

HUMAN RESOURCE PLANNING: TECHNIQUES OF DEMAND & SUPPLY FORECASTING

Nancee, Ph. D.

Assistant Professor, Department of Commerce, S.C.V.B Govt. College Palampur,
Himachal Pradesh, India, Email-id-nancychauhan001@gmail.com

Abstract

In order to fulfill human resource requirements, an enterprise will have to plan in advance its needs and the sources. The terms human resource planning (also called employment or personnel planning) and manpower planning are generally used interchangeably. Human resource planning is not a substitute for manpower planning. Rather the latter is a part of the former i.e., manpower planning is integrated with human resource planning. Human resource planning is a process that identifies current and future human resources needs for an organization to achieve its goals. Human resource is the most important asset of an organisation. Human resources planning are the important managerial function. It ensures the right type of people, in the right number, at the right time and place, who are trained and motivated to do the right kind of work, there is generally a shortage of suitable persons. The enterprise will estimate its manpower requirements and then find out the sources from which the needs will be met. If required manpower is not available then the work will suffer. Presently developing countries are suffering from the shortage of trained managers. Job opportunities are available in these countries but properly trained personnel are not available. These countries try to import trained skill from other countries. Therefore, it can be said that Human resource planning, or HRP, is the ongoing, continuous process of systematic planning to achieve optimum use of an organization's most valuable asset its human resources.



Scholarly Research Journal's is licensed Based on a work at www.srjis.com

INTRODUCTION

Human Resource Planning (HRP) is the process of forecasting the future human resource requirements of the organization and determining as to how the existing human resource capacity of the organization can be utilized to fulfill these requirements. It, thus, focuses on the basic economic concept of demand and supply in context to the human resource capacity of the organization. It is the HRP process which helps the management of the organization in meeting the future demand of human resource in the organization with the supply of the appropriate people in appropriate numbers at the appropriate time and place. Further, it is only after proper analysis of the HR requirements can the process of recruitment and selection be initiated by the management. Also, HRP is essential in successfully achieving the strategies and objectives of organization. In fact, with the element of strategies and long-term

Copyright © 2017, Scholarly Research Journal for Interdisciplinary Studies

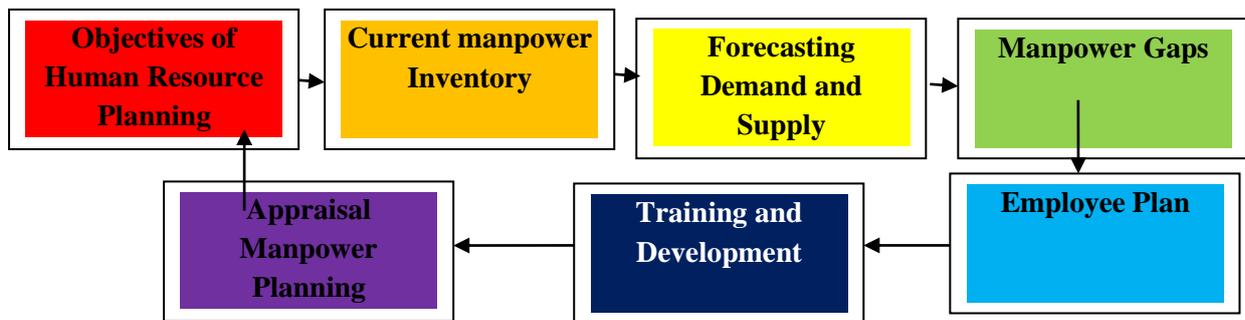
objectives of the organization being widely associated with human resource planning these days, HR Planning has now become Strategic HR Planning.

Human Resource Planning Process

Human resource planning is a process through which the company anticipates future business and environmental forces. Human resources planning assesses the manpower requirement for future period of time. It attempts to provide sufficient manpower required to perform organizational activities. Fig 1.1 depicts the various steps involved in human resource planning.

Fig 1.1

HUMAN RESOURCE PLANNING PROCESS



Forecasting Demand & Supply of Human Resource

Demand Forecasting:

Demand forecasting (Manpower Forecasting) is the process of estimating the future numbers of people required and the likely skills and competences they will need. Forecasting human resource demand is the process of estimating the future human resource requirement of right quality and right number. Human resource requirement is to be estimated keeping in view the organisation's plans over a given period of time. Analysis of employment trends; replacement needs of employees due to death, resignations, retirement, termination; productivity of employees; growth and expansion of organization; absenteeism and labour turnover are the relevant factors for human resourced forecasting. At a more practical level, forecasting demand involves determining the numbers and kinds of personnel that an organization will need at some point in the future. Most managers consider several factors when forecasting future personnel needs.

Techniques of Demand Forecasting

In the age of competition, companies do not have any other choices than to compete better than their competitors. Human Resource Management has critical role to play in corporate strategic plan. All the HR functions contribute positively to achieving the objective. The main task of HR is to support other departments to have the best people. Human resources planning can use following two approaches to forecast human resource demand.

- 1. Quantitative methods of demand forecasting**
- 2. Qualitative methods of demand forecasting**

Quantitative methods of demand forecasting

Quantitative methods rely on statistical and mathematical assessment. Following are main methods of quantitative demand forecasting:

- 1. Ratio Analysis**
- 2. Benchmarking/Thumb rule**
- 3. Scatter Plot**
- 4. Trend Analysis**
- 5. Computerised Forecast**
- 6. Work Study**

Ratio Analysis:

Ratio analysis is the process of determining future Human Resource demand of an organisation by calculating an exact ratio between the specific business factor and the number of employees needed. So, Ratio analysis is a forecasting technique that assumes a set relationship between one variable and another, and that the relationship allows for the prediction of workforce needs. This is the quickest forecasting technique. The technique involves studying past ratios, like, between the number of workers and sales in an organization and forecasting future ratios, making some allowance for changes in the organization or its methods. Ratio analysis uses historic information to project future staffing needs. The ratio establishes a relationship between the number of employees needed and another factor such as past staffing levels or past gross sales revenues. **For example** HR is forecasting demand for the clothing department of a retail department store. Gross sales revenues for the past year were \$75,000 and the clothing department currently employs five full-time employees; the ratio is 75,000:5 or 15,000:1. This means that for every \$15,000 in

gross sales, the department needs one employee. If sales are expected to rise by \$30,000 in the coming year, the department will need to hire two full-time employees.

Benchmarking/Thumb rule:

In business, benchmarking is a process in which a company compares its product and methods with those of the most successful companies in its field, in order to try to improve its own performance. In other words Benchmarking is a measurement of the quality of an organisation's policies, products, programs, strategies, etc., and their comparison with standard measurements, or similar measurements of its peers. The objective of benchmarking is

1. To determine what and where improvements are called for?
2. To analyse how other organizations achieve their high performance levels.
3. To use this information to improve performance.

Benchmarks or rule of thumb rise out of many years experience. Like general benchmarking, Human Resource benchmarking is extremely important. When information on HR performance has been gathered, it must be compared to a standard, which is a model or measure against which something is compared to determine its performance level. **For example**, the international benchmark for HR is 1:100 in an automated environment, which indicates one HR employee can support and service 100 employees. Therefore if the employee strength is 5,000, 50 HR employees will be needed. These benchmarks are useful when forecasting has to be done in large volumes for a new business.

Scatter Plot:

Scatter plot is a graphical method used to help identify the relationship between two variables- such as sales and a firm's staffing levels. Scatter plots show how much one variable is affected by another. By using scatter plot organization can forecast the needs of human resource against the business activity (like sales). Thus, The Scatter Plot is a graphical method used to identify the relationship between two variables. If these two variables - for example, a measure of business activity and business staffing levels - are related, then if company forecast the measure of business activity, company should be able to forecast their HR requirements.

Fig 1.2
SCATTER PLOT

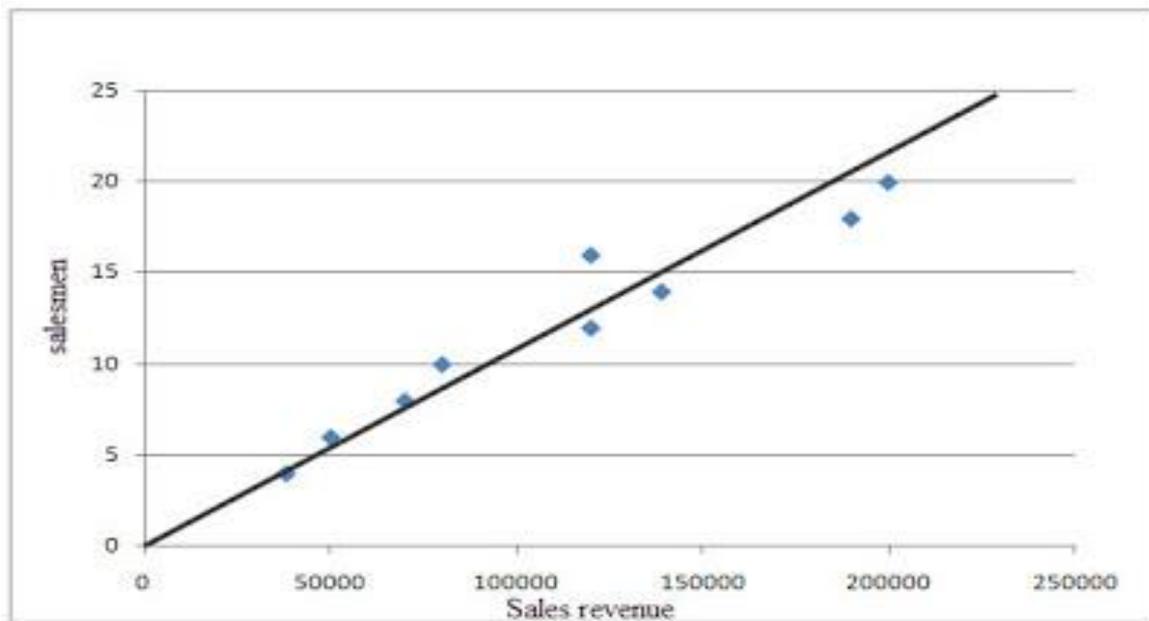


Fig 1.2 shows graphically how two different variables i.e., sales revenue and salesmen are related. Scatter plot help determine if a factor as historically been related to staffing levels, accordingly will determine what staffing levels should be change.

Trend Analysis

Trend analysis means studying historical organizational employment levels to predict future employment levels. For example: If, on average, employment levels in the organization have increase 5% per year, it might be logical to forecast a 5% increase for the next planning period. A more accurate forecast using this method might be to evaluate trends in separate departments or other organizational sub entities and then aggregate the increases (or, potentially, decreases) at the organizational level. Doing so provides more specificity as to not only the numbers of employees but also the types of employees needed. Hence, Trend analysis assumes that history will repeat itself. In today's more volatile times that might not be the case. However, trend analysis provides some data on which a final forecast can be made. The trend analysis provides both data describing how trends such as turnover will affect the workforce and is a key element in the overall planning process.

Trend data is not limited to turnover data. It also may include the following:

- Hiring and retirement patterns.
- Years of service.
- New-hire retention rate.
- Transfers.
- Promotions.

Trend information can help predict the supply of skills that may be available in the future and project the future workforce supply needed. Careful planning and a thorough analysis of data can help the workforce planner build a strategic plan for addressing the future needs of the organization. **For example-** In a manufacturing plant in 2016-17 they were producing 10000 unit of product X with the help of 100 workers. Now they planned to expand the production to 15000 unit of X product in 2017-18 year. We can calculate by trend that number of workers required would be 150. So they need to hire 50 more workers.

Computerized Forecasts:

Computerized forecast means the determination of future staff needs by projecting a firm's sale, volume of production, and personnel required to maintain this required volume of output, using computers and software packages. Employers also used computerized system to personnel requirements. **For example**, the requirements for sales officers would depend on the trend of sales in different markets, the number of product introduced, the difference in the products (whether one salesman sell both products?) and customers for the product. The computer program enables the manager to enter all these variables to generate the resource requirement that is required to meet the business objectives. Hence, computerized forecasting method can forecast in a complex environment better than other methods.

Work study Technique

This technique is also known as '**work-load analysis**'. This technique is suitable where the estimated work-load is easily measureable. Under this method, estimated total production and activities for a specific future period are predicted. This information is translated into number of man-hours required to produce per units taking into consideration the capability of the workforce. Past-experience of the management can help in translating the work-loads into number of man-hours required. Thus, demand of human resources is forecasted on the basis of estimated total production and contribution of each employee in producing each unit items.

For example the estimated production of an organisation is 3,00,000 units. The standard
Copyright © 2017, Scholarly Research Journal for Interdisciplinary Studies

man-hours required to produce each unit are 2 hours. The past experiences show that the work ability of each employee in man-hours is 1500 hours per annum. The work-load and demand of human resources can be calculated as under

- Estimated total annual production = 300000 units
- Standard man-hours needed to produce each unit = 2 hrs
- Estimated man-hours needed to meet estimated annual production (i x ii) i.e., $300000 \times 2 = 600000$ hrs
- Work ability/contribution per employee in terms of man-hour = 1500 units
- Estimated no. of workers needed (iii / iv) = $600000 / 1500 = 400$ units

The above example clearly shows that 400 workers are needed for the year. Further, absenteeism rate, rate of labour turnover, resignations, deaths, machine break-down, strikes, power-failure etc. should also be taken into consideration while estimating future demand of human resources/ manpower.

Qualitative/ Judgmental methods of demand forecasting

Qualitative forecasts use managerial judgment on a more individual basis, spotting needs internally and then bidding for or training the requisite skills. Following are the main qualitative techniques used in forecasting demand of human resource:

1. **Managerial judgment**
 - Bottom- up approach**
 - Top-Down Approach**
2. **Delphi Technique**
3. **Zero based Forecasting**

Managerial Judgment:

Managerial judgment is a type of brainstorming that involves a meeting of managers who gather to diagnose and predict the future job market. These can generally be either top-down or bottom-up, with either the executives forming their plans and trend analysis for discussion, or the mid-level managers bringing their forecast to the meeting. The best types of managerial judgment will combine forecasts from many sources, including HRM. Thus, Managerial judgement technique is very common technique of demand forecasting. This approach is applied by small as well as large scale organisations. This technique involves two types of approaches i.e. 'bottom-up approach' and 'top-down approach'.

Bottom-up approach, under this approach line manager sends their departmental requirement of human resources to top management. Each manager who is in charge will create his own requirement. It starts from lowest level and moves to the middle level and then to the senior. Thus, Top management ultimately forecasts the human resource requirement for the overall organisation on the basis of proposals of departmental heads.

Top-down approach, under this approach there is minimum involvement of line managers in the forecasting process. Most of the responsibility for forecasting is taken by the top management who based on their experience, their view of future business and resource constraints estimate human resource requirement for the future. This method is more time efficient and business driven than the bottom approach.

However, a combination of both the approaches i.e. 'Participative Approach' should be applied for demand forecasting. Under this approach, top management and departmental heads meet and decide about the future human resource requirement. So, demand of human resources can be forecasted with unanimity under this approach.

Delphi Technique

This Technique named after the ancient Greek Oracle at the city of Delphi. Delphi technique is also very important technique used for estimating demand of human resources. This technique takes into consideration human resources requirements given by a group of experts i.e. managers. The human resource experts collect the manpower needs, summarises the various responses and prepare a report. This process is continued until all experts agree on estimated human resources requirement. In a Delphi technique, the identity of the group members is not revealed, and they are not even required to gather for a physical meeting. Each member is free to give his opinion with respect to the problem, thereby avoiding the influential effect that a powerful or authoritative member can have on the other group members. This technique is quite advantageous as different opinions can be gathered from the large pool of experts who might be geographically separated. Also, the quality of decision gets improved as the expertise of each group member is capitalized to reach to a final solution.

Zero based Forecasting

Under this technique, the organization's use current level of employment as the starting point for determining future staffing needs. Managers need to build a budget for their manpower requirement as if no baseline existed (i.e., previous records are not considered for forecasting
Copyright © 2017, Scholarly Research Journal for Interdisciplinary Studies

future needs of manpower). Resources are not necessarily allocated in accordance with previous patterns. The main emphasis is on the analysis of human resource needs. It produces more and better management information in a readily accessible form. This improves the quality of management decision, as there is participation of lower level management in the budgetary process. Unexpected events that occur during the financial year can be more readily adjusted for.

Supply forecasting

After demand forecasting, next step is to check availability of manpower inside the organization too. So, Human Resource supply forecasting is the process of estimating availability of human resource followed after demand for testing of human resource. For forecasting supply of human resource organisation need to consider internal and external supply. Internal supply of human resource available by way of transfers, promotions, retired employees & recall of laid-off employees, etc. Source of external supply of human resource is availability of labour force in the market and new recruitment external supply of human resource depends on some factors mentioned below:

- Supply and demand of jobs.
- Literacy rate of nation.
- Rate of population
- Industry and expected growth rate and levels
- Technological development.
- Compensation system based on education, experience, skill and age.

Techniques of forecasting supply of human resource

- Markov Analysis
- Replacement charts
- Staffing Tables
- Wastage Analysis
- Succession Planning

Markov analysis

Markov analysis is named for the Russian mathematician Andrei Andreevich Markov. In hierarchical systems, routes for the employees, which is the promotion ladder, are well defined. It means every employee elevates himself in the organisation through a well defined career path. All employees start in an organisation at the bottom rung and climb up the ladder one at a time. The basic assumption of this model is that an employee in a particular grade or a status group has a fixed chance of promotion in a given year, independent of vacancy. At the organizational level, Markov analysis may be applied to describe and forecast the process of human resource flows or movements within, into, and out of the organization.

No workforce is stable or stationary. People are hired, they grow within system and then some of them leave for a variety of reasons. The focus of Markov analysis is to attempt to project into the future what the current workspace would like if the current mobility flow continues with no changes. It is use to study the flow of people entering and existing the system. **For example** Fig 1.3 shows hypothetical flow of people in a call center. In 2011 the number of people in different jobs is given in the first column. There are 12 program manager, 36 assistant manager, 96 supervisors, 288 team leaders and 1440 customer service representative (CSRs). How these people make a transition in the next year is given in the subsequent columns. The figures in percentage represent the transition i.e., the percentage of people who will make a transition into that job in the coming year. For example, 74 per cent of the total number of CSRs (1440) will stay in their current job, i.e., 1066 CSRs will continue. About 6 per cent (of 1,440), i.e., 86 would get promoted to team leaders and 20 per cent would exit the system, i.e., 288 will be separated. Thus, Markov analysis shows the percentage of employees who remain in each job from one year to the next as well as the numbers that get promoted, transferred or exit from the organization. It helps in tracking patterns of employee movements through various jobs and aids in developing a transition matrix of the forecast of manpower supply.

Fig. 1.3
MARKOV ANALYSIS

|  2012 2011 | Program Manager | Assistant Manager | Shift supervisor | Team Leader | CSRs | exit |
|---|-----------------|-------------------|------------------|-------------|-------------|------------|
| Programme manager (n=12) | 90% 11 | | | | | 10% 1 |
| Assistant Manager (n=36) | 11% 4 | 83% 30 | | | | 6% 2 |
| Shift Supervisor (n=96) | | 11% 11 | 66% 63 | 8% 8 | | 15% 14 |
| Team Leader (n=282) | | | 10% 23 | 72% 207 | 2% 1 | 16% 46 |
| CSRs (n=1440) | | | | 6% 86 | 74% 1066 | 20% 288 |
| Forecasted Supply | 15 | 41 | 86 | 301 | 1067 | 351 |

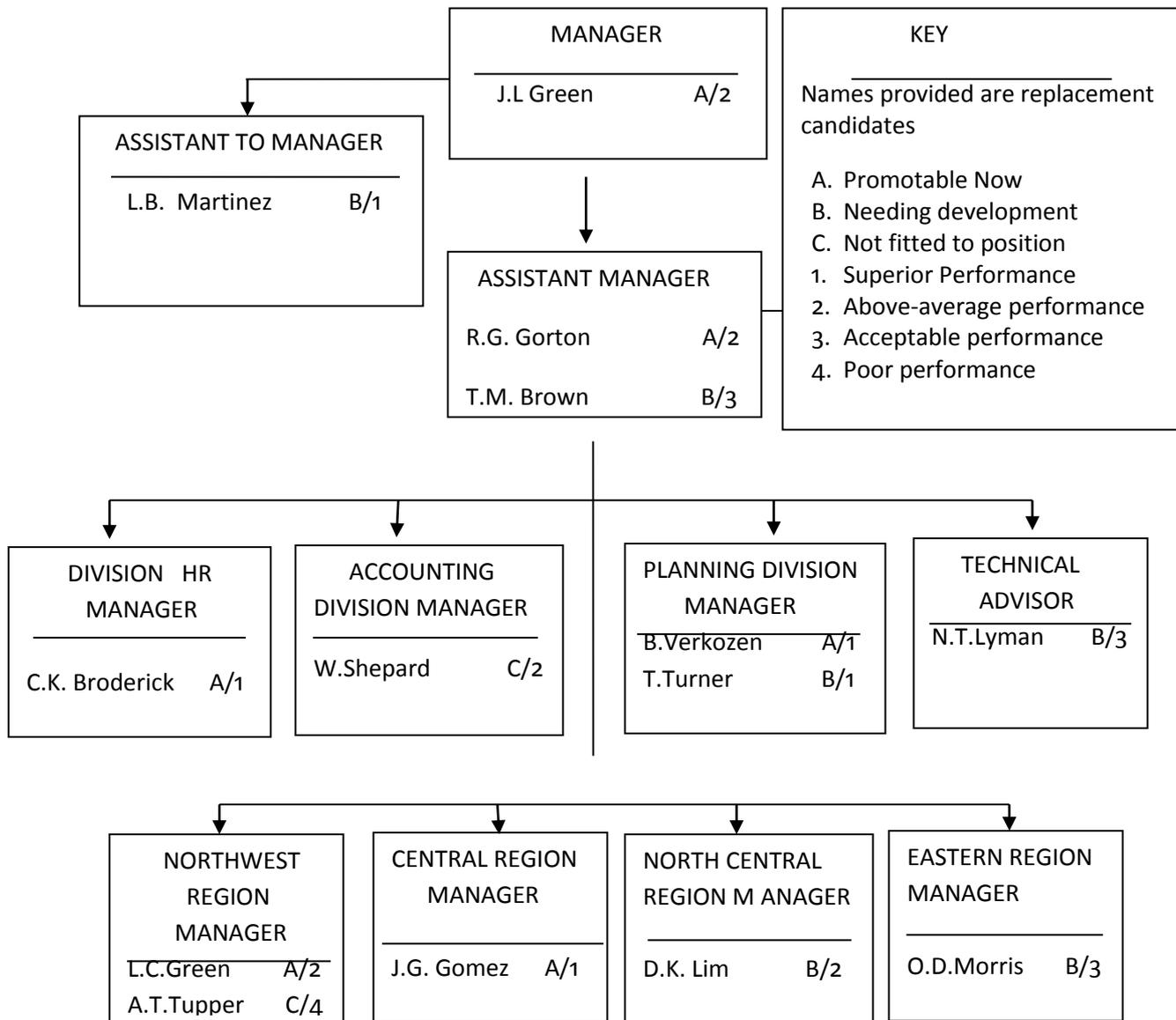
Replacement Charts:

Replacement charts are a forecasting technique used in succession planning to help companies visualise key job roles, current employees and existing and future vacancies. Positions are mapped alongside information such as potential replacements, gender and promotion potential. Updates to replacement charts should be made regularly, at least annually, and especially in response to fluctuations in economic conditions or business activity.

Replacement charts classify employees into four groups

- i) Employees ready for promotion
- ii) Employees who would be ready for future promotions if given additional training.
- iii) Employees performing satisfactorily but needs motivation and further improvements
- iv) Employees who are not fit to be on employment and need to be replaced.

Fig 1.4
AN EXECUTIVE REPLACEMENT CHART



• **Staffing Tables**

It shows the number of employees in each job. It tries to classify employees on the basis of age, gender, position, category, experience, qualifications, skills, etc. A study of the table indicates whether current employees are properly utilised or not.

Staffing table is the graphical arrangement of the jobs in the organization along with the number of employees currently working on this position as well as it shows the details of

future vacancy on each job. In human services, turnover, or employee withdrawal behavior, has become a serious personnel problem.

- **Wastage Analysis:**

Labour wastage should be taken into account while making future forecast and find out the reasons of people leaving the organisation. Action can be taken to arrest the labour wastage and replacement of uncontrollable losses. HR manager must know how to make wastage analysis. For measuring permanent total loss due to labour the following labour turnover formula is used.

Labour Turnover Rate = Number of Employees left specified period (Say one year)/ Average Number of Employees during the same period x 100

HR Managers have to calculate the rate of labour turnover, conduct exit interviews etc. This helps them forecast, the rate of potential loss, causes of loss etc. The steps can be taken to reduce loss. HR Manager can calculate labour stability index by using the formula given below.

Labour Stability Index = Number of Employees with one year's service or more / Number of Employees one year ago x 100

Thus, by knowing all these labour instability can be arrested and labour turnover can be minimised.

Succession Planning

Another aspect of effective workforce planning is succession planning. Succession planning is used by organizations to identify and prepare suitable employees to fill key positions when current employees leave their jobs. An effective workforce planning process will include a review of key leadership and business-critical roles and will identify key incumbents able to progress into these roles. Having a succession plan in place generally ensures a smooth continuation of business when key players leave due to retirement, resignations or transfers within the company.

The types of positions included in a succession plan vary by organization. Traditionally, these plans included only executive-level positions. In recent years, however, companies have been selecting successors for positions throughout the organization. During times of economic upheaval, when the economic security of organizations and their staffs may be uncertain, the need for up-to-date succession plans increases. With a wavering economic outlook, downsizing, mergers and acquisitions become more likely. With these events leading to

Copyright © 2017, Scholarly Research Journal for Interdisciplinary Studies

potential increases in turnover, implementing a succession plan is a key strategy an organization can use to reduce turnover costs and ensure smooth transitions. In addition, a succession plan can help foster employee commitment because it demonstrates to employees that the organization supports their development and internal growth.

Organizations use a variety of models for succession planning, which may range from self-identification or nomination to highly sophisticated software tools that maintain information about individual employees' development plans, training and education completed, classes taken, performance evaluations, and recommendations for future development.

Conclusion

On the basis of above discussion it can be said that, Forecasting has an important role in successful Human Resource Management of a company. By predicting the number of employees to be hired and also by estimating and knowing their quality, a company would get the best people for the right places and at the right time. This is necessary if a company wants to compete in the global market.

Skill Inventories

A skills inventory is one tool that HR can use in the planning process. A skills inventory is a list of basic information on all employees, such as age, gender, education, training, job experience and history, salary (past and current), special achievements, type of job preference, etc. This information should not only be information relevant to the employees current job, it should reflect enough information for a recruiter can go on in the even another position opens that the employee may be qualified for. The benefits to having a skills inventory on employees is that HR can quickly reference and evaluate information about skills of employees within the company. This information can also be used to determine raises, promotions, and future labor needs for the company. In simple words Skills Inventories maybe defined as a comprehensive database of information of the company's workforce focusing on, among other aspects, employee's skills, abilities, knowledge, work preference and other items of information. These essentially indicate the value of the employee to the company. Some of the data included in the skills inventories are:

1. **Knowledge, skills and abilities ratings.**
2. **Previous Work Experience.**
3. **Education Degrees and major fields of study.**
4. **Work Histories and accomplishments**

5. **Trainings Completed**
6. **Geographical Preferences**
7. **Career Aspirations and Objectives**
8. **Anticipated Retirement Dates.**

Need for a skills inventory:

A skills inventory can be a useful tool in human resource development programs since it brings into focus the present level of technical ability and the achievements of all employees who might be considered for participation in education and training programs. It is a tool through which the employees recognize the fact that they are working for an organization which values their skills and competencies and where his contributions are appreciated. Certain factors to which the design of skills inventories may be attributed to are:

1. Most organizations today lack complete, accurate and a comprehensive database regarding the capabilities of the employees. There is always a need of a certain skill level that the workforce possesses but lack of more precise information handicaps ability to project potential and impending future requirements/shortages in certain skill areas. This in turn undermines the ability to plan for necessary employee training and education, as well as the ability to determine future directions for the recruiting, selection of employees and if required purchasing contracted services from outside the organization.
2. If certain individual position openings occurred within the organization that require a unique combination of skills and experience it is difficult to readily identify the best qualified individual. It happens that employees who are “most familiar” tended to appear as potential candidates. This negatively affects management’s ability to move employees periodically to different positions so as to capitalize on their varied talents, as well as to afford employees opportunities for job variety and development of new skills

REFERENCES:

- Ahmad, S. (2019). *Human Resource Planning: Effective Performance. Research Journal. of Humanities and Social Sciences, 10(4), 1120-1124.*
- Akey, B. C. A., Dai, B., Torku, E., & Antwi, E. A. (2017). *Human resource planning and the development of employees in contemporary firms. European Journal of Contemporary Research, 6(1), 299-305.*

- Fahed-Sreih, J. (2018). *Introductory Chapter: Human Resources in the Twenty-First Century*. In *Human Resource Planning for the 21st Century*. IntechOpen.
- Irfan, M., Putra, S. J., Alam, C. N., Subiyakto, A., & Wahana, A. (2018, March). *Readiness factors for information system strategic planning among universities in developing countries: A systematic review*. In *Journal of Physics: Conference Series* (Vol. 978, No. 1, p. 012046). IOP Publishing.
- Oke, L. (2016). *Human resources management*. *International Journal of Humanities and Cultural Studies (IJHCS)* ISSN 2356-5926, 1(4), 376- 387.
- Oke, T. I., & Kefas, S. R. (2019). *Education and Human Resources Planning for Sustainable National Development in Nigeria*. *KIU Journal of Humanities*, 3(4), 17-25.
- Purkey, D. R., Escobar Arias, M. I., Mehta, V. K., Forni, L., Depsky, N. J., Yates, D. N., & Stevenson, W. N. (2018). *A philosophical justification for a novel analysis-supported, stakeholder-driven participatory process for water resources planning and decision making*. *Water*, 10(8), 1009.
- Samwel, J. O. (2018). *Human Resource Planning as an Important Practice to Anticipate Future Human Resource Requirements of the Organization—a Literature review*.
- Shah, G. B. (2018). *A Conceptual Review on Strategic Human Resources Management and Planning in Non-Profit Motive Organization*. *Journal of Business and Social Sciences*, 2(1), 18-26.
- Stewart, G. L., & Brown, K. G. (2019). *Human resource management*. John Wiley & Sons.
- Tuan, T. M., & Dung, N. X. (2020). *Developing human resource in research and development: international experiences and implications for Vietnam*. *Asian Journal of Political Science*, 1-12.
- Zakirova, A., Klychova, G., Yusupova, A., Kirillova, V., & Gimadiev, (2019). *Human resources planning and auditing in agribusiness*. In *E3S Web of Conferences* (Vol. 91, p. 06003). EDP Sciences.