

## QUANTITATIVE MODEL OF ORGANIZATION'S KNOWLEDGE POTENTIAL ASSESSMENT

Juozas Bivainis<sup>1</sup>, Renatas Morkvėnas<sup>2</sup>

*Vilnius Gediminas Technical University, Sauletekio ave. 11, LT-10223 Vilnius, Lithuania*  
*E-mail: <sup>1</sup>vvsevk@vgtu.lt; <sup>2</sup>renatas.morkvenas@vgtu.lt*

**Abstract.** Although plenty of scientists have researched the theoretical and practical problems of assessing organization's knowledge potential for a few decades, a unified and single methodology of assessment has not been accepted. The outcome of our research is the original concept for determining knowledge potential, essentially based on new principles. An assessment of the factors making a real impact helped in building a model including such components as employee's knowledge potential, knowledge potential synergy, and organization's external medium. The quantitative specifications of the above introduced components have been prepared. Practical application of the model has been researched by an experiment.

**Keywords:** organization, employees, knowledge potential, quantitative assessment, model.

### 1. Introduction

All human activities are based on the application of individualized and group knowledge. Both organizations and governments make huge investments into creating intellectual power platforms. As a result of these processes, society has stepped into a new stage of its development, characterized by the formation of knowledge networks that are complex in structure and different in level (Castell 2000). A need to conceptualize the human knowledge potential has arisen in such a society. In the 20th century, this potential has been acknowledged to be the most important resource determining the success of people and organizations, the effectiveness of investment, the development of economy and even the power of states. Media as well as research abundantly employ the concepts of knowledge society, knowledge economy and the like, inviting to allocate more resources for the development of knowledge economy and knowledge itself. Knowledge is taken as a criterion in comparing and prioritizing employees, organizations, and states.

It is self-explanatory that in order to develop something in a certain direction and assertiveness, it is first necessary to be able to measure, evaluate or calculate that something. However, professional as well as scientific literature is very limited in analyzing this aspect of the object of knowledge. On the other hand, quite a few scientific papers and other larger publications explore various aspects of knowledge management.

This gap in the area of knowledge management, as seen against the present day challenges, has encouraged the authors to conduct research

which aims to summarize the results of the work of other authors and prepare a model for knowledge potential assessment on the organizational level.

### 2. Suggested model for organization's knowledge potential assessment

The expansion of humanity is oriented to the systems based on knowledge and the latest technologies. Some published works assessed knowledge of organizations and employees and researched the use of knowledge potential by the organization. However, the exact quantitative adaptation of models for assessment of organization's knowledge potential has not been developed. According to Drucker (1969), Bell (1973), Toffler (1980), Bivainis (1991), Nonaka, Takeuchi (1995), Kim (1999) and Armstrong, Foley (2003) the need for such investigations is caused by changing social structure. The only way of keeping the balance of growing variety and leveling the differences between organization's interests is a constant accumulation of knowledge potential. Therefore, the need for having a method of managing knowledge potential appears. The present methods for evaluating the knowledge potential of organizations and the application of those methods do not satisfy today's needs. Even the knowledge potential assessment models presented in the latest works of the world's scientists contain essential drawbacks.

First of all, qualitative methods of assessment prevail. The perception of subjective reality is considered the biggest drawback of qualitative methods.

Second, the analyzed factors and assessment models are distanced from an individual, the interrelations between individuals, and from the integration of those interrelations into the organization.

Third, synergy, as a significant component of the knowledge potential of an organization, has been under-researched, and its quantitative assessment has not been developed.

The analysis of scientific papers identifies numerous works which assess the competency and knowledge of organizations and employees, as well as analyze the knowledge management and application by organizations. The following works can be considered as more distinct in the area of knowledge management: Wissepsmanagement Forum organization's knowledge management process assessment guide (2003); assessment methods of jobs and office positions by Šileika *et al.* (2004); "Knowledge Measurement and Interviewer Bias" by Fink (2005); organization's knowledge culture creation and development model by Stan and Kandadi (2006); "Organizational Competency Management" by Ley (2006); organization's knowledge management model created by The Knowledge Company, Inc. (2006); organization's knowledge assessment

model by Jonhson (2007); and model of employee competences by Workitect, Inc. (2008).

Therefore, assessing knowledge potential becomes vital in modern managing of an organization. The outcome of our multi-year research is a model (Fig. 1) essentially based on an original concept, and consisting of the following parts: 1) employee's knowledge potential assessment; 2) knowledge potential synergy assessment; 3) organization's external medium assessment.

Firstly, it is aimed at creating a collective medium where all employees are able to find the gaps that might be filled with their knowledge potential. Secondly, the synergy is created when employees interplay in the organization medium. Synergy arises not only when two complementary persons with different skills cooperate. Synergy arises when different types of knowledge are combined and we call it the synergy component of knowledge potential. This part of knowledge potential is particularly hard to assess; however, it is the primary resource of the organization's competitive advantage. Thirdly, the more effective external relations the organization can maintain, the more knowledge it is able to absorb into itself and disseminate this knowledge within the organization via the internal relations.

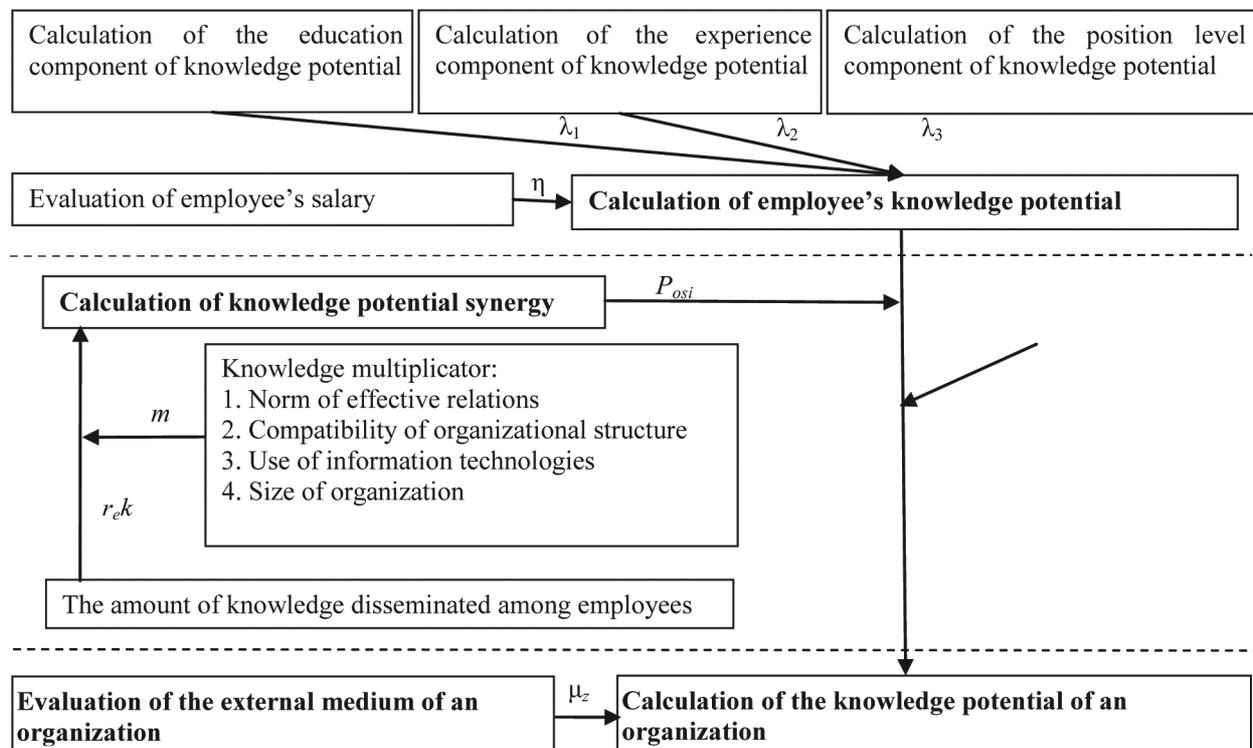


Fig. 1. Scheme of organization's knowledge potential assessment

### 3. Employee's knowledge potential assessment

In assessing the knowledge potential of an employee as a member of an organization, it is necessary to evaluate his actions in a certain complicated organization's internal medium, which is common to all the employees. In our opinion, the main factor that reveals an employee's knowledge potential is the complexity of the work that the employee does. The more complex is the work, the greater knowledge potential is necessary to accomplish it.

According to the International Labor Organization Geneva Scheme (1950), the complexity of the work is determined by evaluating the requirements for the specific job position, i.e., employee's education, professional experience, and level of position. Employee's education, professional experience, and level of position as important factors determining employee's knowledge potential are analyzed by Bivainis, Drucker, Dubinas, Nonaka, Knowledge Company, Inc., World Bank, Stan, Šileika, etc. All these factors are detailed using quantitative methods in our earlier investigations (Bivainis et al. 2008).

*Education component of knowledge potential.* Employee's knowledge potential determined by the employee's level of education can be calculated using Formula 1:

$$V_1 = B + \sum_{c=1}^t (p_c - l_c) h_c \text{ [points]}, \quad (1)$$

where,  $B$  – points for employee's highest acquired education;  $p_c$  – points for employee's additionally acquired education in the level  $c$ ;  $l_c$  – points for employee's acquired education that enabled him/her to acquire additional education in the level  $c$ ;  $h_c$  – number of additionally acquired educations in the level  $c$ ;  $t$  – number of educational levels.

The basis of these calculations is the cumulative vector (Table 1), based on the point distribution according to our calculations of educational levels. Under different conditions, the cumulative vector can be recalculated using our proposed methodology.

*Occupational experience component of knowledge potential.* Employee's knowledge potential, determined by employee's acquired education, can be calculated using Formula 2:

$$V_2 = [\log_{40}(1 + d_s) + \psi(\log_{40}(1 + d_b) - \log_{40}(1 + d_s))]100 \text{ [points]}, \quad (2)$$

where,  $d_s$  – employee's work experience in the sector;  $d_b$  – employee's overall work experience;  $\psi$  – relative importance of the overall work experience compared to the work experience in the sector.

**Table 1.** Cumulative vector of the knowledge potential distribution according to the level of education

Education	Score
1.1. No education	0
1.2. Elementary education	12.18
1.3. Basic education (10 grades)	22.97
1.4. Secondary education	31.30
1.5. Professional education	36.95
1.6. Bachelor's degree (obtained not from a University)	48.71
1.7. Bachelor's degree (obtained from a University)	67.7
1.8. Masters degree	73.51
1.9 Doctors's degree	100.00

*Occupation level component of knowledge potential.* Employee's knowledge potential, assessed from the employee's position level, can be determined from Table 2.

**Table 2.** Cumulative vector of the knowledge potential distribution according to the level of position

Position level	Professional group	Points
Non-management employees	1. Unqualified workers	9.09
	2. Qualified workers	18.18
	3. Administrative employees	27.27
	4. Specialists	36.36
	5. Senior specialists	45.45
Lower level managerial staff	6. Team manager	54.55
Lower middle level managerial staff	7. Middle level division heads	63.64
Upper middle level managerial staff	8. Middle level managers of the central administration	72.73
Highest level managerial staff	9. Heads of territorial divisions	81.82
	10. Highest level managers, responsible for specific important area of an organization's activities	90.91
	11. Highest level managers, responsible for the overall activities of an organization	100.0

Employee's salary is quite a precise indicator of the employee's ability to use his/her acquired knowledge potential. The salary also allows to quantitatively compare the knowledge potential of employees from different organizations. In Formula 3, the employee's knowledge potential is multiplied by the employee's salary coefficient ( $\eta_i$ ) (Formula 4), and the knowledge potential of all the

employees of *l*-organization ( $P_{odl}$ ) is determined according to Formula 5.

$$P_{di} = \eta_i \sum_{j=1}^3 \lambda_j V_{ij}, \tag{3}$$

$$\eta = \frac{u_0}{u_v}, \tag{4}$$

$$P_{odl} = \sum_{i=1}^n \eta_i \sum_{j=1}^3 \lambda_j V_{ij}. \tag{5}$$

where,  $\lambda_j$ –importance of factor *j*;  $V_{ij}$ – points of factor *j* considering employee *i*;  $u_v$  – average salary (brutto) in the labor market;  $u_0$  – employee's salary (brutto) in an organization;  $n$  – number of employees of an organization.

In order to ascertain the importance of factors determining the knowledge potential of an employee, we conducted a research. The importance was evaluated applying the AHP (*Analytic Hierarchy Process*) method (Saaty 1980). The evaluation characteristics of factors by their importance, as determined by experts, are provided in Table 3.

**Table 3.** Synthesized evaluation characteristics of factors by their importance

Factors	$V_1$	$V_2$	$V_3$	$\lambda_j$
$V_1$	1.00	0.52	3.14	0.34113
$V_2$	2.14	1.00	4.29	0.54303
$V_3$	0.34	0.25	1.00	0.11584

#### 4. Knowledge potential synergy assessment

In order to evaluate the synergy of knowledge potential of an organization, it is first necessary to determine the amount of knowledge disseminated among the employees. Fragments of the formula for calculating the network power, as created by Smith (2001), were used to create the formula for calculating the disseminated amount of knowledge in organization. The determination of the amount of knowledge disseminated among the employees in the model is calculated from the average knowledge potential of an employee ( $k_v$ ) per one relation:

$$k_v = \frac{P_{odl}}{r_t}, \tag{6}$$

where,  $r_t$ – maximum amount of relations among the employees within an organization.

Knowing what the average knowledge potential of an employee is per one relation, the second step is to determine the number of effective relations ( $r_e$ ) that form among the employees of an

organization. In large organizations, an N:N cardinal case is impossible. Because of the specifics of an organization's internal medium, the employees often do not have any opportunities to share their knowledge with the other employees. This limits the dissemination and multiplication of knowledge. The model presents two methods for determining the number of effective relations ( $r_e$ ) among employees within an organization:

*I. Method based on theoretical norms.* This method is based on norms accepted in a theory of management. For theoretical calculations, the norm of effective relations  $r_n=5$ .

$$r_e = \begin{cases} \frac{n(n-1)}{2}, & \text{when } n \leq 6 \\ r_n \frac{n}{2} + r_a, & \text{when } n > 6. \end{cases} \tag{7}$$

where,  $r_a$ – number of random relations.

The number of random relations among employees within an organization is calculated as follows:

$$r_a = \left(1 - \frac{1}{n}\right)(n-6). \tag{8}$$

*II. Method based on the analysis of organization's structures.* This method is based on the detailed analysis of an organization's management structure, which determines the existing relations between the employees within a division, as well as relations between the employees from different divisions. The application of this method is described in the empirical part of this article.

Because the multiplier law applies to knowledge (Smith 2001), the amount of disseminated knowledge is multiplied by the knowledge multiplier. To determine the knowledge multiplier ( $m$ ), the following factors are used:

*Norm of effective relations ( $r_n$ ).* First of all, it is important to note that when there is a large number of employees, knowledge is not exchanged between each of the employees. When knowledge dissemination takes place among employees, the knowledge multiplier depends on the number of effective relations maintained per one employee. The management theory indicates that the number of relations that can be maintained effectively by an employee is limited because upon expansion of the number of those relations part of them become ineffective. Therefore, knowledge can be multiplied as many times as is physically possible. Scientific literature indicates that an employee can effectively maintain 4 to 6 relations, and this number is considered the norm. The amount of disseminated

knowledge ( $r_e k_v$ ) within an organization can be multiplied  $r_n$  times.

*Compatibility of organizational structure.* Concerted structure of an organization enables the employees to effectively receive, disseminate, and create knowledge. Whether an organization's structure is concerted or not is revealed by a very important characteristic of an organizational structure – subordination. The norm of subordination has been determined by a Lithuanian scientist Graičiūnas – a rational number of employees, subordinate to the manager is 4 to 6. Urwick (1943) points out that a manager cannot directly control the activities of more than 5 to 7 employees. In our opinion, there exists another characteristic, more precisely determining the compatibility of an organization, i.e., the average number of effective relations per one employee ( $r_v$ ), as the effective work of employees is no less important than that of managers. Determined norms (the model uses the results of the work of Graičiūnas) apply to both managers and employees, i. e., the norm of effective relations ( $r_n$ ) is equal to 4–6 relations. The average number of effective relations per one employee is calculated by dividing the number of effective relations by  $n/2$  (because 2 employees participate in one relation):

$$r_v = r_e \cdot \frac{n}{2} = \frac{2r_e}{n} \quad (9)$$

Knowledge multiplier changes with changing compatibility of the organization's structure. To evaluate the compatibility of the organizational structure, the compatibility coefficient ( $m_s$ ) of organizational structure has been calculated:

$$m_s = \begin{cases} 1, & \text{when } r_v = r_n \\ \frac{r_n}{r_v}, & \text{when } r_v > r_n \\ \frac{r_v}{r_n}, & \text{when } r_v < r_n. \end{cases} \quad (10)$$

*Use of information technologies.* Another factor stimulating the synergy of knowledge potential is the ability of the employees to apply information technologies. Knowledge multiplication increases with the use of information technologies, and without the use of information technologies the knowledge is disseminated less effectively, therefore multiplication does not occur. The coefficient ( $m_t$ ) of the employees' ability to use information technologies is calculated as follows:

$$m_t = \frac{1}{100} \beta, \quad (11)$$

where,  $\beta$  – the percentage of the organization's employees able to use the Internet.

*Size of an organization.* The management theory says that the most effective organizations are those that have an optimal number of employees. Small organizations (2–3 people) may lack the variety of opinions, whereas in large organizations (more than 136 people) effective interrelations are impossible and coordination is more complex (Jackson 2003). In the context of the synergy of knowledge potential, the size of an organization needs to be evaluated according to two aspects. *First*, the management structures of large organizations are often inflexible and not concerted. In this respect, small organizations have an advantage: by having a small number of employees they can rationally manage them, therefore creating synergy due to which the organization is able to significantly increase its knowledge potential. *Second*, large organizations have a clear advantage due to their size. There is a number of factors common to large organizations, that promote knowledge potential synergy. Such factors are a wide variety of opinions, a wide network of qualified experts, large databases of knowledge (e.g. libraries), good financial resources for installing state of the art systems of activity organization, advanced programs for employee education, creation of exceptionally high quality products, etc.

Due to the above mentioned factors, favorable conditions for knowledge multiplication are established. In order to evaluate the impact of the organization's size on knowledge multiplication, logarithmic function can be applied (its application is based on our research). The base of the logarithm is the size of the organization ( $\geq 250$  employees), according to the classification of enterprises as stated in the laws of the Republic of Lithuania.

Therefore, the impact of the organization's size on knowledge multiplication is evaluated by a coefficient ( $m_n$ ):

$$m_n = \log_{250}(n). \quad (12)$$

To sum up, the knowledge multiplier and the synergy of the knowledge potential of the organization's employees is calculated using formulas 13, 14, and 15, respectively.

$$m = r_n m_s m_t m_n, \quad (13)$$

$$P_{osl} = m r_e k_v, \quad (14)$$

$$P_{osl} = r_n m_s m_t m_n r_e k_v. \quad (15)$$

After adding the knowledge potential of the  $I$ -organization and the organization's knowledge potential arising from synergy, the result is obtained using the following formula:

$$P_{ol} = \sum_{i=1}^n \eta_i \sum_{j=1}^3 \lambda_j V_{ij} + r_n m_s m_t m_n r_e k_v. \quad (16)$$

**5. Organization's external medium assessment**

Closed organizations do not exist in the contemporary society, therefore in assessing the organization's knowledge potential it is important to investigate the influence of the external medium on the organization. The more knowledge the external medium contains, the more effective external relations the organization can maintain within that medium. The more effective external relations the organization maintains, the more knowledge the organization can absorb into itself, and disseminate that knowledge via internal relations within the organization. The knowledge potential of each organization has to be corrected by a coefficient ( $\mu_z$ ), the value of which depends on the knowledge economy index of the country in which the organization operates.

$$\mu_z = \frac{KEI_z}{KEI_v}, \quad (17)$$

where,  $KEI_z$  – knowledge economy index of the  $z$  country;  $KEI_v$  – the average of the indices of the countries' knowledge economy.

With respect to the level of the knowledge economy of the country in which the organization operates, the knowledge potential is corrected in the following way:

$$P_{ol} = \left( \sum_{i=1}^n \eta_i \sum_{j=1}^3 \lambda_j V_{ij} + r_n m_s m_t m_n r_e k_v \right) \mu_z \quad (18)$$

**6. The method for determining the organization's level of knowledge potential**

The method for determining the level of knowledge potential is necessary because the organization's knowledge potential calculated by using Formula 18 is difficult to compare in an absolute value. It is important to evaluate the ratio of the organization's knowledge potential per employee, and according to this ratio categorize the organizations into those of very high, high, average, low, and very low knowledge potential (Table 3). Such categorization of organizations is based on the analogy of categorizing enterprises according to the level of their technological development into

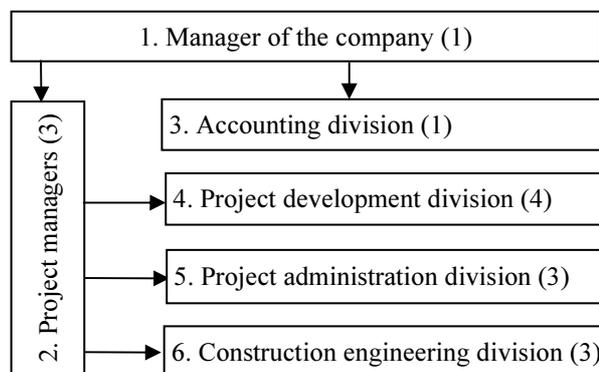
those of very high, high, average, and low technological development, as described in scientific literature.

**Table 3.** The scale for determining the organization's level of knowledge potential

Index	Organization's knowledge potential per employee
Very low knowledge potential	$\leq 50$
Low knowledge potential	(50–150]
Average knowledge potential	(150–300]
High knowledge potential	(300–500]
Very high knowledge potential	$> 500$

**7. Empirical assessment of organization's knowledge potential**

The organization chosen for evaluation is a consulting company VEPROC Research and Consulting, JSC (private joint stock company; further referred as VEPROC). During the evaluation, VEPROC team consisted of 15 experts in areas of economics, energetics, transportation, environmental protection, construction engineering, architecture, and work safety. The majority of experts has a PhD degree or is in the process of obtaining one, teach in the country's leading universities and colleges. The management structure of VEPROC is depicted in Figure 2.



**Fig. 2.** VEPROC management structure

On the basis of VEPROC accounting data, we determined the evaluations of the main factors (education, professional experience, level of position) forming the knowledge potential of each employee, expressed in a point system. The knowledge potential of VEPROC employees was calculated to be  $P_{odl} = 2077$  (points).

According to our methodology, the amount of disseminated knowledge among employees was determined first. By using a method based on the organization's structural analysis, the number of

effective relations at VEPROC divisions has been determined (Table 4).

**Table 4.** The number of effective relations in VEPROC divisions ( $r_p$ )

No	Division	$n$	$r_p$
1	Company manager	1	0
2	Project development division	3	3
3	Accounting division	1	0
4	Project development division	4	6
5	Project administration division	3	3
6	Construction engineering division	3	3
	<b>Total</b>	<b>15</b>	<b>15</b>

After determining how many direct relations form among employees from different divisions, we performed a detailed analysis of the company's management structure, and analyzed the activity processes of VEPROC. According to the company's management structure and the analysis of its activity processes (Fig. 2), a matrix for identifying direct relations among VEPROC employees from different divisions  $A_v$  (Table 5) and a matrix for calculating direct relations among VEPROC employees from different divisions  $R_v$  (Table 6) were created.

**Table 5.** The matrix for identifying direct relations among VEPROC employees from different divisions ( $A_v$ )

	1	2	3	4	5	6
1		1	1	0	0	0
2	1		1	1	1	1
3	1	1		0	1	0
4	0	1	1		1	1
5	0	1	1	1		1
6	0	1	1	1	1	

**Table 6.** The matrix for calculating direct relations among VEPROC employees from different divisions ( $R_v$ )

	1	2	3	4	5	6
1		3	1	0	0	0
2	3		3	4	3	3
3	1	3		0	3	0
4	1	4	0		4	4
5	0	3	3	12		1
6	0	3	0	12	9	

The number of direct relations among employees from different divisions  $r_s$  (according to Table 6), the number of effective relations among

employees ( $r_e$ ), and the average knowledge potential per one relation ( $k_v$ ) are calculated in the following way:

$$r_s = \frac{\sum_{k=1}^g \sum_{f=1}^g r_{kf}}{2} = \frac{59}{2} = 29, r_e = r_p + r_s = 15 + 29 = 44, k_v = \frac{2077}{105} = 19.78 \text{ [points].}$$

In order to determine the knowledge multiplier ( $m$ ), the average number of relations per employee ( $r_v$ ), VEPROC management structure alignment coefficient ( $m_s$ ), coefficient of the application of VEPROC information technologies ( $m_t$ ), and company's size coefficient ( $m_n$ ) are calculated in the following way:

$$r_v = \frac{2 \cdot 44}{15} = 5.86, m_s = \frac{5}{5.86} = 0.8532,$$

$$m_t = 1,$$

$$m_n = \log_{250}(15) = 0.49, m = 5 \cdot 0.8532 \cdot 0.49 \cdot 1 = 2.1.$$

Synergy of VEPROC knowledge potential ( $P_{osl}$ ) is calculated:

$$P_{osl} = 2.1 \cdot 44 \cdot 19.78 = 1819 \text{ [points].}$$

For the evaluation of VEPROC external medium, the level of Lithuania's knowledge potential coefficient was determined  $\mu_e = 1.49$ .

The final VEPROC knowledge potential was calculated:

$$P_{ol} = (2077 + 1819) \cdot 1.49 = 5805 \text{ [points].}$$

The level of VEPROC knowledge potential was determined from calculating the average VEPROC knowledge potential per employee.

$$P_{odv} = 5805 / 15 = 387 \text{ [points]} \text{ (high level of knowledge potential).}$$

## 8. Conclusions

These are the innovative elements of our model, based on a new concept:

1. A quantitative model for evaluating organization's knowledge potential has been created. Its content has been structured using factors that have not been well-researched in the context of knowledge. A precise reduction of qualitative characteristics of factors and their interrelations (when making the analysis of the problem of integrating factors of different types and levels into one evaluation system) has been completed to obtain quantitative results. Because of this, the model can be easily applied to various kinds or organizations,

and can even be applied in evaluating organizations from different countries.

2. The model contains a new set of factors and a new way of assessing an organization's knowledge potential in evaluating the employees' knowledge potential, knowledge potential synergy and organization's external medium. A link has been established between an employee's knowledge potential and the difficulty level of the nature of work. An algorithm based on analytic calculations has been created to evaluate an organization's knowledge potential synergy. Knowledge economy index from the World Bank knowledge assessment methodology was integrated in order to assess the external medium of an organization.

3. The problem of evaluating the synergy of an organization's knowledge potential has been solved, which until now has been only briefly discussed in scientific literature, where guess-based equations of synergy assessment were provided. In assessing an organization's knowledge potential synergy, the need to multiply the amount of knowledge dispersed by employees by the knowledge multiplier has been proved.

An empirical research of the model for evaluating the knowledge potential of a consulting company allows to make the following conclusions regarding the practical application of the model:

1. The calculations are objective because they are based on a clear set of factors that are integrated into a single system, reliable data resources are used (organization's accounting and statistical data), model characteristics are flexibly applicable to the organizations being evaluated, and modern evaluation methodologies are applied.

2. The expenditure acceptability criterion is satisfied, because the application of the model does not require the use of an irrational amount of time, human and financial resources.

3. The results in a quantitative expression as well as transformed in a relative measure are reliable and easy to compare. The knowledge potential of VEPROC was determined to be 5805 [points], with an average of 387 [points] per employee. VEPROC has been determined to be an organization with a high knowledge potential.

## References

- Armstrong, A.; Foley, P. 2003. Foundations for a Learning Organization: Organization Learning Mechanisms, *The Learning Organization* 10(2): 74–103. doi:10.1108/09696470910462085
- Bell, D. 1973. *The Coming of Post-Industrial Society: A Venture in Social Forecasting*. New York: Basic Books.
- Bivainis, J. 1991. *Информационные сети в строительстве* [Information Networks in Construction]. Moscow. 144 p.
- Bivainis, J.; Morkvėnas, R. 2008. Darbuotojų žinių potencialo vertinimas [Evaluation of Employees' Knowledge Potential], *Verslas: teorija ir praktika* [Business: Theory and Practice] 9(2): 105–115. doi:10.3846/1648-0627.2008.9.105-115
- Castells, M. 2000. *The Rise of the Network Society*. Blackwell Publishers Inc. 540 p.
- Drucker, P.; Peter, F. 1969. *The Age of Discontinuity. Guidelines to Our Changing Society*. New York: Harper & Row. 54 p.
- Drucker, P. 1993. *Post-Capitalist Society*. New York: Harper Business. 234 p.
- Dubinas, V. 1995. *Darbo apmokėjimo organizavimas* [Organization of Work Compensation]. Lietuvos informacijos institutas, Tarptautinės ekonominės informacijos analizės skyrius [Lithuania Information Institute, Division of International Economic Information]. Vilnius. 72 p.
- Fink, K. 2005. Knowledge Measurement and Interviewer Bias, in *Proceedings of I-KNOW Conference*, Graz, Austria, 231–237.
- Jackson, S. 2003. Recent Research on Team and Organizational Diversity: SWOT Analysis and Implications, *Journal of Management* 29(6): 801–830.
- Johnson, E. 2007. Organizational Knowledge Assessment (OKA). KM4Dev Manila 2007 Workshop, World Bank Institute.
- Kim, W. C.; Mauborgne, R. 1999. Strategy, Value Innovation, and the Knowledge Economy, *Sloan Management Review* 40(3): 41–54.
- Ley, T. 2006. *Organizational Competency Management – a Competence Performance Approach. Methods, Empirical Findings and Practical Implications*. Seiten. 167 p.
- Nonaka, I.; Takeuchi H. 1995. *The Knowledge-Creating Company*. Oxford University Press. 91 p.
- Saaty, T. L. 1980. *The Analytic Hierarchy Process*. New York: McGraw-Hill. 127 p.
- Smith, R.; Farquhar, A. 2001. Knowledge Management – The Road Ahead, *American Association for Artificial Intelligence*: 17–49.
- Stan, O.; Kandadi, K. R. 2006. How to Develop Knowledge Culture in Organizations? A Multiple Case Study of Large Distributed Organizations, *Journal of Knowledge Management* 10(4): 6–24. doi:10.1108/13673270610679336
- Toffler, A. 1980. *The Third Wave: The Classic Study of Tomorrow*. Bantam Books. 560 p.
- Šileika A.; Blažienė I.; Gerikienė V.; Grigoros V. 2004. *Darbų ir pareigybių vertinimo metodika. Aktualūs socialinės politikos klausimai* [Methodology for Evaluating Jobs and Duties. Topical Questions of

- Social Policy*]. Darbo ir socialinių tyrimų institutas [Institute of Work and Social Research]. 22 p.
- Urwick, L. F. 1943. *Personnel Management in Relation to Factory Organization*. London: L. Urwick Institute of Labour Management. 27 p.
- The Knowledge Company, Inc. 2009. Knowledge Optimization Services. Available from Internet: <<http://www.knowledgecompanyinc.com>>.
- Wissensmanagement forum organisation. 2003. *An Illustrated Guide to Knowledge Management*. Graz, Austria. 43 p.
- World Bank. 2009. Knowledge Assessment Methodology and Scorecards. Available from Internet: <[www.worldbank.org/gdln/kam.htm](http://www.worldbank.org/gdln/kam.htm)>.
- Workitect, Inc. 2008. Resource Guide for Developing Competencies. Available from Internet: <[http://www.workitect.com/developing\\_comp\\_guide.html](http://www.workitect.com/developing_comp_guide.html)>.