certain goals or objectives. As we know, organist ions are never static, they are always dynamic. They go on changing due to certain factors since people leave the organization because of retirements, resignations, accidents, death, and many other reasons which may lead to shortage of the manpower of the right type, therefore a stream of qualified personnel must be kept flowing in the organization.

Some definitions are given here below which are self-explanatory- according to strainer, "Manpower planning is a strategy for the acquisition, utilization, improvement and preservation of an enterprise's human resources. It relates to establishing job specifications or the quantitative requirements of jobs determining the number of personnel required and developing sources of Manpower. Manpower planning is the process of developing and determining objectives, policies and programmers, that will develop, utilize and distribute manpower so as to achieve the goals of the organization.



Anjani Kr. Nathani

Principal,
M.I.T. Muzaffarpur



R. P. Kiran

Assistant Professor,
Deptt. of Mechanical Engg.,
M.I.T. Muzaffarpur

Necessity of Manpower Planning

The Basic objective of Manpower Planning is the proper utilization of human beings, means at the present level of development, the existing manpower inventory must be properly utilized. There are certain other objectives of Manpower Planning.

Effective Manpower Utilization

Effective manpower requires two aspects, firstly, People must be placed in such a way that organization's total manpower utilization is to get maximum productivity. In order to have proper Manpower utilization we will have to take into consideration two factors

1. The competency of the existing staff and their suitability for new positions.
2. To put the right man at the right place to avoid misutilisation of staff, absenteeism, Labor, Turnover, and Plateau.

This can be well-illustrated with the help of diagram

Manpower Foundation Stone of Organisation

It has been very rightly said that Manpower Planning is the core and heart of the success of any business or industrial organization. It is the foundation stone of any business organization. It is the pivot around which the whole activities of organization revolves. There are so many personnel functions namely wage and salary, Recruitment and selection, Placement, Planning and development, training and development, Promotion and transfer Absenteeism & Turnover, Discipline, Performance evaluation, job analysis, maximum utilization of human inventory, Record and audit of Personnel and time Keeping. There is hardly any function of Personnel Mgt. which remains unaffected from Manpower Planning. Every function is related with manpower Planning Process in some way or other. Every activity of the human resource Planning is linked and correlated in such a way so as to achieve personnel goals. Take the other Depts. i.e Finance, production, Marketing, Quality Control and Sales Deptt., They are also linked with manpower Planning process. Because it is only Personnel Deptt. which is supplying the right person, at right time and at right place. The importance of manpower Planning has already been discussed in Chapter 1.

Origination & Administration

Following the example of developed countries, in India also sophistication in the use of modern techniques is constantly increasing. New management techniques have evolved in different areas and greater stress has begun to be placed in recent years even on quantitative techniques which have emerged more since the Second World War. In the beginning. It was thought that the use automation, mechanization, machines and the technological changes would decrease the value of the human resource. However, Experience has sufficiently indicated that the human resource can be neglected at the organization's peril. The Behavioral research findings and techniques are being more observed today as it is now realized that the human component ultimately determines the use of even the quantitative techniques and initiates technological changes. The personnel manager is concerned naturally more with the behavioral aspects.

Industrial Relations Situation In India

The industrial relations situation in India in recent years has indicated a deterioration in the human relations area as is evident from the large number of strikes, lock-outs and gheraos taking place all over the country. The two groups, management and labour, do not seem to be getting along together. Management's strength in terms of financial resources seems to be pitted against labour's strength of large numbers. The latter being harnessed by the trade union movement has posed numerous difficulties in the position of management and there is conflict with management, collected on one side and labour on the other. Democracy has provided for collective bargaining, a negotiation process across the table, so that the two conflicting groups can arrive at a compromise or an agreement or settle some of their differences. This must help avoid conflict as strikes and lock-outs cause loss in production which India can ill afford. Rising process cannot be checked unless production also rises. The law courts, through adjudication, have also helped to put down conflict through their awards. However, this has moved the conflict from inside (that is, within the organization) to outside (that is, into the law courts). This has resulted in outsiders arguing on behalf of both management and labour and increase in the practice of legal practitioners. Thus has grown a group of people who are not truly wedded to the organization but who argue on behalf of their respective sides. As V.V. Giri once said, "compulsory adjudication is the trade union's number one enemy as it provides a temptation to them to resort to this method to force management to grant concessions." Mr. Giri as President had even suggested a moratorium on strikes as the loss in the previous year was as much as 17 million many days indicating that legal safeguards have not proved effective. Unless there is mutual respect, there cannot be good industrial relations.

Beyond Selfish Personal Objectives

The time has now arrived when management must realize that mere making of profits cannot be the final objective of a business. It can only be one of the goals. It must be prepared to pay reasonable wages and improve the living conditions of its employees. The time has come when management must not look upon its employees or workers as some inferior people who are working "under them". For example, Frits Phillips, the Chairman of the worldwide Phillips Electrical Company whose sales trebled from \$1.4 billion to \$4.2 billion during his presidency, always speaks of people who work with us and not as people who "work for us." The articles of association of his company were changed and the new articles state that the aim of the company is "a policy of prosperity in the long run and maximum useful employment."

However, the first step must be taken by management itself and this is the area in which personnel management, with its personnel department, can make its most effective contribution. It must create the climate for the workers. For Example, the employees should 'feel' that increased productivity will result in the workers getting a share in the gains of productivity. In case of introduction of technological changes such as automation, the workers must believe that it will not result in retrenchment.

Man Power Planning For A Workshop

Introduction

There is basic difference in manpower estimation at the time of planning for setting up of a work shop which is more of an estimation based on certain assumptions (as a part of DPR-Detail project Report) compared to actual deployment of manpower after several years of setting up of a workshop. Manufacturing enterprises are subject to constant changes that are influenced by development of technology. Changes in business policy, the external environment and the economy. Changes demand flexibility and quick adoptability on the part of manufacturing enterprises. So, often manpower envisaged is quite different at the time of deployment.

Deployment of manpower has close relationship with many factors, like.

1. The overall economy of managing a business establishment.
2. Number of work stations; proximity of similar work stations those can be managed by same manpower (group/ individual)
3. Type of work- process or discreet activity oriented; process types has close dependence on different sub-processes like chemical plant while in discreet activity oriented units, work units can be addressed independently.
4. Work culture.
5. The decision is also influenced by economic make & buys decision.
6. Further the regulatory machineries have certain directives like; deployment of safety office, first aid station, fire-fighting/disaster management, training cell, provision of canteen etc.
7. Permanent manpower deployment is associated with long term responsibility of the company which needs to be compared with availability manpower with adequate skill level on short term contract basis(deployment mix of permanent and short term contract work force)
8. Decision of deployment of permanent & contract employee again needs to be seen against the background of core competency of the organization. An organization's strength lies on the competency, skill, knowledge, experience of its human resource which is more closely associated with the company.
9. Long term business objectives and company policy about employment.
10. Supervisory/ managerial staff strength depending on spread of stations/ common features of work station delegation of power.

Selection of Subject for Case Study

For analysis of manpower requirement we have selected on work shop: Medium & small shop (02 shop) in Heavy Machine Building Plant (HMBP) of Heavy Engineering Corporation Ltd. based at Ranchi. The basis of selection is that- the function of the shop can be treated as a complete work unit within a large frame work of the corporation. There are two main functional areas in it: Machine shop (020), Assembly shop (021)

Environment of the Work Unit

Other plants / departments / units of the Corporation acts as the work environment for the selected work unit. The corporation has four operating plants / divisions along with a corporate office. Common

facilities to all the four units like Township, Hospital Branch offices are controlled by the corporate body.

The selected work unit 02 shop is a unit of Heavy machine Building Plant (HBMP). The Broad structure of HBMP is as given below.

HMBP administration has the following Working Units (Shops)

1. Heavy Machine Shop (010 shop)
2. Medium & Small machine Shop (020 shop)
3. Reduction Gear Shop (030 shop)
4. Fabrication Shop (041-042 shop)
5. Machine Shop (043-044 shop)
6. Structural & Fabrication Shop (080 shop)
7. Heat Treatment Shop (050)
8. Tool manufacturing shop
9. Mechanical Repair shop
10. Electrical Repair shop
11. Card Repair Shop
12. Mechanical test laboratory
13. Box making and packing shop

The Above units are Supported by the Following Common Departments

1. Design & Product Development
2. Process & Technology (engineering, machining, welding, assembly, special tools including jigs & fixtures)
3. Marketing function along with field service team
4. Materials Management department including the function of Procurement of material, Material Planning and indenting department.(MM)
5. Ancillary & Trade department (ACD)
6. Production Planning and Control
7. Centralized maintenance
8. Finance and Pay Roll
9. Personnel & Administration Department (HRD & IR)
10. Canteen
11. First Aid
12. Training cell
13. Inspection & quality Assurance
14. Industrial Engineering Department
15. Central Transport service
16. Shipping & Movement Department
17. Power supply
18. Safety department

Brief History of Heavy Engineering Corporation Ltd

The HEC LTD has been established in the year 1958 to serve the nation in greater interest. Pandit Nehru, prime minister, dreamed to make India self reliant in every respect, especially in industrial arena. To exploit the rich resources of minerals, indigenous industry has a vital role. It is worth to mention that, at that time the index of development of a country was considered and measured on the basis of steel consumption per capita. Our five year plan put emphasis on establishing steel plants. This idea gave birth to HEC LTD, the mother of steel plants. Mainly HEC LTD was designed to manufacture equipments, machinery and other capital goods for steel plants. Later on HEC LTD diversified over to produce variety of products for mining industries, cement plant, power plant, nuclear plant, space industry, railway etc.

At present HEC LTD employs about 2700 regular employees with about 5000 contract workmen and also provides a good township, hospital and other civic amenities.

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HEC LTD comprises three major manufacturing units with one project division. Heavy Machine Building Plant (HMBP), Foundry and Forge Plant (FFP), and Heavy Machine Tool Plant (HMTP) and Project Division.

HMBP

Builds machine and equipments for steel plant and other industries. Its products are for Blast Furnace equipments, Steel Melting equipments like Hot Metal ladle, Continuous casting machinery, rolling mill equipment, Sintering plant equipment, Coke oven equipments like Coke pusher (recently HEC LTD has registered patent for self designed Coke pusher for Durgapur Steel Plant), Coke quenching car, Wagon pusher, Gas cooler, Wagon tippler, etc.

Facilities

1. Induction Arc furnaces
2. Gas fired furnaces
3. 6000T press for forging
4. 2650T press (modernized) for forging.
5. Stress relieving furnace 3.5x6x1.2 m
6. Gas plant based on coal fuel.

HMTP

Heavy Machine Tool Plant manufacturer of machine tools, convectional as well as CNC. It manufactures Lathe, drilling machine, V.T.B, H.T.B, Lathe for railway, Dip drilling machine for army.

Project Division

Project Division is a wing which execute turnkey projects like coal washary, cold rolling mill, coal handling plant etc.

Steel plants of India Bhilai, Rourkela, Vishakhapatnam, Burnpur and Durgapur are the main user of HEC LTD products. Bokaro Steel Plant has totally been supplied all equipments and machinery by HEC LTD. CIL, CCL, BCCL, NCL, MNCL etc are the coal companies that utilize Shovels (Excavators) and Dragline supplied by HEC LTD.

HEC LTD has collaborated with foreign companies for advance technologies in different fields of engineering and manufacturing. Germany, Russia, Czechoslovakia etc are the main collaborators among others.

Production-A Brief Record

EOT Cranes: It is the only plant which manufactures EOT Cranes of big span and capacity. EOT Crane of 44m span has been manufactured and capacity upto 400T for ISRO has been successfully commissioned. TOWER Crane (self designed for Rocket Launching station Sri Hari Kota), Gantry Crane, Grab Bucket Crane etc have been its regular products.

Mining industries: 5 Cubic meter and 10 Cubic meter Shovel, Dragline of bucket capacity 24 meter cube are the ace products for mining industry. Crushers of both type CONE as well as GYRATORY type are the product of coal, cement and steel industry.

Indian Space Research Organization: Mobile launching pedestal, Foldable cum vertical repositionable pedestal for rocket launching.

It exports to Bangladesh, Ukraine, and Russia etc. Special Machine tools in HMBP: For all sorts of machining and advanced fabrication facilities are available.

1. Lathe (biggest): Max OD- 2 Max Length- 16m

2. V.T.B: Height- 4.1m
Table Diameter- 8.6m
Max job diameter- 13m
Max weight of job- 200T
3. V.T.B: Height- 1.8m
Table Diameter- 5.6m
Max job diameter- 6m
Max weight of job- 50T
4. Lathe : Max OD- 4m
Max Length- 7m
Weight capacity- 25T
5. CNC Flame cutting machine: Max thickness of cut- 500mm
Length 25m width 6.5m
6. A number of CNC V.T.B, Milling and Lathe machines are in operation
7. Stress relieving furnace: 3.5x3.5x14 m
8. Heat treatment, Chrome plating, light forging, shot blasting, galvanizing facilities are in the plant.
9. Quality Control and Assurance department with well equipped laboratory for material testing for their mechanical, chemical and metallurgical properties.
10. R.P.D: Research and Product development division either Designing or engineering work is been done by the division.
11. And other sisters and auxiliary departments like maintenance, civil work division, Loco movement department, transport division etc.

Methodology and Application

Introduction

The term 'operation research' was coined in 1940 by McClosky AND Trefthen in a small town of Bawdsey In England. It is a science that came into existence in a military context. During world war II, the military management of UK called on scientist from various disciplines and organized them into team to assist it in solving strategic and tactical problems relating to air and land defense of the country. This new approach to the systematic and scientific study of the operations of the system was called Operations Research (OR), or operational research. Hence OR can be termed as 'an art of winning was without actually fighting it.'

Definitions

Operations Research has been defined in various ways and it is perhaps still too young to be defined in some authoritative way. There have not been any uniformly acceptable definitions of it as yet. Some prominent ones proposed thus far are given below. These have also been developing with the development of the subject.

Operations Research is a scientific method of providing executive departments with a quantitative basis for decision regarding the operations under their control.

Operations Research is the scientific method of providing executive with and analytical and objective basis for decisions.

Operations Research is a systematic method-oriented study of the basic structures, characteristics, functions and relationships of an organization to provide the executive with a sound, scientific and quantitative basis for decision making.

Operations Research is the scientific knowledge through interdisciplinary team effort for the

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purpose of determining the best utilization of limited resources.

The various definitions given above bring out the following essential characteristics of operations research.

1. System orientation
2. Use of interdisciplinary terms.
3. Application of scientific
4. Uncovering new problems.
5. Quantitative solutions
6. Human factors

Scope of Operations Research

There is a great scope for economist, statisticians and technicians working as a team to solve problems of defence by using the OR approach. Besides this, OR is useful in various other important fields. Like :

1. Agriculture
2. Finance
3. Industry
4. Marketing
5. Personnel Management
6. Production Management
7. Research and Development

Models in Operations Research

A model in OR is a simplified representation of an operation, or is a process in which only the basic aspects or the most important features of a typical problem under investigation are considered. The objective of a model is to identify significant factors and interrelationships. The reliability of the solution obtained from a model depends on the validity of the model representing of the real system.

A good model must possess the following characteristics:

1. It should be capable of taking into account, new formulation without having any change in its frame.
2. Assumption made in the model should be as few as possible.
3. Variables used in the model must be less in number ensuring that it is simple and coherent.
4. It should be open to parametric type of treatment.
5. It should not take much time in its construction for any problem.

Advantages of a Model

There are certain significant advantages of using a model. These are :

1. Problem under consideration becomes controllable through a model.
2. A model provides a logical and systematic approach to the problem.
3. A model clearly shows the limitations and scope of an activity.
4. It helps in finding useful tools that eliminate duplication of methods applied to solve problems.
5. It helps in finding solutions for research and improvement in a system.
6. It provides an economic description and explanation of wither the operation, or the systems it represents.

This chapter deals with a very interesting method called the 'assignment technique' which is applicable to a class of very practical problems generally called 'assignment problems.'

The objective of assignment problems is to assign a number of origins (jobs) to the equal number of

destinations (person) at a minimum cost or maximum profit.

Assignment Problem

Definition

Suppose there are n jobs to be performed and persons are available for doing these jobs. Assume that each person can do job at a time though with varying degrees of efficiency. Let C_{ij} be the cost if the i th person is assigned to the j th job. The problem is to find an assignment (which job should be assigned to which person, on a one to one basis) so that the total cost of performing all the jobs is minimum. Problems of this kind are known as assignment problems.

An assignment problem can be stated in the form of $n \times n$ cost matrix $[C_{ij}]$ of real numbers as given in the following table.

Hungarian Method Procedure

Solution of an assignment problem can be arrived at, by using **Hungarian method**. The step involving in this method are as follows:

Step 1-prepare a cost matrix. If the cost matrix is not a square matrix then add a dummy row (column) with zero cost element.

Step 2-subtract the minimum element in each row from all the respective rows.

Step 3-Further modify the resulting matrix by subtracting the minimum element of each column from all the elements of the respective columns. Thus, obtain the modified matrix.

Step 4-then, draw the minimum number of horizontal and vertical lines to cover all zeros in the resulting matrix. Let the minimum number of lines be N . now there are two possible cases.

Case I -If $N=n$, where n is the order of matrix, then an optimal assignment can be made. So make the assignment to get the required solution.

Case II-If $N < n$, then proceed to step 5.

Step 5-Determine the smallest uncovered element in the matrix (element not covered by N lines). Subtract the minimum element from all uncovered elements and add the same element at the intersection of horizontal and vertical lines. Thus, the second modified matrix is obtained.

Step 6-Repeat steps 3 and 4 until we get the case I of step 4.

Step 7-(To make zero assignment) Examine the rows successively until a row-wise exactly single zero is found. Circle (O) this zero to make the assignment. Then mark a cross (x) over all zeros if lying in the column of the circle zero, showing that they cannot be considered for further assignment. Continue in this manner until all the zeros have been examined. Repeat the same procedure for column also.

Computer Programming

- ```
1. #include<stdio.h>
2. #include<conio.h>
3. int hng[10][10],h[10][10],a[10][10];
4. main(){
5. int row,col,i,j,temp,r,c, res=0;
6. printf("Enter order of the matrix :");
7. scanf("%d", &row);
8. col=row;
9. if(row>10 || col>10){
10. printf("\nMEMORY OVERFLOW...\n\nPress any key to exit...");
```

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```
11. return 0;
12. }
13. printf("\nEnter the matrix :\n");
14. for(i=0;i<row;i++)
15. for(j=0;j<col;j++){
16. scanf("%d",&hng[i][j]);
17. h[i][j]=hng[i][j];
18. }
19. printf("\nThe initial square matrix is -");
```

## Result Analysis

The computer program was run for man power such as senior executive, Jr. Executive, Supervisor, Direct worker and indirect worker, deputed of machine shop and assembly shop

## Planning Prospective of Man Power

As discussed in the previous article 7.1, the optimal cost of assignment is coming minimum 2 units for machine shop and 3 units for assembly shop. These values are the optimal value for actual man power deployment to the work at different machine in machine and assembly shop. The number of officers and workers deputed on work according to table no. 6.2.1-21 to 25 are the optimal assignment value of man power and for assembly shop no of officers and workers deputed on work according to table no 6.2.2-68 to 73 are the optimal assignment value of man power. Which can be considered for the optimal long range planning of machine shop and assembly shop.

In this way, the other shops which are situated in HEC Ltd, such type of man power planning can be done by running the computer program and finding the optimal value of assignment cost and the whole of this result will be the proper planning prospective of HEC. Which will be much beneficial and profitable to the company.

## Conclusion

Manpower planning is the system which ensures availability of men in terms of quality and quantity as and when they are required over a period of time. They are organizations which have worked out their manpower requirements ranging from the period of the three years to ten to fifteen years. Manpower planning is the first and most important step to be taken with regard to the effective utilization human resources. We tend to give some attention to the planning required for financial resources, raising of funds, their mobilization, return on capital, etc.; but the human aspect is mostly taken for granted or neglected. Manpower planning is not like picking up a man from the road and putting him to do any job in the organization. It is required for any business activity in its simplest form or with all the technical complication involve in it. The system manpower planning would lead to better selection of people and effective job assignment, it would also enable management to review performance its employees like transfers, promotion, etc. it also helps in organizing proper training activities on the basis. While planning for the manpower requirements following need to be considered:

1. Retirement due: This helps in making provisions and planning for the replacement of people who are due to retire and this can be worked out very well in advance starting from the time range of one year to ten years.
2. New Jobs: This is required to provide new jobs which will be created because of growth, expansion

or new line of activity to be undertaken considering the market conditions, stages of the developing economy, etc.

Besides taking into consideration and b three are a no. of factors such as separation etc. which would make manpower planning very active. However without going into the technicalities of the process, it would be sufficient here to say that even if attempts are made to plan manpower requirements on the basis of a and b, it would increase the effectiveness of the management to a great extent.

Manpower would lead to classifications of jobs at different levels without which one cannot have any information about the quality of people and quantity of people required at different levels and in different job. This clarity can be achieved through the system of job description or otherwise known as position descriptions or management guide. It helps selecting proper men for the different jobs, it helps planning and training people for different jobs, it helps in case of transfers and promotion. Without job description, assessment of the performance of the employees becomes impossible.

## Suggestions

Organizations pass through various stage of growth.

The young organization starts with the creativity of an individual. As it expands, it gets into a crisis of leadership where professional manager is necessary in order to give it professional manager is necessary in order to give it proper direction. The crisis of leadership is solved by a professional management team and there is growth through positive direction.

At various stages of growth of the organization, its structure, its structure will have to change. The working relationships between line structures will also have to change. On this is this is superimposed the growing complexity of technology. A new or a more complex technology cannot be incorporated in disregard of human organization. There are instances of new and more sophisticated plants giving teaser output due to the human aspects having been neglected while installing them.

The human resources management has been one of the neglected subjects. We often find the project manager saying that when the plant is built he would think about staffing it. He could as well say that he would lock the barn door after the horse has bolted. Staffing is assumed, ignored or simply wished away. The organizational structure and interrelationships within them are as important as the technology of plant and machinery. Inventory of human resources, identification of future trends and aspirations of the employees, anti-identification of turn-over, phasing of recruitment over age groups in order to avoid a large number of employees of the same grade expecting avenues of promotion at the same time, planning for succession, making technical and managerial skills coexist and complement each other, the overall manpower planning, organization of executive development programs, etc., are very important functions from which the personnel manager cannot afford to abdicate any more

To forecast and plan for human resources reasonably well, we need to know the characteristics of the job and the demands they make of man-qualities at

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both the position to be filled by a new incumbent and the position from where he would be displaced.

Manpower planning in India is facing challenges of a different order today that it faced during the last twenty years. The acute shortage of different categories job manpower which characterized the labor market during the first and second plan and to a lesser extent during the third plan, have vanished to a large extent. In many categories, as for example engineers and agricultural scientist, the current supply is in excess of the capacity of the economy to absorb the available supply. Therefore, this new set of conditions should dictate a new set of priority to the manpower planners in India.

Another characteristic of manpower planning, especially of the estimates of the demand and supply, was that the end products were global estimate. With the uneven development of various reasons, the increasing demand of economic autonomy of states, the increasing immobility of labor due to the resistance to 'outsiders', there is greater need for studies of different reasons as well as different industrial sectors.

Still one more shortcoming that needs to be remedied is that the manpower planning was concentrated mainly on high level manpower like graduates, engineers, doctors, scientists, etc.

Apart from forecasting demands and supply manpower planners must bestow their attention on the utilization of personnel already in the labor force. It is for management to identify the quantitative and qualitative aspects of underutilization and the factors which stand in the way of optimum utilization.

Manpower forecasting which highlights critical shortage of important skills helps management in avoiding disruption of production programs and underutilization of plant capacity by timely corrective action. Manpower forecast help the management in drawing up appropriate training and retraining programmers.

Labor costs usually account for between one fourth and two fifth of the cost of production, and also an important component of the selling cost. Control of labor cost is therefore crucial for increasing the competitive ability and profitability for business enterprises

As a preliminary to detailed man per planning, the objectives of business enterprise for the duration of the plan period have to clearly specified. The objective may be expressed in terms of the goods and services to be produced and sold, sells volume in absolute terms, or as a share of total market sells,

If manpower forecasting has to provide dependable guidelines for employee recruitment development programs, it is necessary to estimate that wastage that is likely to occur during the period for which forecasts are made.

As future manpower requirements as directly related to the business objectives of the enterprise, the objectives should be clearly specified in terms of the products or services to be produced and the share of the market catered to.

Manpower forecasting can be done by various methods. I would only briefly mention them as I feel it unnecessary to go into details. It can be based on the executive judgment. This method is appropriate only when they are meant for a short term when others

methods cannot be used and when the organization is of a smaller size.

If the existing manpower appears to be surplus to planned activity of the enterprise, alternative ways of using the employees in the organization have to be devised.

## Scope for Future Work

Manpower involves both employers and employees and manpower management refers to direction and control of people in employment situations.

As Yoder, Heneman, Turnbull and Stone observe, manpower management involves procedures through which human resources are organized and directed towards the attainment of organizational, individual and social goals. It makes the best possible utilization dual and human resources. It does not merely mean managing of ran-and-file employees or management of unionized 'labor' as is implied the term of 'about' management' but also involves management of higher personnel and non-unionized labor. Moreover, it does not merely related to the management of employees as individuals as is implied by the term 'personnel management' but also involves the employer's relation with groups of employees, i.e., collective bargaining as is implied by the terms "labor relations" thus, the term 'manpower management; includes both personnel management and labor relations.

The manpower management has been discussed in this thesis only taking a case study of Heavy Engineering Corporation (HEC) Ltd., Ranchi in which the manpower planning has been done only two shops i.e. machine shop and assembly shop of the HEC. In these two shops at their four bay the manpower has been assigned to have the minimum assignment cost. So at this stage of minimum assignment cost, the different officers and workers deployed a shop will produce the high profit in minimum labor cost. This can also be found out at different shops of the HEC by the running the computer program in different cases. It has been observed that it is highly useful in HEC and thus there methodology can be used at different sectors of the industries whether private of government. By the use of such method it will be very much beneficial to different industries and for each of the industry a optimal manpower planning can be done for the other industries.

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