CONTRIBUTION BASED MEASUREMENT OF HUMAN ASSET FOR STRATEGIC DECISION MAKING USING HCIS

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Abstract

The study has been undertaken to test the validity of the variables that contribute in the valuation of human asset using the Human Resource (HR) Valuation Model (Singh, 2002) conducted in three manufacturing companies in NCR on white collar employees. The result indicates that the cost incurred on employees cannot be used as a surrogate measure of their value. The various Organisational and Environmental factors relating to human resource have an impact on Organisation's human resource value. Factor Analysis, a multivariate technique has been used that shows relative importance of all variables used in the model. Thus, there are various variables (i.e. qualitative variables that include behavioral and contribution based variables and quantitative variables) which are instrumental in making the contribution by an individual in the organization upon which the value of an individual is determined. These findings have implications for strategic decision making relating to human asset.

Key Words: *Human Asset, Human Resource Accounting Model, Contribution, Strategic Decision making.*

JEL Classification: L29

1. INTRODUCTION

Whatever the economic condition is, the safest investment is in human asset. Such investment in human asset refers to all forms of investments directed to raise knowledge, skills, abilities, and other characteristics (*KSAOCs*) of the organizations workforce. What is needed is the measurement of abilities of all employees in a company, at every level, to produce value from their knowledge and capability and to assign monetary value to the human asset of the organization. In the management terminology, it is known as human asset measurement.

The 21st Century environment for strategic decision-makers is quite different from the past. Strategy formulation is influenced by factors like whether there are the needed competencies in the organization; possibility of training the employees for developing them and the gaps that exist in terms of competencies of the human resources (Krishnan and Singh, 2004). The information generated by the human asset measurement has many applications for the success of strategy implementation. The value of human resource was not restricted only to the cost of acquisition and development but was largely influenced by the inherent and hidden qualities of human resources. This helps in strategic human resource management (SHRM) as it includes comprehensive concerns about structures, values, culture, quality, commitment, and performance, and the

development of the human resources through whom the goals of an organization are accomplished (Jain, 2005). It also helps in guiding the management to frame policies for human resource management (Singh and Gupta, 2008).

2. HUMAN RESOURCE ACCOUNTING MODELS

One of the primary problems has been to develop valid and reliable measures in order to provide information about human asset cost and value in financial statements. Over the years, a number of models have been put forward to compute the value of the human resource(s) as shown in figure 1.

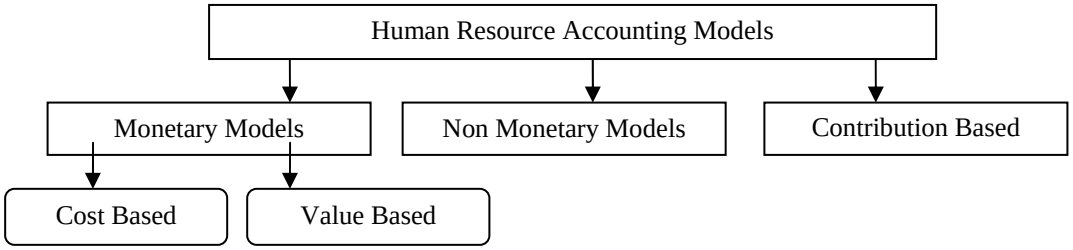

Figure 1: Diagram Showing Human Resource Accounting Models

The main objective of the present study is to test the validity of Human Resource (HR) Valuation Model (Singh, 2002) by applying in the selected companies in manufacturing sector and to find out the value of Human Asset for the organization which is based on the contribution made by him/her so that it can be used for strategic Decision making.

- To find out the most important variables which contribute towards the Cost incurred by the organization on an individual.
- To find out the validity of all the variables used to determine the value of Human Asset as per HR Valuation Model (Singh 2002) using HCIS.
- To find out the impact of factors related to human resource on Organization's human resource value.
- To make recommendations for strategic Decision Making related to HR.

3. RELEVANCE OF THE STUDY

The earlier models had certain limitations which this model overcomes like all models are based on discounted future earnings cash flows of employees resulted into giving more value to freshers without experience in comparison to the senior most persons on the virtue of retirement having the maximum experience in the organization.

The cost-based models for valuing human asset focus on the cost parameters, which relate value to historical cost, replacement cost, or opportunity cost. But cost incurred by an organization on its human asset cannot be taken as a surrogate measure of value of human asset as value is based on the contribution made by an individual to the organization. The value-based models suggest that the value of human resources depends upon their capacity to generate revenue. There is inherent subjectivity involved in determining the discount rate, length of expected employment within the

organization. Probabilities have to be determined for each employee regarding his future salaries and duration of stay. This is rather a difficult and expensive process.

Justification for using the Singh's human resource valuation model

As the model is based on determining the value of individual human resource and total human resource value of an organization, it is useful for decision making about the individuals and the organization as a whole.

It is a comprehensive model, which takes into account various Organizational and environmental factors that are important for valuing human resource.

This model segregates all the historical costs incurred as well as committed to be incurred in future for the purpose of Human Resource Financial Accounting Information System.

This model takes into consideration various contribution based factors that are relevant for managerial decision making.

This model takes into account the value of experience by putting Experience Index in the valuation process.

4. HYPOTHESES OF THE STUDY

On the basis of above objectives, the following null hypotheses (H0) and alternate hypotheses (Ha) were formulated:

- "H01"- There is no variable contributing significantly towards the Cost incurred by the organization on its employees.

  ° "Ha1"- There are variables that contribute significantly and positively towards the Cost incurred by the organization on its employees.

- "H02"- There is no variable used in the HR valuation model that contributes towards determining the value of Human Asset.

  ° "Ha2"- There are variables used in the HR valuation model that contributes towards determining the value of Human Asset.

- "H03"- There is no impact of various Organizational and Environmental factors relating to human resource on Organization's human resource value.

  ° "Ha3"- The factors related to human resource have a positive impact on Organization's human resource value.

5. RESEARCH METHODOLOGY

The Human Asset Measurement Model (Singh, 2002) is divided into two stages:

- Measurement of Value of Each Individual

X1 = { [(AC+DC+CRC) **X** KPAI **X** JSI] + [FRC **X** PAI] } **X** {EI}

Where: X1 = Value of one employee haying number 1

AC = Acquisition Cost

DC = Development Cost

JSI = Job satisfaction Index

PAI = Potential Appraisal Index

EI = Experience Index

CRC = Current Retention Cost (Gross Emoluments including maintenance and separation cost)

KPAI= Current Performance Appraisal Index (Key Performance Areas Index)

FRC = Future Retention Cost (Future Gross Emoluments including maintenance and separation cost)

- Measurement of Total Human Resource Value of an organization

6. MEASUREMENT TOOLS AND TECHNIQUES

For the purpose of the study, both primary and secondary data sources have been used. Published books, journals and periodicals, etc., along with manuals and reports of different companies in India constituted the secondary sources of information. Primary data has been collected from 175 respondents by administering a questionnaire to 379 employees ranging from executives to senior managers and from accountants to engineers in three selected organizations within manufacturing industry in National Capital Region of India.

The data has been analyzed using Microsoft Excel, Statistical Package for Social Sciences (SPSS), and Human Capital Information System (HCIS). Various specific statistical techniques have been used to analyze the data. More specifically, these comprised of summary statistics, correlation, multiple regression, and principle components method of factor analysis.

7. RESULTS AND DISCUSSION

Case: Value of an employee is less than the cost incurred by the organization
There is a case where the value of employee working in the organization is less than the cost incurred on him by the organization. It implies his contribution in the organization is less than what is expected from him. It was further enquired from the management about the employee and his contribution to the company. It was discovered that he was under training period for first four months and has shown satisfactory performance in next 3 months. In addition, benefits provided to him were least. So, there is a need on part of the organization to make an effort to improve his KSAOCs so that his performance gets improved which will also boost up his morale and satisfaction level. Customized training and development may be provided to him to achieve the desired level of performance. If the value of this employee is calculated by using Lev and Schwartz (1971) Present Value of Future Earnings model, the value of the employee will be highest, because the model considers the value of a person on the basis of present value of his/her remaining earnings from employment. However, the human capital may actually be worth more with an additional year of experience. Thus, it is essential to consider the value of employees on the basis of his/her contribution to the organization.

The study found that there exist a marked difference in the cost (investment) incurred on the employees and their value due to various qualitative factors like Performance Appraisal Index, Job Satisfaction Index, Potential Appraisal Index, and Experience Index used in valuing Human Resource. The study also finds that in real life, using the Human Asset Valuation model (Singh, 2002); the value of Human Asset can be less than the cost incurred on the person by an organization. This will help the management in deciding and implementing the various HR strategies for the individuals i.e. whether to increase their contribution, to promote, to transfer or to terminate the service of less efficient employees.

Further, the multiple regression technique has been used in the present study to test the Null hypothesis "H01". R^2 as shown in table 1 explains that 49% of the variation in Human Asset Cost (i.e. cost incurred by the organization) is caused by the 4 variables i.e. Experience index, Performance Appraisal Index, Potential Appraisal Index, and Job Satisfaction Index entered in the regression model.

Table 1: Summary of Regression Model

Model	Multiple R	R^2	Adjusted R^2	Standard Error of the Estimate	Significance F
1	0.7000	0.490	0.478	0.38941	0.000

Dependent Variable: Human Asset cost

When adjusted for the number of variables, it (adjusted R^2) shows that these four variables account for 47.8% of the variation in the Human Asset Cost. Remaining 52.2% of the variation may be due to other variables not included in the model. For example: capacity of organization to pay, scarcity of human resources, profitability, pressure of labor union, and qualification of employees, etc.

Table 2: Associated Statistics for the Determinants of Human Asset Cost

Independent Variable	Standardized Beta	Correlation			t-Value	Sig.t
		Zero-order	Partial	Part		
Constant					166.896	0.000
Experience Index	0.527	0.576	0.583	0.513	9.192	0.000
Performance Appraisal Index	0.515	0.462	0.373	0.287	5.141	0.000
Potential Appraisal Index	-0.148	0.336	-0.115	-0.082	-1.479	0.141
Job Satisfaction Index	- 0.016	0.090	- 0.022	- 0.016	- 0.285	0.776

Dependent variable: Human Resource Cost

Experience Index emerges as the variable with the largest 'pure' impact (52.7%) on cost followed by Performance Appraisal Index (51.5%), the t-values and the significance of the t in the table 2 specify the significance of the individual beta coefficients. As reflected, betas are statistically significant at 0.01 level of confidence for Experience Index and Performance Appraisal Index. Thus, we reject null hypothesis "H01" and accepts alternate hypothesis "Ha1" that there are variables that contribute significantly and positively towards the Cost incurred by the organization on its employees.

Principal Component method of factor analysis has been applied to see whether all the variables used in the model are valid and relevant to predict the value of Human Asset and to reduce the variables in lesser number of factors that are not correlated with each other.

As shown in table 3, 0.65 is the correlation coefficients (r) between Human Asset Cost and Factor B. Each communality (h^2) represents the proportion of variance in the corresponding variable and is accounted for by the two factors (A and B). Thus, 64.4% of the variance in "Human Asset Cost" is accounted for by the factor A and B, and the remaining 35.6% of the total variance in variable is made up of portions unique to individual variables and the technique used to measure them.

Table 3: Varimax Rotated Factor Matrix

Variables	**Rotated Factors**		**Communality** (h^2)
	A	B	
Human Asset Cost	0.471	**0.650**	0.644
Job Satisfaction Index	-0.050	**0.629**	0.398
Performance Appraisal Index	**0.952**	0.055	0.909
Potential Appraisal Index	**0.927**	0.044	0.861
Experience Index	0.059	**0.838**	0.706

In the present study, loading of 0.5 is taken to be the minimum value. So, Performance Appraisal Index and Potential Appraisal Index are the variables contributing more towards factor A and Human Asset Cost, Job Satisfaction Index and Experience Index are the variables contributing more towards factor B.

Table 4: Rotation Sums of Squared Loadings of Factor A and B

Variables	**Component/Factor**		**Communality** (h^2)
	A	B	
Eigen Value	1.994	1.526	3.52
Proportion of total Variance	39.88%	30.51%	70.39%
Proportion of Common Variance	56.66%	43.34%	100%

Further Eigen values as shown in table 4 indicate the relative importance of each factor in accounting for the particular set of variables being analyzed. In the table factor A accounts for 39.88% of the total variance.

If a factor has a low eigen value, then it adds little to the explanation of variances in the variables and may be disregarded. 70.39% of the total variance is common variance. 29.61% of the total variance in variable is made up of portions unique to individual variables and the technique used to measure them.

This rejects the null hypothesis "H02" and thus alternate hypothesis "Ha2" has been accepted that there are variables used in the HR valuation model that contributes towards determining the value of Human Asset.

Measurement of Total Human Resource Value (THRV)

After having calculated HR values for the employees on individual basis, an attempt has been made to measure the Total Human Resource Value (THRV) by using the following model (Singh, 2002).

THRV = (X1+ X2+ X3+……+ Xn) (OCI) (EFI) (LTI) (LUI) (OPE)

Where: X1, X2, …….Xn are employees of the organization from 1 to n.
OCI = Organizational Climate Index
EFI = Efficiency Index
LTI = Labor turnover Index
LUI = Labor Unrest Index
OPE = Output per Employee Index

Table 5: Measurement of Total Human Resource Value (THRV)

Parameters	Organisation A	Organisation B	Organisation C
Total Value of Individuals	242,477,806.00	71,518,526.15	437,031,958.50
Organisation Climate Index	1.38	1.26	1.35
Labour turnover Index	18.11	9.05	0.90
Labour Unrest Index	1	1	1
Efficiency Index	1.10	2.02	1.42
Output Per Employee Index	2.97	1.04	2.20
Total Human Resource Value (THRV)	**20,015,720,327.4**	**1,719,085,232.56**	**1,680,088,399.03**

The statistics on various Industrial and Organizational Factors have been used to calculate THRV as shown in table 5. THRV of Organization A is higher as compared to Organizations B and C. This is due to lower labor turnover, better Output per employee Index and higher climate index organization A as compared to organization B and C. These figures can be better analyzed after comparing average cost per employee, average value of an individual and average of total human resource value among the three organizations as shown in table 6.

Table 6: Average Cost per Employee, Average Total Value of Individuals, and Average THRV of the Three Organisations

Parameters	Organisation A	Organisation B	Organisation C
Average Cost per Employee (1)	1,97,426	1,49,816	2,62,155
Average Value of an Individual (2)	39,75,046	17,87,963	59,05,837
Average of THRV (3)	32,81,26,562	4,29,77,131	2,27,03,897
Difference between (2 and 1)	37,77,619	16,38,147	56,43,682
Difference between (3 and 2)	32,41,51,517	4,11,89,168	1,67,98,060

There are positive differences between the average value of individual and average cost per employee as shown in table 6. Therefore, the cost cannot be used as a surrogate measure of human asset value. Also, the difference between average of total human resource value and average value of an individual shows that the various organizational and environmental factors have an influence on the value of human resource of an organization along with individual's contribution.

As shown in table 6, average THRV of Organization A is higher as compared to Organizations B and C though the average value of an individual employee is higher in organization C. This helps in determining the human resource or manpower utilization in the organization in relation to the industry concerned.

The correlation coefficient between THRV and Labor Turnover Index (as shown in table 7) is 0.882 which shows that there is high positive correlation between the two. Since, LTI measures the industry's Labor Turnover in relation to Organization's Labor Turnover, therefore, the organization having lower Labor turnover, will have higher total human resource value.

Table 7: Relationships {Correlation Coefficients) of Total Human Resource Value with Labour Related Factors

Parameters	Total Human Resource Value
	R
Labour Turnover Index (LTI)	0.882
Output per Employee Index (OPE)	0.802

Similarly, there is a high and positive correlation between Output per Employee and THRV (r= 0.802) i.e. higher the index, higher is the value of the organization as a whole. This rejects "H03" and accepts "Ha3" that the human resource relating factors have positive impact on Organization's human resource value.

8. CONCLUSION OF THE STUDY

Measurement of Human Resource provides information for strategic decision making and helps organization and its employees to know not only about their contribution but also about the improvements required to be made by the firm to be more competitive, productive, efficient, and enhance KSAOCs of the human asset. This will also help in developing strategic plans that will help in attracting the right kind of people, motivate them to perform optimally, and create a supportive climate and structure.

Normally, the value of an asset decreases over a period of time due to depreciation. However, the human capital may actually be worth more with an additional year of experience (Rana & Maheshwari, 2005).

By interpreting Factor structure through factor analysis, it can be concluded that Human Asset Value as calculated is composed of both qualitative and quantitative variables.

Also, the difference between average of total human resource value and average value of an individual shows that the various organizational and environmental factors have an influence on the value of human resource of an organization along with individual's contribution. The organization having lower labor turnover and higher output per employee have the higher value of their human resource as compared to others because, the low labor turnover index and high output per employee has a positive effect on the Organization's human resource value.

9. RECOMMENDATIONS OF THE STUDY

- The development of Human Asset Measurement system provides the data necessary to convert the "qualitative" decision-making inherent in the management of human resources into a quantitative framework. It can help the management in taking various vital and strategic decisions relating to selection, lay-off, transfers, training, promotion, etc.
- Merely quantification of the Human Asset is not enough. The organizations need to identify measure, monitor and interpret the effect of change of organizational strategies and policies, organizational climate, compensation package, etc., on the Human Asset.

- Since KSAOCs increases among human beings with increase in their service term, the value of the person is likely to change over a period of time and, therefore, the value of the Human Asset need to be computed at periodic intervals depending upon the strategic decision making requirement.
- Organizations should find out the ways to reduce the labor turnover ratio as it affects the production and productivity. The output from the new employee will be lower as compared to the experienced employees.
- HCIS is a software which helps in calculating the HR value using the Singh (2002) model of HR valuation based on contribution of HR in organizations. The study has proved that the values calculated by using the above mentioned model gives the information for strategic decision making particularly relating to the human resource decision problems. Hence, HCIS can be used by the decision makers as Decision Support System (Singh, 1999).

Thus, with the given accounting practices and company legislation in India, it is difficult to incorporate human resource as an asset in the company's balance sheet. However, this vital information can be annexed to the financial statements to give an idea to the stakeholders about the changes in the human asset structure of the company during that accounting period. But HRA will work best as a part of the total management information system, serving as a tool for internal management. The Human Asset an indispensable and most important asset must be included in corporate reporting system for internal strategic decision making on the one hand and more informed decision making by other stakeholders on the other hand.

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