

Lesson: 7

Human Resource Planning: Process, Methods, and Techniques

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Article on HRP

We have already touched on this earlier in the first lesson. All expert agree on one thing that there is no fixed or standard procedure as such, but a general outline that has to be kept in mind while planning for human resources.

Keith Davis has rightly pointed out, “*An organization should identify their short-run and long-run employee needs examining their corporate strategies*”. This statement helps us understand that one should always adopt a situational approach to be more effective. Another most important conclusion (that I keep insisting!!) is that *it is the corporate strategies and objectives that set a planning horizon*.

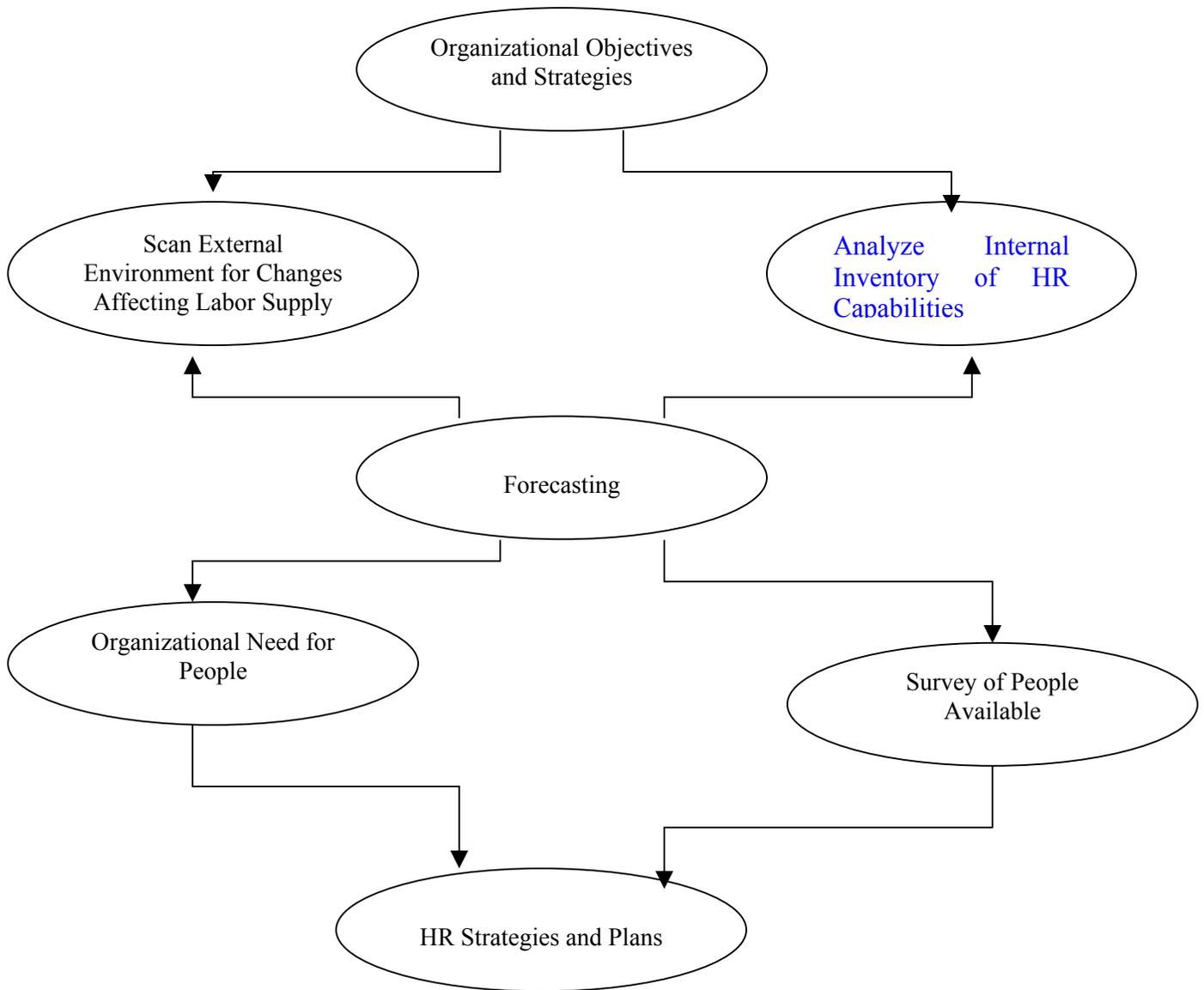
You as the student at the end of the lesson, should be able to:

- a. Discuss the reasons for formal human resource planning.
- b. Describe the steps involved in the HR planning process (as discussed in class). Understand what goes into each step of the planning process.
- c. Recognize the methods available for forecasting demand for human resources.
- d. Describe the options available for follow-up action. Understand when each option is appropriate.

Managers follow a systematic process or a model when planning for HR. the

following figure will illustrate the same.

FIGURE HR Planning Process



You will notice that the process is familiar to you. We have already touched on this when doing lesson 2. The process of the HR planning begins with considering the organizational objectives and strategies. Then both external and internal assessments of HR needs and supply sources must be done and forecasts developed. Key to assessing internal human resources is having solid information, which is accessible through a human resource information system (HRIS).

Once the assessments are complete, forecasts must be developed to identify the mismatch between HR supply and HR demand. HR strategies and plans to address the imbalance, both short and long term, must be developed.

Before we outline the broad step in HRP, it is thus important to view the various kinds of plans that one can construct which tend to put a boundary on the exact steps to taken. For instance, an organization can have:

- *Company level plan*
- *Departmental level plan*
- *Job level*

This is in contrast to the

- *National level plan*
- *Sectorial level plan*
- *Industry level plan*, which are handled by the respective governments of the country. These last three plans provide an environmental constrain on the first three if you go by environmental factors we discussed in the earlier lesson. Similarly one has long-range plans and short range plans. The long range plans go side by side with the corporate strategic planning, such as planning for five-ten years hence; whereas the short range plans point out job openings must be filled over a one-year time frame.

Activity: Please give an example of each of the plans relating to anyone organization you are familiar with.

That is, company level plan, departmental level plan, job level in relation to the relevant national level plan (for example, the 8th year plan), sectorial level plan and industry level plan

The key to success is to blend both the practices that work within the company culture and the realities of business. It is rather a continuous process with provision for control and review. *Remember lesson six!!!* And yes! HR planning will be different for a small and entrepreneurial organization as compared to a well established one. This would be clear if you refer the last lesson, especially *the life stages of an organization*.

Another important question that comes to mind is who is **responsible for this process**.

Top-level executives are responsible for manpower planning, as it is one of the important factors influencing the success of an organization. The plans are usually prepared by the Human Resource Division in consultation with other corporate heads. The responsibility

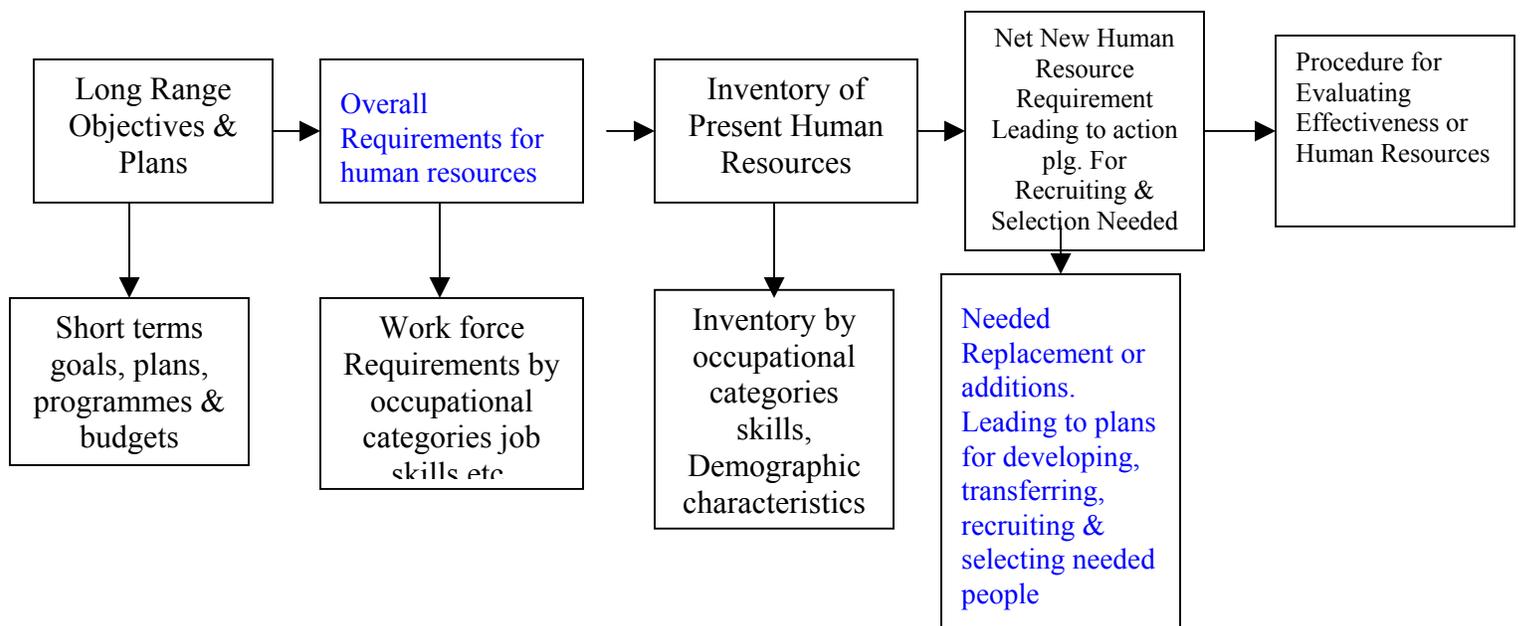
and accountability for manpower aspects of various divisions is on their respective heads. They should undertake their own appraisals of future needs in such a way as to provide a concrete basis for organization-wide forecasting and planning. The Human Resource Division must offer counsel and advice to various divisional heads and coordinate the various manpower estimates from time to time. Prof. Geisler outlined the responsibilities of Human Resource Department in respect of manpower planning thus:

- Assist and counsel operating managers to plan and set objectives.
- Collect and summarise manpower data keeping long-run objectives and broad organizational interests in mind.
- Monitor and measure performance against the plan and keep top management informed about it.
- Provide proper research base for effective manpower and organizational planning.

Thus, *the three key elements of the process are*

- *Forecasting the demand for labor,*
- *Performing a supply analysis, and*
- *Balancing supply and demand considerations.*

A careful attention given to each step is beneficial to top managers and supervisors to meet their staffing requirements. Each of these elements can be blended with the overall process in the following manner:



Once the corporate strategy and objectives are clear, estimates of demand and supply can be made with the help of certain approaches and methods. When each projection is formulated, the difference between them is determined. This difference is termed as known as **Manpower gap**. *The whole purpose behind human resources planning is to close this gap!!* There are different strategies which we will discuss later in this lesson only which result in filling the manpower gap.

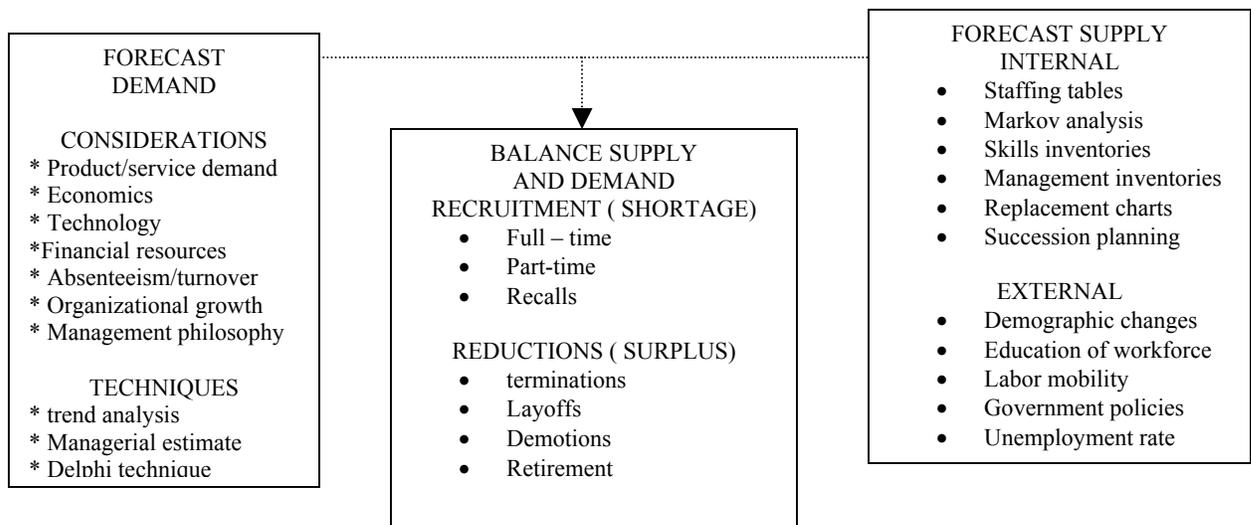
One thing, which you should consider before beginning the process of forecasting: Always decide on

- a. The **approach** of how the estimation are to be based- qualitative or quantitative,
- b. Basic **factors** to be considered, whether we are projecting wastage or redundancy or labor costs or absenteeism or labor turnover,
- c. **Frequency** of the forecasting exercise (that is, dealing with: rate of changes and matching estimations), and finally,
- d. Specific **techniques** to be adopted (this depends upon the approach adopted) such as time series analysis, Markov analysis, probability techniques, work load analysis, work study analysis, job analysis etc.

The moment you have decided upon these parameters, and then it's a smooth sail to towards demand and supply forecasting!!! *And, yes! Good news for you -this is an introductory course, you only need to know about the approaches -qualitative or quantitative, and the techniques used.*

Let us now discuss each element separately. In each part we will cover the following:

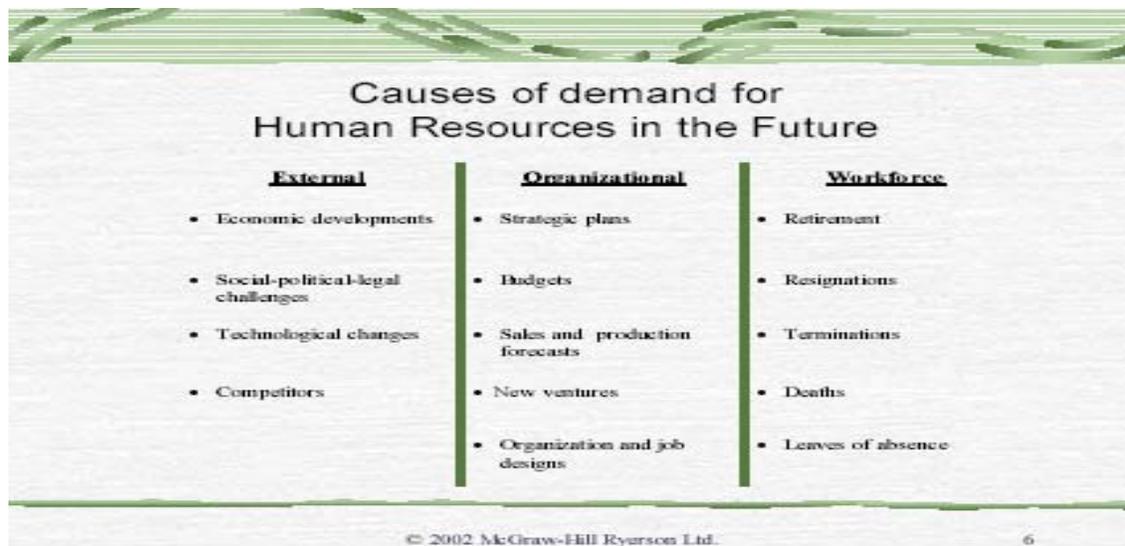
Human Resources Planning Model



Forecasting demand

A key component of HRP is forecasting the number and type of people needed to meet organizational objectives. Since it's an open system that we exist in, a variety of organizational factors, including competitive strategy, technology, structure, and productivity can influence the demand for labor. For example, utilization of advanced technology is generally accompanied by less demand for low-skilled workers and more demand for knowledge workers.

Let us consider few of the main factors, which can help us forecast demand of human resources in an organization. We can easily categories the factors in *three different sources* that can be viewed clearly from the following slide.



1. External environmental challenges: These challenges arise from three important sources *Economic developments, Political, legal, social and technical changes, and the Competition*. For example, liberalization, opening up of banking sector, capital market reforms, the on-line trading systems have created huge demand for finance professionals during 1990-1995 in India. The demand for certain categories of employees and skill is also influenced by changes in political, legal and social structure in an economy. Likewise, firms employing latest technology in construction, power, automobiles, software etc., have greatly enhanced the worth of technicians and engineers during the last couple of years. Technology, however, is a double-edged weapon and hence, its impact on HR plans is difficult to predict. For example, computerization programs in Banks, Railways, Post and Telegraph Departments may reduce demand in one department (book keeping, for example) while increasing it in another (such as computer

operations). High technology with all its attendant benefits may compel organizations to go lean and downsize workforce suddenly. Employment planning under such situations becomes complicated.

External factors such as business cycles-economic and seasonal trends-can also play a role. The Internal Revenue Service, for example, relies heavily on temporary employees between January and April when tax returns are received for processing.

Forecasting is frequently viewed more as an art than a science, providing inexact approximations rather than absolute results. The ever-changing environment in which an organization operates contributes to this problem.

Companies operating in fields where a large number of players are bent upon cutting each other's throat (with a view to enhance their market shares) often reduce their workforce. Competition is beneficial to customers but suicidal for companies operating on thin margins. Such companies have necessarily gone 'lean' by reducing their workforce (e.g., Wipro, GE, TISCO etc.) On the other hand, companies that are doing well and progressing smoothly (e.g., Infosys Technologies, Proctor & Gamble, CIPLA, etc) will always look for people with critical skills.

- b. **Organizational decisions:** HR planning needs to take into account the rest of the organization's strategic plans, sales and production forecasts and new ventures to be more accurate. The reason??? 'Cause it's an open system!!

For example, estimating changes in product or service demand is a basic forecasting concern, as is anticipating changes in national or regional economics. This enables the planning expert to forecast the requisite production schedules and thereby estimate whether any extra workforce is needed in future.

A community hospital can anticipate internal changes in technology, organization, or administration to forecast staffing needs, like Max health care is right now into setting up operations at Gurgaon near Delhi. But then these are workable only if they are within the organization's financial resources

I came across another example for so that you get the point clearly!! If Britannia Industries Ltd. Expects higher demand for biscuits and bread, the long-term HR plan must take this into consideration. Likewise, if it tries to venture into other lucrative fields such as milk-based products, confectionary items the demand for people

possessing requisite skills in those areas in the next couple of years should be looked into carefully.

Furthermore, where plans are changed, the effect of the changes must be estimated. Proposed expansion, contraction or diversification of the organization's activities will obviously affect the demand for labor in general or for particular skills. This may be estimated by market research, competitive analysis, trends in technological advances and so on, (although sudden changes in market conditions complicate the process: for instance, the effect of the collapse of the Soviet Union on defense spending, whereby labor demand in the short term were low: downsizing of staffs and delayering of organization structures were the trend.

c. Workforce factors: Demand is not only influenced by the above factors but by the internal in and out fluxes of the employees through retirements, terminations, resignations, deaths and leaves of absence, etc. These actions by employees become fairly predictable, once you spend more and more time with the organization or a certain industry. The above factors will affect how much labor will be required, given the expected productivity or work rate of different types of employee and the expected volume of business activity. Note that productivity will also depend on capital expenditure, technology, work organization, employee motivation and skills, negotiated productivity deals and a number of other factors.

Thus, the cost of existing labor - including overtime, training, benefits and so on, will put a financial constraint on the organization's manpower levels.

Refurbishing Activity:

Think of as many occupations as you can that are currently in short supply in the job marketplace (and therefore in great demand). Then do a quick analysis of why are they in demand. Similarly, list out occupations where the supply is greater than the demand and find the reasons behind the low demand.

approaches to forecasting can employ sophisticated analytical models, although forecasting may be as informal as having one person who knows the organization anticipate future HR requirements. Organizational demands will ultimately determine which technique is used. Regardless of the method, however, forecasting should not be neglected, even in relatively small organizations.

Quantitative Approaches

Quantitative approaches to forecasting involve the use of statistical or mathematical techniques; they are the approaches used by theoreticians and professional planners.

One example is *trend analysis*, which forecasts employment requirements on the basis of some organizational index and is one of the most commonly used approaches for projecting HR demand.

Forecasting Human Resource Needs

Trend

- Extrapolation
- Indexation
- Statistical analysis

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Following several steps typically does trend analysis:

First, select an appropriate business factor. This should be the best available predictor of human resources needs. Frequently, sales or value added (selling price minus costs of materials and supplies) is used as a predictor in trend analysis. **Second**, plot a historical trend of the business factor in relation to number of employees. The ratio of employees to the business factor will provide a labor productivity ratio (for example, sales per employee). **Third**, compare the productivity ratio for at least the past five years. Fourth, calculate human resources demand by dividing the business factor by the productivity ratio. **Finally**, project human resources demand out to the target year. *Remember your business economics classes???* Apply the all of its knowledge here. ***It's an Opportunity!!***

Other, more sophisticated statistical planning methods include *modeling or multiple predictive techniques*. Several mathematical models, with the aid of computers are

also used to forecast HR needs, e.g., optimization models, budget and planning analysis.

Forecasting Human Resource Needs

Other

- Budget and planning analysis
- New-venture analysis
- Computer models



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Whereas trend analysis relies on a single factor (e.g., sales) to predict employment needs, the more advanced methods combine several factors, such as interest rates, gross national product, disposable income, and sales, to predict employment levels. While the costs of developing these forecasting methods used to be quite high, advances in technology and computer software have made rather sophisticated forecasting more affordable to even small businesses.

Qualitative Approaches

In contrast to quantitative approaches, qualitative approaches to forecasting are less statistical, attempting to reconcile the interests, abilities, and aspirations of individual employees with the current and future staffing needs of an organization. In both large and small organizations, HR planners may rely on experts who assist in preparing forecasts to anticipate staffing requirements. For example, *Expert forecasts*: In this method, managers estimate future human resource requirements, their experiences and judgments to good effect.

Forecasting Human Resource Needs

Expert

- Informal and instant decisions
- Formal expert survey
- Delphi technique



Management forecasts are the opinions (judgments) of supervisors, department managers, experts, or others knowledgeable about the organization's future employment needs. For example, at the Ripe Tomato, a growing family dining chain, each restaurant manager is responsible for employment forecasts.

Another qualitative forecasting method, the *Delphi technique*, attempts to decrease the subjectivity of forecasts by involving a group of pre-selected individual and soliciting and summarizing the judgments. Thus a group decision-making process is invoked which in turn, requires a great deal of process orientation to enhance coordination and cooperation for satisfactory forecasts. This method works best in situation where dynamic technological changes affect staffing levels.

Ideally, HRP should include the use of both quantitative and qualitative approaches. In combination, the two approaches serve to complement each other, thus providing a more complete forecast by bringing together the contributions of both theoreticians and practitioners.

Whatever technique one might utilize, they need to be done systematically!! HR planners many times go further and analyze the demand on the basis of the following:

- a. *Workforce analysis* to determine the rate of influx and outflow of employee. It is through this analysis one can calculate the **labor turnover rate**, **absenteeism rate**, etc. Qualitative methods go a long way in analyzing the internal flow

created by promotions, transfers etc.

b. Workload analysis, with which one can calculate the numbers of persons required for various jobs with reference to a planned output. This takes into consideration factors such as absenteeism, and idle time, etc. Both quantitative and qualitative techniques are utilized for accurate results.

c. Job analysis: Job analysis helps in finding out the abilities or skills required to do the jobs efficiently. A detailed study of jobs is usually made to identify the qualifications and experience required for them. Job analysis includes two things: job description and job specification. Job description, thus, is a factual statement of the duties and responsibilities of a specific job. It gives an indication of what is to be done, how it is to be done and why it is to be done. Job specification provides information on the human attributes in terms of education, skills, aptitudes and experience necessary to perform a job effectively. This you will learn more in the coming lessons.

Hope our above discussion on demand/need forecasting is clear to you all. If yes, then lets discuss the second most important element in HRP process- supply forecasting and analysis.

Forecasting Supply

Once an organization has forecast its future requirements for employees, it then goes on to the next search that is from where can it fulfill its requirements. It therefore needs to determine if there are sufficient numbers and types *of* employees and how many are eligible for the plausible positions. Supply analysis thus, involves planning for procurement: who, from where, how and when of recruitment. It scans the internal and external environment for the best-fit candidate for the positions in question. Thus, there are two source of supply- internal and external.

Internal sources: The most popular approach to be followed by all managers is to look within the organization among its cadre first. Until and unless the opening is not related to immensely diversified field of which the existing workforce might not possess requisite skills, and the cost of training may be working out to be high, it is easier to go in for an internal source for recruitment. Because it is cost saving in many ways to utilize what is already available to the organization.

A profile of employee in terms of age, sex, education, training, experience, job level, past performance and future potential is continuously maintained for use whenever required. Thus, if the requirements in terms of growth/diversification, internal movements of employees (transfer, promotions, retirement, etc.) are determined in

advance then the data can be very useful.

But while provisioning for the above corporate movements, one must keep an eye on the internal movement, such as, attrition, absenteeism, promotion, etc of the workforce as we have discussed earlier, through the workforce analysis. In addition to workforce analysis, the organization needs to maintain replacement charts or succession plans. Regular manpower audits are the best option to keep track of the available talent in terms of skills, performance and potential.

The supply of Human Resource

Internal Supply Estimates

- Human resource audits
- Replacement charts
- Markov analysis

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An internal supply analysis is done with

1. **Staffing tables/manning charts**, which are pictorial representations of all organizational jobs, along with the numbers of employees currently occupying those jobs and future employment requirements.
2. **Markov analysis**, which shows the percentage (and actual number) of employees who remain in each job from one year to the next, thus keeping track of the pattern of employee movements through various jobs. Thus this analysis results in a composite matrix of supply.
3. **Skill inventories** that list each employee's education, past work experience, etc.
4. **Replacement chart** that helps us derive the profile of job holders, department-wise and reveals those who could be used as replacements whenever the need arises.

External sources: It is only when the cost of procuring the labour from internal sources is more and also the present staff cannot be spared for the future assignment, the company can refer to the external market. For this, they need to keep themselves updated

regularly on what is available now, what will be available later. Whether the skills required in future will be easily available or certain training, for instance need to be incorporated. For example, a company in the present scenario wanting to start its BPO operations in India may not have problem which a company 10 years back would have faced, as there are ample requisite skills available in the market. Not only skilled labor but also they are motivated to join such company for fast earnings. Thus, HR planners need to keep themselves abreast of the Labor market conditions such as local employment, trends of relevant categories of employees, competition for such skills, availability of part time labour, migration trends of labor, etc.

Application Learning: Develop a chart of all possible movements of workforce in an organization. What do you see?

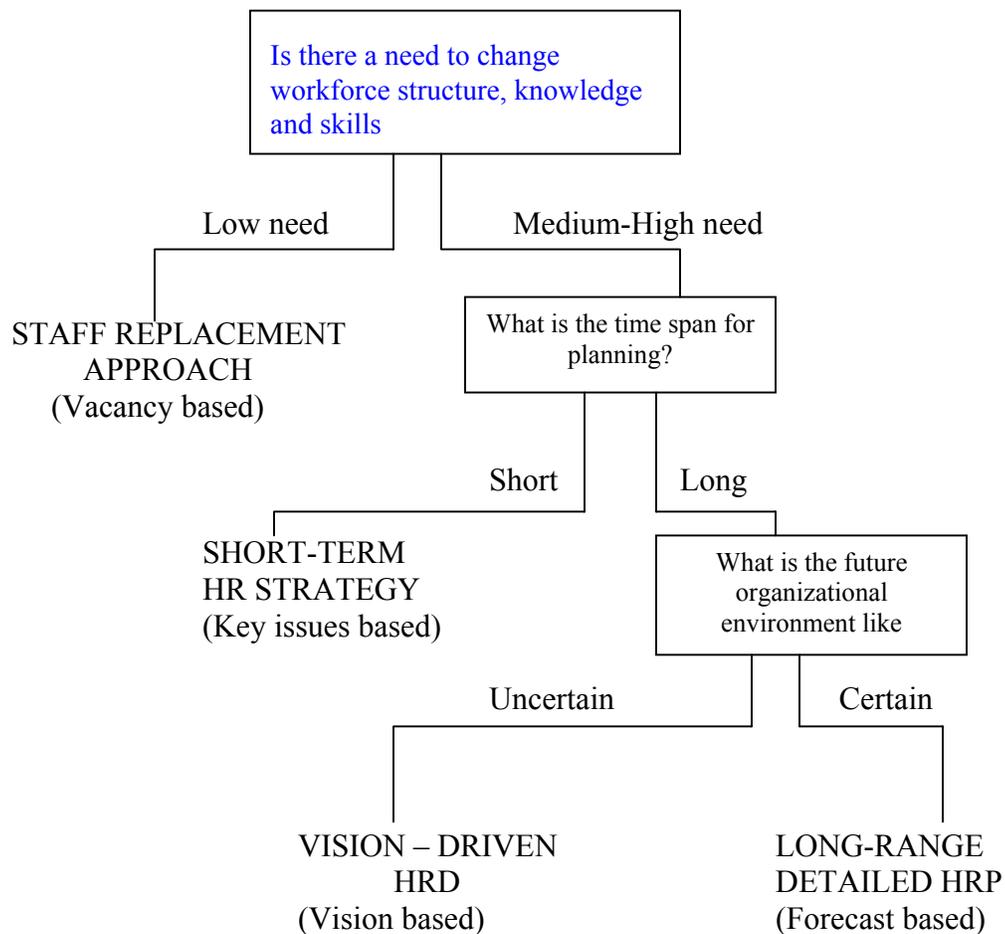
Therefore to summarize what information should be available for a comprehensive the supply forecast and analysis?

1. The *skill base*, potential *trainability* and current and potential *productivity* level of the existing work force.
2. The *structure* of the existing workforce in terms of age distribution, skills, hours of work, rates of pay and so on.
3. The possible *changes* in the productivity, size and structure of the workforce due to resignations and retirements, promotions and transfers, absenteeism and other external factors (economic and cultural), which may induce such changes.
4. The *availability* of the relevant skills in the external labor market for present and future use. The HR planner will have to assess and monitor factors such as: market value, image/preference of the existing labor for the company, motivation of the prospective candidates to join the company.

Determining Manpower Gaps

The final stage is to balance out the demand and supply gap. The closer the gap the better it is for the company when it actually goes into procuring. Now you will see how we can utilize the data we have collected in the last two stages.

A comparison chart can be developed to find what is available and to what extent it can fulfill the demand forecast. This exercise helps us have an idea of the quantitative and qualitative gaps in the workforce. A reconciliation of demand and supply forecasts will give us the number of people to be recruited or made redundant as the case may be. This forms the basis for preparing the **manpower plan**



Managing Oversupply

- Hiring freeze
- Early retirement offers
- Job sharing
- Use of part-time workers
- Internal transfers



In this process a company always needs to keep repeating this step as it operates in a changing environment. Changes in product mix, union agreements, and competitive action are some of the important things that need special attention. The human resource requirements thus identified are translated into a concrete manpower plan, backed up by detailed policies, and other human resources instruments and strategies (for example, recruitment, selection, training, promotion, retirement, replacement, etc.).

The manpower plan is further divided into the following resultant operational plans.

- **Recruitment plan** to show how many and what type of people is required and when they are needed;
- **Redeployment plan** to help chart out the future movement in terms of training and transfers.
- **Redundancy plan** will indicate who is redundant, when and where; the plans for retraining, where this is possible; and plans for golden handshake, retrenchment, lay-off, etc.
- **Training plan** to chart out if a training is required. If yes, when and to which level; whether it will be done in-house, done in phases or included as part of a formal induction program. This includes the cost and benefit analysis of all the options available.
- **Productivity plan:** Will indicate reasons for employee productivity or reducing employees costs through work simplification studies, mechanization, productivity bargaining, incentives and profit sharing schemes, job redesign, etc.
- **Retention plan:** Will indicate reasons for employee turnover and show strategies to avoid wastage through compensation policies, changes in work requirements and improvement in working conditions.

- **Check/reviews points:** The success of the entire exercise is dependent upon frequent reviews so that none of the factors are left out and changes are constantly taken care of. The important thing is to clearly demarcate point for periodical checks to incorporate deficiencies and periodic updating of manpower inventory based on training and performance reviews, in the light of changing circumstances.

Barriers to HRP:

Planners face significant barriers while formulating an HRP. The major ones are the following:

1. People question the importance of making HR practices future oriented and the role assigned to HR practitioners in formulation of organizational strategies. Their argument is simple-there are people when needed. Offer attractive package of benefits to them to quit when you find them in surplus.



Overcoming Employee Shortages

- Overtime
- Part-time workers
- Temporary employment agencies
- Transfers
- Contract workers
- Promotions
- Full-time employees



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Managing Oversupply

- Layoffs
- Leave without pay
- Loaning
- Termination
- Outplacement



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2. HR practitioners are perceived as experts in handling personnel matter, but are not experts in managing business. The personnel plan conceived and formulated by the HR practitioners when enmeshed with organisational plan, might make the overall strategic plan itself defective.
3. HR information often is incompatible with the information used in strategy formulation. Strategic planning efforts have long been oriented towards financial forecasting often to the exclusion of other types of information.
4. Conflicting may exist between short-term and long-term HR needs. For example, there arises a conflict between the pressure to get work done on time and long-term needs, such as preparing people for assuming greater responsibilities. Many managers are of the belief that HR needs can be met immediately because skills are available on the market as long as wages and salaries are competitive. These managers fail to recognize that by resorting to hiring or promoting depending on short-term needs alone, long-term issues are neglected.
5. There is conflict between quantitative and qualitative approach to HRP. Some people view HRP as a number game designed to track the flow of people across the departments. These people a strictly quantitative approach to planning. Others take a qualitative approach and focus on individual employee concerns such as promotabilty and career development. Best results would accrue if there is a balance between the quantitative and qualitative approaches.
6. Non-involvement of operating managers renders HRP ineffective. HRP is not strictly an Hr department function. Successful planning needs a co-ordinated effort on the part of operating managers and HR personnel.

Appendix:

Human Resources Information systems

Let us take up the latest in the HRP, that is HRIS. You must have already done this in information systems. These are a must if any organisation wants to be ahead in today's world.

The human resource information system (HRIS) is a systematic procedure for collecting, storing, maintaining retrieving and validation data needed by an organization about its human resources. The HRIS is usually a part of the organization's larger management information system (MIS). The HRIS need not be complex or even computerized. But

computerization has its own advantage of providing more accurate and timely data for decision making.

The areas of application of HRIS are many. Some of them include training management, risk management and legal requirements, attendance reporting and analysis, HRP, accident reporting and prevention, strategy planning, financial planning and other related areas.

Steps in implementing an HRIS:

As with any major change, proper planning is an absolute necessity for successful implementation of an HRIS. The steps outlined below describe the specific procedures involved in successfully developing and implementing an HRIS.

Step 1:Inception of idea: The idea having an HRIS must originate somewhere. The originator of the idea should prepare a preliminary report showing the need for an HRIS and what it can do for the organizations.

Step 2: Feasibility study: Feasibility study evaluates the present system and details the benefits of an HRIS. It evaluates the cost and benefits of an HRIS.

Step 3: Selecting a project team: Once the feasibility study has been accepted and the resources allocated project team should be selected. The project team should consist of an HR representatives from both management information systems and payroll.

Step 4: Defining the requirements: A statement of requirements specifies in detail exactly what the HRIS will do. A large part of the statement of requirements normally deals with the details of the reports that will be produced. Naturally, the statement also describes other specific requirements. This typically includes written descriptions of how users collect and prepare data, obtain approvals, complete forms, retrieve data, and perform other non-technical tasks associated with HRIS use. The key is here is to make sure that the mission of the HRIS truly matches management's needs for an HRIS.

Step 5: Vendor analysis: This step determines what hardware and software are available that will best meet the organisation's needs for the lowest price. This is a difficult task. The best approach is usually not to ask vendors if a particular package can meet the organization's requirements but how it will meet the organisation's requirements but how it will meet those requirements.

Step 6: Package contract negotiation: After a vendor has been selected, the contract must be negotiated, the contract stipulates the vendor's responsibilities with regards to software installation, service, maintenance, training, and documentation.

Step7: Training: Training usually begins as soon as possible after the contract has been signed. First the HR members of the project team are trained to use the HRIS. Towards the end of the implementation, the HR representative will train managers from other

departments in how to submit information to the HRIS and how to request information from it.

Step 8: Tailoring the system. This step involves making changes to the system to best fit the needs of the organization. A general rule of thumb is not to modify the vendor's package, because modifications frequently cause problems. An alternative approach is to develop programs that augment the vendor's program rather altering it.

Step 9: Collecting the data: Prior to start-up of the system, data must be collected and entered into the system.

Step 10: Testing the system: Once the system has been tailored to the organization's needs and the data entered, a period of testing follows. The purpose of the testing phase is to verify the output of the HRIS and to make sure it is doing what it is supposed to do.

Step 11: Starting up: Start-up begins when all the current actions are put into the system and reports are produced. It is wise to attempt start-up during a lull period so that maximum possible time can be devoted to HRIS. Even though the system has been tested, some additional errors often surface during start-up.

Step 12: Running in parallel: Even after the new HRIS has been tested, it is desirable to run the new system in parallel with the old system for a period of time. This allows for the comparison of outputs of both the system and examination of any inaccuracies.

Step 13: Maintenance: It normally takes several weeks or even months for the HR people to feel comfortable with the new system. During this stabilization period, any remaining errors and adjustments should be handled.

Step 14: Evaluation: After the HRIS has been in place for a reasonable length of time, the system should be evaluated. Is the HRIS right for the organisation and is it being properly used?

Following the above steps when implementing an HRIS will not guarantee success, but it will increase the probability.

HRIS is not just useful in human resources planning. Its uses extend to the whole gamut of HRM.

Manpower Inventories: These include such data as:

- Work history
- Strengths
- Weaknesses-identification of specific training programmes needed to remove the weaknesses
- Promotion potential
- Career goals
- Personal data

- Number and types of employees supervised
- Total budget managed
- Previous management duties

Inventories of human resources are generally computerized and updated periodically. Updating is done at least once in two years. Before updating, employees are encouraged to report major changes, if any, in their careers-such as acquisition of new skills, completion of university degrees, changed duties, seminars attended, papers published, and the like.

Internal supply:

Armed with HR audits, Planners can proceed with the analysis of internal supply. The techniques generally used for the purpose are (i) inflows and outflows, (ii) conditions of work and absenteeism, (iv) productivity level, and (v) movement among jobs.

External Supply: In addition to internal supply, the organization needs to look out for prospective employees from external sources. External sources are important for specific reasons: (1) new blood and new experience will be available (2) organization needs to replenish lost personnel, and (3) organizational growth and diversification create the needs to use external sources to obtain additional number and type of employees.

Sources of external supply vary from industry to industry, organization to organisation, and also from one geographical location to another. Some organisations have found that their best source of further employees is colleges and universities, while others achieve excellent results from consultants, competitors or unsolicited applications.

HR programming: Once the organisation's personnel demand and supply are forecast, the two must be reconciled for balanced in order that vacancies can be filled by the right employees at the right time. HR programming, the third step in the planning process, therefore, assumes greater importance.

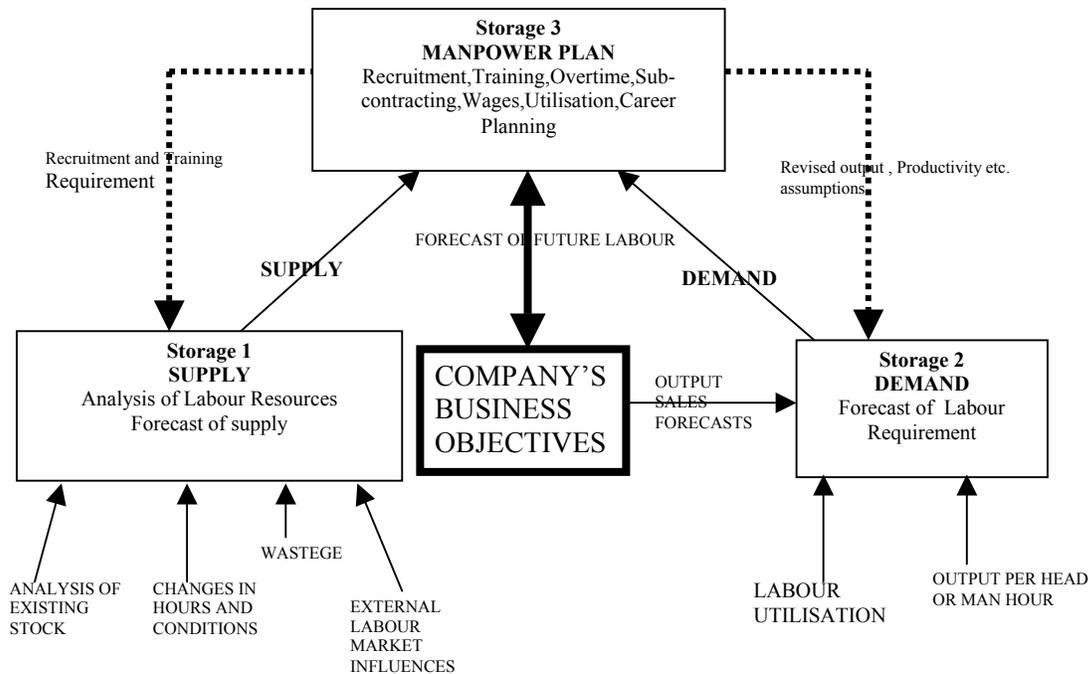
HR Plan Implementation: Implementation requires converting an HR plan into action. A series of action programmes are initiated as a part of HR plan implementation. Some such programmes are recruitment, selection and placement; training and development; retraining and redeployment; the retention plan; the redundancy plan; and the succession plan. All these actions will be covered in detail in subsequent chapters.

Control and Evaluation: Control and evaluation represents the fifth and the final phase in the HRP process. The HR plan should include budgets, targets and standards. It should also clarify responsibilities for implementation and control, and establish reporting procedures, which will enable achievements to be monitored against the plan.

Extra reading:

MANPOWER FORECASTING: TOOLS & TECHNIQUES

By Dr. Alope K Sen



Diagrammatic presentation of manpower planning

Demand Forecasting:

Demand forecasting is the process of estimating the future quantity and quality of manpower requirement. Knowledge of the present situation on manpower requirement is essential if a satisfactory forecast is to be made. The basis of the manpower forecast should be the annual budget and long term corporate plan, translated into activity levels for each function and department. In a manufacturing company, the sales budget would be translated into a manufacturing plan, giving the numbers and types of products to be made in each period. From this information the number of man-hours, by skill categories, to set the target for production, would start from the production plan setting out a programme for installing new machinery. In an insurance company, forecasts of new business would be translated into the number of proposals that would have to be processed by the underwriting department. In a mail order company, forecasts would be made of the number of orders that are to be processed, assembled and despatched. It will not be unusual if the manager has to identify requirements without a clear knowledge of corporate objectives because either there are non-explicitly stated or he has not been informed of them.

Detailed performance targets or objectives must be agreed for each level of management in the company, covering all facets of its operation. At each stage of preparing the long-range business plan; the company must take into account the available resources of men, materials, money and machine. The constraints which each of these imposes would set limits to what it can realistically hope to achieve.

The planning data would refer to expected changes in productivity or manpower levels arising from changes in working methods or procedures. These could be set out as a crude percentage increase in productivity which could be used to adjust the required man hours for a given level of output or they might give specific instances of cases where in the manning for a machine, a production line, clerical section or a sales office is to be increased or decreased.

Time-scale of Forecasts

While forecasting manpower requirement, it is important for a manager or a planner to consider the time-scale for which forecasts are made. This will largely depend on the nature of the decision to be effected for shorter term forecasting, budgeting; the need to prepare expenditure targets up to two years ahead is important to consider for the purpose of a medium and long-range forecast, that is, between two to seven years which opens up the 'possibility' of greater changes resulting from new manpower policies such as decisions to make greater use of apprenticeships or graduate entrants.

A few organisations attempt forecasting beyond seven years, this period would make it possible to think in terms of changing the entire structure and quality of labour force. Although such a long period scale is frightening, it is the one against which decisions for major changes in, say, managerial manpower have to be made.

Basic Demand Forecasting Methods

The basic demand forecasting methods are:

- (i) Work study techniques
- (ii) Job analysis
- (iii) Managerial/Executive judgement
- (iv) Statistical Techniques - Projecting Past Trends in Employment
- (v) Productivity Measurement Method
- (vi) Time series

Work Study Techniques

Work-study is as old as industry itself. Work-study, as the name implies, is the study of human work in the deepest sense and dignity of the word, and not merely in the special and more restricted meaning used in the physical sciences. Even today it is not limited to the shop floor, nor even to manufacturing industry. In one form or another it can be used in any situation wherein human work is performed.

The terms time and motion study have been given many interpretations since their origin. Time study, originated by Taylor, was used mainly for determining time standards, and motion study, developed by the Gilbreths, was employed largely for improving methods. While Taylor and Gilbreths did their pioneering work around the same time, it seems that in the early days greater use was made of time study and wage incentive than of motion study.

In the book "Introduction to Work Study" by ILO, defined "work study" as a generic term for such techniques, particularly, method study and work measurement, as are used in the examination of human work in all its contexts, and which lead systematically to the investigation of all the factors that affect the efficiency and economy of the situation being reviewed in order to effect improvement". Work-study, therefore, has a direct relationship with productivity. It is most frequently used to increase the amount produced from a given quantity of resources with little or no further capital investment. As discussed in the preceding paragraphs work study was widely known for years as "time and motion study" but with the development of the technique and its application to a very wide range of activities it was felt by many people that the older title was both too narrow and insufficiently descriptive.

From all the definitions and observations made by the authors, the ultimate motive of work-study is the best utilisation of men, machine, and material and money i.e. higher productivity. It is important to define the term Productivity. Productivity is a term that has a number of different meanings although it is most commonly associated with labour effectiveness in industry. In a broad sense productivity is the ratio of output to some or all of the resources used to produce the output, e.g. Productivity "output per labour hour".

Labour Productivity = Units Produced / hours worked

Capital Productivity = Output / Capital input

Material Productivity = Output /Material input

Labour productivity or "output per hour" as compiled by the U.S. Bureau of Labour Statistics for many parts of the economy is recognised as one of the standard guidelines. Taking the ratio of output to input and indexing this relationship over time determine labour productivity. Using the Bureau of Labour Statistics methods, a company can determine its labour productivity or output per man-hour by dividing its total annual labour output by the total hours worked. The output is the 'real' annual sales, that is, net sales adjusted by a corporate price index. The labour input is the average number of employees multiplied by the average number of hours worked during the year. The annual adjusted net sales are divided by the man-hours for the year to give the output per man-hour. Productivity is essential for a prosperous economy, a prosperous company, and a prosperous employee. The productivity of all three is influenced by work methods, work-studies and employee motivation.

By helping to determine the best possible use of company resources men, materials and machines – work-study is one of the principal aids by which an organisation can improve its productivity. Many of the companies currently engaged in manpower forecasts are using the results of work-study exercises as the main basis for their estimates of future manpower requirements. The starting point in the work-study-based approach is usually the sales or output forecasts established for the planned period. In order to determine the manpower that will be required these forecasts is converted to a production schedule (taking into account existing levels of stock). The production schedule is then split up into monthly and weekly programmes for the first year. To do this following information are obtained:

- (a) Things to be made or done
- (b) The quantity involved
- (c) The operations/methods needed to carry out the work

- (d) The plant, equipment and tools required
- (e) The type and quality of labour required
- (f) The time each operation is expected to take
- (g) The amount of labour required
- (h) How much plant and equipment of the types necessary is available
- (i) How much labour of the types and quality necessary is available

As far as labour is concerned, information on item (a) should be available from the company system of personnel records; the data on item (e) can be supplied by method study, and for the items (f) and (g) by work measurement. The production schedules required to carry out the predicted work load (items (a) and (b)) can then be worked out and established time standards applied to these schedules in order to ascertain the number of man-hours or man-days required for each class of labour.

A very simple example will illustrate the logic of this approach. A department estimates that its production for the following five years will be 40,000 components per year. Work measurement has shown that it takes, on an average, 4 skilled men to produce 40 components per day.

Therefore man years required are:

$$\frac{40,000}{10 \text{ (Components per man/day)}} = 4000 \text{ maydays}$$

Therefore maydays required are:

$$\frac{4,000}{250 \text{ (assumed working days in a year)}} = 16 \text{ man years}$$

Thus, to fulfil the plan for the production of 40,000 components, an average of 16 skilled men will be required in the department during the following year. To this figure would, of course, have to be added the necessary adjustment for wastage and possibly, absenteeism including leave reserve.

Job Analysis

Before manpower planning can be carried out, management must first define what is the work to be performed and how the tasks to be carried out can be divided and allocated into manageable work units, that we called jobs. Such an assignment of tasks to job is commonly known as "job design". Once the jobs have been defined, it is important to maintain current information about their content. This information gathering process is called 'job analysis'. It comprises both job description and job specification. Accurate job description and specifications are intimately related to the preparation of inventories of executive talent, which form a basis of manpower planning strategy.

Pertinent information relating to a specific job can be obtained through:

- Observation
- Questionnaire
- Interview
- Checklist
- Daily Diary
- Collection of past & present records/historical records
- A combination of two or more of these

All these methods are time-consuming but they are worth the efforts. An important by-product of a job analysis programme is that it creates greater understanding and common agreement between job holder and person undertaking the task of manpower planning on the precise requirements of the job and time normally required for performing them.

The job analysis helps in understanding the job of executives and breaking into convenient groups of activities so as to time each activity and assess the total time required for the job. Before analysing the job, it is necessary to go through files, annual reports, published literature on organisation so as to get acquainted with the major objectives and activities of a given organisation and realise how the activities of each executive fit into the total framework of the organisation. For many jobs historical records would provide the basis for setting norms, provided they have been continuously updated.

Assessing Executive Manpower

Executive manpower requirement is mostly determined by job analysis. The job of an executive is understood in its proper perspective; what follows is grouping of activities into two major parts, namely routine or maintenance activities, and non-routine or adaptive activities. Once the total activities of each executive in a given department are enumerated and the time is allocated for each of them, what is left, is adding up those times on the daily, monthly or quarterly basis whichever is convenient depending on the nature of the work of an executive and thus integrating total time required for each executive in a given department. Once the time for all activities has been determined, certain percentage allowance has to be added to this time to account for what an executive may lose in personal time (tea, personal visitors etc.) or because of fatigue or unexpected contingencies. The man-days required for doing both types i.e., routine and non-routine activities for each executive would be calculated as under:

$$\begin{array}{rcl}
 \text{Total man-days* of} & & \text{Total man-days* spent} \\
 \text{an executive per} & = & \text{by each executive} \\
 \text{month for all} & & \text{per month for routine} \\
 \text{activities} & & \text{month for non-} \\
 & & \text{routine activities} \\
 & & + \\
 & & \text{Total man-days*} \\
 & & \text{spent by each} \\
 & & \text{executive per activities}
 \end{array}$$

(* Each man-day consists of six hours allowing for personal time and contingencies).

On the above basis, the total man-days of all executives in a given department per month can be calculated. The formula for assessing manpower is:

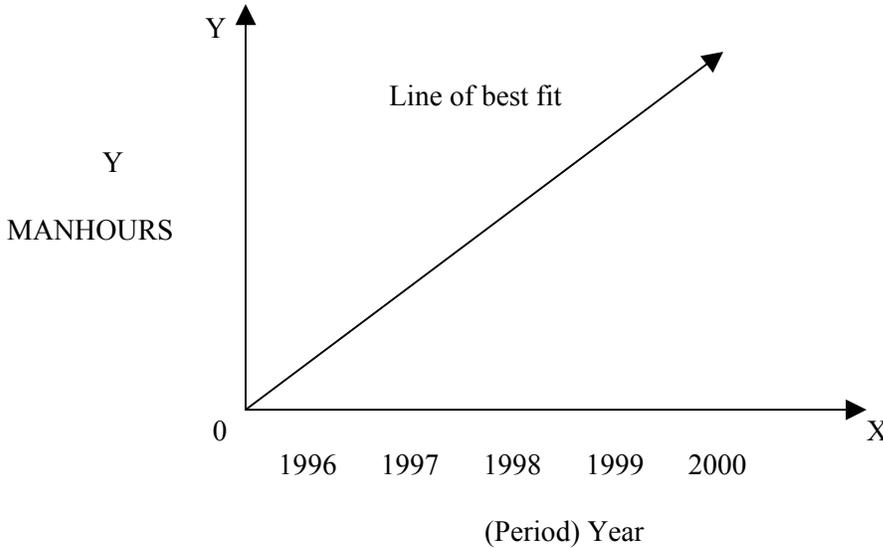
$$\text{Total executive manpower} = \frac{\text{Total man-hours of all executives in a department}}{\text{-----}}$$

Statistical Techniques - Projecting Past Trend in Employment

The most commonly used statistical approaches to manpower forecasting are considered, ranging from methods of simple extrapolation, through regression or correlation analysis, to econometric models. All of these methods depend for their validity on the assumption that developments in the future will exhibit some continuity with the past. Simple extrapolation assumes that past trends will continue, regression analysis assumes that particular relationships will hold firm and econometric models assume that the basic inter-relationships between a whole range of variables will be carried on into the future.

Extrapolation

Methods of simple extrapolation are concerned with predicting the growth or decline of a single variable (or set of variables such as a ratio) over time and can thus be simply illustrated in graphical form. As shown in the figure below, time is taken on the X-axis (i.e. horizontal axis) whereas labour requirements (in man-hours) on the Y-axis.



Projection of Manpower Requirement

The first stage in the forecasting process is to identify any trend line that may show itself in such a scatter diagram. The method of simple extrapolation consists simply of extending this line into the future i.e., line of best fit is drawn after plotting the past data. In case the trend line slopes upwards then labour requirements in future might be expected to rise, on the other hand the trend line sloping downwards indicate a fall in future requirement levels.

Regression and Correlation

This method seek to provide a measure of the extent to which movements in the values of two or more variables - as for example labour input and sales are related (or correlated) with each other. The aim is to predict changes in one variable by reference to changes in the other or others, where the future value of these other (or explanatory) variables is already postulated. Thus, if a company finds that the number of hours put in by a group of workers bears a strong relationship to the amount of output from the department, or sales, a knowledge of future output or sales levels should make possible a forecast of future manpower requirements. Where only two variables are concerned the analysis is known as simple regression or correlation. Where more than two variables are considered together, the analysis is known as multiple regression.

In the figures given below, possible relationships are examined to see whether they might prove useful for forecasting from the first, it is clear that manpower requirements are not closely related to investment. From the second, however, it appears that the number of engineers has in the past been closely related to the level of sales. If the relationship appears likely to be continued into the future, estimates of manpower required can be derived from prediction of sales levels.

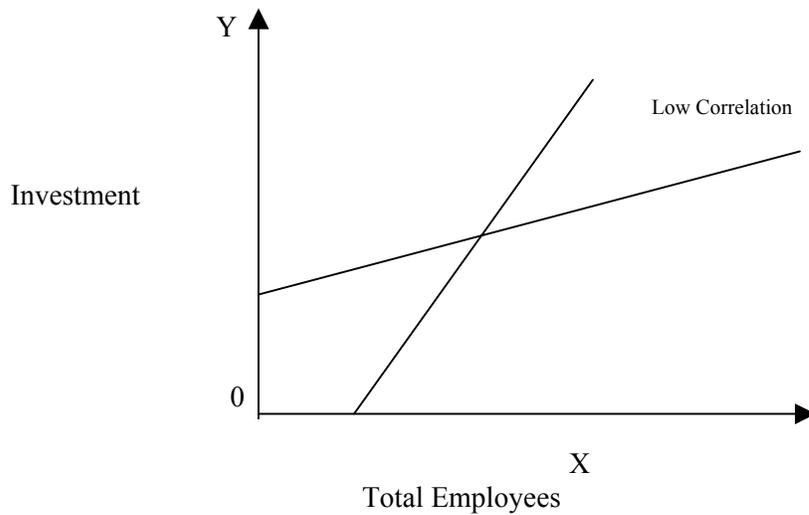


Figure-1

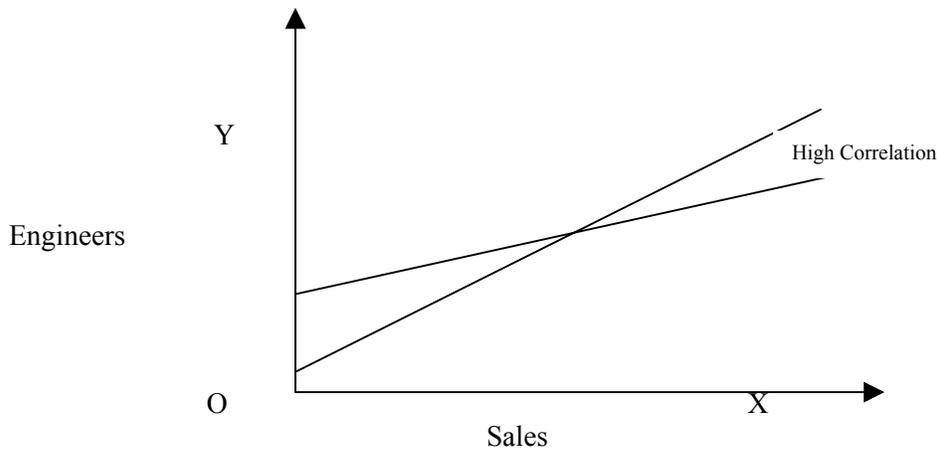


Figure-2

The possible relationship is useful in forecasting

Econometric Models

Econometric models for estimation of manpower requirement differ from the statistical methods. Past statistical data are analysed in the hope that it will prove possible to describe precisely the relationships between a number of variables in mathematical and statistical terms. To portray the relationships between different types of manpower requirements and measures of investment, profitability, sales, complexity and quality of the product, any other factors which may be thought important in a particular company, in terms of a single equation or more likely building a series of equations, which together described the various relationships can be worked out with the help of econometric models. Very often, such models are based on simple and multiple regression analysis of the types described above.

Econometric models have considerable inherent practical difficulties. The use of such complex models for forecasting future manpower needs, or indeed any other variable, at the company level, is still very much in its infancy (gascoigne 1968) and the effort and cost involved in building up a satisfactory model are at the moment well beyond the reach of most companies.

Productivity Measurement Method for Manpower Forecasting

This approach is closely related to work study method. Both seek to determine the amount and effectiveness of the human content of the work involved in any activity. Work-study involves a thorough analysis of the work process and seeks to establish the man-hours needed per unit of output. On the other hand, productivity measurement is generally more concerned with the inverse of this ratio i.e. output per hour.

The use of measures of productivity in manpower forecasting seems straightforward enough. Output (measured say by gross tonnage or sales) divided by labour productivity (output per man-hour) gives the number of man-hours required to complete the task. In practice, this method is a different and hazardous one. Accurate measures of productivity in the individual company are notoriously difficult to obtain even for the current situation, let alone for the future.

Illustration

To forecast manpower requirement in 2000 for Engineering Company: Production Department.

Basic Data 1994

- (i) Production for the year = 2,400,000 units
- (ii) Average number of employees = 400
during a year
- (iii) Number of Weeks worked = 49
during a year
- (iv) Average hours per week = 40
per worker
- (v) Total hours per worker per year = $49 \times 40 = 1960$ man-hours

- (vi) Total man-hours per year = 400×1960
= 784,000 man hour

(vii) Productivity /Production		
Per man hour	= 2,400,000	

	7,84,000	
	= 3 units per man-hour.	

Basic Data 2000

(i) Target production	= 36,30,000 units	
(ii) Productivity is expected to be 10 per cent higher than in 1994 Therefore, in added value terms, it should reach.	= 3.30 units	
(iii) Therefore, required man hours in 2000	36,30,000 units = ----- 3.30 units = 1,10,000 man hours	
(iv) Total hours per worker per year	= 1960	
(v) Therefore required number of men in production deptt. in 2000 would be:	1,00,000 = ----- 1,960	= 561 men.

Manpower assessment is not only a number game rather it is a human resources development game. The earlier concept was that right man for right job but the present concept is to match the individual to the job/work. While assessing manpower requirement, methodology assumptions should be clearly defined. In the assumption nature of the task, criticality and non-criticality of different jobs, shift workings, effective, non-effective, set up time, crew size and composition and skills required have to be taken into consideration. If all the points as mentioned above are considered carefully during the process of manpower assessment, forecast of requirement would be more accurate and realistic. Considering the criticality of the jobs, suitable off and leave reserves can be worked.

Time Series and Trends

It is necessary to analyse past trends in manpower activities and sift the significant points while preparing a forecast. This requires an understanding of the concept of the time series. A time series is a set of observed values recorded at intervals of time - 'data classified chronologically' - for example, monthly absenteeism rates. The recording of such a casual relationships between different variables - for example, is there a positive correlation between absence and age or length of service? or with prediction of future.

A time series unlike an algebraic curve will not have a definite predictable state - it will vary with fluctuating data which must be analysed as to their probable confining or not for making future forecasting.

Therefore, it is an alternative method to analyse employment levels over a time and use as a basis for forecasting manpower levels. This means projecting the past into the future and then allowing for any foreseen changes resulting in a change in use of capital and machinery, change in external economic climate, internal problems within the organisation and emergence of competitors.

The employment, when recorded over a period, will potentially reveal five distinct elements as follows: (a) a trend could be a gradual and regular increasing or decreasing level of employment, probably over some years; (b) cyclical effects which could be a gradual and repeated upward and downward movement over a period. This may well be associated with some events such as economic activity in the country; (c) seasonality, which may occur one when more than one time point per annum, is recorded. It records the different levels of activity between say summer and winter; (d) a step is a sudden change in the level of employment which will probably accompany some identifiable change in the environment, such as decrease/increase in sales or introduction of new machinery; and (e) random fluctuations in a series of changes in levels of employment that do not follow any obvious pattern. In this case "moving average" will help to highlight the trend and suggest the amount of possible error in the forecast".

Suggested Readings:

C.B. Matoria and S.V. Gankar, *A textbook of Human Resource Management*, Himalaya publishing House, 2003.

K. Aswathappa, *Human Resource and Personnel Management: Text and Cases*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002.

V.S.P. Rao, *Human Resource Management: Text and Cases*, Excel Books, New Delhi, 2002.

Gary Dessler, *Human Resource Management*, Prentice-Hall of India Private Limited, New Delhi.

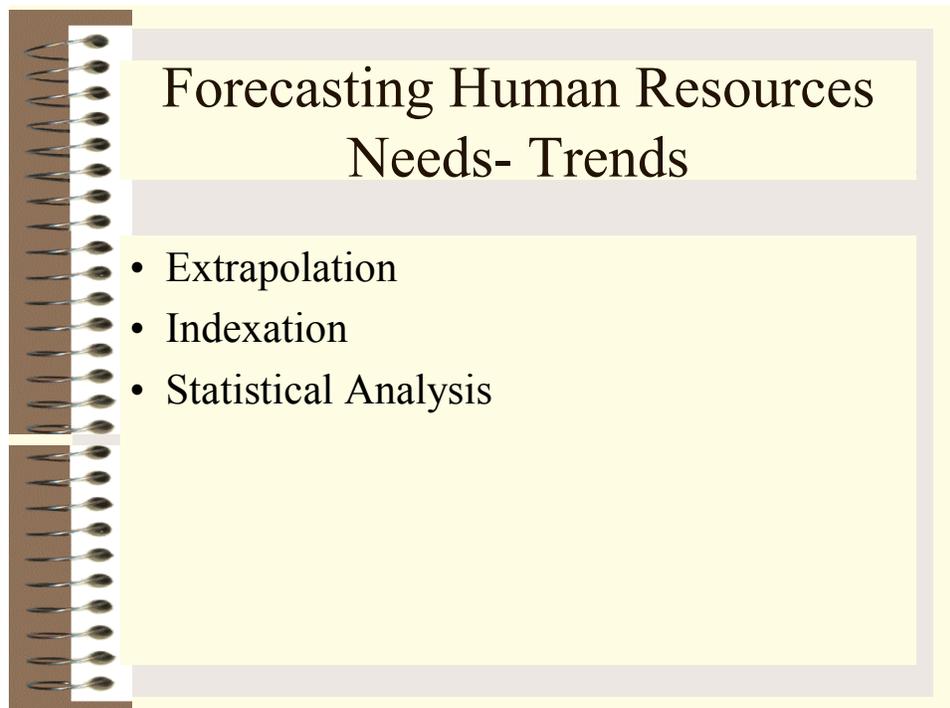
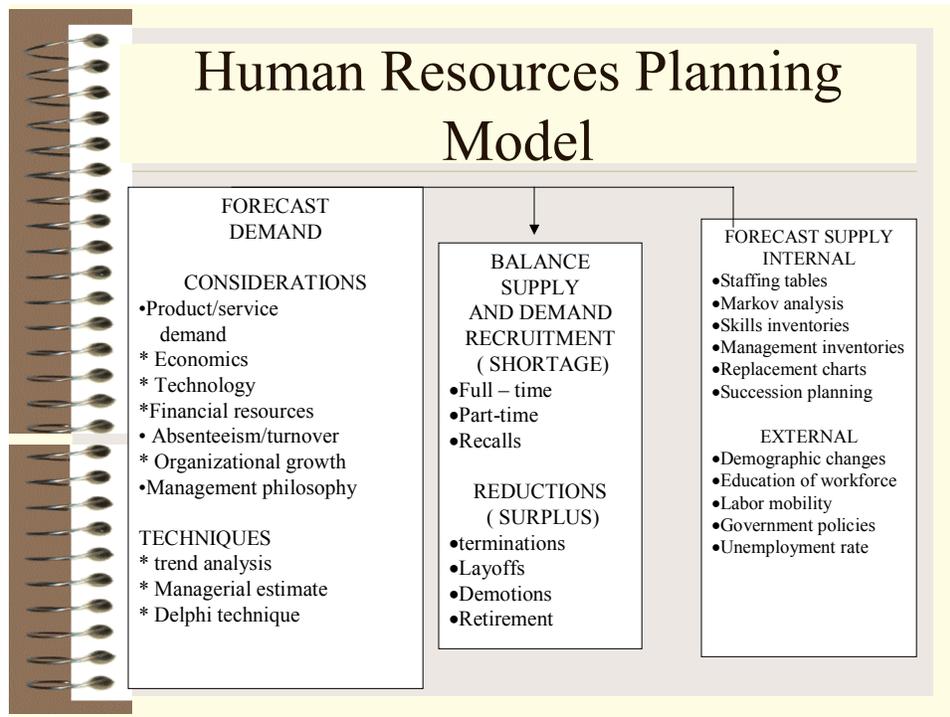
Lawrence S. Kleiman, *Human Resource Management*, Biztantra Innovations in Management, New Delhi, 2003.

Arthur Sherman, George Bohlander & Scott Snell, *Managing Human Resources*, An International Thomson Publishing Company.

Edwin B. Flippo, *Personnel Management*, MacMillan India (6th Ed. 1984)

Charles P. Greer, *Strategic Human Resource Manager: A General Managerial Application*, Pearson Education Asia, 2001.

Arun Monappa, *Managing Human Resources*, MacMillan India, 1997.





Forecasting Human Resources Needs- Others

- Budget and Planning Analysis
- New Venture Analysis
- Computer Models



Forecasting Human Resources Needs-Experts

- Informal and instant decisions
- Formal Expert Survey
- Delphi Technique



Supply of Human Resources: Internal Supply Estimates

- Human resource Audit
- Replacement Chart
- Markov Analysis



Managing Oversupply...

- Freezing Hiring process
- Early retirement Offers
- Job sharing
- Use of part-time work force
- Internal transfers



Managing Oversupply...

- Layoffs
- Leave without pay
- Loaning
- Termination
- Outplacement



Managing short supply

- Overtime
- Use of part time workers
- Transfers
- Outsourcing
- Contract workers
- Internal recruitment etc.