

Examination of Mental States:HR Costing Management with an Emphasis on Process Costing in a HRA system

Abstract

The purpose of the study was a view over a method of human resource costing based on process costing with an emphasis on the mental state of individuals. Most of the previously carried out studies are based on human resource training, employment, and relocation costs. The study tried to examine the costs that the mental states of human resources impose on an organization. As the following study was a research type, the questionnaires included in the theoretical foundations of the present study, such as mental states of the individuals, life satisfaction rate and so on, are merely based on the assumption and have not been implemented in any organizations. It must be noted that the study assumed that people have no prejudice or relationship with their organization. Secondly, as there is no certainty about the mental state of humans, all the states stated in the study are relative. For a better understanding of human resource costing in the study, examples of human resource costing models such as the Likert-Bowers model, Hermanson's Unpurchased Goodwill, and so on were given. Then the proposed idea of human resource costing was based on mental states.

Keywords: *Human resource, process costing, mental states*

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Introduction

Definition of human resource accounting:

According to the American Accounting Association, "human resource accounting (HRA) is the process of identifying and measuring information about human resources and transmitting this information to stakeholders."

This definition encompasses three main purposes of HRA.

1. Identification: identifying the quantity and quality of human resources and preparing appropriate statistics.
2. Evaluation: measuring economic value and determining its financial values.
3. Reporting: Preparing and submitting proper financial reports about it.

HRA is transforming the qualitative and subjective concept of human resource value into the quantitative and objective form using accounting knowledge. It deals with three important and basic parts of human resources, including identifying its quantity and quality, evaluating and measuring its economic value and proper financial reporting.

- HRA encompasses accounting concepts and methods in human resource management.

Objectives and necessities of HRA:

- Creating the right thinking about human assets as a valuable resource, identifying the value of human resources, and measuring their cost to the organization.
- Recording the economic value of human resources in the books and financial reports.
- Increasing the efficiency of management using human resources accounting as a management tool and creating conditions and facilities to enhance and

better the efficiency of human resources in education and skills.

- Encouraging company personnel to reduce production costs by motivating them to work and training the personnel.
- Measuring the value that human resources create in the company's financial and physical resources and good reputation.
- Provision of the necessary information for the effective and efficient management of human resources by managing the economic unit.
- Provision of the context for measuring the effectiveness of costs associated with promoting and developing human assets, such as training costs.

History of HRA

(Confrontation of the traditional view of management with the school of human management)

- The traditional management view believed that people should work together like car gears. Chaplin's New Age film was a good example of this way of thinking; however, over time, humans and their needs became an influential factor in the industry. Research by thinkers like Elton Mayo has not been ineffective in this way of thinking, but it would have been years before classical HRA research began.
- The studies in this regard started in 1960 and have grown consistently with the school of "human management." This school mainly focuses on humans as one of the valuable resources of any organization. From 1971 to 1976 could be seen as increasing attention to HRA. However, attention to HRA by

scientific and commercial circles declined from 1976 to 1980. In 1970, many writers were interested in emerging as pioneers of HRA and innovators. These ideas are commonly referred to as human assets accounting. It is hard to determine the starting point of HRA as a research or study topic. In 1976, the Journal of Accounting published a list of organizations and societies associated with the subject, eleven of which were connected to unpublished doctoral dissertations and the first reference based on the work of Dublin and Lotka in 1930.

- T Holtz Flam states five steps in the development of HRA:

The first stage between 1960-1969: In this period, HRA was an inference from the economic theory of “human capital” affected by the school of “new human resources” and the psychology of centralized organizations and the effect of the leadership role in the organization.

Second phase 1966-1971: Technical and practical studies in this period focused on models for accurate measurement and identification of potential users of this method and the empirical use of HRA in real organizations.

The third stage, 1971-1976: This period can be seen as the period of attention of researchers and organizations to HRA. Small organizations tried more to use HRA. The estimates and conclusions made were based on the potential effects of HRA information on executive management and investor decisions, and some companies included human resources in their statements.

Stage four 1976-1980: During this period, there was inattention of accounting researchers and business institutions to HRA, and the reasons for the reduction of attention problems in data collection and evaluation have been the complexity of its concepts.

From 1980 until now, the fifth stage is the period of attention to HRA. New studies have shown this to be the case for some large organizations trying to use HRA. Maybe a real interest in some executives to measure the value of human resources in terms of currency has led to HRA re-emerging in the present era to prepare senior managers to consider employees as the most valuable assets. The main reason for the re-emergence of HRA was the rise of the Japanese in the Western business world as one of the main competitors. The Japanese used the philosophy of increasing employee productivity in the long run (Kaizen), and the Americans used the philosophy of hiring and firing.

In 1980, a new way of thinking about human resources in management science emerged. After the exchange rate fluctuated and the traditional relationship between gold and dollars disappeared, the issue of human resources as the

backbone of countries' production and money became an obvious principle (Violation of Marshall's view).

Human resource costing methods:

1. Leo Schwartz's Model

According to Liu and Schwartz, the value of a company's human resources will always increase over time, regardless of the profitability of the business unit. Additionally, the attitude and morale of employees, their pensions and other factors are not considered in Leo and Schwartz's model for evaluating human resources. However, one can clearly state that, first, the value of a company's human resources will only increase if these resources can improve the company's profitability, not harm it. Secondly, in calculating the value of human resources, the expected salaries of employees' retirement should be considered too.

- One of the key limitations is that failure to comply in many cases will lead to incorrect evaluation of staff costs. Hence, it has been tried to include these cases in presenting the new model. Considering the above, a modified model can be presented as follows:
- $E(S) = S_1 \times P(S_1) + S_2 \times P(S_2) + \dots + S_n \times P(S_n)$
- s) E): all quality of services expected from individual E,
- Si: quality of service,
- Si)(p:) profitability of the Si event
- The above equation can be represented by including the discount factor to reach the present value as follows:
- Ri: the value of services,
- P: Profitability of service retention i,
- T: Duration of staff service time,
- N: The number of employee benefit periods,
- V: Discount rate,
- S: The value of an employee when he leaves the company.
- An individual may leave the organization in the coming years due to death, leaving the organization or redemption while he is currently an employee. Here S is the value expected of the individual when leaving the company (Batra, 1996).

$$HRV = \sum_{t=1}^n \sum_{i=1}^m \frac{(R_i \times P)}{(1+R)^T}$$

- The second step in human resource reporting is to prepare a comprehensive system for recording accounting operations associated with the recruitment, training, and evaluation of human resources of the organization. An initial model is now proposed to record the amount and turnover of human resources in the accounting system, the primary purpose of which is to report the organization's human

resources as an asset in the text of financial statements or explanatory notes. Prior to recording the value of human resources in offices, the company's employees should first be divided into two groups of ordinary and key employees:

1- Key employees of the company: They are the ones who, besides cooperating for the normal and ordinary interests of the company, can use their taste and talent to earn extraordinary income in excess of normal income. Thus, sometimes it is agreed that such employees shall be paid a percentage of sales revenue or net profit besides their normal salary

2- Ordinary employees of the company: They are the ones who perform the assigned tasks regularly and uniformly but have no role in conducting additional research to identify ways to enhance the performance and profitability of the company. The evaluation of human resources for both groups involves the following steps:

1- Calculating actual paid expenses associated with staff recruitment, training, and development,

2- Calculating the current value of future staff salary payments, and

3- Performance evaluation (efficiency)

Total value of human resources = A + B + C

Performance evaluation = A

Current value of future salary payments and staff salaries = B

Actual costs paid = C

- It must be noted that the proposed system for both categories of key and ordinary employees are very similar, and the slight difference in the evaluation of key employees is mentioned after the general system is elaborated.

1- Actual costs: All costs connected to the employment, training and employment of employees should be capitalized when paying or incurring such costs by recording the following:

Investing in human resources xx(debt)

Different banks/accounts xx(credit)

- Investing in human resources is seen as non-current assets to be depreciated during the expected period of using the services of employees and needs to be included in the profit and loss account by recording the following:

- Profit and loss account summary xx

- Investing in human resources xx

- Bottom: At the time of employee death or leave, the entire investment in human resources must be transferred to the profit and loss account.

2- Calculating the current value of salaries and wages paid to employees: At this stage, the company's human resources need to be evaluated - when a company hires employees or intends

to start using HR accounting, it must record the present value of all employee payroll payments at the time HR accounting starts or at the start of the financial year as follows:

Investment in human resources xx

Human resources reserve xx

One must note that the HR account is not depreciated but is revalued at the end of each year.

The following registration needs to be made when paying staff salaries:

Salary cost xx

Bank xx

At the end of the fiscal year, human resources and the difference between the investment in human resources value must be calculated at the end of the year, and the investment in human resources recorded in the books should be credited to the human resources reserve account. On the contrary, the total cost of the registered salary at the time of payment is credited, and the difference between the two is transferred to the profit or loss account.

A = B - C

Human resources reserve = A

Value of human resources at the end of the year = B

Value of human resources at the start of the year = C

B If B < C, reserves are owed,

B If B > C, reserves are credited,

If B = C, the reserve is not established.

We will have:

Reserve of human resources (equal to the difference between human resources at the start and end of the year) xx

Sum of profit and loss (difference) xx

Salary fee (total amount paid) xx

Now, the amount owed in the HR investment account must be depreciated over the expected years of using the staff's services and transferred to the profit and loss account by entering the following:

Profit and loss summary xx

Investing in human resources xx

One must note that the HR account is not depreciated over time but is re-evaluated at the end of each year.

3- Performance evaluation section: If key employees are paid more than normal salaries, the additional amount must be deducted from the profit and loss account and transferred to the HR investment account. Additionally, the equivalent of the above amount must be recorded simultaneously in the debtor of the HR investment account and the creditor of the HR adjustment account (it must be noted that this section is used only for key employees). The HR adjustment account is like the HR savings account and shows the excellent performance of the staff, but this part must not be depreciated but always increase with the good performance of the staff. The HR payroll account must be used for the following purposes only:

- 1- Staff training,
- 2- Elimination of abnormal losses because of death or dismissal of employees, and
- 3- Increasing the welfare of employees to encourage them
- Paying excess normal salaries to key employees needs to be recorded as follows:
 - Summary of profits and losses xx
 - Human resources investment salary xx
 - Simultaneously with the above registration to invest the calculated value of human resources, the following registration needs to be done:
 - Investing in human resources xx
 - Adjusting human resources xx
 - If an abnormal loss comes from the death of an employee for the company, this loss can be removed from the HR capital account by the following registrations:
 - Human resources investment capital xx
 - Summary of losses and profits xx
 - Adjusting human resources xx
 - Investment in human resources xx
 - In this system, the amounts paid for the monthly salary of individuals need to be credited to the payer of the salary expense account; as such payments are made for income collection and based on the principle of matching cost to income, such expenses should be reported in the profit and loss account. Nonetheless, the costs imposed on recruiting and training employees must first be recorded as an asset and then depreciated during the expected periods of employee benefit
 - Flame Hoitz model

Based on this model, the value of an individual is the present value of the services he or she is likely to provide to the organization in the future. As individual moves from one position to another, at the same level or different levels, the characteristics of the services he provides are likely to change. The cumulative present value of all services an individual might provide during their relationship with the organization is their values.

- Normally, this value is indeterminate and has two aspects. The first is the expected conditional value of the individual. This is the value that an organization can potentially get from the services of an individual during their years of service in the organization. It consists of three elements:
 - Productivity or efficiency (is a set of services that an individual is expected to provide in his current position)
 - 2- Transferability (the set of services that an individual is expected to provide when they are at the same level in different situations)
 - 3- Upgradeability (a set of services that an individual is expected to provide in higher-level situations).
- These three factors largely rely on individual factors such as the individual's level of activity (motivation and energy level)

and organizational factors such as the opportunity to use these skills or roles and the reward system.

- The second dimension of an individual value is the expected recoverable value, which is a function of the expected conditional value and the probability that the individual will remain in the organization during his or her working life. Because people do not belong to the organization and are free to leave, it is important to ensure they are likely to leave the service.

- The interaction between individual and organizational factors above results in job satisfaction. A high level is job satisfaction, and a low level is the probability of employees leaving the service. Thus, a high level is the expected recoverable value.

- Flame Hoitz proposed three methods for evaluating cost center groups. In all these criteria, an alternative value is used for evaluation. The three methods are as follows:

- Capital: The capital method involves investing an individual's salary and using it as an alternative measure of human value. This criterion could also be well defined for groups of individuals. Group value is the total value of the people in the group. This method is not an ideal group evaluation method because it ignores the possible effects of cooperation (synergy). Nonetheless, this method could reach the approximate value of a group in the company.

- Replacement cost evaluation: The replacement cost of a group is defined as the value that must be incurred today to recruit, select, hire, train and develop an alternative group that can provide services to the current group. This method involves considerable subjective estimation that reduces its validity.

- Main cost evaluation: The principal cost estimation method involves estimating the core cost of recruiting, selecting, hiring, training and developing individuals in the organization. The need to use main costs for group value arises from estimating the cost of developing an effective team. Teamwork is crucial for effective communication, decision making, coordination and many organizational processes. Nevertheless, the costs of creating this group work are largely ignored when the main costs are used to estimate the value of the cost center

- Flame Hoitz model (reward evaluation method):

This model was proposed in 1971 by Flame Hoitz. This is an improvement on the current value model of future profits as it considers the possibility of changing the role of employees in professional life as well as leaving the company before death or retirement. Based on this model, the ultimate measure of an individual's value for an organization is the expected recoverable value. Expected recoverable value assumes no direct relationship between the costs incurred by an individual and his value to the organization at a particular point in time. The value of the individual to the organization can be defined

as the present value of the future set of services that the individual is expected to provide during his or her tenure in the organization.

-Fame Hoitz has identified the factors affecting an individual's expected value as individual conditional values and the likelihood that they will remain in the organization. The former is a function of an individual's abilities and level of activity, whereas the latter is a function of the variables of job satisfaction, commitment, motivation, and other factors

$$\bullet E(R) = \sum_{t=1}^N \frac{\sum_{t=1}^N RtP(Rt)}{(1+r)^t}$$

Where E (R) = expected recoverable value

□ Ri = the value obtained by an organization in position i of possible services

□ P (Ri) = the probability that an individual will be in position i

□ T = retirement time

□ R = discount rate

□ - Morse model (net profit model)

□ This approach was first proposed by Morse in 1973. Based on this method, the value of human resources is equal to the present value of the net profit earned by the organization from the services of its employees. The method involves the following steps:

1. Determining the gross value of services that employees will provide in the future, either individually or as a group.

2. The value of future payments (both direct and indirect) to employees is specified.

3. The surplus value of future human resources over the value of future payments should be determined. As a key factor, this shows the organization's net profit for the HR account.

4. The present value of net profit is determined through a predetermined discount rate (usually the cost of capital). This value shows the value of human resources for the organization

5. Hekiman and Jones' Competitive Bidding Model

□ In this model, an internal market for workers has been presented, and managers determine the value of employees. Managers bid against each other for the human resources that currently exist in the organization. The highest bid wins the tender. There are no criteria for the tender, but managers rely only on this judgment (Akintoye, 2012).

□ **The models are not based on money value**

□ **6- Pekin Ogan's model (certainly equivalent to the net profit model)**

- Pekin Ogan proposed this method in 1976. It is, in fact, a development of the "gross profit method" proposed by Morse. Based on it, the degree of confidence that net profit will be awarded in the future should be considered when determining the value of human resources.

□ This approach has to determine the following:

1- The net profit of each employee should be calculated under the net profit method

2- Confidence in the availability of resources

3- Net profit from all employees multiplied by reliability. This will be the value of the organization's human resources.

- Group value measurement:

- A) The economic value model of Brummett, Film Holtz and Ply

- Film Holtz, Brummett, and Ply's model is based on the principle that the value of a resource is equal to the present value of future services that can be expected and can therefore be a measure of the value of a group of individuals

- Hermanson's Unpurchased Goodwill model

Hermanson has suggested that extraordinary profits are a sign of resources not given on the balance sheet, such as human assets. Even his approach to the value of human resources is explicitly intended for use in a company's published financial statements and not for domestic consumption. This includes predicting future profits and allocating surplus above expected profits to the organization's human resources. Nonetheless, the hypotheses are subject to uncertainty in all predictions

8- Likert and Bowers's model

Likert and Bowers proposed causal, intervening, and ultimately outcome variables that determine group value in an organization. Causal variables are those that the organization can control. These variables include managerial behavior, organizational capabilities, group processes in leadership, organizational status, and subordinate satisfaction. Both causal and intervening variables determine the outcome variables of the organization. The result variables show the achievements of the organization or the total productivity in terms of sales, costs, revenue, market performance, and so on. They depend on casual and intervening variables

In search of a way to find the costs of changing an individual's mental state:

The above lines are a history of the efforts made in human resource costing modeling. However, as stated at the start of these lines, the paper's emphasis is on providing new methods of industrial accounting in human resources.

As is known, the historical costing method is the dominant method in industrial accounting in Iran. Firstly, we write about modeling the historical costing method in human resources, then will finish by elaborating on the fair value method in HRA.

- In the historical costing method, we can reach a base for calculating the cost if we can obtain the cost of everyone within the active projects of the organization. The cost for everyone is calculated as follows:

- The rate of function of everyone in the project is the direct salary of everyone in the project: The important point here is that the employees' motivational factors will directly affect the cost. For instance, if an individual is dissatisfied with the conditions of their work environment, they cannot have proper functioning. Thus, all the efforts of human resources accountants should be spent on converting qualitative variables into quantitative variables. One of the proposed methods is to evaluate qualitative variables. For instance, satisfaction with the work environment can be shown by 100, environmental health conditions by 200, and so on.

For a more precise explanation of the above, industrial accounting in the costing system should be reviewed. In a cost pricing system, the costs incurred, including direct and indirect costs along the route of the production circle, will affect the cost of the manufactured goods. Cost in the form of measurable variables plays a role in cost calculations. However, in the case of human resources, cost calculations are more difficult to solve to some extent since all variables are small. To some extent, numerical human resources can be assigned to each variable to solve this problem. In this proposed model, we define qualitative variables with multiples of 100 to obtain the cost price more accurately. In the following, we describe the relevant variables.

1- Satisfaction with the work environment: Many factors affect an individual's satisfaction with the work environment. Besides physiological issues like an individual's well-being, having an illness or not, and so on, environmental factors also affect physiological issues. Concerning physiological issues, it is possible to understand the situation of everyone with daily questionnaires and self-declarations. We show each answer with a numerical variable for the questionnaires to apply to a financial information system. For instance, the answers can be arranged from good to bad states: the good state of an individual with number one, the semi-good state with the number two, and so on. Normally, the results obtained from this questionnaire may differ on two consecutive days. By measuring such parameters over one month, the results obtained, which are in the form of numbers, can be multiplied by one hundred.

2- Environmental health conditions: Environmental or environmental health conditions directly affect an individual's productivity. When we talk about health conditions, besides the general word health, which refers to the individual's beauty and environment, we refer to the individual's psychological effects on the environment. For instance, if the work environment is hot or cold, it does not have disgusting odors, and so on, it affects the productivity of the individual. As explained in the level of satisfaction with the work environment, the effect of environmental conditions on an individual may not be equal for two consecutive days, which

could be understood through questionnaires or self-declarations by putting these questionnaires together for a month and putting a quantitative variable instead of a qualitative one and multiply the result by 200 (environmental health conditions).

3- Communication with colleagues in the work environment: An individual's relationship with colleagues is very important in a work environment. Individual views toward his colleague will be effective in improving work productivity. If the individual's relationship with his colleague is in line with administrative principles and rules if the conditions of mutual respect are established, and so on, and in group collaboration, the implementation of a joint project of single efficiency will be better. The difference in the way of communication in the organization and its effect on the individual is in people's knowledge of each other is less affected by daily changes. Therefore, with the first questionnaire and self-declaration of individuals, the desired results can be achieved to a large extent. By putting the results together in the same order mentioned above, the result obtained can be multiplied by 300 (contact with colleagues in the Work environment).

4- Mental and psychological states of the individual (coefficient 400): In organizations where humans have a role as an influential factor in productivity, individuals' mental and psychological states play an effective role in productivity. This is one of the most complex factors that affect people's efficiency in the organization. The cases that can affect people's morale are as follows:

A- Family problems: For an individual to work inside the organization, regardless of family problems, he needs to have the least problems within the family. Whenever an individual has many family problems, he cannot have proper efficiency within the organization. Based on the above, family problems can be different on consecutive days, which can be reached with questionnaires, self-declarations, and conversion of qualitative variables into quantitative.

B- Economic problems: Nowadays, economic problems are the main factors affecting people's morale. Whenever an individual is concerned about economic issues, he cannot do the job properly in the organization. Thus, the productivity of the individual in the organization will suffer. Economic issues have a slightly different effect on other people's morale - problems may be resolved by temporarily resolving one of the economic issues, such as an individual's rights in the organization or economic issues, or the individual's problems might not be resolved quickly, in which case the type of questionnaire or self-declaration will differ.

B-1-A states where an individual's economic problems are completely or partially solved: In this case, the results obtained from the questionnaires and self-declarations might vary on

consecutive days, in which case, it is better to make these self-declarations during each month to have more realistic results.

B-2 - A state where an individual's economic problems are not solved: A questionnaire and self-declaration, in this case, is prepared at the start of each reporting period; for instance, a worker who knows his state in the workplace and naturally compared to an employee with economic background is at a lower level and does not expect economic states to improve during the financial period.

Regardless of the two states stated, as economic items may be many, it is tried to avoid blaming economic cases in the questionnaires and only deal with solving or not solving economic problems.

C- Other problems: mental condition, physical condition, and so on, which can change on consecutive days and according to the state of the individual, and one can reach the results with a questionnaire and self-declaration during each month.

5. Difficulty of conditions and environment (coefficient 500): In some jobs, depending on the work and activity, people may work far from their family and place of residence or in very bad environmental conditions (geographical conditions or other conditions). This state is called difficulty of conditions and environment. Difficult working conditions can affect the productivity of people in the organization; however, changing these conditions change with changing the work environment of these people. Thus, if a person's working conditions in the environment have not changed, there will be no changes in people's productivity. Thus, the questionnaires used to obtain information in these states can be administered once and at the beginning of the person's activity in that environment. The items of this questionnaire, including the effect of distance from family, bad environmental conditions, bad weather conditions, and non-compliance with the culture of the workplace community, could be classified from the worst to the best and from number one onwards and the sum of all these states is multiplied by 500.

Conclusion:

As already stated, the mental states of individuals, whether good or bad, could have a key role in the productivity of the organization. If the mental state of the individual within the organization is inappropriate, if the economic conditions of the people are not at the highest level, if the family problems of the people within the organization are high, the costs imposed by the person on the organization will be very high. The efficiency of the individual in the organization will decrease. Hence, it will be the duty of the senior managers of the organization to be active in improving the situation of the organization, at least by understanding the state of the people. The study stated above confirms the need for an HRA information system in Iranian organizations; therefore, senior managers of organizations in Iran can help increase the productivity of their

organization by understanding the conditions of human resources.

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