Chapter II

Human Resource Accounting: Theoretical Exposition
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The main objective of this chapter is to provide an overview about the theoretical aspects of human resource accounting. This chapter starts off with a brief chronicle of the definitions proposed by advocates of human resource accounting since 1960s. The objectives and the need for human resource accounting are highlighted in this chapter. The development and the state of the art of human resource accounting are reviewed in short. Various aspects relating to human resource accounting, like factors to be considered in choosing a HRA system, the phases in the development of HRA system, types of HRA systems, and future directions of HRA, are mentioned in this chapter. The different approaches/models for measuring the economic and non-economic aspects of human resources are discussed in details. This chapter concludes with a review of the recent developments in the field of HRA.

I. Definitions of Human Resource Accounting

The advocates of Human Resource Accounting (HRA) have proposed several definitions and some of these are as follows:

Rensis Likert defined human asset accounting as “the activity devoted to attaching dollar estimates to the value of a firm’s human organization and its customer goodwill” (Likert, 1967, p. 149).

In the words of Brummet, Flamholtz and Pyle (1968), “Human resource accounting is the process of identifying, measuring, and communicating information about human resources to facilitate effective management within an organisation” (Brummet et al, 1968, p.217).

HRA was defined by the American Accounting Association’s Committee on Human Resource Accounting as “a process of identifying and measuring data about human resources and communicating this information to interested parties” (AAA, 1973, p. 169). This definition implies three major objectives of HRA, viz. (i) identification of HR value, (ii) measurement of the cost and value of people to organisations, and (iii) investigation of the cognitive and behavioural impact of such information.

According to Eric G. Flamholtz, HRA represents “accounting for people as an organizational resource. It involves measuring the costs incurred by the business firm and other organisations to recruit, select, hire, train and develop human assets. It also involves measuring the economic value of people to organizations,” (Flamholtz, 1974, p. 3).
represents both a paradigm and a set of measures for quantifying the effects of human resource strategies upon the cost and value of people as organisational resources (Flamholtz, 1999, p. 10).

In the words of Robert L. Woodruff Jr., Vice President of the R. G. Barry Corporation, “Human resource accounting is an attempt to identify and report investment made in resources of an organization that are not presently accounted for under conventional accounting practices. Basically, it is an information system that tells management what changes over time are occurring to the human resources of the business. It must be considered as an element of a total system of management – not as a separate device or gimmick to focus attention on human resources” (Woodruff, 1970, p. 157).

A. Friedman and B. Lev considered HRA as “an internal management tool” and defined it as “a process of identifying, measuring and communicating data about a firm’s HR to increase the efficiency of management process and to allow an evaluation of the effectiveness of personnel policies of the organization (Friedman & Lev, 1974, p. 235).

HRA may be defined as a process of measuring the worth of human resources of an organization in a systematic manner as a whole to the organization and recording them for presenting the information in a significant manner in the financial statements to communicate their value with changes over the period and results obtained from their utilization to the users of financial statements (Sur, 1995).

In short, HRA is an attempt to identify, quantify and report investment made in human resources of an organization that are not presently accounted for under conventional accounting practice. As such HRA comprises three aspects: (i) measurement and valuation of human resources, (ii) recording the valuation in the books of accounts and (iii) communicating the relevant information through financial statements to management and external users (Dasgupta, 1998, p. 2).

II. Basic premises of Human Resource Accounting

The basic premises underlying the theory of HRA are as follows:

- People are valuable resources of an enterprise;
- The usefulness of manpower as an organizational resource is determined by the way in which it is managed, and
III. Objectives of Human Resource Accounting

HRA helps in developing financial assessments for the people within the organization. Rensis Likert, one of the earliest proponents of the subject, has listed the following as the objectives of HRA:

- To furnish cost value information for making management decision about acquiring, allocating, developing and maintaining Human resources in order to attain cost effective organizational objectives.
- To allow management personnel to monitor effectively the use of human resources.
- To provide a sound and effective basis for asset control, i.e., whether and how assets are conserved, depleted or appropriated.
- To aid in the development of management principles by classifying the financial consequences of various practices.

Eric G. Flamholtz, who is credited with doing lot of research on the subject, has specified the following objectives of HRA:

- To develop methods of measuring HR cost and value;
- To monitor the effectiveness of management utilization of HR; and
- To develop a theory explaining the nature and determinants of the value of people to formal organization (Flamholtz, 1974, p. 5).

Hence, the objective of HRA is not just the recognition of all resources used or controlled by a business enterprise but it also includes the improvement of the management of HRA so that the quantity and quality of goods and services are increased (AAA, 1973, p. 115).

IV. Need for Human Resource Accounting

There is a need for establishing a system which can generate monetary and non-monetary information about human element in the organization. Identifying, measuring, recording and reporting human resources form an integral part of accounting because of the following reasons:
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- The balance sheet of a business concern cannot represent a 'true and fair view', of the state of its financial affairs as long as all the assets including the human resources are not properly disclosed.

- The return on investment cannot be computed properly unless the investment in human resources is taken into consideration.

- Human resources constitute a vital part of the total investment of business firms and their productivity and profitability largely depend on the contribution of human resources. Hence, real assessment of the total value of a firm can only be made if the value of its human resources is accounted for.

- Accounting information regarding human resources and changes thereof may provide valuable aids to management for developing employees, regulating organizational behaviour, monitoring efficiency of performance, reducing absenteeism and turnover and improving human relations. Participation of employees in the decision making process can be more fruitful if the value of human resources is explicitly brought into the accounting records.

- HRA helps the management in the decision making process about employment, allocation and utilization of human resources.

- It helps the information seekers to know whether human resources are giving adequate return in comparison to payment made to them and whether they are overpaid or underpaid.

- HRA plays an important role in labour based production processes like service centre, scientific investigation centre etc. because in these institutions physical resources are secondary and human resources are the real resources.

- The information generated through HRA can help the management in formulating policies and programmes in the following areas: (a) manpower planning, (b) appraisal of HR development programmes, (c) identification of training needs, (d) usefulness of cost reduction programmes in view of their possible impact on human relations, (e) studying the impact of budgetary control on motivation and morale of employees, and (f) facilitating allocation, conservation and reward of human resources. (Sur, 2002)

The above points highlight the need for human resource accounting.
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V. Evolution of Human Resource Accounting

The development of human resource accounting has passed through several stages and the entire period can be divided into five distinct stages (Flamholtz, 1999, p.1-3)

Stage I: Derivation of basic HRA concepts [1960 -1966]

The first stage of development, from 1960 to 1966, was marked by interest in HRA and the derivation of basic HRA concepts from related bodies of theory. The initial impetus for the development of HRA came from a variety of sources, including the economic theory of human capital, organisational psychologists' concern for leadership effectiveness (Likert, 1961), the new human resource perspective, and a concern for human assets as components of corporate goodwill. Roger Hermanson (1964) in his monograph Accounting for Human Assets, described a model to measure human resource value in external financial reports, and this work was instrumental in providing inspiration for the next phase in the development of HRA.

Stage II: Basic academic research developing measurement models [1966 -1971]

The second stage of the development of HRA was a period of basic academic research to develop and assess the validity of models for the measurement of human resource cost (both historical and replacement cost) and value (both monetary and non-monetary). It was a time of research designed to formulate the present and potential uses of HRA as a tool for human resource professionals, line managers, and external users of corporate financial information. This stage, which occurred from 1966 to 1971, also included a few exploratory experimental applications of HRA in actual organisations. The research team of University of Michigan, comprising of Rensis Likert, R. Lee Brummet, William C. Pyle and Eric G. Flamholtz carried out a series of projects designed to develop concepts and methods of accounting for human resources. The HRA system for the first time was designed and implemented at the R. G. Barry Corporation, Ohio, USA.

Stage III: Significant academic research and growth [1971 to 1977]

The third stage of development of HRA, which dated from 1971 to 1977, was a period of rapid growth of interest in human resource accounting. It involved a great deal of academic
research throughout the Western world and in Australia and Japan. It was a time of increasing attempts to apply HRA in business organisations like R. G. Barry Corporation, Lester White & Company, etc. The research conducted during stage three also involved assessments of the potential impact of HRA information on decisions by human resource professional, line managers, and investors. It also involved the continued development of concepts and models for measuring and accounting for human resource cost and value. This stage was characterized by a considerable amount of published research dealing with HRA as well as a great deal of seminar activity. Many of the studies conducted during this period are considered to be very important. During this period the American Accounting Association established committees on human resource accounting in 1971-72 and 1972-73. These committees published reports on the development of HRA. Empirical research studies found that HRA had an impact on decision making. Some of the studies on the impact of HRA on external decisions were carried out by Elias (1972), Hendricks (1976), Schwan (1976), and Acland (1976). Studies on the impact of HRA on managerial decisions were carried out by Zaunbrecher (1974), Tomassini (1974), Flamholtz (1976), Spiceland and Zaunbrecher (1977), Lombardi and Flamholtz (1979), Harrell and Klick (1980).

In addition to study the effect of HRA information on decisions, research during the third stage involved the continued development of concepts and models for measuring and accounting for human resource cost and value.

**Stage IV: Declining interest of HRA [1977 to 1980]**

The fourth stage in the evolution of HRA, from 1977 to 1980, was a period of declining interest both in academia and in the corporate world. One of the reasons for the reduced interest was that most of the relatively easy preliminary research had been accomplished; the remaining research required to develop HRA was complex, could only be accomplished by a relatively few scholars, a required the cooperation of organisations willing to serve as research sites for applied research studies. During this period, corporate participation was diverted to other, more pressing issues. It was this point that HRA seemed to have been an idea that was promising but that would not be developed much further.
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Stage V: Resurgence of interest in HRA [1981 to the present]

The fifth stage, i.e., the current stage of development of HRA, from 1981 to the present, has involved the beginnings of resurgence of interest in the theory and practice of human resource accounting, although interest in HRA had clearly waned during the period from 1976 to 1980, it never completely died. The first sparks of renewal occurred during 1980, and since that time there have been an increasing number of significant new research studies dealing with the development and application of HRA as well as an increasing number of attempts to apply human resource accounting by major organisations. One of the significant events that served as a catalyst to the renewal of interest in HRA was a decision by the U.S. Office of Naval Research to sponsor a research project dealing with the feasibility of the application of HRA to naval human resource management issues.

Around this time, there was a growing recognition that most of the world’s advances economies have made a gradual yet fundamental transformation. They have shifted from industrial economies in which plant and equipment are the core assets to post-industrial economies, in which human capital and intellectual property are the core assets. The potential success of an organisation lies in its intellectual capabilities rather than in its physical assets. While long dominant companies such as US Steel and General Motors have declined, new companies such as Microsoft, Intel and Amgen have emerged as the hallmark of the new era. The make-up of the Standard and Poors 500 index has significantly changed, away from manufacturing toward technology companies, which rely more heavily on their human resources than industrial firms.

Unfortunately, accounting has not responded to this change in circumstances – and it is likely that investors have paid a price due to lack of information about managerial and human capital. As a result, measurement tools cause anomalies. Accounting today is still based on an industrial paradigm in which only physical and tangible property is considered an asset. But organisations now need systems that continually assess and re-assess the people they employ, including their skills, talents and behavioural attributes, while paying attention to how human resources impact the bottom line. One accounting tool that is relevant to the measurement and, in turn, the management of intellectual capital, specifically human capital, is HRA (Flamholtz et al, 2002, p. 947)
VI. Role of Human Resource Accounting

Human resource accounting has three major functions for the human resource professionals:

- It serves as a framework to facilitate human resource decision making;
- It provides numerical information about the cost and value of people as organisational resources; and
- It can motivate line management to adopt a human resource perspective in their decisions involving people.

These functions are shown in Figure 2.1.

Figure 2.1 Functions of Human Resource Accounting


VII. Types of Human Resource Accounting Systems

All organisations do not require the same degree of human resource accounting capability. A firm may require only the most rudimentary system, while only the most advanced capability may be required by another company. Similarly, the human resource accounting capability
suitable for a firm at one stage may be quite inadequate at a later stage. The different types of human resource accounting capability are shown in Table 2.1.

Table 2.1: Human Resource Accounting Systems I-V

<table>
<thead>
<tr>
<th>HRM Functions</th>
<th>System I Pre requisite Personnel System</th>
<th>System II Basic HRA System</th>
<th>System III Intermediate HRA System</th>
<th>System IV Advanced HRA System</th>
<th>System V Total HRA System</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Human Resource Planning</td>
<td>Personnel skills inventory Replacement tables</td>
<td>Estimate costs of recruiting, training, etc.</td>
<td>Replacement costs</td>
<td>Standard and actual personnel costs</td>
<td>Stochastic rewards valuation model</td>
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<td>Personnel mobility models Personnel simulations</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HR valuation simulations</td>
</tr>
<tr>
<td>II. Human Resource Decision Making</td>
<td>Personnel costs included in “General and Administrative expenses”</td>
<td>Personnel costs budgeted separately</td>
<td>Budgetary system for recruitment, training, etc. Budget replacement costs</td>
<td>Budget standard and actual costs. Original and replacement costs</td>
<td>Human Capital Budgeting Budget ROI on Human Capital Investment</td>
</tr>
<tr>
<td>A. Budgetary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Policy</td>
<td>Value-oriented selection decisions</td>
<td>Recruitment vs. trade off analyses</td>
<td>Personnel assignment optimization models</td>
<td>Value based compensation</td>
<td></td>
</tr>
<tr>
<td>III. Human Resources Conservation:</td>
<td>Turnover rates</td>
<td>Turnover cost</td>
<td>Replacement cost</td>
<td>Opportunity cost</td>
<td>HR value depletion</td>
</tr>
<tr>
<td>A. After-the-fact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Before-the-fact</td>
<td>N.A.</td>
<td>Attitudinal data</td>
<td>Expected Turnover costs</td>
<td>Expected opportunity costs</td>
<td>Expected conditional and realizable value depletion</td>
</tr>
<tr>
<td>IV. Human Resource Evaluation</td>
<td>Performance and potential ratings</td>
<td>Perceived value rankings</td>
<td>Psychometric predictions of potential value Interval value scaling of value</td>
<td>Measurement of economic value of groups</td>
<td>Measurement of economic value to individuals</td>
</tr>
<tr>
<td>V. Human Resource Management</td>
<td>N.A.</td>
<td>Comparison of actual costs with historical costs</td>
<td>Comparison of budgeted and actual costs Variance analysis</td>
<td>Comparison of actual costs against standard variance analysis</td>
<td>Inter-unit comparison of costs</td>
</tr>
<tr>
<td>Efficiency Control</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>


This table illustrates various functions of human resource management (human resource planning, decision making, conservation, and so on) and the human resource accounting capabilities provided by each system level.

An organisation with a System I human resource accounting capability possesses most of the personnel systems that are prerequisite for the implementation of human resource accounting. System I consists of nominal but very elementary human resource accounting capability; that
is, it consists of personnel systems which are aimed at the same functions of more sophisticated human resource accounting systems but which lack the advanced capabilities.

In System II, the human resource planning function incorporates estimates of costs of recruitment and training. Personnel costs are budgeted separately and not merely lumped in "general and administrative" expenses. Personnel policy decisions based on a cost-value calculus. For example, personnel selection decisions are based on such criteria as a person's expected value to the firm. Decision makers are more aware of the trade-offs between one person with a high expected conditional value and another with a high expected realizable value. In a System II organisation, management not only has data on turnover rates; it also has data on the cost of turnover. Thus turnover is expressed in a meaningful common denominator. Attitudinal data, such as measures of satisfaction and perceived motivation, are available, and they are used as leading indicators to forecast probable changes in turnover.

Under System II, human resource evaluation is based on criteria of perceived value that are obtained by alternation-ranking methods. The efficiency of the human resource management process is assessed, and reports compare actual costs with historical costs of similar activities.

Under System III, there is intermediate human resource accounting capability. Human resource planning incorporates replacement costs as well as original costs. Budgetary and policy decision making for human resources is subject to more systematic analysis. There is a formal system for budgeting recruitment, training, and so forth. Personnel needs are planned as a formal part of overall corporate planning, and not just an ad hoc basis. Policy decisions involving trade-offs between human resource variables are subjected to analyses. In System III, the replacement cost of turnover is measured and reported. Managers may be requested to explain controllable turnover. The human resource evaluation process is based on psychometric predictions of a person's potential, and value is assessed in non-monetary terms using interval scaling methods. The efficiency of the overall human resource management process is based on a comparison of budgeted and actual personnel costs, and explanations of variances are required.

An organisation with a System IV capability has an advanced human resource accounting system. In such organisations, human resource planning is based on standard personnel costs. Stochastic models are used to forecast personnel mobility and predict future human resource
needs. The computer is used to run human resource planning simulations, and parameters in the models are varied so that sensitivity analyses can be performed. In the decision-making process, budgets are based on standard costs. Optimization models are used for personnel policy decisions. Human resource conservation is assessed not only in terms of historical and replacement costs, but also in terms of the opportunity cost of human resources. The organisation has an ongoing system of human resource accountability, and one criterion used to evaluate managers is human resource conservation. The firm also has an ongoing turnover control programme, and it uses measures of expected opportunity cost of turnover as a basis for turnover control decisions. Under System IV, the organisation accounts for the value of groups but not for individuals. The efficiency of the human resource management process is evaluated by comparing actual costs against standard, and there is a formal system for reporting and explaining variances.

**System V** represents total human resource accounting capability. Human resource planning is based on a stochastic rewards valuation model, and simulations of the effects of overall corporate plans on human resource value are performed. In the decision-making process, there is formal human capital budgeting. Return on investment is the criterion used to assess capital expenditures in human resources just as it is used for other resources. Personnel policy decisions are based fully on a cost-value calculus; for example, compensation is based on a person's expected value to the firm. Human resource conservation is controlled both before and after the fact. Anticipated human resource depletion is measured in terms of expected conditional and realizable replacement cost. Turnover control programmes are initiated when expected depletion is too high. The System V organisation has a human resource accountability subsystem, and managers are charged with the opportunity cost of controllable human value depletion. They are expected to conserve human as well as physical and financial assets entrusted to them. The human resource evaluation process includes the measurement of the economic value of individuals per se as well as that of aggregates such as departments, plants, or divisions. Finally, the efficiency of the human resource management function is assessed not only by comparison among comparable organisational units. In sum, System V represents maximal human resource accounting capability.

These five systems of human resource accounting can be thought of as different levels of capability. At a particular time, System II may be more appropriate for a given firm than
System III or IV. The systems can also be viewed as stages in the development of a firm’s human resource accounting capability. A firm may presently be in the first stage of human resource accounting capability and desire ultimately to reach the fifth stage. It may be reasonable, however, to move gradually from stage to stage and incrementally increase the firm’s capability. Alternately, the conditions may be appropriate for designing a System IV or V capability (Flamholtz, 1999, p. 285).

**VIII. Factors to be considered in choosing an HRA System**

The four major factors which should be considered for determining the requirement of the human resource accounting capability are - type of organisation, size and structure of organisation, existing human resource accounting capability, and availability of data for developing human resource accounting.

**Type of Organisation.** The main variables that influence the types of organisations in which human resource accounting is applicable are the degree of human capital intensiveness, the number of highly educated or skilled personnel, and the number of people occupying similar positions.

**Size and Structure of Organisation.** The size of an organisation has both direct and indirect influences on the type of human resource accounting capability required. The smaller the organisation, the more likely it is that management can exercise personal control over human resource management. In very small organisations there may be no need for human resource accounting because management has personal knowledge of operations. The larger the organisation, the more likely it is to be decentralized; and the greater the degree of decentralization, the greater the need for human resource accounting.

**Existing Human Resource Accounting Capability:** A company’s existing personnel systems and human resource capability will also influence the choice of a human resource accounting system. A company with inadequate personnel systems is unlikely to be able to digest more than system I capability. An organisation with a computer-based human resource information system is in fine position to develop System V capability.

**Potential for Developing Human Resource Accounting.** Another major factor influencing the choice of human resource accounting system is the potential for actually developing given levels of capability. In some cases, all the necessary data are either presently available
or easily accessible. In other cases, some data may simply be unobtainable (Flamholtz, 1999, p. 288).

IX. Designing and Implementing an HRA System

This section describes the phases involved in the designing and implementing a human resource accounting system. It provides a step-by-step approach to the development of such a system. The five phases in the development of a human resource accounting system are to-

(i) **Identify Human Resource Accounting Objectives.** The first step in designing a system is to identify the specific objectives of the system. The objectives of the system should be an outgrowth of management’s requirement for human resource information which must be explicitly defined.

(ii) **Develop Human Resource Accounting Measurements.** The second step in the design of a system is to develop human resource accounting measurements. The system may include either a single measurement or a set of measurements; it may include monetary or non-monetary measurements or both; and it may include measurements of cost and value. Once the measurements have been selected, their validity and reliability must be tested, which typically involves special research studies.

(iii) **Develop Human Resource Accounting Database.** The next step in designing a human resource accounting system is to develop the database. The database is simply the source of inputs required for human resource accounting, including cost data, time sheets, psychological measurements, and the like.

(iv) **Test the System and Revise.** The purpose of this step is to experiment with the system and eliminate its weakness prior to fully implementing it. The system should be analyzed for its utility, efficiency, and cost and modified if necessary.

(v) **Implement the System.** The final step involves the actual implementation of the system. In this phase, the input and output documents must be standardized, and instructions for administration of the system must be issued. A key step involves the orientation of the personnel to the new system. Its purposes, uses, and methods should be explained.
(vi) **Modify the System.** In time it may become necessary to modify the system, either because limitations in the system’s design have been observed or because of changes in management’s human resource accounting needs. The modifications may involve simple adjustments in the system or an entire recycling through the design and implementation process. (Flamholtz, 1999, p. 290).

So these are the different phases in the design and implementation of a human resource accounting system.

**X. Approaches/Models of Human Resource Accounting**

The HR measurement approaches so far developed date can be categorized under two heads—Measurement of Human Resource Costs and Measurement of Human Resource Value.

**Measurement of Human Resource Costs**

The notion of human resource cost is derived from the general concept of cost. Human resource costs are the costs incurred to acquire or replace people. Like other costs, they have expense and assets components; they may be composed of outlay and opportunity costs; and they may have both direct and indirect cost elements (Flamholtz, 1999, p. 56).

The different models/approaches that have been developed for the measurement of human resource costs are as follows;

**I. Historical Cost-Based Approaches:** The historical cost is used as the basis for valuation of HR. This approach is in tune with the conventional accounting practices, where the physical assets are valued on the basis of historical costs. In this method the costs incurred with respect to the acquisition and development of human resources are worked out and it is amortized over the period for which the benefits are expected to flow to the organisation. The unexpired value is shown in the balance sheet as investment in human resources. If any employee leaves the organisation due to dismissal, resignation, death, etc., the entire amount not written off is charged to the current revenue. According to Flamholtz the original cost of human resources, which refers to the costs associated with acquisition and development, typically includes costs of recruitment, selection, hiring, placement, promotion, formal training and orientation, on-the-job training, trainer’s time, and lost productivity during training. The Figure 2.2 shows the model for measurement of original (historical) human resource costs as proposed by Flamholtz.
Figure 2.2: Model for Measurement of Original Human Resource Costs


The different cost components associated with acquisition and development of the human resources as proposed by various proponents are presented in Table 2.2 (Kolay, 1996, p. 22).
### Table 2.2: Classification of Relevant Costs of HRA

<table>
<thead>
<tr>
<th>Proponents</th>
<th>Implemented at</th>
<th>Constituent Cost Elements</th>
<th>Relevant Functional Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. At an individual level</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Brummet, Flamholtz &amp; Pyle (1969)</td>
<td>Management Level at R. G. Barry Corporation</td>
<td>Recruitment cost</td>
<td>To locate and select new personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acquisition cost</td>
<td>To bring a new employee on board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formal training cost</td>
<td>To orient formally immediately after hire/transfer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Informal training cost</td>
<td>To teach a new person to adopt to existing skill</td>
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<tr>
<td></td>
<td></td>
<td>Familiarization cost</td>
<td>To integrate a new person into organisation</td>
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<tr>
<td></td>
<td></td>
<td>Investment building experience cost</td>
<td>To develop individual capability through on the job training</td>
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<tr>
<td></td>
<td></td>
<td>Development cost</td>
<td>To increase individual's capability</td>
</tr>
<tr>
<td>Woodruff (Jr.) (1969)</td>
<td>Clerical level at R. G. Barry Corporation</td>
<td>Acquisition cost</td>
<td>To select and acquire an individual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orientation cost</td>
<td>To orient an individual on the job</td>
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<tr>
<td></td>
<td></td>
<td>Training cost</td>
<td>To train an individual for further development</td>
</tr>
<tr>
<td>Gustafson (1974)</td>
<td>Operator level AT&amp;T</td>
<td>Employment cost</td>
<td>To recruit and select individuals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Initial training cost</td>
<td>To provide initial training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Efficiency Recovery cost</td>
<td>Loss equivalent due to non-attainment of expected level of productivity after training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extra supervision cost</td>
<td>To provide extra supervision to enable to attain normal level of productivity</td>
</tr>
<tr>
<td>McRae (1974)</td>
<td>Employment cost</td>
<td>To attract, screen and select employees</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Training cost</td>
<td>To train before assignment on to productive work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Efficiency recovery cost</td>
<td>Loss equivalent due to non-attainment of expected level of productivity and to provide extra supervision to attain the same</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other cost</td>
<td>To maintain the personnel in a state of readiness to perform their intended functions</td>
</tr>
<tr>
<td>Flamholtz (1974)</td>
<td>Manager level at R. G. Barry Corporation</td>
<td>Recruitment cost</td>
<td>To locate new personnel</td>
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<tr>
<td></td>
<td></td>
<td>Selection cost</td>
<td>To select new personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hiring and replacement cost</td>
<td>To bring individual to the organisation and place them on the job</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orientation cost</td>
<td>To familiarize the new recruits with the organisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On the job training cost</td>
<td>To provide training on the job</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trainer’s time cost</td>
<td>To provide additional supervision during training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost of loss productivity</td>
<td>Loss equivalent due to fall-off in productivity level of neighbouring workers</td>
</tr>
<tr>
<td><strong>B. At an organisational level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brummet, Flamholtz &amp; Pyle (1969)</td>
<td>R. G. Barry Corporation</td>
<td>Start up-cost</td>
<td>To build and develop group interaction amongst the employees for the first time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organisational planning cost</td>
<td>To plan for organisational human resource as whole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organisational development cost</td>
<td>To develop human resource in general</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Periodic measurement cost</td>
<td>To assess the organisational health through periodic measurement of causal and intervening variables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other investments</td>
<td>To provide development opportunities and welfare measures to the employees in general</td>
</tr>
</tbody>
</table>

Brummet, Flamholtz and Pyle introduced this model at R. G Barry Corporation, Ohio, USA in the year 1969. The value of human resources based on historical cost easily matches with other information on financial statements as the other items are valued on the same basis. It meets the test of traditional matching principle of accounting. Though this approach is simple but it is not perfect and there is lots of problem associated with its implementation. The main problem is associated with the rate of amortization.

II. Replacement Cost-Based Approach: This approach was developed by Eric G. Flamholtz on the basis of the concept of replacement cost suggested by Rensis Likert. According to Prof. Flamholtz the replacement cost of human resources refers to the sacrifice that would have to be incurred today to replace human resources presently employed. There is dual notion of replacement cost- positional and personal. Positional replacement cost refers to the sacrifice that would have to be incurred today to replace a person occupying a specified position with a substitute capable of rendering equivalent services in the given position. There are three basic elements of positional replacement cost- acquisition costs, learning costs, and separation costs. Personal replacement cost refers to the sacrifice that would have to be incurred today to replace a person with a substitute capable of providing a set of services equivalent to that of the individual being replaced. In figure 2.3, the model for measurement of human resource replacement costs is presented.
Figure 2.3: Model for Measurement of Human Resource Replacement Costs

Recruitment
  Selection
  Hiring
  Placement

Cost of promotion or transfer from within

Formal training and orientation
  On the job training

Cost of trainer's time

Separation Pay

Loss of efficiency prior to separation
  Cost of vacant position during search

Direct costs
  Indirect costs

Acquisition costs

Learning costs

Positional replacement cost

So the replacement cost of individuals in an organisation as conceptualized by Prof. Flamholtz comprises of:

(a) the present estimated cost of hiring, training and developing individuals up to the normal level of productivity of the existing individuals; and

(b) the costs associated with moving the existing position holders either out of the organisation or to new positions within the organisation.

Gustafson and Hekimian & Jones also advocated the use of replacement cost method. The concept of replacement cost was implemented in many industrial organisations, like R. G. Barry Corporation, Mid-western Insurance Company, AT&T, International Bank (USA), Touche Ross & Company, US Navy, to make the management conscious about the extent of outlay needed in case the individuals leave the system and the extent of rebuilding the human organisation and accordingly guide the management in formulating various man-management strategies in the areas of acquisition, maintenance, development and utilization of the organisational HR (Kolay, 1996, p. 30). This approach incorporates the current value of an organisation’s human resources in its financial statements prepared at the year end. The replacement cost approach is better than the historical cost approach of valuing human resources but it suffers from certain serious limitations. The replacement cost determination is affected by subjective considerations and it is very unlikely to have exact replacements of human resources with equivalent talents and experiences.

III. Opportunity Cost Model: Hekimian and Jones (1967) used the concept of opportunity cost for the valuation of organisational HR. This model is also known as the competitive bidding model. The main emphasis of this approach is given on proper allocation of the human resources among different departments or divisions within an organisation and to provide a quantitative base for planning, evaluating and developing human resources of the organisation. The situations that would warrant the applicability of the proposed bidding are as follows:

- an organisation is having at least two or more investment centres which have been properly identified with specific responsibilities;
- at least two of these investment centres of the organisation have been demanding for the scarce resources;
• the investment centre managers are motivated and recognize return on investment as the important criteria for performance evaluation of investment centres;
• top management of the organisation has an established target of return on investment;
• Physical assets of the organisation are represented at current economic values (Hekimian and Jones, 1967, p. 107).

Hekimian and Jones (1967) proposed the following procedures for valuing human resources:
• Identification of the various responsibility centres in the organisation.
• 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 the investment centre manager who would be successful in winning the bid.

According to this approach, the investment centre managers bid for the employees and the highest bid for an employee is considered his price, which is reflected in the balance sheet. The bid price is the measure of the employee’s competence and experience, and is the value that would be generated by the employee for the organisation. Critics argued that competitive bidding involves assessing the future contribution of an employee to the organisation’s goals and may force more individuals to dissociate themselves from the bidding process. This complicated process makes the bidding system more difficult to the organisation for measuring the value of individuals. They further argued that the bid price placed on an employee may be based on the perception of the bidder, which may not give a correct estimation of employee’s true value. The value to be generated by an employee is relative and hence the measurement could not be effective (Chandran, 2003, p.236).

Measurement of Human Resource Value

The concept of human resource value is derived from the general economic value theory. Like all resources, people possess value because they are capable of rendering future services. We can define the value of people as the present worth of their expected future services. The concept of human resource value can be extended to individuals, groups, and the total human organisation. Thus an individual’s value to an organisation can be defined as the present worth of the set of future services the person is expected to provide during the period he or she is anticipated to remain in the organisation. Similarly, a group’s value to an
organisation may be defined as the present value of its expected future services. Finally the value of the human organisation as a whole is the present worth of its expected future services to an enterprise (Flamholtz, 1999, p.160). The value of human resources can be measured both in monetary and non-monetary methods.

**Monetary Measurement Methods:**

I. **Unpurchased Goodwill Method:** Hermanson (1964) advocated two approaches to value the human resources of an organisation. According to the first approach, human resource value is equated to its relevant contribution i.e. HR Value = Goodwill x Amount invested in HR/Investment in Total Assets. As per the second approach HR value is conceptualized as the imputed amount of investments on which the same level of contribution has been made i.e. HR Value = Goodwill / Rate of Estimated Contribution of HR. This model has been criticized on the basis that the additional or extra profit or revenue earned by an organisation during a period may be influenced by other factors and it may not be attributed to the HR of the organisation only. For proper application of this model it is essential to identify the different variables and their relationships with the company’s goodwill.

II. **Adjusted Discounted Future Wages Model:** In his pioneering monograph, *Accounting for Human Assets*, Roger H. Hermanson (1964) proposed to use compensation (the present value of the future stream of wage payments to people) as a surrogate measure of a person’s value to the organisation. Hermanson proposed to adjust the discounted expected future wage payments to people by efficiency factor. The efficiency factor is a ratio based upon the return on investment derived by the specified firm relative to all other firms in the economy for a specified period and he supported the use of this ratio on the ground that differential earnings of a firm are attributable to human resources. The value of the organisational HR is equivalent to the present value of future wages and salaries payable for the next five years discounted at the adjusted rate of return. For calculating the efficiency ratio, Hermanson proposed to use a weighted average of the firm’s net income during the past five years. It is calculated by the following expression:

\[
\text{Efficiency ratio} = \frac{5(RFO / REO) + 4(RF1 / RE1) + 3(RF2 / RE2) + 2(RF3 / RE3) + (RF4 / RE4)}{15}
\]
where,

\[ RFO = \text{rate of accounting income on owned assets for firm for current year.} \]

\[ REO = \text{average rate of accounting income on owned assets for all firms in economy for current year.} \]

\[ RF4 = \text{rate of accounting income on owned assets for firm for fourth previous year.} \]

\[ RE4 = \text{average rate of accounting income on owned assets for all firms in economy for fourth year previous.} \]

The efficiency ratio measures the effectiveness of the human resources engaged in a firm over a period of five years. If the ratio is greater than one, the average rate of return for a firm will be above the average rate for all firms in the economy. On the other hand, if it is less than one, the average rate of return for a firm will be below the average rate for all firms in the economy.

This model is criticized to be subjective pertaining to- the present value of future wages restricted to five years, the calculation of efficiency ratio based on last five years rate of return, and assignment of weightings to the past rate of return for weighted average calculation. The assumption that employee wages are based on the adjusted rate of return achieved by them may not be valid and the present value of future wages may not reflect the HR asset value, perhaps still reflects a liability only (Kolay, 1996, p. 92).

III. **Present Value of Future Earnings Model:** Baruch Lev and Aba Schwartz (1971) developed this model by using the economic concept of human capital. This model is also known as the Compensation Model. On the basis of the Fisher’s 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, the Lev and Schwartz have defined the value of human capital embodied in a person of certain age as the present value of employee’s remaining future earnings from the employment. Under this model, the following steps are adopted to determine HR value:

- Classification of the entire labour force into certain homogeneous groups such as skilled, unskilled, semi-skilled, technical staff, managerial staff etc. and in accordance with different classes and age groups.
- Construction of average earnings stream for each group.
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- Discounting the average earnings at a predetermined rate in order to get the present value of Human resources of each group.
- Aggregation of the present value of different groups which represents the capitalized future earnings of the concern as a whole.

By using the following expression the value of an individual in an organisation can be obtained:

\[ V_r = \frac{I(t)}{(1 + r)^{tr}} \]

where, 
- \( V_r \) = the value of an individual ‘r’ years old,
- \( I(t) \) = the individual’s annual earnings up to retirement,
- \( t \) = retirement age, and
- \( r \) = discount rate specific to the person.

Though this model is an improvement over the cost models but it suffers from some serious limitations. The possibility and probability that an employee may leave the organisation before the scheduled tenure is ignored. It also disregards the probability that individual will make role changes during their career.

IV. Stochastic Rewards Valuation Model: Eric G. Flamholtz (1971) developed this model to measure the value of an individual to a firm. According to Flamholtz the value of an individual depends on the value of the service states the person occupies in an organisational hierarchy as well as the probabilities that the person occupies each possible service state. This implies that the value of human resources to a firm is based on a stochastic (probabilistic) process. An individual generates value for an organisation as he occupies and plays different roles and renders services (rewards) to the organisation. In the organisation an individual moves from one role to another is a stochastic process with rewards. The rewards are the benefits derived by the system. Based on the preceding notions, an individual’s expected realizable value to an organisation can be measured as the discounted mathematical expectation of the monetary worth of the future rewards an individual is expected to render to the organisation in the future roles he/she is expected to occupy, taking into consideration the probability of his/her remaining in the organisation. In order to measure an individual’s
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expected conditional and realizable value we need to follow the following five steps (Flamholtz, 1999, p.181):

1. The first step is to define the states of the system. The states should be defined to include the various organisational roles and the state of exit. These states are known as service states.
2. The second step is to determine the value the organisation derives when an individual occupies each service state for a specified time period. These values are known as service state values.
3. The third step is to estimate a person’s future tenure in the organisation i.e. the valuation period.
4. The fourth step is to estimate the probability that a person will occupy each possible state at a specified future times.
5. Finally, we have to determine the present value of the expected future benefits by discounting future values to be derived.

The following expression can be used to calculate the expected realizable value of an individual to a firm:

$$\sum (RV) = \sum_{t=1}^{n} \left[ \sum_{i=1}^{m} R_i \cdot P(R_i) \frac{1}{(1 + r)^t} \right]$$

where,

- $\sum (RV)$ = Expected Realizable Value;
- $R_i$ = Set of $i$ possible service state values;
- $P (R_i)$ = Probability that the organisation will derive $R_i$;
- $t$ = Expected service life (tenure);
- $m$ = State of exit; and
- $(1 + r)^t$ = the discount factor for money.

The figure 2.4 depicts the model proposed by Flamholtz for determining an individual’s value to a formal organisation.
Figure 2.4  MODEL OF THE DETERMINANTS OF AN INDIVIDUAL’S VALUE TO A FORMAL ORGANISATION

Determinants of Conditional Value  Elements of Conditional Value

Individual
- Skills
- Activation Level

Organisational
- Role
- Rewards

Promotability
Productivity
Transferability
Satisfaction

Individual’s conditional value

Probability of maintaining organisational membership

Individual’s expected realizable value to a formal organisation

Legend: Symbol Meaning
- Hypothesized determinant
- Hypothesized interaction
A subset
- Possible determinant

According to Flamholtz, because this concept is equivalent to the general notion of a resource's economic value the ultimate measure of an individual's value is the expected realizable value – the present value of its expected future services. An individual's expected realizable value is multidimensional and it is the product of two interacting variables— the individual's expected conditional value and the probability of maintaining organisational membership. Again an individual's conditional value is the present worth of the potential services that could be rendered to the organisation if the individual maintained organisational membership throughout his or her expected service life and it is composed of three factors – productivity, transferability and promotability. Productivity refers to the set of services an individual provides while occupying his or her present position. Transferability is the set of services an individual is expected to provide if and when he or she is transferred to other positions at the same level in a different promotion channel. Promotability represents the set of services an individual is expected to provide after his promotion to higher positions. The elements of an individual's conditional value are the product of certain attributes of the individual, like skills and activation level, and certain dimensions of the organisation such as role and rewards. Individual’s skill may be defined as the currently developed potential to provide service to an organisation. Activation level of an individual is the extent to which that individual is affected by motivation. Role refers to the set of behaviours expected from all persons occupying a specified position in the organisation. Organisational rewards are the benefits which people expect from the organisation during their stay with it. Probability that an individual will maintain membership with the organisation depends on satisfaction. There is an inverse relationship between the need satisfaction and the likelihood of exit. Again satisfaction is presumed to be caused by the same process that produces an individual’s value – the interaction between the individual’s skill, activation level, role and the organisational reward structure. Taken as a whole, this model represents a quantitative framework for understanding the factors influencing an individual’s value to an organisation and it may be used to analyse a wide variety of human resource actions in terms of their impact on the value of human resources. This model is obviously an improvement over the Lev and Schwartz Model because it takes into account the possibility and probability of an employee’s movement from one role to another in his career and of his leaving the firm earlier than his retirement or death. However, the implementation of this model in real
organisations is not easy as the collection of reliable data regarding the value of service state, a person's expected tenure, and the probabilities of occupying states at specific times is quite difficult (Flamholtz, 1999, p.160).

V. Human Asset Multiplier Method: W. J. Giles and D. F. Robinson (1972) assumed that the goodwill of an organisation in terms of supernormal earnings is attributable to its HR. According to this approach, the total value of an organisation's HR is the value of the goodwill as assessed by the relative price earning ratio of the organisation as compared to the industry average. From the total value of the HR of an organisation, to reflect the value of an individual or of the different groups, the concept of multipliers has been advocated which is popularly known as HAM. An employee multiple factor is designed to reflect the following factors:

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

These multipliers are used as means of reflecting the cost of wages and salaries to the asset value of the employees. This approach 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 are multiplied by the HAM relevant to individuals or group of individuals based on job grading, tenure, employee dimensions, etc and aggregated to reflect the value of the organisational HR. The multipliers are then proposed to be adjusted, either scale up or down, so that the total value of HR so assessed should be equal to the value of the goodwill. This model is criticized on the basis that the aggregation of values of individuals or groups may not lead to value of the HR as whole due to the synergistic component of value. Even the values of the HAM, the relative weightings to wages are considered to be too subjective to reflect their comparative values (Kolay, 1996, p. 94).
VI. Net Benefit Model: This model was propounded by W. J. Morse in 1973. Under it, the value of human assets equals the present value of human resources less present value of payments to employees. This model involves the following steps:

i. Computation of the gross value of the services to be rendered in future by the people of the organisation both in individual capacity and collective capacity.

ii. Determination of the value of future payments (direct and indirect) to be made to the people of the concern.

iii. Ascertaining the excess of the value of future services over the value of future payments (i.e. the net benefit to the organisation).

iv. Discounting the net benefit at a predetermined rate in order to get the present value of human resources.

The following expression can be used to calculate the value of human resources:

\[ A = \sum_{i=1}^{N} \int_{r}^{T} G_i(t) / (1+r)^{t-r} dt + \int_{r}^{t} x(t) / (1+r)^{t-r} dt - \sum_{i=1}^{n} \int_{r}^{T} E_i(t) / (1+r)^{t-r} dt \]

where,

- \( A \) = value of human assets to a formal organisation;
- \( N \) = number of individuals currently employed by the organisation;
- \( r \) = current time;
- \( T \) = highest time at which an individual currently employed leaves the organisation;
- \( I_i(t) \) = net value of services rendered by individual \( i \) at time \( t \) by the organisation;
- \( G_i(t) \) = gross value of services rendered by individual \( i \) at time \( t \) to the organisation;
- \( x(t) \) = value of the services of all individuals currently employed working together in excess to the value of their individual services at time \( t \); and
- \( r \) = time value of money.

The study made by Morse has made a valuable contribution by specifying the human resource algorithms (Malik, 1993, p.22)

VII. Jaggi and Lau Model: In their pioneering study, "Towards a Model for Human Resource Valuation", Bikki Jaggi and Hong Shiang Lau (1974) recognized the difficulties in
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assessing the career movement of employees between service states on an individual basis, so also the probability of individuals leaving the organisation before retirement as necessary to evaluate individual employees as proposed by Flamholtz (1971). Instead of individuals as the basis, Jaggi and Lau advocated group basis of valuation to have greater reliability of the estimates of career movement and the likely exit and consequently, the value of the human resource. A group in an organisation implies homogeneous employees who may or may not belong to the same department or division. It might be difficult to predict an individual’s expected service life in the organisation or at a particular service state, but on a group basis it is easier to ascertain the percentage of people in a particular group likely either to leave the concern during each of the forthcoming periods, or to be promoted to higher levels. The use of Markov Chain Representation has been suggested to consider the career movements of the employees within the organisation and the chances of their retirement or death. This model requires the determination of Rank Transitional Matrix (i.e., an estimate of the probabilities of group’s career movements) on the basis of the historical personnel records usually available in the organisation and also the measurement of the expected quantities of services for each rank of service with the help of a certain service or performance criterion. The value of the services an organisation’s current employees render in a future period is computed by multiplying the estimated number of current employees that will be in each service state in that period, by the value of the services an employee in each state renders to the organisation. As per this model, the value of human resources can be obtained by using the following expression:

\[
[TV] = [N] \cdot \sum_{n=1}^{\infty} r^n \cdot [T]^n \cdot [V]
\]

where,

- \(TV\) = column vector indicating the current value of all employees in each work,
- \(N\) = column vector indicating the number of employees currently in each work,
- \(n\) = time period,
- \(r\) = discount rate,
- \(T\) = rank transitional matrix indicating probability that an employee will be in each rank within the organisation or terminated in the next period given his current rank, and
$V = \text{column vector indicating the economic value of an employee of rank } 'i' \text{ during each period.}$

This model tries to simplify the calculations of the HR value by taking groups of employees as valuation base. However, it is not easy to apply in practice because collection of relevant data is really a big problem. This model also does not recommend any method to evaluate the extent of services that may be available from the employees (Kolay, 1996, p. 95).

VIII. **Stochastic Model on Human Resource Valuation:** Simcha Sadan and Len B. Auerbach (1974) proposed a mathematical stochastic model for accounting valuation of human assets. This model synthesizes the contribution of Lev and Schwartz (1971) and Flamholtz (1971) to provide a basis for valuation of human resources. The model includes consideration of the uncertain future environment. The economic value of an individual to a firm is defined as the present value of the expected future contributions of the individual, discounted by the firm’s cost of capital. Thus, the economic value of an individual $j$ at the time of valuation can be determined with the help of the following formula:

$$V_j = \sum_{t=1}^{T} \frac{C_{jt}}{\prod_{i=1}^{t} (1 + r_i)}$$

where,

$C_{jt} = \text{the expected contribution of individual } j \text{ in period } t \text{ hence.}$

$T = \text{the last period hence that an individual is expected to contribute to the firm.}$

$R_i = \text{the discount rate (cost of capital) for period } i \text{ specific to the firm.}$

The aggregate value, $V$, of the $J$ individuals currently employed by the firm is:

$$V = \sum_{j=1}^{J} V_j$$

This model provided many useful statistics and a framework for manpower analysis by the firm.

IX. **Friedman and Lev Model:** A. Friedman and B. Lev (1974) proposed a surrogate measure for the firm’s investment in human resources relying on the economic theory of human capital. This model is based on firm versus market wage relationships. It is assumed
that the differences between a given firm’s wage structure and the average wages prevailing in the relevant labour market are caused by the personnel policies of the firm. Under this model, the following steps are followed for assessing the value of a firm’s human resources:

i. The employees of the organisation are divided into certain groups according to their service states.

ii. Construction of employee distribution vectors in different service states in future period up to the period ‘n’ at the end of which all current employees would move to exit.

iii. Determining the total manpower cost for different future periods by multiplying the employee distribution vector for the period with the mean salary per employee vector for the period with the mean salary per employee vector for the period, using both organisation specific and market average rate.

iv. The internal and external values of human resources are estimated by discounting the likely total manpower cost for all future period at organisation specific rate and at market average rate respectively.

The difference between the external and internal values of HR reveals the investments in HR. A positive difference, i.e., when the external HR value is greater than the internal HR value, indicates the discounted value of the stream of wage savings resulting from the firm’s personnel policies, whereas a negative balance (the external HR value is less than the internal HR value) indicates the discounted value of the stream of wage dissavings as a result of below average indirect compensation, training, etc.. This model is criticized on the ground that the differential wages may not be the result of HR investments and as such may not be the basis of HR value.

X. Myers and Flowers Model: In this model, it has been hypothesized by M. S. Myers and V. S. Flowers (1974) that five dimensions or attributes of an individual – knowledge, skills, health, availability, and attitude, and their interrelationships determine an individual’s contribution and therefore his or her value to the organisation. This model is based on the premise that knowledge enables an individual to direct his skills and health enables to apply them. An employee continues to stay with the organisation 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 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 asset dimensions. A twenty-item attitude survey questionnaire has been developed with a provision for relative weightage on different employee’s attitude score based on job grade level and tenure of employees in the organisation to determine the employee attitude index. The employee attitude index multiplied by the wages payable reflects the likely benefits as against wages payable as the cost and the gap between the benefits and the cost reveals an individual’s value. In this model, it is proposed that the assessment of gain per individual employee (or group of employees or of a department or the entire workforce as a whole) related to the investments in the HR will guide the management to formulate various strategies pertaining to direct and indirect HR investments in the presence of external factors to reinforce the work and non-work related factors, thereby optimizing the value of the organisational HR. The information obtained may be used for internal management purpose only. It was suggested by Dicarlo (1983) that the relationship between attitude measures and subsequent firm profitability must be established to enable the model to be useful for investment decisions.

XI. Chakraborty Model: S. K. Chakraborty (1975) made a pioneering contribution by suggesting a model of valuation of human resources of an organisation in the context of Indian industry. Under this approach, the following steps are adopted to determine the organisational HR value:

i. On the basis of past experience, the average tenure of employment of employees is estimated.

ii. The total remuneration of the employees payable in future is determined.

iii. The future total remuneration is discounted at an appropriate rate to arrive at its present value.
iv. The total HR value is obtained by adding the expenditure incurred on recruitment, training and development of such resource to the present value of total future remuneration.

Under this model, the expected average post-tax return on capital employed measured from asset side of a conventional balance sheet over the average tenure period is used as the discount rate for the purpose of ascertaining the present value of total remuneration. Prof. Chakraborty argued for the adoption of such a long term rate in order to avoid fluctuations in the HR valuation from year to year simply due to changing annual rates of return. But in a year of low rate of return, the value of HR will have an upward bias and conversely in a year of high return it will have a downward bias (Chakraborty, 1976, p. 397).

XII. Certainty-Equivalent Net Benefit Model: This model was proposed by Pekin Ogan (1976) for HR valuation of professional service organisations. Basically, it is an extension of Morse’s Net Benefit Model. In this model, the proponent highlighted the effects of costs and benefits. According to this approach, the total adjusted net present human resource value is equal to the aggregate discounted certainty equivalent net benefits of the employees on the organisation. This model can be presented in the following form:

\[ K_{kj} = \sum_{j=1}^{N} \sum_{k=t}^{L-t} \frac{1}{(1+r)^k} V_{qj} \]

where,

- \( K_{kj} \) = total adjusted net present values of human resources in a professional service organisation.
- \( V_{qj} \) = certainty equivalent net benefits.
- \( L \) = end of the estimated useful life of the employee for the organisation.
- \( j = j \) th individual; \( j = 1, 2, \ldots \), \( n \).
- \( r \) = a discount rate external to the organisation (risk-free).
- \( k \) = time periods in the future. Revenues and costs are assumed to occur at the end of \( k \)th time period.
- \( t \) = sometime from 1 to \( L \) which is a point in the useful life of the employee to which the certainty-equivalent net benefits that occur after \( t \) are discounted, \( q = k + t \)
The following steps are followed for assessing the HR value under this model:

i. Determining the net benefit from each employee

ii. Selecting certainty factor at which the benefits will be available in future.

iii. Computation of certainty equivalent net benefits by multiplying the certainty factor with the net benefits derived from the people of the organisation to get the value of human resources of the organisation.

This approach is certainly an improvement over the other approaches proposed earlier. It makes use of the ‘certainty factor’ designed to measure the Probability of Continued Employment and Probability of Survival. However, one of the major limitations of this model is that it can be implemented in those organisations only in which ‘costs’ and ‘benefits’ of the employees can be traced objectively.

**Nonmonetary Measurement Methods:**

Money is used as the basic unit of measurement in accounting. But a committee formed by the American Accounting Association stated in their report that “there is also no reason why only measure applied should be ‘value’ in terms of dollars. It is entirely conceivable that accounting should deal with various measures and do so in a systematic form, say, a vector or number of measures.” Thus the committee has advocated the use of nonmonetary measurement also and this will be included within the scope of accounting in the near future.

In human resource accounting, nonmonetary measures of human resource value have significant uses. First, they may be used for decisions that do not require monetary measurements. Layoff decisions, for example, do not require monetary measures of human resource value. Second, nonmonetary measures may also be used as surrogates for monetary measures. For example, a ranking of people according to their conditional value may be used as a surrogate for the monetary measurement of conditional value. Third, nonmonetary measures may be used to predict monetary measures. Thus it is important to develop valid and reliable nonmonetary methods of measuring human resource value (Flamholtz, 1999, p. 219).

There are several concepts and techniques that might be used as nonmonetary measures of human resource value and some of them are described below:
I. Skills Inventory: This is one of the basic techniques for evaluating the human resources of an organisation. The capabilities of the organisational members are enumerated. It represents a nominal level of measurement. It is a classification of people according to their skills and represents a type of balance sheet of the potential services that can be rendered by people at a specified time.

II. Performance Evaluation Methods: There are many techniques to facilitate performance evaluation, including ratings, rankings, and checklists. The first two are relevant to human resource accounting. Ratings are the methods of assessing a person’s performance in relation to a set of scales. Rankings are an ordinal form of rating, and this method ranks people on one or more dimensions. There are several procedures to obtain rankings like alternation ranking, paired comparisons etc.

III. Assessment of Potential: Potential assessments are designed to determine a person’s capacity for development and promotion. Its main objective is to measure the services that people are potentially capable of rendering to an organisation. One of the popular approaches to the assessment of potential is the trait approach. The assessment may be made either by judgemental or psychometric methods.

IV. Attitude Measurement: The techniques for measuring the attitudes are designed primarily to get information about the tendencies of people to express feelings about some object. With the help of attitude surveys, organisations may assess the attitudes of the people toward their job, pay, working conditions, or the organisation as a whole. Thus the sources of employee satisfaction and dissatisfaction may be identified.

V. Subjective Expected Utility: The concept of subjective utility combines two more fundamental notions: utility and subjective probability. Utility is the economic concept of subjective value. It is a resource’s perceived value to its user. Subjective probability is the subjective estimation of an event’s likelihood. It is an individual’s degree of belief in the likelihood of an event. To measure utility and subjective probability directly some psychophysical methods have been developed.
VI. The Human Organisational Dimensions Method (Behavioural Model): This method is based on the premise that the value of people, like that of all other resources, should be measured in terms of the present worth of their expected contribution to a firm's future earnings. The method attempts to overcome the difficulties involved in forecasting the firm's future earnings as well as to take into account the contribution made by human resources to such earnings.

This valuation approach is derived from the model proposed by Rensis Likert and David G. Bowers (1973) for the measurement of group's value to an organisation. It is based on the hypothesized relationship among the so-called causal, intervening, and end-result variables. The causal variables are independent variables that influence the course of development within an organisation and the results achieved by the organisation. There are two different types of causal variables- managerial behaviour and organisation structure. Managerial behaviour refers to the dimensions of supervisory behaviour influencing group effectiveness, and the dimensions are support, team building, goal emphasis, and work facilitation. Organisational structure refers to the structural relationship among organisational roles. Intervening variables reflect the internal state, health, and performance capabilities of the organisation. There are four types of intervening variables – work group process, peer leadership, organisational climate and subordinate’s satisfaction. End-result variables are the dependent variables that reflect the achievements of the organisation such as its productivity, costs, scrap loss, sales, earnings, etc. In this approach it is hypothesized that the causal variables influence the intervening variables, which in turn determine the end-results of the organisation.

Based on these concepts, the proponents have described a method for determining the monetary estimate of the expected change in the value of human organisation. The five steps to be followed in this method are as follows:

i. The dimensions of the human organisation are measured at specified time periods in nonmonetary terms. These measurements, which are typically measured on a Likert scale, are the scaled responses of people to the items of a questionnaire.

ii. The scores are then standardized by statistical methods to take into account the degree of variability of the set of responses.
iii. The difference between two standardized scores from one period to the next is calculated. This difference or change is known as delta.

iv. The next step is to estimate the expected future change in end-result variables from observed present changes in dimensions of the human organisation. For a given variable the delta is multiplied by the coefficient of correlation between that variable and an end-result variable. This provides an estimate in standard scores of the anticipated change in the end-result variable attributable to a change in the human organisational dimension hypothesized to cause that change.

v. The final step is to translate the standard scores into measuring units of the end-result variables. (Likert and Bowers, 1973, p. 17)

In principle, this method can be used to predict changes in any end-result variable, monetary or nonmonetary.

VII. Social-Psychological Model: The Likert-Bowers model specifies the variables to measure as indicators of the value of the organisation. To measure these variables, researchers at the University of Michigan's Institute for social Research have designed and assessed the validity of an instrument called the survey of organisations (Taylor and Bowers, 1972). The survey of organisations is a questionnaire based on the theoretical framework proposed by Likert and Bower. The questionnaire is designed to measure what Bowers and Taylor called "organisational climate" and Likert has termed this as the "state of the human organisation". Organisational climate refers to organisational members' perceptions of the social-psychological context of the organisation in which they exist. It refers to the social psychological reality of the organisation and is hypothesized to influence organisational behaviour (Flamholtz, 1999, p. 225). The variables selected for measurement in the survey of organisations include leadership processes, the character of motivational forces, communication processes, decision making processes, goal-setting processes, and control processes. A questionnaire, containing a set of items, designed to measure the causal and intervening variables as perceived by the organisational members. The individual questionnaire items can be combined into indices for each of the variables being measured. Taylor and Bowers found five distinct and consistent clusters of variables: technological readiness, human resource primacy, communication flow, motivational conditions, and
decision-making practices. The technological readiness index is the measure of technological capability, i.e., the extent to which equipments, facilities, methods, and procedures are kept adequate, efficient, and up to date. Human resource primacy refers to the degree of concern for human resources. Communication flow represents the direction of information flows in the organisation. Motivational conditions refers to the major reasons leading employees to work hard and the barriers to motivation caused by interpersonal or inter-unit conflict. The decision-making practices index refers to the character of decision-making processes. (Taylor and Bowers, 1972, p. 70). The proponents have studied the internal consistency reliability and discriminant validity of the five composite indices of the organisational climate. They found that all of the indices except technological readiness have acceptable internal consistency reliability and discriminant validity, and the four indices may be used in practice (Taylor and Bowers, 1972, p. 73).

Although there is need for nonmonetary measurement of human resource value, the current state of human resource accounting has not fully developed this measure.

Other Surrogate Measures

I. Performance Measure as a Surrogate of Organisational HR Value: This model was suggested by M. K. Kolay and K. C. Sahu in 1995 to assess the relative value of organisational HR. Under this model, the value of organisational HR is measured on the basis of total performance of the organisation. The total performance of an organisation is determined not only by its profitability but also by its ability to achieve social goals.

II. Scalar Model: This model was proposed by J. F. Puett (Jr.) and D. D. Roman in 1976. Under this model, for assessing the HR value the steps which are to be followed are as follows:

1. Identifying the attributes of the people of the organisation.
2. Defining the acceptable standard for each of such attributes.
3. Selecting a scale from 1 to 10 or 1 to 100 ranging around the selected standard.
4. Computing the value of the attributes of the people of the organisation by using this scalar technique to get the value of human resources.
III. Simulation Models

A. Gambling Model: T. E. Gambling proposed this model in the year 1974. According to this model, the HR of an organisation is a dynamic system with feedback loops and this dynamic system is designed by using simulation technique.

B. Dawson Model: This model was advocated by C. Dawson in 1988 to simulate employee resourcing process. Under this model, the following factors are taken into consideration while assessing the HR value of the organisation.

- labour turnover characteristics of workers being modeled;
- the acquisition activities involved in resourcing this type of workers;
- the resourcing interventions commonly used; and
- implications of a failure to achieve the exact number of workers of this type within the organisation for any period of time (Dawson, 1988, p. 34).

There are modern approaches which can be used for analyzing human capital information and to produce meaning information for the business both internally and externally (Baron and Armstrong, 2007, p.67). Some of the modern approaches along with the name of the proponents have been listed below.

- The Skandia Navigator by Edvinsson (1991)
- The Balanced Scorecard by Kaplan and Norton (1996)
- The Human Capital Monitor by Mayo (2001)
- The Organisational Performance Model by Mercer HR Consulting (1990)
- The Newbury Index Rating by Kearns (2005)

In Figure 2.5, the different methods for human resource accounting have been shown on the basis of the classification of the methods made by Gebauer (2003).
Figure 2.5: Methods of Human Resource Accounting

Methods for Human Resource Accounting

Objects Individuals

- Monetary
  - Determinants of an Individual’s Value to a Formal Organization by Flamholtz
  - Firm Capital by Esselborn/Henneke

- Non-monetary

Objects Groups

- Monetary
  - Social-Psychology indicators by Likert
  - Dollarized Attitudes by Myers/Flowers
  - Human Capital Index by Pfau

- Non-monetary

Human Resource Cost Accounting (HRCA)
- Original Costs by Brummet/Flamholtz/Pyle
- Replacement Costs by Flamholtz
- Opportunity Costs by Helin/Helmers
- Discounted Wage Flows by Lev/Schwartz
- Adjusted Present Value by Hermanson

Human Resource Value Accounting (HRVA)
- Stochastic Rewards Valuation without Service Stations by Waters
- Stochastic Rewards Valuation with Service Stations by Flamholtz

Human Resource Cost Accounting (HRCA)
- Original Costs by Brummet/Flamholtz/Pyle
- Opportunity Costs by Likert
- Discounted Wage Flows by Lev/Schwartz

Human Resource Value Accounting (HRVA)
- Unpurchased Goodwill Method by Hermanson
- Discounted Future Earnings by Brummet/Flamholtz/Pyle
- Group Valuation by Jaggi/Lau
- Skandia Navigator by Edvinson

XI. Conclusion

The concept of HRA has been appreciated by the accounting profession and by and large its usefulness has also been acclaimed in the literature but unfortunately, its application has not flourished throughout the world. But today the importance of human resources in organisations has increased to a great extent and we have realized that the main mantra to attain success lies in the proper management of human resources. It’s high time that we adopt such practices which can contribute towards the effective utilization of the people. The human capital can only provide us sustainable competitive advantage. HRA is one such practice. But this practice needs to adopted with caution, that is, instead of getting ourselves busy in putting the people on the balance sheet let us ponder upon the other aspects of HRA too. Disclosure of HRA information has been accepted as a point of immense importance and growing awareness among the investors, managerial people and other interested parties has been noticeable. Hence, considering the significance of human resources, proper initiation should be taken by the governments as well as professional bodies both at the national and international levels in respect of formation of specific accounting standard and suitable valuation models on the measurement and reporting of value of human resources.
References:


