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MODELS AVAILABLE TO VALUE

HUMAN RESOURCE
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MODELS AVAILABLE TO VALUE THE HUMAN RESOURCE

3.1 INTRODUCTION

With the ever expanding dimensions and growing complexities of business activities, increasing governmental monitoring in business affairs, pressing trade union demand for greater disclosure on human performance in business and emanation of scientific management within the organization necessitate the development of a system of accounting for the associated men who are indispensable resources to an organization. For the last few decades, the accounting scenario across the world is much concerned with the valuation of human resources and reporting the same in the annual accounting statements. The academics, practitioners and institutes in the accounting world are deeply engrossed in the issue and have shown an increasing interest in the application of the models, developed so far, into practice. Although the technique of measuring HR's and development on this issue is still in developing stage, the subject has created an widespread appeal and appraise the major HRA models enunciated by the erudite authorities.

The object of this chapter is to study the models available to value human resource. However, the researcher had tried to bring together the theoretical background of various models suggested by different proponents at global level. This chapter is totally based on secondary data and
presented as it is without any modification. This topic will help to understand the theoretical background of various models, and at the end, effort will be made to suggest the best feasible models.

3.2 CLASSIFICATION OF HUMAN RESOURCE COSTS

The variegated types of costs associated with the employees or the human resources have been classified by the experts into a number of categories such as cost of selection, training cost etc. Anyhow, on the basis of the purpose for which the costs are incurred by the companies, the human resource costs may broadly be classified into three categories. They are acquisition costs, development costs, and periodical wages and salaries.

3.2.1 Acquisition Costs

'Acquisition', here, does not denote the purchase. Because the employees cannot be purchased like building, machine, etc. And therefore, there is no question of companies owning the employees. Acquisition, therefore, refers to the recruitment of people. All the costs incurred by the companies up to the time of 'reporting for the duty' by the candidates selected are usually termed as acquisition costs. Costs for advertising, application processing, screening, conducting tests and interviews, honorarium to the members of the recruitment committees, a share of administrative expenses, etc. fall into this category.

3.2.2 Development Costs

After the selected candidates report for duty, usually they will be given some training by the employer – company before assigning productive work to them. Hence, the development costs are the costs incurred by the companies from the time the selected candidates report for duty to the stage
of placing them on the jobs. The development costs, therefore, include the salary of both the trainees and the trainers, cost of study materials, consultancy fees, a share of administrative expenses, etc., include the salary of both the trainees and the trainers, cost of study materials, consultancy fees, a share of administrative expenses, etc. Development costs also include a portion of the trainees' salary which is not represented by their production if they attend to some productive work even during the training period. For instance,

"Assume that XYZ Company pays, on an average, Rs. 3,000 monthly salary to each of its existing experienced employees who produce, on an average, 150 units of its sole product 'P' per month. On the other hand, it pays only Rs. 2,400 to each of newly recruited employees who produce only 80 units per month during the training period.

It may be noted here that the labour costs, in the case of an experienced employee comes to Rs. 20 per unit (i.e., Rs. 3,000/150 units). At this rate, the Company would have paid only Rs.1,600 to each of its newly recruited employees during the training period (i.e. Rs. 20 x 80 units). But the company pays Rs. 2,400. Therefore, the difference of Rs. 800 (i.e. Rs. 2,400 - Rs. 1,600 or Rs. 2,400 - Rs. - Rs. 3,000 / 150 units x 80) is to be treated as an item of development costs as this cost is not represented by the output."

3.2.3 Periodical Wages and Salaries

Once the selected candidates report for duty and start attending the work assigned to them by employer – company, the company pays salaries to them periodically (say, every month). These include even the employer’s contribution towards the employees’ insurance fund, provident fund and also
the cost of non-monetary facilities provided to the employees besides the periodical wages and salaries. It also includes a part of salaries payable to the new recruiters during the training period. For instance, in the above XYZ Company illustration, out of Rs. 2,400 monthly salary payable to the trainees, Rs. 1,600 is to be reckoned as an item of periodical wages and salaries.

3.3 HUMAN RESOURCE COSTS - CRITICAL EVALUATION

It may be recalled here once again that the majority of experts who have contributed to the current literature on human resource accounting have reckoned either the first two groups of costs or the third group of human resource costs for the purpose of ascertaining the value of human resources without bothering to find whether they possess the features of assets or not. Hence there is a need for a critical analysis of different categories of human resource costs to find out the category of human resource costs which possesses the features of assets and which do not possess. Only those human resource costs which possess the features of assets can be assetized but not all the human resource costs. With this objective, the following analysis has been made.  

3.3.1 An Evaluation of Periodical Wages and Salaries

As already stated, periodical wages and salaries denote the payments made by the employer company to its employees. These payments represent only the reward for the effort put in by the employees during the month just ended. The payment is not made by the company with the intention of extracting work from its employees in future but made as a reward for the past service or work.
for examples,⁵

"The amount of salary paid by the Mysore Paper Mills Limited, Bhadrawati to its employees for the month of January 1992 (either on January 31, 1992 or on February 1, 1992) is the reward for the work done by the employees during January 1992, just because the mill has paid salary for the month of January 1992, it cannot get the work from its employees during the next month viz., February 1992 unless it pays the salary even for the month of February 1992 also (of course, at the end of February). That means, the salary paid for the month of January 1992 is not capable of extracting the work from the employees during February 1992 (without ensuring payment for February also). To put it alternatively, salary for the month of January fails to yield benefits to the Mill even during the month of February 1992."

The above illustrative analysis clearly brings out the fact that the periodical wages and salaries do not possess one of the most important and essential features of assets which has clearly been brought out by the opinion of Brummet et al. have strongly felt that:⁶

"If the benefits pertain to future period of any human resource expenditure, it should be treated as assets."⁷

A comparison of what the established principle, as stated above, says about the costs to be assetized with the nature of periodical wages and salaries reveals that this category of human resource costs (viz., periodical wages and salaries) does not possess the features of assets. The same aspect has differently been stated by the AAA's committee on ASOBAT which is reproduced below.
“Costs should be capitalized when they are incurred in order to yield future benefits.”

From the above, it is unequivocal that the periodical wages and salaries do not possess the ability to ‘yield future benefits’ nor pertains their (viz., periodical wages and salaries) benefits to the future period. As the periodical wages and salaries do not possess the above features, there is no justification to assetized these costs. It is astonishing to find a good number of experts suggesting to accord assets status to human resource by capitalizing or assetizing the (present value of) future earnings (i.e. salaries and wages) of the employees. What is not understandable is how they suggested to assetized periodical wages and salaries when they do not possess any of the features of assets.

In the light of the above evaluation, it may be said that the current practice of charging these periodical wages and salaries to the profit and loss account as an item of revenue expense should continue as there is no logic or rationale in the assetization of these costs.

3.3.2 An Evaluation of acquisition and Development Costs

Unlike the operational wages and salaries, the ‘acquisition and development’ costs including the development costs of existing experienced employees possess all the essential features of assets. Because, these are the cost incurred for the purpose of acquiring and developing human resources to at least normal level of performance expected to possess in a given situation or to enhance the skill of employees. It is because of these sacrifices that the organizations are able to undertake the production and sales activities. To put it alternatively, it is due to this that the organizations equip themselves with adequate manual labour force which is
capable of producing goods and services. That means, these costs are incurred with the hope of extracting work (i.e. benefits) from employees in future. In other words, these costs benefit the organization in future. From this, we can say that the acquisition and development costs possess one of the features of assets as pointed out by Brummet et al. & AAA’s Committee on ASOBAT. Horngren has also opined on the same lines which reads as follows: 10

“Assets are economic resources that are expected to benefit future activities.”11

Even Tsay has also felt the same which is reproduced herein under:

“If any expenditure can be proved to benefit future periods, it should be capitalized.” 12

Further, once these costs are incurred by the companies, there is no need to incur them once again. Because, there is no need to recruit the employees (once again) who have already been recruited by the companies to a particular cadre. It is also not necessary to impart an identical type of training to the employees to whom this type of training has already been given. It does not mean that there will not be any acquisition and development costs in future. But it is only to stress the point that there is no need to rerecruit the employees of the organizations (already recruited) and to train the trained employees to whom similar type of training has already been imparted. This clearly brings out the fact that the acquisition and development costs possess another important feature of assets which has rightly been pointed out by Lynch and Williamson as follows: 13
"Assets (unexpired costs) ordinarily represent costs whose reincurrence is unnecessary in the future." 14

The analysis made in the above paragraphs apparently indicates the fact that the acquisition and development costs possess the features of an asset. It is, therefore, necessary to reckon only these costs for the purpose of assetization. The capitalized amount may be placed on the assets side of the balance sheet and amortized over a period during which the employees stay on with the organization. The procedure to be followed here is identical to the accounting treatment of acquisition costs of physical assets such as building, machine, etc. 15

3.4 CLASSIFICATION OF HUMAN RESOURCE ACCOUNTING MODELS

The present research monograph deals with the different approaches/models that have been advocated by the different proponents in the field of human resource accounting. The models are cost based, value based or behavioral based; some models are based on various other surrogate measures.

A subjective valuation of the invisible human assets and reporting in balance sheet may pose a problem to the traditional accountants. There is a need for a joint approach by accountants and personnel manager to develop HRA as a decision support system. The research monograph is suggestive of the need to evolve a consensus approach to account for them in terms of cost value calculus in the context of the present liberalized environment.

Various models have been promulgated by numerous authorities for measurement and valuation of human assets. Notable among the authors who

The different approaches/models have been advocated by different proponents in the field of HRA. Some of them are cost based, some of them are value based and some are behavioural based. Various other surrogate measures have also been proposed for the valuation of the organizational human resource.16

The following Chart 3.1 provide brief explanations of models on human resource accounting at glance.

**Chart 3.1**

**Classification of HRA models**

<table>
<thead>
<tr>
<th>HRA models</th>
<th>Underlying principles</th>
<th>Proponents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A) Cost based models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Historical cost based</td>
<td>Actual cost incurred as HR value following historical cost</td>
<td>Brummet, Flamholtz and Pyle (1968); Woodruff</td>
</tr>
<tr>
<td>models</td>
<td>principle</td>
<td>(1969)</td>
</tr>
<tr>
<td>b) Replacement cost</td>
<td>Cost of replacing the HR and rebuilding the human</td>
<td>Flamholtz (1969)</td>
</tr>
<tr>
<td>based models</td>
<td>organization (actual or hypothetical)</td>
<td></td>
</tr>
<tr>
<td><strong>B) Opportunity cost</strong></td>
<td>Best possible return from an individual in all possible</td>
<td>Hekimian &amp; Jones (1967)</td>
</tr>
<tr>
<td>Models</td>
<td>alternative positions as individuals value</td>
<td></td>
</tr>
</tbody>
</table>
C) Economic models

a) Goodwill method
   Supernormal profits of the concern as HR value
   Hermanson (1964)

b) Adjusted discounted future wages method
   Present value of future wages for a limited period as HR value. Differential rate of return between a firm and the economy average credited to HR.
   Hermanson (1964)

c) A model on the use of economic concept of human capital
   Present value of future wages upto retirement as HR value. Wages dependent on age alone.
   Lev & Schwartz (1971)

d) Normative economic model
   Individual's value dependent on his rank and performance rating, estimated stochastically
   Flamholtz (1971)

e) Human asset multiplier method
   Individual's value dependent on his personal qualities and job characteristics. Total HR value equated to supernormal earnings of the concern
   Giles & Robinson (1974)

f) A model on valuation of HR
   HR value dependent on rank and performance rating estimated on a group basis using stochastic method.
   Jaggi & Lau (1974)

g) A stochastic model on HR valuation
   Present value of future wages (upto exit) measured stochastically considered as HR value
   Sadan & Auerbach (1974)

h) A surrogate measure for the firms investment in HR
   Present value of differential wages (upto exit) between the firm and industry average considered as HR value
   Friedman & Lev (1974)

i) A model on the measurement of human assets.
   Employee attitude considered as the reflection of human productivity and the basis of HR value
   Myers & Flowers (1974)

j) A model on estimation of human capital associated with an organization
   Present value of future wages (upto exit) measured stochastically, considered as human capital value
   Morse (1975)

D) Behavioural based model

A model on valuation of human organization
   Management system determines the conditions of the human organization that results in performance. HR investments amortized in tune with condition of human organization reflects HR value.
   Likert (1967)

E) Other surrogate measures

a) Performance measures as a surrogate of individual employees value
   Employee appraisal through ranking and rating
   Watson (1975)
b) Performance measures as surrogate of the concern HR value
Achievement level of corporate objectives in relation to the value of plant base considered as HR value
Kolay & Sahu (1975)

c) Management information system and management control reports
(i) HR information related to HR investment, employees related variables and output related variables
Powell & Wikens (1973)
(ii) Employee movement analysis from each position
Mahoney, Milkovitch & Weiner (1977)
(iii) Performance evaluation in HR selection, compensation, development & retention
Lapointee (1983)
(iv) Effectiveness of HR functions related to HR value
Steffy & Maurer (1988)
(v) ROI on training & development
Davidove and Schroeder (1992)

d) The scalar method
Employee evaluation through comparison against a set of acceptable standards of attributes
Puett Jr. & Roman (1978)

e) Simulation approach
Inflow & outflow rate analysis through simulation for suitable level of HR

3.5 COST BASED MODELS

3.5.1. Historical Cost Model

This model was first developed by Rensis Likert and his associates at R.G. Barry Corporation in Ohio, Columbia (USA) in 1967. According to them, human resources are treated like other physical asset. The actual expenditure incurred on advertising, selecting, recruiting, training and familiarization, experience building in the labour force is Capitalised and treated as an assets and amortized over a period of time like other capital assets. In case the human becomes useless before the expected period (e.g. retirement or death) it is charged to the revenue and written off. 18
This method has the following merits

a) It is easy to understand and estimate the cost of human resources.

b) The value of physical assets and human resources are made on an uniform basis.

c) The cost of human resources gets evenly distributed over a period of time.

d) It enables the firm to compare the cost incurred in developing human resources and the benefit derived from it.

However, the methods also suffers from the following limitations

a) Like other cost based models this method takes into account only the cost incurred and not the value of the potential services the human resources are likely to render in future.

b) It is difficult to estimate the period over which business resources are useful.

c) Human resources may becomes more valuable by gaining experience and becoming more loyal to the organization which cannot be measured in terms of money.

d) Such organizational investments in HR, not specific to individuals it is considered in groups.

Individuals grow and deteriorate physically and mentally at different rates. Some grow more capable as a result of work experience, others do not. The rate of contribution of individuals over the years towards the organizational goals is a subjective phenomena as agreed to by all the proponents of HRA. The extent of amortization of HR investments depends on the individuals performance level which in turn depends on a number of factors. The different aspect of amortization reflecting the extent of the
same over the years relevant to HR investments in individuals as suggested by the different proponents in the below given Chart 3.2. ¹⁹

Appreciating the difficulties of estimating the contribution rate of individuals consequent to individualized HR investment, it has been proposed to review on a periodic basis each individualized functional account to record the expiration and to monitor the condition of human assets. Monthly review has been suggested in the case of Bell - System of project of AT&T where as quarterly review has been suggested in the case of R.G. Barry Corporation. Besides periodic monitoring of HR condition for assessing the extent of amortization of HR investments, it has been suggested to assess the extent of losses on account of short tenure of employees, abnormal level of labour turnover (cost of normal level of turnover may be allocated to the remaining employees as it may be necessary and desirable to provide a healthy environment to new growth), obsolescence due to change of technology and change of systems and procedure, so also losses on account of health deterioration of individuals. ²⁰

The recording of expiration of organizational investments in the interaction influence of social system presents more difficult problems as regards to their period of amortization and the pattern of year wise amortization schedule. ²¹ Benefits could be derived indefinitely from such investments that mould the organization into a system of effective interacting groups despite a moderate level of individual employee turnover within the system. This suggests that some organizational investments may be free from amortization. Again, the entire investments on development of employee attitude and motivation may have to be written off consequent to deteriorations in those attitude and motivation. ²²
Chart 3.2
Different aspect of amortization as advocated by historical cost–based HRA proponents

<table>
<thead>
<tr>
<th>1. Approach for amortization</th>
<th>Proponents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii) Accumulated HR cost to be amortized element wise</td>
<td></td>
</tr>
<tr>
<td>a) acquisition cost</td>
<td>Brummet, 1970; Woodruff (Jr.) 1970.</td>
</tr>
<tr>
<td>b) training &amp; development cost</td>
<td></td>
</tr>
</tbody>
</table>

2. Starting point of amortization
   i) Since joining of the individual |
   ii) Since start contributing |
   Most of the proponents
   Brummet, 1970

3. Period of amortization
   3.1 Amortization on total cost basis
      i) Maximum service life |
      ii) Expected service life* |
      iii) Relevant benefit period |
      Brummet, Flamholtz & Pyle, 1969; McRae, 1974 |
      Brummet, Flamholtz and Pyle, 1969; McRae, 1974 |
   3.2 Amortization on elemental cost basis
      Expected service life for acquisition cost Element and expected benefit period for the Training and development cost element. |
      Brummet, 1970; Woodruff (Jr) |

4. Method of amortization
   i) Straight line |
   ii) Reverse sum of digit |
   iii) Varying depending on the HR condition (including physical) as assessed from periodic review. |
   Pyle, 1970; Sinclair, 1978 |

*Expected service life of an individual employee has been proposed to be assessed; |
i) Based on multi-factor attributes like age, marital status, tenure, organization level, job satisfaction and other related factors with weighted probability. |
ii) Based on actuarial assessment.
3.5.2 Replacement Cost-based Model

This method values human resources at their present replacement cost instead of the cost of acquisition (historical cost). It is valued on the basis of the assumption that if the entire human resources are to be replaced, what would be the cost of such replacement to the firm. This is simple variation of the previous method in that it takes the current cost of acquiring human resources.23

This approach has the following merits

a) The current cost of acquiring human resources is more realistic than putting them at the historical cost in financial statements

b) If the estimate is made at replacement cost the potential value of the labour gets indirectly included.

The demerits of this approach are

a) This methods suffers from all the deficiencies of the historical cost method.

b) Replacement cost of valuation of assets is against accounting convention of valuating assets at historical cost.

c) It is difficult to estimate replacement cost of varying categories of labour with different levels of service and experience.

The replacement cost of individuals in an organization as conceptualized by Flamholtz (1969, 1973) comprises of:

a) The present estimated cost of hiring, training and developing individuals upto the normal level of productivity of the existing individuals, i.e. it includes the basic cost elements like;24
b) Cost associated with moving the existing position holders either out of the organization or to new positions within the organization, i.e.

- The cost of carrying a vacancy until a suitable replacement can fill it, i.e. likely loss of contribution during the period when vacancies remain unfilled.
- Cost of moving and displacement,
- Loss of productivity of the employees and their co-workers prior to their separation,
- The effect of a vacant position on other employees.

Beside the assessment of replacement cost of individuals, such a cost a cost item may be estimated with reference to different positions in an organization rather than specific individuals to be referred as positional replacement cost. It may be difficult to identify a suitable replacement of an individual employee in an organization. One good design engineer may be produces from a batch thirty graduate engineer trainees after twenty years. Recognizing this fact, Flamholtz (1986) has introduced the concept of marginal value replacement cost.

The marginal value replacement cost has been defined as the summation of
• the cost of recruit one person at the entry level

• the cost to select one person at the entry level

• the cost to develop one person at each intermediate level and

• the separation cost for one person at the critical level.

The full replacement cost refers to the summation of all such cost elements not for only one person but for number of persons as needed so as to make available the replacement for one individual.

The replacement cost phenomena may not only be applicable to the cost of acquisition, training and development of the individual, replacement cost of servicing an individual like the salary that the organization may have to incur to hire an equivalent employee for replacement, may also be important. In case salary payable to an employee is considered as the value surrogate of human assets such as a replacement cost of servicing may be reckoned as value using the replacement cost principles. 27

Many proponents (Likert and Brummet, Flamholtz and Pyle, Likert & Bowers,) based on the replacement cost principles, advocated the concept of estimating the cost of rebuilding the human organization back to its present level of effectiveness, leading to the replacement cost of the organizational investments for decision making purposes. The current cost of rebuilding the human the human organization being quite substantial and accordingly, the true worth of this important assets, the proponents stressed the need for an estimate of the dimension of such an assets. The replacement value of the human organization equals the sum of the replacement cost and opportunity cost of forgone income during the period of development of replacement of the organization. 28
The concept of replacement cost as advocated above has been implemented in many real life industrial organizations to make the management conscious about the extent of outlay needed in case the individuals leave the system and extent of rebuilding the human organization and accordingly guide the management in formulating various man-management strategies in the areas of acquisition, maintenance, development and utilization of the organizational HR. Chart 3.3 represents the development of replacement cost at different levels of certain organizations to aid the human resource management process.

**Chart 3.3**

**Development of replacement cost of human resource at different organizations**

<table>
<thead>
<tr>
<th>Proponents</th>
<th>Developed at</th>
<th>Subject</th>
<th>Major issues involved</th>
<th>Objective for the development of replacement cost.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brummet, Flamholtz &amp; Pyle (1968)</td>
<td>R.G. Barry Corporation</td>
<td>Individual manager</td>
<td>Historical cost based HRA developed and implemented for the first time in the history of HRA considered not very relevant for managerial decision making</td>
<td>To incorporate relevant additional information along with historical HR cost data to bring improvements in the HR management process.</td>
</tr>
<tr>
<td>Flamholtz (1973)</td>
<td>Mid-Western Insurance Co.</td>
<td>Sales &amp; claim personnel</td>
<td>Employee turnover for these personnel associated with high incidence on cost.</td>
<td>i) To guide the modification in compensation strategy of the co.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ii) Manpower requirement planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>iii) Personnel cost control</td>
</tr>
<tr>
<td>Flamholtz &amp; Kaumeyer (1980)</td>
<td>International Bank (USA)</td>
<td>Tellers &amp; management associates</td>
<td>To continue with tellers &amp; management associates or to think of some other alternatives</td>
<td>ii) To improve various personnel procedures and programmes.</td>
</tr>
</tbody>
</table>
In short, implies that an individual generally moves in different positions during the total tenure of his service life. Hence, the positional replacement cost refers to the current cost of replacing the series of services expected from an employee during his total stay at different positions in the firm. The expected realizable value $E(RV)$ of an individual may be determined by using following formula.

$$E(RV) (Expected \ Realizable \ Value) = \sum_{t=1}^{n} \sum_{i=1}^{m} \frac{R_i - P(R_i)}{(1 + r)^t}$$

Where, $R_i =$ Value R (i.e. benefit) that can be derived by the Organization in each possible service state ‘i’.

$P(R_i) =$ Probability that a person will hold the position ‘i’.

$m =$ Position at the time of exist (after holding each position)

$n =$ Number of years an employees is expected to stay with the firm.

$r =$ Appropriate discount rate.

$t =$ Time.
3.5.2.1 Discounting Rate

There is also the question of determining the appropriate rate of interest for discounting the future salary flows of the employees to their present worth. Opinions differ sharply among economic and finance experts as to what constitutes the appropriate cut-off rate in capital budgeting decisions. Suggestions, in this respect, range from the application of the normal return on investment (ROI) to such intricate concepts as that of the cost of fund or cost of capital.31

Return on investment is an index used to measure the profitability of the organization during a particular period of time. It is expressed in terms of the ratio which the profit earned by the organization during a certain period of time bears to that of its total assets employed at the end of that time. It is an accounting rate of return rather than the cost of funds invested by the organization in its capital project. It is, therefore, not particularly suited as cut-off point for project evaluation. One of the main defects of ROI is that it throws up an unreasonably high rate of return which projects should satisfy before they are being selected. Explicitly, this will not only limit the choice of the company for considering alternative projects but will also prevent it from taking up projects which might otherwise increase the overall returns of its shareholders. A further defect of the ROI is that it does not take into account the costs of the source for financing the projects, or the proportion which each source bears to the total capital fund of the organization.32

3.6 OPPORTUNITY COST MODEL

The concept of opportunity cost has been advocated by for the valuation of the organizational HR by Hekimian and Jones by developing
what is known as the ‘Competitive Bidding Model’. The major emphasis of this model has been on proper allocation of the HR among different departments / divisions etc. within an organization. If an organization has at least two divisions, projects or contracts, both of which desire or require the services of a particular employee or a particular group of employees, the organization has been conceptualized as a market place with different investment center managers competing for the resource as buyers. The use of services of a particular employee may not be viable in more than one investment center; in that case, its use by one division would not deny the use of the same to any other divisions leading to assignment of zero-value to that particular person consistent with Dearden’s implicit recognition that assets have only when there is an alternative use for them. The situations that would warrant the applicability of the proposed bidding model are:

- An organization is having at least two or more investment centers which have been properly identified with specific responsibilities.
- At least two of these investment centers of the organization have been demanding for the scarce resources.
- The investment center managers are motivated and recognize return on investment as the important criteria for performance evaluation of investment centers.
- Top management of the organization has an establishment target of return on investment.
- Physical assets of the organization are represented at current economic values.
Hekimian and Jones have proposed the following procedure for valuing human assets:

- Identification of the various responsibility centers in the organization.
- Determination of the assets, both physical and human, used by each centre.
- Physical assets represented at their current economic values.
- The human assets have been proposed to be valued by the maximum bid price quoted by investment centre manager who would be successful in winning the bid.

In essence, different investment centre managers, desirous of having the scarce resource, assess the potential incremental benefits of having the employee in their own centers keeping in view the targeted return on investment objective and accordingly, quotes certain money value against that particular employee. The potential incremental benefits refer to the present value of expected benefits from services (i.e. net of cost) from the employee during his likely stay with the investment centre. The likely stay with the investment center would depend on the possibility of retaining the employee in the subsequent bidding based on the relative effectiveness of the employee in other investment centers.  

- Establishment of a profit goal based on the total investment value (physical & human) and the expected rate of return.
- The profit goal has been suggested to be used as a performance evaluation.
The proposed model has been based on the marginal productivity of the employee in different assignment of the organization, as such conceptually; it may lead to optimal allocation of personnel within the organization. The proposed competitive bidding model has been applied by the proponents in a multidivisional electronics company in U.S. The Micro-circuit Division and the Defense Products Division represented the two investment centers for the scarce resource of design capability. 36

3.7 ECONOMIC MODELS

3.7.1 Goodwill Model

Taking the lead from traditional accounting practices of goodwill as a measure of intangible assets, Hermanson (1964) has proposed two approaches to value the organizational HR. Both the approaches center on the assumption that the HR, being the prime resource, governs all other physical and financial resources to manage the business effectively and as such the credit for organizational profitability performance goes to the HR. 37

First Approach

- Difference in the level of profits of an organization as compared to the industry average reflects the goodwill i.e. the contribution allocated to the HR as well as to the other tangible asset bases.

- Rate of contribution from the investments in all asset bases are more or less the same.

- Human resource value is equated to its relevant contribution i.e. HR value = Goodwill \times \text{Investments in HR} / \text{Investments in total assets}.
Second Approach

- Difference in the level of profits earned by an organization as compared to the industry average reflects the goodwill i.e. the contribution of the HR itself.

- Rate of contribution of the HR may estimated. (The model is silent on the method to estimate the same).

- HR value conceptualized as the imputed amount of investments on which the same level of contribution has been made i.e. **HR value** = \( \text{Goodwill} / \text{Rate of estimated contribution of HR} \).

A flow diagram of the Goodwill method for the two specific approaches is reflected in Chart 3.4.38.
Average level of investments in human resource (HR) $[HIO,]$ 

Industry average rate of return on investments $[RIA,]$ 

Profit (after tax) during period (t) $[APO,]$ 

Normal profit at industry average rate $[NPO,]$ where, $NPO, = TAO, RIA,$ 

Average level of investments in human resource (HR) $[HIO,]$ 

Proportion of HR in total assets $[HIO, / TAO,]$ 

Goodwill value of the organisation $[GLO,]$ where, $GLO, = APO, - NPO,$ 

Estimated rate of return on the HR goodwill value of $[RHO,]$ 

Proportional goodwill as HR value - 1st approach $[HVO_{1st},]$ where, $HVO_{1st} = GLO, HIO, / TAO,$ 

Notional HR investments as HR value with entire goodwill as the return -2nd approach $[HVO_{2nd},]$ where, $HVO_{2nd} = GLO, / RHO,$ 

Chart 3.4

HR valuation following goodwill model
3.7.2 Adjusted Discounted Future Wages Model

Hermanson has proposed in this method to value organizational HR based on the following hypotheses:

- The return of an organization on owned assets reflects the contribution of its HR.

- The differential rate of return on owned assets of an organization as compared to that of the average of all firms in the economy reflects the relative rate of contribution of the organizational HR.

- Remuneration payable to HR in the form of wages and salaries would be based on their relative contribution in general.

- Likely future wages and salaries payable reflects the periodic returns on the HR asset base of an organization.

- Net present value of likely future wages and salaries bill, discounted at the relative rate of return, would reflects the value of the HR assets base of an organization. 39

Based on the aforesaid hypotheses, the proposer has suggested the methodology to value the HR of an organization as a whole on a periodic basis as follows:

- The average rate of return on owned assets for all firms in the economy for the current period is first worked out.

\[
\text{Owned Assets} = (\text{Total Assets}) \times (\frac{\text{Net Worth}}{\text{Total Capital Employed}})
\]

- The differential rate of return between an organization and the average of the economy has been proposed to be reflected through an efficiency ratio defined as follows:
Efficiency ratio = \text{Weighted average rate of return of the organization / weighted average rate of return for all firms in the economy where,}

i) rate of return refers to owned assets

ii) weighted average refers to last five years average with relatively lower weightings as we move to the earlier years.

- The rate of return of HR of the organization relative to that of all firms in the economy on an average i.e. adjusted rate of return would be equal to average rate of return for the economy multiplied by the efficiency ratio.

- The likely future wages and salaries payable to the employees for the next five years is assessed.

- The value of the organizational HR during the period would be equal to the net present during the five years discounted at the adjusted rate of return on the HR.  

A flow diagram of the above method is presented in Chart 3.5
Rate of return on owned assets during past five years

\[ RNO,_{t} \text{ for } t = (t-5) \text{ to } (t-1) \]

Weightings assigned to past rate of returns with comparatively lower weighting to each preceding year

\[ AW_{t}, \text{ where } AW_{t} = AW_{t-1} > AW_{t-2} > AW_{t-3} \]

Average rate of return on owned assets for all firms in the economy during past five years

\[ RNA,_{t} \text{ for } t = (t-5) \text{ to } (t-1) \]

Weighted average rate of return of the organisation

\[ WRO,_{t} = \sum_{t} A W_{t} RNO,_{t} / \sum_{t} A W_{t} \]

Weighted average rate of return for all firms in the economy

\[ WRA,_{t} = \sum_{t} A W_{t} RNA,_{t} / \sum_{t} A W_{t} \]

Estimates wages and salaries payable to employees during the next five years

\[ EFS,_{t} \text{ for } t = (t+1) \text{ to } (t+5) \]

Efficiency ratio of the organization

\[ ERO,_{t} = WRO,_{t} / WRA,_{t} \]

Average rate of return on owned assets for all firms in the economy during the current year (t)

\[ RNA,_{t} \]

Adjusted rate of return

\[ ARO,_{t} = RNA,_{t} ERO,_{t} \]

Present value of estimated wages and salaries as HR value of the organisation

\[ HVOA,_{t} = \sum_{t} EFS,_{t} / (1 + ARO,_{t})^{t} \]

Chart 3.5
3.7.3 A Model on the use of Economic concept of Human Capital

Based on Fishers definition of capital as a source of income stream and its worth as the present value of future income, discounted by a rate specific to the owner of the source or to the potential buyer, Lev and Schwartz have defined the value of human capital embodied in a person of certain age as the present value of employees remaining future earnings from the employment. In absence of market prices for human capital, the value has been proposed to be based on census or firm’s earnings data. To assess annual earnings, it has been suggested to use current data available on earnings distribution by (a) age, race, education, geographic area of employment etc. and (b) different profession or skill and transform the observed across person’s earning profile to cover time earnings profile by identity transformation as usually practiced in human capital study. The proponents have considered that the labour force as a whole would be constantly associated with the firm. As long as the employees can be replaced, it may not matter for the purpose of the model whether the labour force always would contain the same persons or a rapidly changing group, as such, premature termination may not be relevant for the estimation of future earnings. However, the model proposes to take into account the possibility of death prior to retirement (from the published mortality table) to assess the expected value of the person’s human capital.

The above method of measurement of the capital value may be applied to a person or a group of persons. The firm’s labour force has been proposed to be divided into homogeneous groups of employees such
as unskilled, semiskilled, skilled, engineers of different disciplines, salesmen, managerial staff etc.

It is recognized that a specific firm may pay different wages and salaries than those indicated by the census data. As such it has suggested in the model to assess for a firm's labour force, a general value of human capital based on census data and a specific wage scale of the firm. To arrive at the present value of future earnings, the cost of capital of the firm has been suggested as the appropriate discounting rate. A flow diagram of the proposed method is presented in Chart 3.6.

3.7.3.1 Lev & Schwartz model suggested by ICAI

The Lev and Schwartz Model (1971), known as discounted wages and salaries model. This model involves determining the value of human resources as the present value of estimated future earnings of employees (in the form of wages and salaries etc.) discounted by the rate of return on investment (coat of capital). According to Lev and Schwartz, the value of human capital embodied in a person of age $\tau$ is the present value of his remaining future earnings from employment. This valuation model for a discrete income stream is given by the following:

$$ V_\tau = \sum_{t=\tau}^{T} \frac{I(t)}{(1 + r)^t} $$

Where,

$V_\tau$ = the human value of a person $\tau$ years old.

$I(t)$ = the person's annual earnings upto retirement.

$r$ = a discount rate specific to the persons.

$T$ = retirement age.
Chart 3.6
HR valuation using economic model of human capital
However, the above expression is an ex-post computation of human capital value at any age of the person, since only after retirement can the series $T(t)$ be known. Lev and Schwartz, therefore, converted their ex-post valuation model to an ex-ante model by replacing the observed (historical) values of $I(t)$ with estimates of future annual earnings denoted by $I^*(t)$. Accordingly, the estimated value of human capital of a person $\tau$ year old is given by:

$$V^*_{\tau} = \sum_{t=\tau}^{T} \frac{I^*(t)}{(1 + r)^t}$$

Lev and Schwartz again pointed out the limitation in the sense that the above model ignored the possibility of death occurring prior to retirement age. They suggested that the death factor can be incorporated into the above model with some modification and accordingly they recommended the following expression for calculating the expected value of a person's human capital:

$$E(V^*_{\tau}) = \sum_{t=\tau}^{T} P_t (t + 1) \sum_{i=\tau}^{I^*} \frac{I^*_i}{(1 + r)^r}$$

Where $P_t (t)$ is the probability of a person dying at age 't'.

Lev and Schwartz have shown in the form of a hypothetical example the method of computing the firm's value of human capital. Employees of the hypothetical firm have been decomposed by age groups and degrees of skill and the average annual earning for each age and skill group have been ascertained. Finally the present values of future earnings for each group of
employees have been calculated on the basis of a Capitalisation rate. The sum of all such present value of future earning was taken as the firm’s value of human capital.

In this model, wages and salaries are taken as surrogate for the value of human assets and therefore it provides a measure of ‘future estimated cost’. Although according to economic theory, the value of an asset to a firm lies in the rate of return to be derived by the firm from its employment, Lev and Schwartz model surrogated wages and salaries of the employees for the income to be derived from their employment. They felt that income generated by the work-force is very difficult to measure because income is the result of group effort of all factors of production.

However, this model is subject to the following criticisms:

(i) A person’s value to an organization is determined not only by the characteristics of the persons himself (as suggested by Lev and Schwartz) but also by the organizational role in which the individual is utilised. An individual’s knowledge and skill is valuable only if these are expected to serve as a means to given organizational ends.

(ii) The models ignores the possibility and probability that the individual may leave an organization for reasons other than death or retirement. The model’s expected value of human capital is actually a measure of the expected ‘conditional value of a person’s human capital - the implicit condition is that the person will remain in an organization until death or retirement. This assumption is not practically social.

(ii) It ignores the probability that people may make role changes during their careers. For examples, an Assistant Engineer will not remain in the same position throughout his expected service life in an organization.
In spite of the above limitations, this model is the most popular measure of human capital both in India and abroad.

3.7.4 Normative Economic Model

The model as proposed by Flamholtz aims at measuring an individual employee’s value to the organization to which he/she belongs, based on the economic principles. An individual has been considered as the unit of valuation as individual has been considered as the unit of valuation as individuals are the central focus for various management decisions like selection, training, job allocation, promotion, compensation and retirement. Moreover, individual values may be aggregated easily to arrive at the value of a specific group or for the organizational HR as a whole, disaggregation of the value to its constituent individuals, on the other hand, may be difficult.  

An individual is hypothesized to move through a set of mutually exclusive organizational roles or service states during a time interval. A service state can be thought as a position in which an individual is expected to render a specified quantity of services to the organization associated with the position occupied. In actual practice, service states can be identified in terms of

i) service level which corresponds to position and salary grade level and

ii) service group which corresponds to different degrees of performance such as average, above average and below average performance at a particular service (position) level.
The movement of an individual from one state to another has been referred to as a transition between service states. Since it is generally not possible to predict with certainty which state an individual will occupy at a future point of time, we can only estimate the probability that one will occupy each state in the set of mutually process as 'stochastic process with rewards'. The transition process is stochastic and it is assumed that the state to be occupied at some future point in time would depend upon the previous state occupied. Rewards accrue as the system makes transition from one state to another over a time. The rewards, in other words, reflect the earnings of the system. 

An individual would continue to give services to the organization during the service life. Service life is influenced by many factors indicating the individuals' natural life expectancy, health and emotional state, organizational retirement policies and employees inter-organizational mobility. Since these factors may not be known with certainty, it is proposed to measure the individuals 'expected service life' probabilistically.

Following Fisher's definition of the value of a resource, the present worth of the services expected from an individual as the individual moves from one service state to other during one's expected service life has been termed as the expected value of the individual to the organizational.

To dimension the value of the services associated with each state, the proponent has examined the possibility of assessing the value directly through the relevant income generated or through the choice of a specific service criteria. However, as it might be difficult to find out directly the relative contribution or a service criteria associated with each service state
to be occupied by the individuals in their expected service life, the proponent has suggested the use of different surrogate measures like i) Acquisition cost; ii) Replacement cost; iii) Current cost; iv) Compensation and v) Performance measure. 49

Flamholtz had examined the convergent and discriminant validity of the three surrogate measures i.e. compensation, replacement cost and performance measures in the case of a medium sized mutual insurance company. It has been observed by him that measures had the required validity as surrogate of individuals value.50

A general flow diagram reflecting the above method is presented in Chart 3.7.
Present value of total services associated with service state (i) \([PVS_i]\)

Probability that a particular employee would attain the service state (i) \([PSI_i]\)

Conditional value of services available from the individual at service state (i) \([CVS_i]\)

\[CVS_i = PVS_i \times PSI_i\]

Expected value of services available from the individual at service state (i) \([EVS_i]\)

\[EVS_i = (1 - NAP_i/100) \times CVS_i\]

Expected value of services available from the individual from all service states \((i=1,2,...,m)\) together i.e. value of the individual \([HV_{Vi}\]

\[HV_{Vi} = EVS_i\]

and \[EVS = \sum_{i=1}^{m} EVS_i\]

Chart 3.7

HR valuation following normative economic model
3.7.5 Human Asset Multiplier Model

Giles and Robinson hypothesized that the goodwill of a firm in terms of supernormal earnings is attributable to its HR. As such, the total value of its HR is nothing else other than the value of the goodwill of the firm as assessed by the relative price earning ratio of the organization as compared to the industry average. From the total value of the HR of an organization, to reflect the value of an individual or of the different groups, the concept of multipliers has been advocated in the model, popularly known as HAM. 51

An employee multiplier factor is designed to reflect the relative importance of the job requiring the level of skill it demands, the individual profile who does the job, the level of motivation, drive, attitude etc. so also the working conditions in which the job is done, it attempts to reflect the following factors: 52

- Qualification and technical expertise
- Experience required on the job
- Personal qualities and attitude
- Promotion capability
- Replacement scarcity
- Loyalty and expectation of future services

The multipliers so designed are proposed to be used as a means of relating to the cost of wages and salaries to the asset value of the employees. The method proposes to divide the employees into different categories like the senior management, middle management, supervisors, clerical and operative grades.
The salaries and wages for each of these groups which when multiplied with appropriate multipliers and aggregated reflect the value of the organizational HR. The multipliers are then proposed to be adjusted, either scale up or down, so that total value of HR so assessed should be equal to value of the goodwill as hypothesized earlier. 53

The salary figures for the different groups of employees multiplied by their respective multipliers (duly adjusted) reflects the value of the HR, proposed to be incorporated in the balance sheet. Besides incorporation of HR in the balance sheet, the model proposes to correct the overstatement of earnings as the asset bases are depleted and understatement of earnings as the asset bases are built up in the traditional accounting practices. Expenditure on human resources of capital nature such as recruiting, hiring, training etc. are proposed to be multiplied by the HAM, proposed as the cost outputs, to be included on the other side of the trading statement to reflect the true periodic profits earned by an organization. 54

A flow diagram of the above method of HR valuation is presented in Chart 3.8.
Chart 3.8
HR Valuation following human asset multiplier model
3.7.6 A Model on Valuation of Human Resource

Jaggi and Lau have recognized the difficulties in assessing the career movement of employees between service states on an individual basis, so also the exit probability of individuals from a firm as necessary to evaluate individual employees as proposed by Flamholtz. Instead of individuals as the basis, the proponents have advocated group basis of valuation to have greater reliability of the estimates of career movement and the likely exist and consequently, the value of the HR. 55

It has been suggested to classify the employees into a number of homogeneous groups who may be working even in different departments. The economic value of such a group of employees will be present value of the expected services that would be available depending upon the rank, the group of individuals would be occupying and the performance rating they would be having.

Consequently, the model aims to assess the profitability of moving to the various service states (different ranks and performance rating) that the group of individuals would occupy during different periods of time. To take into account employee exit, provision of one extra service state has been considered to which the group may move meaning the exit of the employees from the firm. However, no provision for demotion has been included in the model.

The probability of a group’s career movement from one service state to another i.e., service state transition matrix has been proposed to be assessed based on the historical records of the organization. It has been assumed that the pattern of movement is likely to remain more or less
constant and as such the use of Markov chain has been suggested to reflect the career movement of the employees within the firm and the chances of leaving before their retirement or death.

Based on the employee likely career movement on to different service states (including exit) as above on group basis, the model suggests the present value of expected services associated with different service states as the value of the group of employee (as shown in the flow diagram in the Chart 3.9). However, unfortunately, the model has been silent on the main issue how to assess the extent of services relevant to each service state.56

3.7.7 A stochastic model on human resource valuation

The proposed model synthesizes the contribution of Lev and Schwartz and Flamholtz to provide a basis for HR valuation. The economic Value of an individual to a firm has been defined as the present value of the expected future contributions from the individual, discounted by the firm's cost of capital. Accounting surrogate for the contribution of a production factor (HR in this case) is its periodic cost but the rationale for accounting surrogate may be true in the case of a perfectly competitive profit maximizing firms and accountants do not restrict the practice to perfectly competitive environment only. However, the proponents are of opinion that rational decision making would make the cost to be lower than their contribution in an imperfect environment and as such cost may be used as a surrogate measure of contribution in line with traditional accounting practices of historical cost and the principle of conservatism.57
Number of employees matrix in different service states \((i = 1, 2, \ldots, m, m+1)\) during the current period \((t=0)\), \(m\) being the number of service states and \((m+1)\), the exit state \([ANO,_{m+1}] \times (m+1)\) matrix

Service state transition probability matrix for transition after \(n=1\) period \([TRP^\top, (m+1) \times (m+1)\) matrix]

Discounting rate for assessing present value of service \([DCO_\top]\)

Number of employees available in service state \((i)\) after \(n\)-periods of time i.e. during the period \((t)\) \([ANO_{i} where, ANO_{i} = \text{ith element of the matrix} [ANO_{i}] \times [TRP^\top]\]

HR value of employees in service state \((i)\) during the current period \((t=0)\)

\[HVO_{i}, where, HVO_{i} = \sum_{i=0}^{\infty} ANO_{i}RVS_{i}(1+DCO_{i})\]

HR value of employees in service states \((i = 1, 2, \ldots, m)\) during the current period \((t=0)\)

\[HVO_{i}, where, HVO_{i} = \sum_{i=1}^{m} ANO_{i}\]

Chart 3.9
A model on valuation of HR as proposed by Jaggi & Lau
To be acceptable to the traditional accountants, the cost figures proposed to be used as surrogate measures must be known with certainty. However, in real life future wages of employees may depend on their individual capacity and their rate of development, different organizational strategies and the external environment and thus may be uncertain. The proponents have described three situations in decreasing order of certainty of informational (ultimately the wages figure) and increasing order of conformity of occurrence.  

Case - I: Informational certainty situation corresponds to where the firms have contractual arrangement with each one of its employees to pay at the point of hire. The present value of periodic salary up to the period of severance. The payment is assumed to be financed by a loan with an interest rate, repayable in installments along with interests. In such a situation the total salary may be accepted as a surrogate for contribution of the HR and its value may be incorporated in the external reporting with the following points in its favour:

- wages payable known with certainty
- wages payable at the point of acquisition, reflecting a transaction in conformity with the traditional accounting practices
- historical cost at the point of acquisition as the accountant’s surrogate of contribution and from the economists’ point of view, cost as the conservative value surrogate in an imperfect environment accounting treatment possible with prepaid salary as the assets and the loan as the liability.
Case – II: in the case of semi-certain information assumption of payment to the employees in advance and the loan to finance have been relaxed to reflect an analogous situation of leasing an asset. In line with the accounting practices for leased assets it has been advocated that the statement of resources should include the future contracted manpower cost of alternatively the present value (with a note disclosing the discount rate) of these costs and similarly the reports on commitment should include the resources figures as obligations. 60

Case – III: In case of informational uncertain situation the assumption regarding the determination of future manpower cost as in certainty situation has been relaxed to reflect uncertainty that is more common and more troublesome for the accountants. To overcome the difficulties associated with uncertainty the use of a stochastic model has been advocated to estimate the likely employees movement on to different service states (including exit) through determination of transaction probability matrix and consequently, the present value of future manpower cost as presented in the flow diagram in Chart 3.10. 61

3.7.8 A surrogate model for the firm's investment in human resources

The wages and salaries of similarly qualified employees may vary considerably across firms in the same industry and location. For such differences to persist, Friedman and Lev felt that these should reflect factors associated with the firm’s personnel policies, otherwise the differences would tend to be eliminated by employee mobility. One such policy pertains to employee training that might be a cause of systematic wage differentials between a firm and the industry as a regular phenomena. Wage differentials may also result from the variation in the level of
indirect compensation and specific personnel policies aimed at employee welfare. Depending on such a level of indirect compensation and welfare programmes, employees may accept lower than average industry wage, specially when such benefits are not subject to income tax to be paid by the employees and usually less expensive as provided on a group basis. In addition, organizational policies might aim at meeting certain employee preferences like fast promotion opportunities, independent and creative nature of jobs offered etc. that may cause wage differentials to persist between an organization and the industry averages.

The firm's personnel policies pertaining to training, indirect compensation, welfare provisions, job design or promotion policies etc. represent firm's actual wages and the average market wages may be viewed as the return on the firm's such investments in HR. Based on such a premise, the present value of differences in wages that might exit between the firm and market average over the years during the expected service life of the employee may be considered as the value of HR investments due to specific personnel policies adopted by the firm. The present value of actual wages likely to be paid in future to current employees over their expected service life has been considered as the 'internal value' of the organizational HR. The present value of wages that may be paid in future at market average rate to current employees over their expected service life has been considered as the 'external value' of the organizational HR. This is presented in the flow diagram in Chart 6.11. 62
Employee distribution in different services states during the current period (t=0), m being the number of states and (m+1), the exit state

\[ \text{ANO}, m \times (m+1) \text{ vector} \]

Employee transition probability matrix during period (t=1,2,...,n) till all current employees reach (m+1) state

\[ \text{TRP}, (m+1) \times (s_{m+1}) \text{ matrix} \]

Estimated mean salary level vector services statewise for future periods

\[ \text{RSO}, (m+1) \times 1 \text{ vector} \]

Employee distribution vector in different services states during future periods

\[ \text{ANO}_t, \text{Where}, (\text{ANO}_t) = (\text{ANO}_{t-1})(\text{TRP}_t), 1x(M+1) \text{ vector for } n \text{ periods} \]

Present value of likely total manpower cost i.e. HR value of the organisation

\[ \text{HVO}_c, \text{where}, \text{HVO}_c = \sum_{t=0}^{\infty} \frac{\text{ANO}_t \times \text{RSO}_t}{(1+\text{DCO})^t} \]

Chart 3.10
A stochastic model HR Valuation as proposed by Sadan & Auerbach
Chart 3.11
A surrogate model for the firm's investment in HR as proposed by Friedman & Lev
To implement such a concept in practice, the first step would be to forecast the future career movement of employees in the organization and their likely turnover. The use of Markov chain model as developed by Vroom and MacCrimmon has been proposed to be used for the same. The past data derived from employees personal records may be the basis for deriving the probability transition matrix. The proponents appreciated that the firm's manpower policies might change over time and had suggested to derive the representative transition matrix (which is assumed to remain static in the model) based on the data for past several years. The next step would be to evaluate the likely wage rate vector for the organization and for the market average during future periods of time. The two sets of wages data should be matched as far as possible for occupational classification and demographic characteristics. To assess the likely wage rate vectors over time, both for internal and external, the expected changes due to leading collective agreements, seniority clauses and price level escalator clauses have been suggested to be considered by the proponents. 63

The investment in HR would be the difference between the external and internal HR values. A positive difference will indicate the discounted value of the stream of wage savings (relative to the market) resulting from the firm's personnel policies (investments in HR), while a negative difference will indicate the discounted value of the stream of wage dissavings resulting from below average indirect compensation, training etc.

3.7.9 A model on the measurement of human asset

It has been hypothesized by Myers and Flowers that five dimensions or attributes of an individual and their interrelationships determine an individual's contribution and therefore his/her value to the organization. The five dimensions identified are (i) knowledge, (ii) skills, (iii) health, (iv) availability, and (v) attitude.
It has been hypothesized that knowledge enables an individual to direct his/her skills and health enables to apply them. Employees continue to stay with the organization due to various combinations of work and non-work reasons. However, the psychological availability is primarily determined by the work-related factors. Attitude reflects both personal values and job attitudes, constituting a readiness to respond to various live situations, thereby directing the other four attributes of individuals, i.e. knowledge, skill, health and availability.

The relationship between the factors has been conceptualized as follows:

\[\text{(Knowledge + Skills + Health)} \rightarrow \text{availability} \rightarrow \text{attitudes} \rightarrow \text{job performance}\]

The model seeks to assess the prevalence of the above attributes in individuals through questionnaire technique. Since job attitudes are symptoms of the other four attributes of human assets, it is hypothesized that a reliable and quantitative measure of attitudes is the best single measure of effectiveness of all five human assets components. A twenty-item attitude survey questionnaire has been developed with a provision for relative weightage on different employees attitude score based on job grade level and tenure of employees in the organization to work out the attitude index. Based on the assumptions that organization incurs the wages and salaries to purchase the productive human skills, the monetary value of attitudes for a group of employees has been proposed to be reflected by the relevant attitude index multiplied by the total annual pay bill for the group and the gap between the monetary value of attitudes and the salary has been considered as the gain or benefit due to favourable attitudes, as shown in the Chart 3.12.\(^{64}\)
Chart 3.12
A Model on the measurement of human asset as proposed by Myers & Flowers
3.7.10 A model on estimation of human capital associated with an organization

Morse appreciated the difficulties to estimate the likely contribution of employees in a mix of physical and financial inputs for the assessment of the value of organizational HR as assets. As such the proposed model aims at attaining more modest objective of valuation of human capital rather than their value as assets. Extending the definition of human capital as proposed by Fisher and Lev and Schwartz, the value of the human capital associated with an organization has been equated with the present value of future earnings of its current employees. 65

To operationalize the above model, it has been proposed to use the Markov chain technique to deal with the likely movement of employees between service states, age categories and wage classifications, represented by the transition probability matrix to obtained from the records of employee movement during the past. Based on the likely movement of employees on to different wage scales, the present value of estimated future wages payable during their remaining service career, subject to exit probability, has been considered as the value of human capital as reflected in the flow diagram in Chart 3.13. 66
Employee transition probability matrix between different services states
(i=1, 2,... M, m+1, m being the number of non-absorbing states and (m+1) being the exit state

$[\text{TRP}_i, (m+1) \times (m+1) \text{ matrix}]$

Employee transition probability sub-matrix between different non-absorbing states
(i = 1, 2,...m

$[\text{TRP}_i, (m \times m) \text{ matrix}]$

Adjusted transition probability sub-matrix between different non-absorbing states
(i = 1, 2,... M)

$[\text{TRP}_i, \text{ where, TRP} = 1/\text{DCO} \text{ (scalar TRP)}]$  

Mean number of years (duly adjusted for present value) an employee to spend in each non-absorbing state (i) for each possible non-absorbing starting state

$[\text{MNY}_i, \text{ where, MNY} = (I-\text{TRP})^{-1}, I \text{ being the identity matrix}]$

Employee distribution in different services states during the current period (t=0)

$[\text{ANO}_i = _t]$  

Average number of man years all current employees to spend in different services states
(i=1, 2,...m)

$[\text{ANM}_i, \text{ where, ANM} = (\text{ANO}_i = 0) \text{ MNY}_i]$  

Rate of annual average compensation to employees in different services states

$[\text{ASO}_i, \text{ mx1, vector}]$

Present value of likely total compensation payable to all current employees during their service life with the organisation

$[\text{HVOMT}_i, \text{ where, HVOMT} = (\text{ANM}_i) (\text{ASO}_i)]$

**Chart 3.13**

A Model on estimation of human capital of an organisation
3.8. BEHAVIOURAL AND OTHER SURROGATE MODELS

3.8.1 A model on valuation of human organization

Likert, the pioneer in propagating the behavioural approach to HRA, has made attempts to dimension the complex character of the human organization and has suggested a mode of valuation for the same. It has been hypothesized that every aspect of a firm’s activities is determined by the human organization which is not simply a conglomeration of strangers with individuals’ skills and aptitudes with no knowledge about other members but in order to be effective, individuals must know each other and learn to work in a cooperative and coordinated manner representing a tightly – knit social system. Such a synergistic organization and its management determine an organization’s success. 67

Likert has identified the key dimensions of human organization which may be categorized into three groups:

- Casual variables
- Intervening variables
- End – result variables

Casual variables are independent variables pertaining to the quality and productive capacity of the human organization that influence the course of developments within an organization and the results achieved by it like organization structure, leadership strategies, management skill and behaviour, management policies and decisions. Intervening variables reflect the state and health of the organization like loyalties, attitudes, motivations, performance goals, perception of all members and their collective capacity for effective interaction, communication and decision making. End – result
variables are dependent variables reflecting the achievement of the organization such as volume of production, level efficiency, quality level, attendance, development, level of satisfaction, cost of human resources etc. It has been conceptualized by Likert that management by adopting suitable strategies may choose causal variables, thereby preferring any one of the four management systems. The causal variables thus chosen would produce corresponding changes in the intervening variables which in turn determine the performance of the organization as reflected in the end-result variables. 68

The current value of a firm’s human organization may be assessed by measuring the casual and intervening variables through the psycho-social measures using questionnaire technique along with the investment made by the organization on its HR, reflecting the condition of the human organization. It has been further hypothesized that there may not be any likely changes except in response to modification in major casual variables. The intervening variables usually change slowly unless some dramatic or major events occur. Consequently, the organizational health factors like attitude, loyalty, motivation, perception and similar kinds of intervening variables can be measured reliably and interpreted in relation to the magnitude of the errors of measurement. The end-result variables are usually being measured and monitored by all organizations. Based on empirical research Likert has advocated that valid and reliable relationships between the three sets of variables could be established. The proponent has appreciated that some of the behavioural scientists could not establish dependable relationships among these three set of variables and opined that the reason could be, 69
i) The difference between leader's report of one's behaviour and one's actual behaviour.

ii) Inaccurate or inadequate measure of productivity.

iii) The influence of subordinate's values, expectations and skills upon one's perception of one's supervisor's behaviour and the response to it.

iv) The effect of the manager's capacity to exercise influence upward.

v) Effect of time gap between today's style and behaviour of the management as conceptualized through the set of casual variables and the turnover, productivity, cost and earnings etc.

Out of all the above factors it has been felt that time has been the most influencing parameter responsible for inconsistency in relationships. The effect of change in the casual variables may be affecting the health of the organization and consequently, the end-result variables, not immediately but after a time gap. From empirical study it has been shown that it may take even two to three years time to bring about such changes and the time gap will depend on the nature of the job. Shorter for complex, innovative type of job, than routine and machine paced operation. Based on such result, Likert demonstrated that valid and reliable relationship between the three sets of variables could be established considering the time lag. Moreover, it has been advocated that such psychological measurements of the organizational parameters should be made over several periods of time developing valid relationship. The data may be collected at quite frequent intervals, initially it may be quarterly. The optimum
frequency will depend again on the nature of the work involved. The total period of time required for the cycles to reach equilibrium will vary also with the nature of work. It has been demonstrated by empirical research that stable relationship may be reached faster for the complex tasks as compared to machine paced work. It has been proposed that the measurement of casual and intervening variables should be obtained for each profit centre and the organization as a whole. The end-result variables may be measured in monetary terms as well as in socio-psychological units in the case of employees satisfaction. Using statistical procedures it has been proposed to relate the changes in casual and intervening score with the long term profitability of the organization, thus leading to the value of the human organization. Socio-psychological measures of investment and the evaluation of the effectiveness of alternative investment in human organization.\textsuperscript{72} Quantitative surveillance on the condition of the human organization through regular reporting of casual and intervening score has been advocated by Likert. As it may possibly take couple of years to collect the necessary data through sociopsychological questionnaire before one can establish valid relationship to analyze the cause and effect, the trend in the variable score itself would reflect the productive capacity of the human organization and safeguard company's human assets in the intervening period.\textsuperscript{73}

Considering the huge amount of data that may have to be obtained from so many employees to measure the casual and intervening variables and the consequent difficulties and cost associated with implementation of the system, the proponent has suggested
i) identification and measurement of key variables to have a reliable prediction of the state of the human organization,

ii) use of sampling technique to keep the cost of HRA within reasonable limits, while maintaining fair degree of accuracy of valuation through socio–psychological measures,

iii) introduction of the concept of standards in HRA like standard costing when more and more organization would be introducing such valuation approaches in their organizations.

3.8.2 Other surrogate models

Besides the various models on HRA, many proponents have suggested the adoption of other surrogate measures for the valuation and management of the organizational HR. These are discussed below.74

3.8.2.1 Performance model as a surrogate of individual employees’ value

Performance measures have been the traditional and most widely used method of internal appraisal of employees of an organization on a periodic basis. It reflects the effectiveness of a person in achieving predetermined organizational goals. It demonstrates the ability with which an individual has played the desired organizational role reflecting attributes like intelligence, technical skills, staff relations, organizing ability, motivation, punctuality etc, leading ultimately to profit performance of the organization.75 Managers use various techniques to evaluate their subordinates performance like rating, ranking and scoring through check list of desired attributes. Flamholtz has demonstrated through empirical research in a branch of a medium sized mutual insurance company that performance measure of individual possesses convergent and discriminate validity as a
surrogate of individual’s value to an organization (along with two other surrogate measures of compensation and replacement cost).  

3.8.2.2 Performance model as a surrogate of organizational HR value

A method has been proposed by Kolay and Sahu to assess the relative value of organizational HR based on total performance. The total performance of the man-machine resource base of an organization includes its profitability together with how it affects the interests of consumers, the national economy and the society (i.e. other than profitability performance). The total performance thus achieved, judged in relation to the plant base used, reflects the productivity of HR. Such a productivity level achieved by the HR viewed in relation to the man-related cost reflects the “external value” of HR. The impact of certain uncontrollable external factors (which may not be attributable to HR) has been assessed on the organizational total performance to reflect the controllable dimension of HR value, i.e. the “internal value" of organizational HR. The method has been applied in an integrated iron and steel plant to study its HR value over a ten-year period.  

3.8.2.3 Management information system (MIS) and management control reports as surrogate models

Many proponents in the field of HRA have suggested the design and maintenance of suitable HR information system and the preparation of various periodic analytical reports based on the suggested MIS for effective planning and control of the HR within the broad scope of HRA. The salient features of the different proposed measure are discussed as under:
Powell and Wilkens have suggested the design and implementation of a suitable management information system in three different sections:

i) Proper identification and recording of the different items of investment variables in HR of the organization.

ii) Information may be collected, monitored and reported on a regular basis on employee attitude, motivation, and satisfaction and also such factors as employee's perception of job security, potential for advancement, job recognition and satisfaction with present job.

iii) Information may be collected on a regular basis for monitoring and control about end-result variables like production, product quality, turnover, and absenteeism.

The employment report of Dunlop (U.K.), incorporated in its annual Corporate Report, presents a lot basic information about its employees like: (i) number of male/female employees, (ii) age distribution, (iii) geographical location, (iv) operating hours, (v) work schedule, (vi) employment costs, (vii) pension schemes, (viii) training, (ix) safety, (x) health, (xi) labour turnover, (xii) wage rate, (xiii) profit lost due to disputes and absenteeism, and (xiv) effect of inflation.

Based on the stock flow model, Mahoney, Milkovitch and Weiner has suggested for working out certain ratios for monitoring the human resources activities like:
Gain Index measuring the number of movement into a specific resource category relative to the number of resources in that category at the start of the measurement period:

ii) Loss Index measuring the number of movements out of a specific resource category relative to the number of resources in that category at the start of the measurement period;

iii) Growth Index (Gain Index - Loss Index) reflecting the net change in stock levels of a specific resource category.

iv) Retention Index (1-loss Index) reflecting the relative stability of a resource in a specific resource category.

Mahoney and others have opined that HR flow analysis and the different indices may contribute significantly to improve HR planning like the cash flow analysis in traditional accounting.

Lapointee has suggested that the HR management effectiveness may be evaluated and monitored based on certain performance indices, periodically calculated in the different functional areas like employee section, compensation, development and retention. Turnover rates may be analyzed not only in total number over time but also according to (i) department, (ii) job, (iii) supervision, (iv) shift, (v) recruitment service, (vi) employees original hometown, for effective managerial planning and control. In fact, The analysis algorithm is virtually unlimited with the aid of a company.  

- Individual's use value has been conceptualized by Steffy and Maurer (1988) as a continuous, linear function of the effectiveness of HR activities. Such a value has been measured using analysis.
HR investments in training and development of employees have been proposed to be accumulated elementwise like the payroll for people to plan, develop, deliver and attend training. Other investments include travel and lodging of those who attend the training. The effectiveness of different training methods has been measured by determining how it affects individual and business performance through establishing the relationship between the learning objectives and business objectives. Return on investments on training and development has been measured to account for such HR investments.  

3.8.2.4 The scalar model

Based on a research project undertaken by Puett Jr. and Roman, a technique may be evolved which for the sake of uniformity has been titled as the scalar method. This procedure, they opined, would enable the valuation of even the most intangible variable:

i) Initial requirement of different employee attributes has been proposed to be identified. The acceptable standard for each of such attributes is to be defined.

ii) A scale is then selected from (1 to 10) or (1 to 100) ranging around the selected standard.

iii) The standard is to be matched to the scale and the assessment may be recorded using experience and judgment. The proponents have felt that though the valuation approach is subjective and soft, as long as the standards are constant over time, the assessment may be comparable from period to period.
3.8.2.5 Simulation model to HRA

Gambling has hypothesized that the HR of an organization represents a dynamic system with feedback loops. There are number of flows within any organization, some physical like services and cash, others are more subjective in nature like loyalty, skill etc. These flows do not enter and leave or tangible and intangible assets. The proponent has conceptualized that to account for HR, one should not search for an accounting solution, it is a management and social problem. Gambling has suggested that the art of managing the HR which is key to HRA should be to design and redesign the system of feedback loops in such a way so as to achieve the most satisfactory series of levels throughout the foreseeable future of the organization. The use of simulation technique for the design of such a dynamic system has been advocated.  

Dawson attempted to simulate employee resourcing process. Data input to model includes;  

i) labour turnover characteristics of workers being modeled  
ii) the acquisition activities involved in resourcing this type of workers  
iii) the resourcing interventions commonly used and  
iv) Implications of a failure to achieve the exact number of workers of this type within the organization for any period of time.  

Such a simulation model is expected to facilitate the HR managers to plan for desired number of employees for different positions in the organization.

3.9 INDIAN MODELS TO VALUE HUMAN RESOURCE

It is heartening to note that some enlightened companies in India have reported HRA in their annual reports. Since none of the industry have
mentioned the purpose for which HRA information is being used by them, it seems that their objective of introducing HRA has been image building and they have been successful in this as BHEL, CCI, and MMTC have received the rewards from the Institute of Chartered Accountants of India for best presented published accounts.

If we look at the Indian literature on human resource accounting, it is heartening to note that except the few model of Chakraborty, S. M. Shukla and Prof. Das Gupta no other model are available for the said purpose. The limiting fact of both the model were lack of empirical evidence.

3.9.1 CHAKRABORTY’S MODEL

In Indian context, Chakraborty proposed this model for human resource valuation. The important aspect of the model are:

1. Valuation of the human resource in aggregate fashion. He suggested the method for two distinct groups, namely, managerial group and non-managerial group.

2. Average salaries of the employees of a group are ascertained. Average tenure of employment of employees of that group is also calculated. Calculated average salaries are multiplied by the calculated average tenure. The resultant of the multiplication is the value of the human resource.

3. Expenditure on recruitment, hiring, training and development of the employees is calculated on individual basis and then the expenditure is treated as deferred expenditure.
4. The calculated deferred expenditure is written off during the period, during which the employee is expected to remain in the organization.

5. The portion of the deferred expenditure not written off is shown on the assets side of the balance sheet.

6. If the employees leaves the organization (due to resignation, retirement, retrenchment or death) the unwritten off balance of the deferred expenditure is transferred to the profit and loss A/c of that year in which the employees leaves the organization.

7. The present value of estimated payments to be made to the employee in future is found out by discount rate. The discount rate is the expected average rate of return over capital employed, but tax should be deducted from the above return before finding out the average rate.

8. Chakraborty is of the view that human resource shall be treated as an asset and should be included in investment and in fixed assets or current assets in the asset side of the balance sheet.

Though this model recognizes the possible alternatives in ascertaining human resource value, the limiting factor is the lack of empirical evidence.

3.9.2 S. M. SHUKLA’S MODEL

S. M. Shukla’s model takes into account the expenses incurred by the employer over employees, which are grouped under four categories for treatment in human resource accounting.
Calculation of deferred revenue amount:

1. Average tenure of employment of an employee should be found out.
2. Average salary of an employee should be found out.
3. Above two should be multiplied.
4. The above process should be adopted in case of all employees who belong to middle and lower level and then all multiplied amounts should be totaled. This total should be divided by the total of average tenure of employment of all the middle and lower level of employees and the amount thus arrived is written off to profit and loss account and the balance should be recorded in the asset side.
5. In the case of top management, valuation of human resource may be made on individual basis.

This model can be viewed as an extension of Chakraborty's model, in the sense, an attempt is made to cover the top management. May be for simplicity, creative mathematical formulations are not included in both these models. There is no reference for this model being experimented or tried to assess the human resource value in any business enterprise.
3.9.3 PROF. N. DAS GUPTA’S MODEL

This method tries to eliminate the deficiency of considering the individual only from the point of his being hired by an organization only from the point of his being hired by an organization. The potentials gained by him previously through education, training in professional institutes, experience gained by surviving in precious organization are ignored in the calculations. According to this method the total cost incurred for bringing the individual to his present state of efficiency whether by the government or individual himself or by the precious and present organization should be aggregated and taken as representing the value of human resources.

This value is to be adjusted at the end of each year by taking into account the improvement in performance, leadership qualities, age and seniority. Experts in the field are to be consulted for such assessment.

This method though ideal has too many complicated calculations most of which are subjective.

3.10 HUMAN RESOURCE DEPRECIATION SYSTEM

3.10.1 INTRODUCTION

Depreciation, as applied to physical asset, has been defined to denote a decline in the service potential of the asset due to usage, lapse of time, physical deterioration and technical obsolescence. Its measurement has taken many forms depending upon:

(a) the characteristics of the asset, (b) the nature of the business in which it is used, (c) and the pace of change in the design of the asset as well as its technical improvement.
The two basic depreciation approaches commonly used in business organizations are the allocation and the decline in the value of the assets approaches. The former approach views depreciation as an allocation problem. It seeks to distribute the original cost of the asset over its useful life, using various depreciation methods such as the variable charge method, the straight line method, the increasing or the decreasing charge methods. The selection of the appropriate method depends upon many factors including the nature of the asset, the degree of its expected usage, the pattern of its repairs and maintenance and its anticipated working life. 88

The latter approach, by contrast, conceives depreciation as a diminution in the service potential of the asset over time. The asset, in this context, is considered to produce a stream of services over its expected productive life. The portion of the service potential lost is measured as the difference between the stream of services of the asset at the beginning of the period and its stream of services at the end of that period. Since, however the measure of service potential is also a measurement of the value of the asset, depreciation can also be considered as the decline in the value of the asset over time. Depreciation methods used under this approach include the present value method and the revaluation method. 89

Both these approaches, having been modified to take account of the different characteristics of the human asset, can be advantageously used to measure human depreciation.

In fact, the difference between the depreciation of the physical asset and that of the human asset lies not so much in the methods employed to measure such depreciations as much as it is in the factors contributing to them. Whereas physical asset depreciation is being generally promoted by natural factors such as physical
deterioration and consumption through use, human asset depreciation is being mainly determined by behavioural dimensions such as personality attributes, motivation, job satisfaction and group cohesion.\textsuperscript{90}

The basic difference between the characteristics of the physical and human assets can be outlined as follows:

(1) \textbf{Inflexibility of Human Time}\textsuperscript{91}

Unlike machine time, human time is characterized as inflexible. It cannot be transferred, renewed or replaced, nor can it be speeded up or stored for later use. It occurs in a fixed sequence over the life time of the individual. Hence, time lost at any point in the life cycle of the individual is lost forever.

This rigid structure of human time has a great impact upon the utilization of the organizational human resources. Man-days lost, for instance, as a result of absenteeism or strikes will essentially reduce the human time available for work and thus, will affect the amount of the organizational human asset. The unutilized human time is therefore, considered to constitute a wasted resource that cannot be replenished. This is, however, not the case with machine or other non-human time. Hours that are not used in the operation of the physical asset also deteriorates through lapse of time, such deterioration is not as large as that of the human asset. Indeed, the useful lives of many physical assets can be extended beyond their retirement ages, whereas such possibility can rarely exist for human assets whose life spans are limited to those of the individuals' maximum living ages.

The pattern of distribution of human time between work and non-work (i.e. absenteeism and strikes) will, therefore, ultimately determine the amount of the organizational human capital and, thus, its associated depreciation.
(2) **Non-Ownership of Human Capital**

Another factor differentiation human capital from physical asset is the notion of ownership. Two basic characteristics derive from this. First, human capital is embodied in the person acquiring it and cannot be disassociated from him. This indicates that human capital does not have a separate identity of its own but resides in the person carrying it. It follows, therefore, that human capital exists where the person associated with it exists. It is a mobile asset which moves with the person embracing it from one place of work to another. Second, human capital cannot be legally owned by the organization, but it can be utilized by it. This means that a person acquiring this asset will be relatively free either to continue to provide his services to the organization or withhold them from it (i.e. quit). However, since every organization will have a stake in the investment of its human capital, any premature separation of its employees from their work will essentially cause the organization a loss of that part of its human investment that has not yet been recouped (amortized).

However, these two characteristics does not function in the same way with the physical asset is not as mobile as the human asset. It cannot be transferred from one organization to another except through sale or liquidation. Further, once this asset is bought, it remains under the jurisdiction of the organization until such time as it exhausts its useful life of the organization chooses to dispose of it or replace it with another asset.

The relative freedom, therefore, of the organizational employees to remain with the organization or to separate from it determines the amount of its human capital as well as the associated human depreciation.
(3) **Impact of Obsolescence**

Physical and human assets differ also in the way they contain or overcome obsolescence. The out-method physical assets, for instance, can rarely be adjusted or altered to suit the production requirements of a new technology. Once these assets become redundant by virtue of new inventions, they will automatically lose their utility to the organization will have to change those assets with new ones of better technical efficiency, higher production and lower operating costs.

The case with human assets is actually quite the reverse. The impact of obsolescence on these assets is not as decisive as that of its impact on physical assets.

Indeed, human assets are considered to be more adaptive to changes in the work organization as well as to the techniques and procedures of work. They can easily absorb new skills and knowledge through such measures as in-company training programmes, seminars and conferences and job related training schemes. The extent of the loss attributed to their obsolescence, therefore, is not as substantial as that resulting from the obsolescence of physical assets.

The question of overcoming human obsolescence is not, however, as easy, as portrayed above. There is a host of factors which either facilitate or inhibit human obsolescence including the age of the person, his cognitive abilities and his job scope and level.

(4) **Employees' Health and Safety**

Industrial accidents also affect physical and human assets differently. The damage suffered by physical assets as a result of industrial accidents is not as detrimental as that suffered by human assets. Machines, which have lost some of their parts, will be able to function at full capacity once these parts are fully
replaced. Humans, on the other hand, who have lost some of their organs, will not be able to function at their full capacity. They will be partially incapacitated all their original conditions. Humans who suffered such injuries will either be assigned less work in their present jobs or be shifted to other jobs more suited to their condition of health. Consequently, therefore, the amount of loss associated with human accidents is by far greater than that attributed to the accident of the physical assets.

Changes in the value of human investment, as noted earlier, are being induced by such factors as absenteeism, strikes and lockouts, skill obsolescence, technological displacement of labour, labour turnover and industrial accidents.

It is, therefore, the objectives of this part to:

(a) define the principal factors contributing to human depreciation,
(b) analyse the various causes promoting these factors, and
(c) Design methods to measure the human depreciation cost associated with these factors as well as the distribution of this cost among the various subsidiary factors comprising them.

3.10.2 ABSENTEEISM

One of the significant factors impeding the utilization of the organizational human asset is absenteeism. This factor does not only reduce the span of time over which the organizations will enjoy the services of its employees but also results in additional costs of replacing the absent employees, disruption of production and loss of human investment.
The magnitude of the absence problem is manifested in the large number of maydays lost because of the employees' non-attendance behaviour. In India, for instance, the average rate of absenteeism in various sectors of the economy has been estimated in 1978-80 at about 20 percent compared to that of 7 percent in 1957-78.

It is evident, therefore, that absenteeism constitute a major problem for the developed and the developing countries. Its consequences, however, differ for both these two types of countries. Whereas the developed countries can easily absorb the negative impacts of absenteeism due to their larger resource endowment (material, finance and human), the developing countries, and suffering as they are from lack of such resources, can hardly be able to do so. In fact, absenteeism makes the developing countries lose part of their valuable resources (human time) which they might otherwise utilize in certain profitable projects.

In view, therefore, of the magnitude of the problem it creates for both the developed and the developing countries, absenteeism should be thoroughly studied to identify the causes promoting it as well as the human depreciation associated with it.

3.10.2.1 Causes of Absenteeism

Most of the studies undertaken to determine the causes of absenteeism have tackled this problem from a uni-dimensional rather than a multi-dimensional aspect. They have viewed absenteeism as a product of a single factor or a set of factors rather than a function of complex socio-economic forces interacting together. They have, thus, failed to portray the major factors contributing to absenteeism as well as the relative importance of such factors (i.e. their inter-relationship).
It is not surprising, therefore, that the results of these studies have been mainly related to some common facts known about absenteeism such as, for instance,

(a) “absenteeism is far more severe in major cities than in small towns

(b) and rural areas”

(c) absenteeism among the females tends to decrease during their careers whereas absenteeism among males tends to increase

(d) cigarette smokers experience 45 percent more days lost due to illness and injury than non-smokers.”

**The job situation variables consist of job content as well as job context**

(a) Job content refers to the nature of the job and the elements comprising it and includes such variables as job scope, job level and role stress.

**Job Scope** influences directly the employee’s attendance behaviour. In particular, elements of job scope such as task identity, variety, level of responsibility participation in decision-making, sense of achievement and job challenge, are all found to be inversely related to absenteeism.

**Job level** refers to the occupational level of the employee as well as his job grade. This is also said to be associated with absenteeism. The higher the occupational level of the employee, the more satisfied he is with his job and the less prone he becomes to absenteeism; whereas, the lower the occupational level of the employee, the less satisfaction he derives from his job and the more liable he becomes to absenteeism.
Role Stress is a strain an employee experiences on his emotion, thought process and physical condition because of performing his job.

(b) Job context is the other component of job situation variables. It is more concerned with the physical and social environments surrounding the work rather than the nature of work itself or the tasks comprising it. It includes such factors as work group size, leader style, co-worker relations and opportunity for advancement.

The type of leadership (i.e. leader style) provided to the work group also determines their work attitude and thus their absence behaviour. Leadership style, however, is a function of job attitude rather than absenteeism. It influences absenteeism, through creating a healthy working environment for the employees.

3.10.3 STRIKES AND LOCKOUTS

Strikes and lockouts have become a constant feature of the Indian Economy during the last few decades. They have levied a heavy cost upon the economy of the country in the form of added value forgone and production curtailed. At the enterprise level the damage caused by strikes and lockouts is also substantial. The organization affected by the strikes or the lockouts is not only hindered to utilize its human and physical resources but is also madder to lose a large portion of its output and profit margin. The impact of strikes and lockouts does not stop at the organization directly involved in them but spills over to other organizations whose activities are linked with the affected organization. A strike in a cement manufacturing company, for instance, will not only disturb the production schedules of this company but also those of the other construction organizations whose mainstay is dependent upon the utilization of cement products. Workers also are not spared from the negative effect of strikes and lockouts. Indeed, they suffer most in terms of hardship caused to their families as a result of loss of
wages, during the period of the strike. Moreover, they may be forced to contract loans higher rates of interest during the period of the strike to make up for the loss of their wages, thus imposing upon their limited income a further burden in the form of debt repayment with the consequence that little or no income is lift to them to met their necessary living expenses.

A strike is defined as an act initiated by a body of workers to discontinue their work or go slowly about it until their grievances are redressed or their demands are met, whereas a lockout is defined as a move initiated by the employer to close the place of work until the workers concede to his terms and conditions of work. Both strikes and lockouts are temporary stoppage of work. They do not generally give rise to a permanent closure of the business. The work is resumed as soon as the disputants reach an agreement or the conflict is resolved.

A strike takes many forms. The most common is the one leading to a total abstention from work. Another form is a sit-down or stay-in strikes where the workers remain at the work place but refuse to work. A go-slow strike is also staged by the workers as a tactic to force the employer to submit to their demands. It involves a deliberate reduction in the speed of work below that of the normal performance. It does not, however, entail a complete stoppage of work. The workers will normally attend their jobs and work slowly so as to inflict a loss upon the employer in terms of reduced output and lower profit margin. The most dangerous form of industrial unrest is the one called "Gherao", whereby the workers resort to the use of force to achieve their demands. In this form of strike, the members of the management or the owners of the business are confined by the workers inside the work place or their residence sometimes without food and water, until they concede to their demands. Such forms of strikes, however, involve problems of law and order and might invoke a widespread violence.
3.10.4 SKILL OBsolescence

The advancement in information and knowledge has been tremendous during the last three decades, which we are said to be heading to what is termed as "information society". This is not, of course, unsubstantiated. There has been a rapid progress in recent years in the field of science and technology as well as other spheres of social science that has affected upon the different aspects of economic, social and political systems of many advanced countries. The outcome of such progress has invariably been a drastic change in the structure of various activities of the business organizational including its methods of operation, the nature and quality of its work, the control procedures and the index of its end results.

The emphasis in the information era is said to be more on the type of work, which requires brainwork, rather than manual skills that have characterized the industrial era. In fact, there is ample evidences to indicate that the economies or certain advanced countries are undergoing some basic changes in their structure from those primarily based on the production of goods and services to those based on the creation, processing and distribution of knowledge and information.

However, whether the Indian economy will changes over to an information economy is a simply a question of time. Although there are shortage of studies regarding the numbers of information workers in the Indian economy and the nature of their work, the trend indicates that their number will grow substantially in the future as the economy absorbs more and more of the modern technologies.

Skill obsolescence embraces both reduction and elimination of skills. It is defined as the degree to which the acquired knowledge and skills of an employee have been rendered – through technological changes and others personal factors – insufficient to carry out the tasks of his present organizational work role.
Skill obsolescence, however, is not the same as skill deterioration. The former indicates redundancy or out-datedness of skills previously acquired while the latter indicates the loss of such skills.

Skill obsolescence does not only affect professionals and managers but also clerical employees, administrators, technicians and other manual labourers. The degree of obsolescence, however, varies from one person to another depending upon the knowledge acquisition potentials of the individuals themselves as well as the magnitude of change in the nature of their work.

3.10.4.1 CAUSES OF SKILL OBsolescence

Skill obsolescence is triggered by a combination of factors acting separately or in a group, including technological changes, personal factors and organizational variables.

(a) **Technological Changes**: One of the main factors contributing to skill obsolescence is technological changes. A major stride has been made in recent years in many fields of science and technology, such as microelectronics, information technology, communication systems, optic fibers and so on that have changed the structure of activities of many organizations and thus their occupational requirement. As a consequence, a large number of technical and skilled jobs have either been totally displaced or reduced into insignificance. Among the major development in these fields are, perhaps, the extensive use of industrial robots, the electronic transmission of information and other areas of microelectronic applications.

(b) **personal characteristics**:

Another major factor contributing to skill obsolescence is the personal characteristics of the individual affected by it. Factors such as age,
information acquisition capacity and area of interest of the individual employees are all said to influence their subsequent skill obsolescence.

Age, for instance, has been directly correlated with the performance of the individuals. A person's performance is said to peak at his middle and thereafter gradually decline until he reaches the age of retirement.

(c) Organizational factors are also said to influence skill obsolescence. Factors related to job content and context such as job scope, leadership style, participation in decision making, relation with co-workers, are all indicated to affect the skill level of the individual and thus the degree of their obsolescence.

To sum up, skill obsolescence is being promoted by a host of factors including technological, personal and organizational variables. These factors may, either, act separately or together in a group to inhibit or facilitate skill obsolescence.

Skill obsolescence will have wider implications for the organization. It will not only depreciate part of its human investment, but also reduce its profit margin, destroy its competitive edge and ultimately force it out of business. Organizations should, therefore, take measures to identify the causes of skill obsolescence, determines its financial impacts and design methods to combat it.

3.10.5 LABOUR TURNOVER 99

Labour turnover has been a major problem in many organizations. Its consequences for the organization in terms of disruption of its production activities and a premature loss of its human investment have rather than alarming. The costs associated with labour turnover have, by no means, been small. They involve not only the costs of the unamortized part of the human investment, but also those of the lost opportunities resulting from the underutilization of the other
organizational resources. Labour turnover also affect the organizational effectiveness in many other ways. It may lead to demoralization of the existing employees, promote work concentration and impair social interaction.

Labour turnover has been defined as the permanent separation of the employee from his organization rather than a temporary withdrawal from his work as in the case of absenteeism. It differs from absenteeism in at least three important aspects (a) The negative consequences of turnover are much more than those associated with absenteeism. The employee in the case of turnover completely sever his relationship with the organization while in the case of absenteeism, he merely seeks a temporary relief from his employment. (b) The act of separation is rather serious and involves a carefully considered decision while that of absenteeism is generally more spontaneous and involves a relatively simple decision. (c) Absenteeism may provide a temporary shelter for an ultimate turnover especially when opportunities for alternative jobs are rather tight or unavailable.

Labour turnover can either be voluntary or involuntary. Voluntary turnovers are initiated at the instance of the workers, such as quite and resignations, while involuntary turnover are initiated at the instance of the employers and include layoffs and discharge.

Voluntary turnover, in their turn, are divided into avoidable, such as, those caused by low morale and unavoidable such as those caused by illness or death.

The following are some of the important push – pull factors involved in labour turnover:-

<table>
<thead>
<tr>
<th>Push factors</th>
<th>Pull factors</th>
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<tr>
<td>(1) Organizational variables</td>
<td>(1) Organizational variables</td>
</tr>
<tr>
<td>(a) Absence of pay and Promotion policies</td>
<td>(a) Well- framed employees progression plan</td>
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3.10.6 INDUSTRIAL ACCIDENTS AND HAZARDS

Employees' health and life safety is one of the important factors contributing to the maintenance of the organizational human resource.

Industrial accidents have been the cause of large number of fatal and non-fatal in most of the manufacturing concerns of both industrialized and the industrializing nations.

The consequence of industrial accidents for the individual as well as the organization cannot be over-emphasized. A person who loses his limb in an industrial accident or whose health deteriorates as result of some occupational disease will be partially or totally handicapped all his life. He will not be able to
restore his limb or health to that of its original condition. His service capacity will be reduced relative to that of similar healthy person. Hence, the injured person will be considered to have lost part of his human capital as a result of his accident. The amount of his human capital loss, in this case, will be determined by the ratio which the difference in his work resulting from accident bears to his standard work as healthy person times his human investment. This is symbolically expressed as follows:

\[ \frac{DW}{SW} \times HC \]

Where: \( DW \) represents the difference in the work of the injured person resulting from his accidents, \( SW \) his standard work as a healthy person and \( HC \) the balance of his human capital at the date of his accident.

If the injured person, however, is totally incapacitated or made unfit for his present work as a result of his accidents, the amount of his human capital loss will represent that part of his human investment which remains unamortized at the date of his accident.

### 3.11 SUMMARY & CONCLUSIONS

A number of valuation models have been developed for estimating the value of human resources in an organization by using various valuation bases. Cost measurement of human resources are based either on historical costs or present value. The historical cost approach is based on the cost of recruitment, selection and training of employees, the replacement cost approach is based on the cost of replacing the entire employees of an organization, the opportunity cost approach is based on the opportunity costs of employees on the basis of efforts made by other organizations. However, most authors in human resources accounting area have defined economic
value of human resources in terms of the discounted present value of expected future earnings attributed to human resources. The American Accounting Committee on human resources accounting stated in 1973 that the concept of human capital is closely allied to the value attributed to property acquired by an organization by way of a leasing agreement. Lease financing involves the acquisition of the economic usage of an assets through a contractual commitment to make periodic lease payments to a lessor who owns the assets. Thus both human resources and leased resources are of the same value to an organization because of their productivity or usefulness. But the existence of that productiveness being dependent upon the continuance of a stream of payments overtime and not on any form of ownership interest.

Broadly speaking, there are two basic approaches for valuation of human resources. The first one is cost based approach and second one on estimating the future expenditure on the labour force depending upon the period each individual or group of persons are expected to serve the organization, among these two method many proponents have opinion that second method (Lev and Schwartz method) provide an objective assessment, to some extent, of HR value. HR depreciation is another important aspect of human resource accounting that has not received any attention in the earlier HR cost and value based models.
REFERENCES


2. Ibid, p. 216.


