

Oleg Y. Kuzmin¹, Igor B. Oleksiv², Galyna V. Mykhailiak³

INTEGRAL EVALUATION OF COMPANY EMPLOYEES' COMPETENCE SYSTEM

The system and evaluation criteria of company employees' competence are formulated and grounded. That allows a quantitative assessment of competence for appropriate management decisions regarding the impact of development on a company financial performance.

Keywords: competence; criteria for evaluation; employees.

Олег Є. Кузьмін, Ігор Б. Олексів, Галина В. Михайляк

ІНТЕГРАЛЬНЕ ОЦІНЮВАННЯ СИСТЕМИ КОМПЕТЕНЦІЙ ПРАЦІВНИКІВ ПІДПРИЄМСТВ

У статті сформовано й обґрунтовано систему та критерії кількісного визначення та оцінювання компетенцій працівників підприємств для прийняття відповідних управлінських рішень щодо впливу їх розвитку на ефективність фінансової діяльності підприємства.

Ключові слова: компетенції; показники оцінювання; персонал.

Форм. 1. Рис. 1. Табл. 7. Літ. 17.

Олег Е. Кузьмин, Игорь Б. Олексив, Галина В. Мыхайляк

ИНТЕГРАЛЬНАЯ ОЦЕНКА СИСТЕМЫ КОМПЕТЕНЦИЙ РАБОТНИКОВ ПРЕДПРИЯТИЙ

В статье сформирована и обоснована система и критерии количественного определения и оценки компетенций работников предприятий для принятия соответствующих управленческих решений относительно влияния их развития на эффективность финансовой деятельности предприятия.

Ключевые слова: компетенции; показатели оценивания; персонал.

Introduction. To ensure a well-balanced development of a company it is necessary to have systemic evaluation of its financial and economic activity, and also the level of employees' competence development, since of urgent importance are nowadays employees' skills and knowledge. Judging by this, we find it important to work out employees' competence evaluation system, which will allow showing different angles of this economic category level. Apart from this, it is worth noting that such evaluation will serve as a basis for managerial decisions-making concerning employees' education, development and promotion.

Latest research and publications analysis. The review of (Gruzyna, 2011; Melnyk, 2010; Kytaev, 2003) testifies that employees' competence development and evaluation are not investigated to full extent and need further insights. The notion "competence" has been revealed in a number of works by foreign and national scientists among whom we can mention L. Balabanova and O. Stelmashenko (2010), I. Gruzyna (2011), I. Docenko (2013), O. Kytaev (2003), O. Kuzmin and O. Melnyk (2007), M. Malyar (2009), O. Melnyk (2010), R. Noe (2002), B. Samorodov (2011) and many others. The papers of the given scholars contain definitions of "competence", the employees' role, competence importance and their qualification are

¹ Lviv National Polytechnic University, Ukraine.

² Lviv National Polytechnic University, Ukraine.

³ Lviv National Polytechnic University, Ukraine.

shown there, advantages and disadvantages of employees' professional education and development are also considered. As a whole we need to accentuate that a number of important problems for modern economics has not been investigated in the papers by national and foreign scientists yet. One of such problems is the investigation of employees' competence evaluation methods. The issue under consideration is becoming very urgent and needs further investigations.

Paper objectives. Taking into account the topicality of the research, the paper objectives are to consider foreign and national scientists' approaches to employees' competence evaluation methods, analyze their pros and cons and improve them.

Key research findings. National companies' development, the rise of their competitiveness at inner and outer markets is predetermined by competitive personnel. It is obvious that the greatest importance should be attached to the problems of development, professional studies, personnel career promotion, in other words to the factors which can influence the competence and competency of each employee at a company, that is why one of important factors of development is well-balanced system of employees' competency rise.

There are several approaches to company employees' competence evaluation, presented in the papers by national and foreign scientists. I. Gruzina (2011) defines 3 competence groups: corporate, professional, and the behavioral ones. The author claims that employees' competence evaluation "means the validity definition of offered competence within the group which characterizes the degree of importance of each competence for effective fulfillment of the tasks and achieving general goals of the company". Apart from this, the scientist has offered the model of personnel competence evaluation which allows making a map of employee's competence and define the areas of certain competence manifestation. V. Jygyr (2012) suggest evaluating employee's professional competence with the help of defining coefficients of efficiency according to different types of activities; V. Bohoslovsky, B. Karayeva and A. Shenohin (2008) suggest implementing structural matrix of complex evaluation of employees' competence.

The evaluation of employees' competence in national companies is accompanied by a great number of perfect methods. Considering this, the problems of codimension and results comparability of such evaluation arise. It causes the necessity to formulate a universal approach to employees' competence evaluation in national companies.

One of such approaches to employees' competence evaluation is the application of an integral index. The determination of an integral index gives the opportunity to compare employees' competences of different companies. However, different types of companies and the quantity of employees there may become a significant disadvantage which will influence the objectivity of comparison.

The methods for determination of integral indices and weighable coefficients of companies' activity importance indicators are given in the works (Gruzyna, 2011; Docenko, 2013; Melnyk, 2010; Kuzmin and Melnyk, 2008). O. Kytaev (2003) determines economic rating of a company with the help of an integral index. V. Samorodov (2011) makes a comparative analysis of methods for determination of banks activity weighable coefficients importance while rating. M. Malyar (2009) determines a purposeful change of weighable coefficients within polycriteria choice. I. Docenko (2013) counts integral indices of economic safety of a company etc.

According to (Izmaylova, 2000; Kuzmin et al., 2006) to objectively evaluate the company employees' competence we may apply a R-model, which supplies with the information about evaluation up to 81% probable:

$$R' = \sqrt{\frac{k_1}{\sum k} x_1^2 + \frac{k_2}{\sum k} x_2^2 + \dots + \frac{k_n}{\sum k} x_n^2}, \tag{1}$$

where R – the integral evaluation; x_1, x_2, \dots, x_n – standardized indices; k_1, k_2, \dots, k_n – weighable indices coefficients chosen by experts.

Applying the R-model a general rule is: "the higher R is, and respectively the standardized indices deviations x_n from 0, the better, that is why 1 may be considered the best weighable coefficient, 0 is the worst".

An integral evaluation of employees' competence calculation may be demonstrated on the example of VAT "Gorodocky Mechanic Plant", producing machines and equipment for mining and construction.

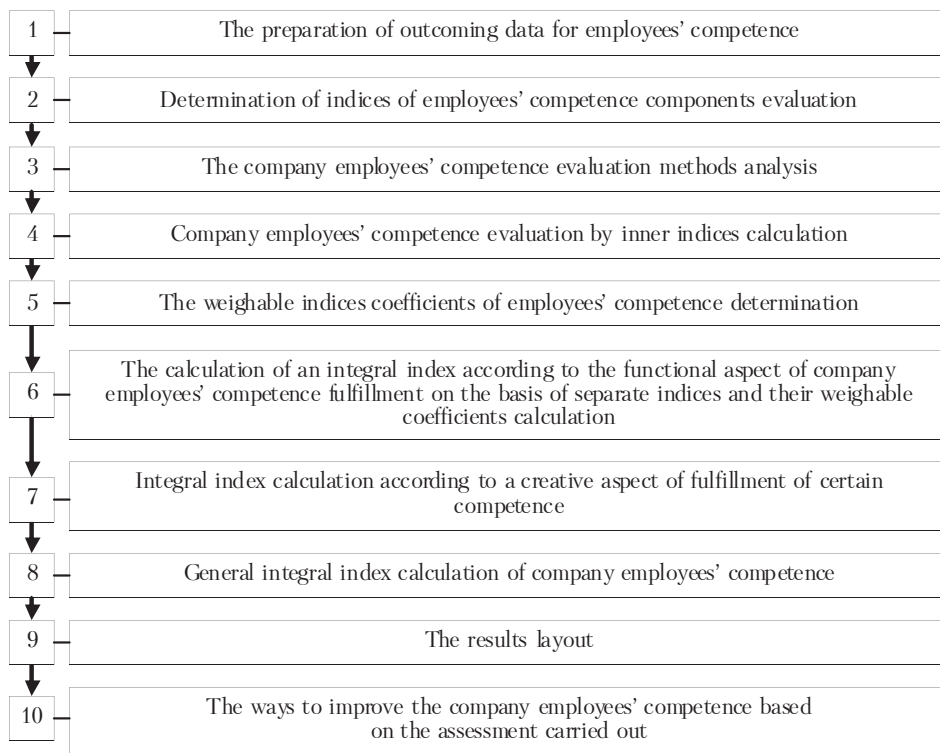


Figure 1. Sequence in the integral evaluation of company employees' competences, developed according to the analysis of the works (Docenko, 2013; Melnyk, 2010)

The calculation efficiency of integral evaluation of employees' competences is advisable to consider through the subsequence of stages given in Figure 1. Thereby, the first stage aims at indices determination with the purpose of competence components evaluation. On the basis of determining the indices mentioned above for a par-

ticular company the probability of employee's competence level manifestation is evaluated. Demonstration probability of competence level is based on distinguishing factual employees' competence list with the comparison to normative ones with the aim of identification of their state and during a particular period. Such comparison warns employers about potential menaces and forms an informational base which enables analyzing the factual state of employees' development, react to certain problems and deviations and decide upon grounding managerial decisions.

Thereby, employees' competency is advisable to be evaluated with the help of key indices (Table 1) and their integration into a unified system. Having analyzed the results of national and foreign scientists' investigations on employees' competences it is worth considering them by separate components, such as: knowledge, skills and personal qualities of employees. Such approach to indices grouping will allow finding out to what extent workers apply their competency within their responsibilities and also making respective management decisions.

Table 1. Employees' Competence Evaluation Matrix

	Knowledge	Usual Skills	Creative Skills	Personal qualities
Functional aspect of company employees' responsibilities fulfillment	The level of notions and facts mastering (Ln)	The efficiency of actions fulfillment (La)	The level of acquired skills (La)	The level of responsibility (Lr)
	The level of methods and procedures mastering (Lm)	The level of ability concerning the methods of tasks fulfillment formulation (Lt)		The level of emotional intellect (Li)
Creative aspect of company employees' responsibilities fulfillment	-	The level of creative decision making (Lc)	-	The level of creative intellect (Lc)
		The level of innovative mechanisms implementation (Lm)		The level of initiative (Lin)
				The level of rational activity (Ra)

Note: the approaches to competence evaluation indices calculation is given in (Mykhailiak and Oleksiv, 2013).

Evident employees' competency does not always coincide with the functions mentioned in positional instructions. To achieve the compliance between employee's positional instruction and one's competency it would be advisable to apply the methods which ensure the highest efficiency of functions fulfillment meant by a respective positional instruction. That is why, first of all, it is necessary to determine an evident level of competency a certain employee possesses according to functional and creative aspect of responsibility fulfillment, which means the second stage of an integral company employees' competence evaluation.

To ensure a high level of adequacy of VAT "Gorodocky Mechanic Plant" employees' competence evaluation results it is advisable to compare their factual level with the one meant by a positional instruction. Listed indices according to which it is worth evaluating employees' competence are given in Table 1. The results of standardized meanings determination of employees' competence evaluation at VAT "Gorodocky Mechanic Plant" in functional and creative aspect of responsibility fulfillment are given in Tables 2 and 3 respectively.

The third stage in the integral determination of employees' competence evaluation aims at applying the expert evaluation methods, since this is one of the most

important ways to predict and evaluate future results of actions and determination of weighable coefficients of evaluative indices.

Table 2. The Results of Determination of Standardized Meanings of Indices of VAT "Gorodocky Mechanic Plant" Employees' Competence Evaluation, Functional Aspect of Responsibility Fulfillment

#	Indices	Index Calculation
1.	The level of notions and facts mastering	15 / 22 = 0.68
2.	The level of methods and procedures mastering	9 / 14 = 0.64
3.	The result efficiency of actions fulfillment	10 / 12 = 0.83
4.	The level of ability to form methods of tasks fulfillment	3 / 15 = 0.2
5.	The level of acquired skills	15 / 22 = 0.68
6.	The level of responsibility	17 / 22 = 0.77
7.	The level of emotional intelligence	0.6

Table 3. The Results of Determination of Standardized Meanings of Indices of VAT "Gorodocky Mechanic Plant " Employees' Competence Evaluation of Creative Aspect

#	Indices	Index Calculation
1.	The level of creative decision making	36/40 = 0.51
2.	The level of innovation mechanisms implementation	2/15 = 0.13
3.	The level of creative intelligence	0.6
4.	Initiative level	126/257 = 0.49
5.	Rational activity level	130/270 = 0.48

To ensure the high level of adequacy of employees' competence evaluation results it is necessary to determine the importance of the indices mentioned above. It is advisable to note that to determine the importance of indices we apply expert methods, which are advisable to be generalized into a matrix of copair comparisons (Terstoun's matrix), which gives an opportunity to experts-analysts to fulfill a subsequent comparison of all the indices within the group with the aim of finding their copair priority (Tables 4–7) (Melnyk, 2010).

Table 4. The Matrix of Paired Comparisons of the Validity of Indices of VAT "Gorodocky Mechanic Plant" Employees' Competence Evaluation

Indices	1	2	3	4	5	6	7	e_{ij}^1 – the frequency of prevalence of parameters in the string above the parameters in the columns
1. The level of facts and notions mastering		1	3	1	5	6	1	3
2. The level of methods and procedures mastering	-		3	2	5	2	2	3
3. The result efficiency of action fulfillment	-	-		3	3	3	3	4
4. The level of ability to form the methods of tasks fulfillment	-	-	-		5	4	4	2
5. The level of acquired abilities	-	-	-	-		6	5	1
6. The level of responsibility	-	-	-	-	-		7	1
7. The level of emotional intelligence	-	-	-	-	-	-		-
e_j^2 – the frequency of prevalence of parameters in the column above the parameters in strings	-	0	2	0	3	2	0	

Table 5. The results of Validity Determination of VAT "Gorodocky Mechanic Plant" employees' competence evaluation, functional aspect of responsibility fulfillment

Indices	e_{ij}^1	e_{ij}^2	e_{ij}^s – total prevalence frequency	e_j – importance of indices ($e_{ij}^s / \sum e_{ij}^s$)
1. The level of facts and notions mastering	3	-	3	0.143
2. The level of methods and procedures mastering	3	0	3	0.143
3. Results efficiency of actions fulfillment	4	2	6	0.286
4. The level of ability to form the methods of tasks fulfillment	2	0	2	0.095
5. The level of acquired skills	1	3	4	0.19
6. Responsibility level	1	2	3	0.143
7. The level of emotional intelligence	-	0	0	0
Total	14	7	21	1

Table 6. The Matrix of Copair Comparisons of Significance of the Indices of VAT "Gorodocky Mechanic Plant" Employees' Competence Evaluation, Creative Aspect of Responsibilities Fulfillment

Indices	1	2	3	4	5	e_{ij}^1 – the frequency of prevalence of the parameters in strings above the parameters in columns
1. The level of creative decision making		1	3	1	5	2
2. The level of innovation mechanisms implementation	-		3	2	5	1
3. The level of creative intelligence	-	-		3	3	2
4. The level of initiative	-	-	-		5	1
5. The level of rational activity	-	-	-	-		-
e_j^2 – the frequency prevalence of the parameters in column above the parameters in strings	-	0	2	1	3	

Table 7. The Results of Determination of the Validity Indices of VAT "Gorodocky Mechanic Plant" Employees' Competence Evaluation, Creative Aspect of Responsibility Fulfillment

Indices	e_{ij}^1	e_{ij}^2	e_{ij}^s – total frequency of prevalence	e_j – indices validity ($e_{ij}^s / \sum e_{ij}^s$)
1. The level of creative decision-making	2	-	2	0.167
2. The level of innovation mechanisms implementation	1	0	1	0.083
3. The level of creative intelligence	2	2	4	0.333
4. The initiative level	1	1	2	0.167
5. The level of rational activity	-	3	3	0.25
Total	6	6	12	1

The following stages aim at the calculation of the integral index according to functional and creative aspects of responsibility fulfillment by company employees and summing them up into the general integral index.

$$R_f = \sqrt{\frac{0.143}{1} \cdot 0.68^2 + \frac{0.143}{1} \cdot 0.64^2 + \frac{0.286}{1} \cdot 0.83^2 + \frac{0.095}{1} \cdot 0.2^2 + \frac{0.019}{1} \cdot 0.68^2 + \frac{0.143}{1} \cdot 0.77^2} = 0.706;$$

$$R'_2 = \sqrt{\frac{0.167}{1} \cdot 0.51^2 + \frac{0.083}{1} \cdot 0.13^2 + \frac{0.333}{1} \cdot 0.6^2 + \frac{0.167}{1} \cdot 0.49^2 + \frac{0.25}{1} \cdot 0.48^2} = 0.523;$$

$$R' = (0.706 + 0.523) / 2 = 0.6145.$$

According to the results of employees' competence evaluation of VAT "Gorodocky Mechanic Plant" the integral index (R) is 0.6145, which testifies to a sufficient level of employees being ready to fulfill their positional responsibilities.

Conclusions. The necessity for effective employees' management and achievement of its high level cause a subsequent, precisely regulated activity of employees in the company and determine the topicality of working out and applying the methods of employees' competence evaluation.

References:

Балабанова Л.В., Стельмащенко О.В. Стратегічне управління персоналом підприємства в умовах ринкової економіки: Монографія / М-во освіти і науки України, Донец. нац. ун-т економіки і торгівлі імені Михайла Туган-Барановського. – Донецьк: ДонНУЕТ, 2010. – 238 с.

Богословский В., Каравалева Б., Шехонин А. Принципы проектирования оценочных средств для реализации образовательных программ ВПО: компетентностный подход // Высшее образование в России. – 2008. – №10. – С. 3–9.

Грузіна І.А. Удосконалення системи оцінки компетенцій персоналу підприємства // Бізнес-Інформ. – 2011. – №9. – С. 177–181.

Доценко І.О. Механізм управління ризиками підприємницької діяльності в системі економічної безпеки підприємства: Автореф. дис... канд. екон. наук. – Хмельницький, 2013. – 20 с.

Жигір В.І. Оцінювання професійної компетентності фахівця як фактор його формування // Збірник наукових праць Бердянського державного педагогічного університету. – Серія: Педагогічні науки. – 2012. – №2. – С. 138–144.

Ізмайлова К.В. Фінансовий аналіз: Навч. посібник. – К.: МАУП, 2000. – 152 с.

Китасєв О.В. Методичні підходи до визначення еколого-економічного рейтингу підприємства // Вісник Сумського державного університету. – Серія: Економіка. – 2003. – №5. – С. 93–97.

Кузьмін О.Є., Мельник О.Г. Індикатори оцінювання ефективності функціонування корпорації // Тези доповідей міжнародної науково-практичної конференції «Корпорації та інтегровані структури: проблеми науки та практики» (Харків, 22–23 травня 2007 р.) / Харківський національний економічний університет, Науково-дослідний центр індустріальних проблем розвитку НАН України. – Харків: ІНЖЕК, 2007. – С. 144–147.

Кузьмін О.Є., Мельник О.Г. Інноваційні системи індикаторів діагностики діяльності підприємств // Тези доповідей Міжнародної науково-практичної конференції «Міжнародний бізнес та менеджмент: проблеми та перспективи в умовах глобалізації» (м. Тернопіль, 22–24 жовтня, 2008 р.) / Міністерство освіти і науки України, Тернопільський національний економічний університет. – Тернопіль: Економічна думка, 2008. – С. 275–277.

Кузьмін О.Є., Мельник О.Г., Меренюк Т.В. Індикатори формування та використання персоналу підприємства // Наукові записки: Збірник наук. праць каф. економічного аналізу Тернопільського національного економічного університету. – 2006. – Вип. 16. – С. 62–68.

Маяр М.М. Визначення та цілеспрямована зміна вагових коефіцієнтів при багатокритеріальному виборі // Системний аналіз, управління та інформаційні технології: Вестник НТУ «ХПІ». – 2009. – №9 // www.kpi.kharkov.ua.

Мельник О.Г. Діагностика діяльності машинобудівного підприємства на засадах системи економічних індикаторів: Монографія. – Львів: Укрпол, 2009. – 188 с.

Мельник О.Г. Системи діагностики діяльності машинобудівних підприємств: полікритеріальна концепція та інструментарій: Монографія. – Львів: Національний університет «Львівська політехніка», 2010. – 344 с.

Олексів І.Б. Методи оцінювання і планування економічних показників діяльності підприємства; Дис... канд. екон. наук. – Львів, 2003. – 202 с.

Самородов Б.В. Порівняльний аналіз методик визначення вагових коефіцієнтів важливості показників діяльності банків при їх рейтингуванні // Збірник наукових праць Університету банківської справи Національного банку України. – 2011. – №2 // archive.nbuv.gov.ua.

Mykhailyak, G., Oleksiv, I. (2013). The formation of the system of evaluation of enterprise workers' competence. *Econtechmod. An International Quarterly Journal on Economics in Technology, New Technologies and Modelling Processes*, 3(2): 53–57.

Noe, R.A. (2002). *Employee training and development*. 2nd ed. New York: McGraw-Hill Irwin.

Стаття надійшла до редакції 20.09.2013.