Evaluation of Intellectual Capital

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Intellectual capital represents the most important factor of a business process. However, its value is not shown in a company’s financial statements. The main reasons for this shortcoming are objective difficulties in determining its value. Determining the value of intellectual capital is of vital importance when managing employees. Therefore, financial statements that are omitting the value of employees cannot represent a true picture of the company’s past operations.

The aim of the paper is to present the basic futures of existing monetary evaluation models of intellectual capital and describe the main futures about the original model developed at the Economic Institute of the Faculty of Management. First, we compare the basic futures of four most convenient monetary models which are: capitalization of historical costs model (Likert, 1967), discounted wages and salaries model (Lev and Schwartz, 1971), replacement costs model (Flamholz, 1973), and opportunity costs model (Hekimian and Jones, 1967). We draw attention to their main performance disadvantages which are the starting point for constructing our original monetary model. Their main features will be described in the second section of the article. We conclude our analysis with presentations of the explanatory power of our original monetary model with respect to the selected four monetary models.

INTRODUCTION

Man’s work is an important element of the business process. However, apart from its role as a means of production, products and services, its value is not disclosed on the assets side of the classical balance sheet. Are there any solid grounds for such consideration of work? Does such consideration of Man’s work result from underestimating the meaning of this element of the business process? And finally, isn’t work (employees, human potential, intellectual capital) a factor that has a crucial influence on successful business operations? These and similar questions arise within the scope of Human Resource Accounting.
Findings on the value of intellectual capital are not new. In fact, its value has already been well recognised by pre-classical economists who treated Man as a national treasure. Over time, this knowledge underwent the process of maturation; nowadays, however, intellectual capital finds its position in financial statements only exceptionally.

This article identifies the most significant monetary and non-monetary models of intellectual capital evaluation. Additionally, our model of evaluation (the dynamic model) is presented.

**MODELS OF INTELLECTUAL CAPITAL EVALUATION**

Intellectual capital may be disclosed among the assets on a balance sheet only if it is expressed in value terms. In order to disclose intellectual capital among balance sheet items, one must find a proper method for measuring its value. So far, some monetary and non-monetary models have been developed for this purpose. Some of the most important models are outlined below. Additionally, our original (dynamic) monetary model of intellectual capital evaluation is presented.

**Non-Monetary Models for Evaluating Employees**

Among the non-monetary models, the Michigan, Flamholz and Ogan models are presented below. The first two models are purely non-monetary, whilst the third one is combined, since it includes both monetary and non-monetary methods of evaluation.

*The Michigan Model.* The very first ideas of a non-monetary evaluation of employees can be traced to works of researchers from the Institute for Social Research, which operates under the umbrella of the University of Michigan. The researchers of the Institute shaped the model known as the Michigan or Likert model (named after the leading researcher of the Institute). The model defines variables that are likely to influence the effectiveness of individuals in an organisation and, therefore, the successful operation of a human organisation per se (Likert et al. 1969, 14).

The Michigan model aims at indirectly define the value of employees in an organisation. It does not enable a determination of their initial value, but rather monitors value changes resulting from changes within the organisational climate. Despite the aforementioned, and though there are numerous open questions to which the authors of the Michigan model have found no suitable answers (i.e. the question of various interpretations of such results), Flamholz is of the opinion that the Michigan
model represents the most successful trial of the non-monetary eval-
uation of employees in an organisation (Flamholz 1982, 23).

*The Flamholz Model.* Contrary to Likert, Flamholz shaped his non-
monetary model of human resource evaluation in terms of the individ-
ual. He wanted to explain factors that influence the value of an individ-
ual in an organisation. This model consists of behavioural and economic
variables.

It is based on the assumption that the value of an individual in an
organisation depends on two interrelated variables, namely:

- the individual’s conditional value and
- the probability of maintaining organisational membership.

The individual’s conditional value is determined as ‘the current value
of future services that may be rendered by an individual in an or-
ganisation during his/her expected working life’ (Flamholz 1972, 668).
Flamholz tested his model by evaluating employees in a company reg-
istered for services in the area of accounting and business finances
(Flamholz 1972, 241–66).

*The Ogan Model.* Similarly to Flamholz, Ogan shaped a model in
which some of the most important variables influencing the value of an
individual in an organisation are defined. The model aims at evaluating
human resources especially in those service enterprises where market-
determined prices are not in use. Prices of some services, for example, are
determined by professional associations such as bar associations, med-
ical associations etc. This is a combined model since it includes both
monetary and non-monetary measures. The basic idea of the model is
to measure the amount of a company’s long-term benefit from an em-
pLOYEE. The value that an employee has for the company should equal the
employee’s long-term benefit resulting from his/her employment. This
long-term benefit is determined by two factors, namely:

- the direct benefit of an employee on the account of his employment,
  and
- the certainty of his employment.

The direct benefit of an employee is the sum of all expected benefits
resulting from his employment. Employment certainty indicates the level
of probability that the employment remains permanent. The value of an
employee for the company is obtained by multiplying the values of both
factors (Ogan 1976, 311).
We will present the following monetary models of intellectual capital evaluation: the replacement costs model, the opportunity costs model, the discounted wages and salaries model and our dynamic model.

**Replacement Costs Model.** The replacement costs model was developed by Flamholz in 1973. The author acknowledges two concepts of replacement costs: individual and positional. Individual replacement costs are defined as a current sacrifice that is mandatory if one wants to replace an individual of particular capacity with someone (an individual) or something (a machine) of the same capacity. These costs reflect the value of an individual for a company.

However, the value of an individual largely depends on his current and future position in a company (achieved due to his capacity). Flamholz defines positional replacement costs as those resulting from replacing the particular mandatory services of each employee in a particular work position (workplace) in a company (Flamholz 1973, 11).

The usage of this model is limited. The model requires not only an evaluation of the amount of costs stemming from replacing an employee with someone or something, but also an evaluation of the probability that another employee (or machine) will accomplish the same work. Additionally, evaluating the amount of replacement costs of all employees is a rather difficult task.

**Opportunity Costs Model.** The opportunity costs model was developed by Hekimian and Jones in 1967. This model is composed of the opportunity costs of an employee that reflect the value of an employee shown in case of using his alternative. Opportunity costs are defined as costs of lost benefits in a situation when an employee performs another task and/or as costs resulting from acquisition of the needed employee (Hekimian and Jones 1967, 108-10). According to this definition, an employee has a certain value only if he/she is an exceptional resource, namely, when his/her movement from department A to department B causes a lack of labour force in department A. The main weakness of this model is that it does not recognise the possibility of acquiring certain work abilities by employing new people.

**Discounted Wages and Salaries Model.** The discounted wages and salaries model was developed by Lev and Schwartz in 1971. According to this model, the value of intellectual capital is defined as the present value of anticipated (future) remuneration of employees corrected for
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performance ratio. The performance ratio of employees is defined as the ratio between the company’s rate of return and the average rate of return in the economy. Positive correction of the present value of anticipated remuneration of employees occurs when a company’s rate of return is larger than the average rate of return in the economy, and on the contrary, negative correction of the present value of anticipated remuneration of employees occurs when a company’s rate of return is lower than the average rate of return in the economy (Lev and Schwartz 1971). Therefore, the underlying assumption is that the future value of the employees’ work may be evaluated by the amount of their wages and salaries.

Dynamic Model for Evaluating Employees. This model is based on the economic concept of value. According to this model, the value of particular goods depends on the present and future benefits associated with these goods. This also applies to employees. Therefore, the value of employees depends on the present value of their expected future services. This definition may apply to an individual as well as to all employees within a company. Therefore, this model is intended to evaluate:

- individual employees and
- groups of employees (i.e. all employees within a company).

The value of individual employees may be determined directly, while the value of a group of employees may be determined indirectly, as a corrected sum of values of individual employees. This model is based on an approach usually used for evaluating the majority of tangible fixed assets by recognising some specific features of employees.

Some may find the comparison of tangible fixed assets and employees unsuitable, morally disputable or even offensive. We apologise in advance for any misunderstandings. We treat human resources as assets not because we would like to underestimate their human characteristics, but because we would like to emphasise their economic value. It means that we treat human resources as economic goods.

Evaluating Individual Employees. As was already mentioned above, this model originally aims at evaluating individual employees. It was also mentioned that the value of a group of employees may be determined indirectly as a corrected sum of values of individual employees. Our dynamic model for evaluating individual employees is presented in fig. 1.

Concepts and other items from the model are explained below.

Purchase Value. The purchase value of tangible fixed assets normally
equals the investment value associated with their acquisition. It is composed of the purchase price along with costs in relation to customs duties, transport, assembly and similar.

The purchase value of an employee is composed of investments into an employee before and directly upon his/her arrival at a company. The company does not necessary participate in all components of these investments. In the context of this evaluation model, the purchase value of an employee includes three components, namely:

- investments in employee training,
- investments in employee acquisition, and
- employee opportunity costs.

Investments in employee training are associated with acquiring his/her work capacity. In this context, we talk about investment value associated with primary school, high school and university education. The investment value associated with training an employee to perform certain tasks may be defined as the usual investment needed in the process of acquiring his/her work capacity. The investment value associated with training an employee does not depend on the method of acquiring an employee. It means that the value of this investment is not subject to change when equally trained employees are of concern. An assumed value, obtained
from the sum of investments needed for an employee in the process of acquiring relevant work capacity, may serve as the investment value associated with employee training.

Investments in employee acquisition include:

- investments in job advertisement and
- investments in direct employee acquisition.

Investments in job advertisement are associated with: placing ads for an available position, interviews, evaluation of candidate suitability etc. Investments in direct employee acquisition are associated with the medical assessment of an employee, his placement etc.

Opportunity costs are lost benefits resulting from choosing a particular alternative. Employee opportunity costs are an individual’s investments into his/her own knowledge and development. Let’s assume that we are in the position of employing a university graduate. This is an individual who has successfully accomplished his/her education on all three levels: primary, secondary and tertiary.

Learning is time consuming (since it is measured in years) and tiresome. However, the results of the lasting efforts put into one’s studies are not tangible material goods, but acquired knowledge and a diploma. Therefore, the decision for an education forces the employee to decline remunerations that would be collected in the case of him/her being employed during the time of study. The lost remunerations of an employee are, therefore, the opportunity costs that reflect the value of an individual’s investments into his/her knowledge and development. Their value is low at the primary school level and increases with additional years of study.

Value Adjustment. The value adjustment of a tangible fixed asset is a value of a fixed asset that is, via its usage, transferred to business effects. This value depends on the purchase value of a tangible fixed asset and its useful life. The value adjustment of an employee is a value transferred by an employee, via his co-operation in a business process, to business effects. It may be obtained by calculating the sum of an employee’s purchase value adjustment and the value adjustment of investments into an employee. The calculation is presented below:

\[
\text{Value adjustment of an employee} = \text{Employee’s purchase value} + \text{Value adjustment of investments into an employee}
\]
The employee’s purchase value adjustment is obtained by multiplying the employee’s purchase value by his annual depreciation rate. The calculation is presented below:

\[
\text{Employee’s purchase value adjustment} = \text{Employee’s purchase value} \times \text{Employee’s annual depreciation rate}
\]

The annual depreciation rate of an employee is obtained by dividing 1 by his useful life expressed in years. The useful life of an employee, expressed in years, is the period during which the employee shall render services to the company. This period depends on the expected presence of the employee in a business process. However, there is a significant difference between a tangible fixed asset and an employee. If ownership is considered in the classical way, one may quickly figure out that an employee is not owned, since he/she is free to leave a company. Therefore, the useful life of an employee is the period during which it is reasonably expected that the employee shall render services to the company. It is a period from the present day to the day when an employee quits working for a company because he/she finds employment elsewhere, retires or similar.

The value adjustment of investments into an employee is obtained by multiplying the value of investments into an employee by the annual depreciation rate of these investments. The calculation is presented below:

\[
\text{Value adjustment of investments into an employee} = \text{Value of investments into an employee} \times \text{Annual depreciation rate of investments into an employee}
\]

Investments in employee acquisition include:

- investments in direct assurance of working abilities,
- investments in health and well-being, and
- investments in loyalty to the company.

Investments in direct assurance of an employee’s working abilities are those that are most profoundly relative to the employee’s work in a company. They include: investments into formal and informal training and introductory training, a lower productivity of an employee during the period of his introductory training, and a lower productivity of an employee prior to his leaving the company (the opportunity costs of the company).
Investments into health and well-being are those that enable regular attendance in the workplace. They include: periodic employee medical check-ups, co-financing the lease of recreational buildings, organising sport events, and similar.

Investments in employee loyalty reduce the probability that an employee will quit working for the company due to disability, retirement or similar reasons.

The remaining item to be defined is the annual depreciation rate of investments into an employee. This rate may be obtained by dividing 1 by the useful life of investments into an employee (expressed in years) as shown below:

\[
\text{Annual depreciation rate of investments into an employee} = \frac{1}{\text{Useful life of investments into an employee (in years)}}
\]

The useful life of investments into an employee is a period during which the employee shall render services to the company as a result of investments directed toward his/her employment. The duration of this period depends on the intensity of knowledge obsolescence and varies across employees. The knowledge obsolescence of employees with a technical education depends on the technical/technological development in a particular economic area while the knowledge obsolescence of an employee graduating in the social sciences depends more on scientific development in that particular area and similar.

**Net Carrying Amount.** The net carrying amount of a tangible fixed asset is the positive difference between its purchase value and its adjusted value. It is a value that shall be transferred by a tangible fixed asset to business effects during its remaining useful life.

Similarly, the net carrying amount of an employee depends on two factors, namely:

- the previously determined positive difference between the purchase value of an employee and his/her adjusted value and
- his/her significance to a company.

The value of an employee to a company depends on his/her position in the company in terms of its organisational structure. Of course, this also influences his/her remuneration. The wages and salaries of employees are, therefore, important indicators of their value within the company. Employee wages and salaries may be defined as a factor that reflects the efficiency of the used work abilities of an individual in the company. An
employee, with his/her presence in a business process offers the company a service and receives a salary in return. The salary amount reflects the value of services offered by an individual to a company and also the employee’s value to the company.

Accordingly, the net carrying amount of the value of an employee must be corrected. The correction factor in this context is the ratio between the annual salary of an employee in a company and the average annual salary of an employee in a national economy. The correction factor may be defined as follows:

\[
\text{Annual salary of an employee in a company} \div \text{Average annual salary of an employee in a national economy}
\]

Evaluating a Group of Employees. The value of a group of employees is not a simple sum of the values of individual employees – this value usually differs from such a sum due to synergetic effects.

However, a certain relationship between the sum of values of individual employees and the value of a group of employees exists. We are of the opinion that this relationship depends on the successful performance of employees in the company compared to the successful performance of employees in the entire economy.

The employees’ performance coefficient serves as a measure of the successful performance of employees. It is defined as the ratio between the sum of weighted average added value per employee in a company and the entire economy during the last three years (numerator) and the sum of the number of years used (denominator). This ratio of last year is then multiplied by a factor of 3, the ratio of two years ago by a factor of 2, and the ratio of three years ago by a factor of 1. The sum of the factors \(3 + 2 + 1\) equals 6. Accordingly, the performance coefficient is calculated as follows:

\[
\text{Employees’ performance coefficient} = \frac{3 \frac{\text{AA}_0}{\text{BB}_0} + 2 \frac{\text{AA}_1}{\text{BB}_1} + \frac{\text{AA}_2}{\text{BB}_2}}{6}
\]

Abbreviations in the equation mean:

- \(\text{AA}_0\) – added value per company employee during the last year
- \(\text{BB}_0\) – added value per employee in the entire economy during the last year
- \(\text{AA}_1\) – added value per company employee two years ago
- \(\text{BB}_1\) – added value per employee in the entire economy two years ago

The remaining two abbreviations in the equation are defined by using the same logic as above.
When the value of a group of employees is to be determined, the aforementioned approach enables recognition of the overall performance of a company for a period longer than one year. When calculating, the period selection is a matter of subjective judgement, however a three-year period seems to be suitable. The business life of a company is rather intensive, and in the light of this, a three-year period seems long enough. In addition, the overall performance of a company during the last year is more accentuated than is the performance of previous years.

CONCLUSION

Employees are economic goods, and therefore we are of the opinion that their value must be known. Knowing this value is crucial for obtaining more realistic company financial statements and for anyone wishing to manage human resources efficiently.

REFERENCES


