UDC 005.332.2

COMPETENCE ESTIMATION AS A CRUCIAL COMPONENT OF ENTERPRISE MANAGEMENT SYSTEM

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Ємельянова Т.В., Тубальцева С.А. Оцінка компетентності як необхідна складова в системі управління підприємством.

Сучасні умови жорсткого ринкового середовища і поглиблення конкурентної боротьби вимагають особливої уваги до наукових досліджень з удосконалення системи управління підприємством. Стаття присвячена обгрунтуванню доцільності розробки механізму оцінки компетентності нижчої ланки управлінського персоналу, що необхідно для підвищення ефективності системи управління на промисловому підприємстві. Проведено порівняльний аналіз підходів до системи управління, визначені певні зміни в зовнішньому оточенні підприємства. Проаналізовано сучасні концепції управління. Розкрито необхідність використання оцінки компетентності для підвищення дієвості системи управління. Запропоновано механізм розрахунку оцінки компетентності на основі використання чинників, які характеризують базові, функціональні і управлінські компетентності.

Ключові слова: система управління, базові, функціональні, управлінські компетентності

Емельянова Т.В., Тубальцева С.А. Оценка компетентности как необходимая составляющая в системе управления предприятием.

Современные условия жесткой рыночной среды и углубление конкурентной борьбы требуют особого внимания к научным исследованиям по усовершенствованию системы управления предприятием. Статья посвящена обоснованию целесообразности разработки механизма оценки компетентности нижнего звена управленческого персонала, что необходимо для повышения эффективности системы управления на промышленном производстве. Проведен сравнительный анализ подходов к системе управления, определены выделены определенные изменения во внешнем окружении предприятия. Проанализированы современные концепции управления. Доказана необходимость использования оценки компетентности для повышения эффективности системы управления. Предложен механизм расчета оценки компетентности на основе использования факторов, характеризующих базовые, функциональные и управленческие компетентности.

Ключевые слова: система управления, базовые, функциональные, управленческие компетенции

Yemelyanov T.V., Tubaltseva S.A. Competence estimation as a crucial component of enterprise management system.

Modern conditions of tough market environment and strained competition require special attention to scientific research on improvement of enterprise management system. The article seeks to substantiate the feasibility of developing a competence estimating mechanism of the lower-level management personnel which is necessary for increasing of management system efficiency in industrial enterprises. The comparative analysis of approaches to management system was done and certain changes in the external environment of the enterprise were identified and highlighted. The modern management concepts were analyzed. The necessity of the use of competence estimation in order to enhance management system effectiveness was proved. The mechanism for calculating competence estimation based on the use of the factors that characterize basic, functional and managerial competences were applied.

Keywords: management system, basic, functional, managerial competences

Deepening processes of globalization and competition, the impact of information and communication technologies, the impact of the financial crisis of 2008-2010 exercise significant influence over enterprise production. New features of modern market economy transition are characterized by business integration of economic, technological, organizational, informational and social components and by need to strengthen the role of management in the company [1]. Under changing conditions of today's environment, we need to construct such a management system which would be able to comprehensively consider the action of various factors both from external and internal environment.

Current socio-economic conditions of Ukrainian enterprises are characterized by highly low labor productivity (3.5 times lower than in Europe and America), a low level of innovative activity and competitiveness, which is primarily a consequence of poor quality domestic management [2]. Challenging economic relations in the country, the lack of fiscal transparency and clear development guidelines, and political instability in the society put the modern Ukrainian manager in a very difficult position. The complexity of the situation is aggravated by rejection of state regulation of product prices by a centralized management of the economy and the lack of management experience in the global recession. All this leaves the manager with a brand-new list of tasks, the solution of which affects economic performance, competitiveness, opportunities for future development, which in turn cause more demanding and reasoned approach to management.

In Ukraine, the poor management is currently a big issue because it is an initial cause of economic problems and complications in the state. Ignorance of the initial causes and sole focus on its consequences elimination will slow most attempts to reform and revive the national economy in the future [2].

Analysis of recent researches and publications

The problems related to management issues were explored by domestic researchers, such as I. Alexandrov, S. Bai, A. Balatskiy, V. Vishnevsky, V. Geyets V. Zakharchenko, M. Merkulov, V. Stadnyk, K. Weaver, S. Harichkov, L. Fedulova,

A. Szegdy. Among foreign academics, the biggest success in the study of management was reached by V. Vesnin, E. Denison (1967), R. Drucker (1983), M. Mescon, F. Khedouri (1984) P. Romer (1990) A. Toffler (1990). We should also mention the researchers who work on increasing competence of employees: D. Dmytrenko I. Gruzina, O. Yeskov, P. Makovyeyev, I. Oleksiv, E. Sharapatova.

The problems of management mechanism were discussed in numerous scientific studies, however, despite significant developments in this direction, there is insufficient research done in the formation and development of the lower-lowel managers' activity based on their expertise in modern conditions. The conditions of hard market environment require constant attention and research in this area, which involves finding ways and mechanisms of combining classical theories of communication with new management concepts based on the evaluation of competence management personnel.

The aim of the article is to study the feasibility of developing competency estimation mechanism of the lower-level management, the need to improve the quality of management in an industrial enterprise.

The main part

The economic system development during the crisis requires new approaches to organization and management. The old industrial economy with its classical management theories is becoming the thing of the past. Production modernization, innovative technologies, information organization of social space exercise significant influence on the intensification of labor, and consequently, the management system.

Thus, L.I. Fedulova believes that the development of new approaches to the enterprise management should take into account certain changes in the external environment of enterprises, including:

— changes in technology – the use of global information networks, and high-speed communications;
— international economic integration – free transfusion of capital on a global scale, technology transfer, economic growth slowing;
— increasing the role of the intellectual component in the economy – rapid growth of the sectors with intensive use of knowledge [1].

While designing an optimal management system at the enterprise, we must take into account not only external conditions but also use the experience of classical approaches and obtain information regarding current concepts and theoretical works.

The classic view of industrial enterprise management system based on theories and approaches which were developed in the first half of the twentieth century. They are based on functional aspects of the company and solving the problems of labor, production and marketing, as well as human resources. The rapid development of the world economy in the second half of the twentieth century influenced the emergence of new features of management structure which are not typical for the industrial economic model. They are as following:

— changes in the hierarchical management structure, reducing the value of the vertical component by strengthening horizontal relationships;
— decentralization, reducing the number of management levels;
— a clear trend towards the elimination of hierarchical distribution of functional responsibilities, reduction of differences in powers, rank, wages.

The differences in management approaches in the company are shown in table 1.

The emergence of new features in the management system is linked to the growing importance of the human factor in economic development. The American economist G. Becker, the author of the theory of human capital, said that there was reassessment of the driving forces of the economy, the quality of human capital began to affect economic growth [3].

Table 1. Comparative Analysis management approaches in the 20th and 21st centuries

Features	The second half of the 20th century	The beginning of the 21st century
The aim of management system	Ensuring the presence of staff in the right place at the right time. Reaching a compromise between workers and management. Cost savings, lack of managerial interest in long-term investments in human capital	Combination of qualifications and human resources potential with the strategy of the company. Development of the enterprise by supporting initiatives and open discussions between employees, a strong corporate culture. The maximum return on investment in human capital, providing professional growth of employees.
Tasks of management system	Involvement of experts, their keeping in the enterprise, motivation, conflicts elimination.	Staff competence improvement, measures to ensure the flexibility of labor. Search for harmony in the team.
Management style	A functional, vertical management type, one-way communication. Slow decision-making. The focus is an employee and their needs.	A partnership style, horizontal management, emphasis on team development, two-way communication. Accelerating the intensity of the process of decision making. The focus is an employee, a team and enterprise needs.
Management structure	A central structure with a large number of regulations and instructions. Strict internal vertical connections.	A decentralized structure with a reduced number of regulations and instructions. Horizontal and vertical internal communications.

Source: Own elaboration

The researcher and economist E. Denison proposed classification of economic growth, which has twenty-three factors, three of which describe the process of human labor (employment, working hours, the level of education) [4]. Later P. Romer showed that economic growth is directly dependent on the value of human capital in his model of economic development [5].

These parameters indicate the legality of the proposed theories and models. According to the World Bank, the physical capital in the modern economy generates 16% of the total wealth of each country, natural – 20%, and human capital – 64%. In the countries, such as Japan and Germany, the proportion of human capital is up to 80% of national wealth [1].

The variability of economic environment, increasing competition, development of information technology and communications influence the appearance of new management approaches such as reengineering, controlling, transfer of knowledge, theory of total management, the concept of a balanced scorecard. Reengineering affects both horizontal and vertical work implementation, cancellation of linear streamline operations, minimization of checks and approvals, wages dependence on the evaluation. The main aim of controlling is overall coordination, informative and advisory support of management subsystems in the enterprise.

The theory of total quality management (TQM) is a collection of about twenty concepts that characterize different positions of the quality of production. Overall, TQM is responsible not only for the quality of products, but also for high-quality balanced operation of the enterprise as a whole.

The concept of the balanced scorecard is a continuation of theoretical developments in implementing management decisions in the strategic direction of the company and has two differences. The first difference is that the new concept offers ways to implement the development strategy rather than the strategy development process, the second difference is aimed at forming an integrated comprehensive management system based on evaluation methods of performers and their results of labour.

Today, the characteristic of economic growth in developed countries is the use of intellectual assets as the main means to provide a competitive advantage in the global market. According to the renowned specialist in the field of knowledge economy L. Edvinssona, the success of businesses in today's economy increasingly depends on the ability to accumulate and use knowledge unique competitive advantage lies primarily in the unique competencies which are based on unique knowledge [1]. By some estimates, 42% of corporate knowledge is personnel intelligence which is not fixed in tangible media. A study of the Swiss research organization, which studied the knowledge management, showed that only 20% of workers' knowledge are used by the companies. This means that the mere efficiency of knowledge management within the enterprise will raise productivity, accelerate growth, increase profits and strengthen competitive advantage [1].

From the systemic perspective, a modern enterprise is a complex socio-technical system that has two components: the material and human factors of development. As for the material aspect of economic development, it is the direction the humanity has been engaged with for the last two thousand years and identified the ways and mechanisms for further improvement. Regarding the human factor, it is a new and most promising area for investment. Today, the biggest value for enterprises is not expensive equipment or technology, but talented, promising and creative workers and competent managers. The Professor of Stanford Business School Jeffrey Pfeffer in his book "The Human Equation" (1998) suggested "companies that properly manage their people, will overtake the companies which do not do this, 30-40%. Effective human resource management – this is the problem that more and more managers will face in the XXI century". [6] As the driving force of the modern enterprise is management, the competence and level of intellectual development are its main quality characteristics.

The importance of competence factor of the manager is confirmed by many studies of foreign researchers. Hence, the Indian economist Karaikudi analyzed the internal state of the organization and its impact on the needs of employees for the following parameters: interesting work, decent wages, opportunity for development, strict liability, autonomy and independence, adequacy of information, workplace quality equipment, friendly relations with colleagues, opportunity to see the results of their work, competent manager [7, 8].

The analysis of the latest management concepts and research experience of foreign academics suggest finding ways to increase productivity through activation and subsequent use of intellectual potential, as the development of employees' and managers' competence and its evaluation are now very necessary. We propose to estimate the competence of management personnel using indicators divided into three groups: basic, functional and managerial. The basic competences are a set of personal characteristics and abilities which contribute to the professional duties. The functional competences are the list of professional skills which are needed to complete the task. The managerial competences are required to perform duties which are associated with the management staff.

The authors estimated the competence of lower-level managers – masters from the state Enterprise "Zorya-Mashproekt" based on the expert method. Six masters from the same workhouse were evaluated by following five experts:

— the first expert is a head of the unit (a foreman) who has a competence coefficient of 0.25;
— the second expert is an independent expert of the highest category, who has a competence coefficient of 0.25;

— the third and fourth experts are experienced masters (even ex officio), specialized in the subject of work and have a competence coefficient of 0.2;
— the fifth expert is a representative of the enterprise administration with a competence coefficient of 0.1.

The levels of experts' competence are distributed so that their sum is equal to one. The experts estimate masters on a ten points scale on five indicators. Each indicator has a weight of significance, and the sum of the coefficients must be equal to one. For ease of calculation and visual results, we used the given parameters, using a mathematical method (multiply by 5 – number of studied parameters) [9].

Table 2 shows the factors of basic, functional and managerial competencies as well as the first's expert estimation of six masters according to three groups of competence indicators.

Table 2. The first export's estimation according to three groups of competence

Indicators	Significance	Reduced significance	Master 1	Master 2	Master 3	Master 4	Master 5	Master 6
Basic competences								
Flexibility and creative thinking	0.15	0.75	7	6	9	7	5	8
Autonomy and initiatives	0.25	1.25	6	5	8	4	5	9
Determination and personal energy	0.2	1.0	7	6	7	7	4	8
Speed of work impalement	0.25	1.25	8	6	9	5	5	9
Communicativeness	0.15	0.75	6	5	6	5	6	7
Average value of expert 1	1	5/5=1	6.8	5.6	7.8	5.6	5	8.2
Functional competences								
Education level and qualification	0.2	1.0	6	8	6	7	6	7
Professional skills. experience	0.25	1.25	7	8	7	8	7	9
Ability to make a decision	0.15	0.75	6	7	7	6	6	8
Ability to plan and organize work	0.25	1.25	8	7	7	6	6	8
Ability to learn (increase an educational level)	0.15	0.75	9	6	9	6	6	7
Average value of export 1	Σ=1	5/5=1	7.2	7.2	7.2	6.6	6.2	7.8
Managerial competences								
Planning and forecasting	0.2	1	7	6	8	7	8	8
Task formulation and opportunities for its realization	0.25	1.25	9	8	9	8	8	9
Cooperation management	0.15	0.75	7	8	7	8	7	8
Ability to accept and evaluate other point of view	0.2	1	9	7	7	8	8	9
Achievement of agreements	0.2	1	8	8	7	7	9	8
Average value of export 1	Σ=1	5/5=1	8	7.4	7.6	7.6	8	8.4

Source: Own elaboration

Using equation (1) the estimation of competence (aj) was calculated for each (j) master according to all indicators, taking into account the weight factor of importance and all the experts based on their competence.

$$a_j = \frac{\sum_{i=1}^{m} \sum_{k=1}^{l} \alpha_k \beta_i a_{ijk}}{ml} \quad (1)$$

where α_k is a weighting coefficient of experts' competence;

β_i is a weighting coefficient of significance of indicator;

a_{ijk} is evaluation of the j-th professional by k-th expert according to i-th parameter;

l is a number of experts;

m is a number of parameters;

n is a number of masters.

The obtained results are summarized in table 3.

Average estimation of masters' competence according to all groups of indicators is summarized in table 4. The analysis of calculated values of average competence indicators considering the importance and competence of the experts illustrates that all six masters have sufficient basic characteristics (independence, initiative, perseverance, personal energy, the ability to quickly perform tasks). The value of functional competencies masters is within 6.14-8.15, which indicates their potential to perform their duties, they also have significant opportunities to perform administrative tasks (evaluation within the 7.40-8.28).

Table 3. Average estimation of masters according to groups of competence

Indicators	Master 1	Master 2	Master 3	Master 4	Master 5	Master 6
Basic competences						
Flexibility and creative thinking	7.35	5.90	8.25	6.8	5.15	8.25
Autonomy and initiatives	6.05	5.25	7.35	4.45	5.00	8.25
Determination and personal energy	7.35	5.75	6.90	7.15	5.05	8.15
Speed of work performance	7.75	6.45	8.50	5.50	5.35	8.35
Communicativeness	6.05	6.35	6.95	5.85	5.90	7.20
Functional competences						
Education level and qualification	6.35	7.95	6.10	7.45	6.50	7.75
Professional skills. experience	7.25	8.00	6.80	8.05	6.35	8.60
Ability to make a decision	5.25	6.75	7.15	6.35	6.10	7.90
Ability to plan and organize work	7.70	6.45	7.10	6.75	6.00	8.55
Ability to learn (increase an educational level)	8.25	5.55	8.05	5.80	5.60	7.55
Managerial competences						
Planning and forecasting	7.65	6.20	7.85	6.80	7.55	8.55
Task formulation and opportunities for its realization	8.55	8.30	8.55	8.30	8.30	8.80
Cooperation management	7.05	8.15	7.05	7.75	6.80	8.25
Ability to accept and evaluate other point of view	8.35	6.60	7.00	7.85	7.40	8.25
Achievement of agreements	7.80	7.75	7.00	7.00	8.05	7.40

Source: Own elaboration

Table 4. Average estimation of competence masters according to all groups of indicators

The group of indicators	Master 1	Master 2	Master 3	Master 4	Master 5	Master 6
Basic competences	6,93	5,91	7,62	5,81	5,25	8,10
Functional competences	7,03	7,04	6,97	7,01	6,14	8,15
Managerial competences	7,95	7,40	7,56	7,56	7,69	8,28

Source: Own elaboration

Using formula (2) we calculated the average value of each competence indicator (a_i) of the entire group of masters on the basis of experts' competence (table 5):

$$a_i = \frac{\sum_{j=1}^{n} \sum_{k=1}^{l} \alpha_k a_{ijk}}{\ln} \quad (2)$$

Table 5. Average competence indicator significance

Indicators	Indicator significance	Average values of basic competences	Average values of functional competences	Average values of managerial competences
Flexibility and creative thinking	0.75	6.95		
Autonomy and initiatives	1.25	6.06		
Determination and personal energy	1.0	6.73		
Speed of work performance	1.25	6.98		
Communicativeness	0.75	6.38		
Education level and qualification	1.0		7.02	
Professional skills. experience	1.25		7.51	
Ability to make a decision	0.75		6.58	
Ability to plan and organize work	1.25		7.09	
Ability to learn (increase an educational level)	0.75		6.80	
Planning and forecasting	1			7.43
Task formulation and opportunities for its realization	1.25			8.47
Cooperation management	0.75			7.51
Ability to accept and evaluate other point of view	1			7.58
Achievement of agreements	1			7.50

Source: Own elaboration

The analysis of calculated competence indicators (see table 5) shows that the average basic competencies are within 6.06-6.95, the minimum value is 6.06 (autonomy and initiatives), and the maximum rate is of 6.98 (the speed of work emplacement). The second highest value is flexibility and creative thinking (6.95). The numerical values indicate the compliance of evaluated masters with their position, the ability to solve tasks quickly and efficiently, displaying a sufficient level of persistence and creativity of thought. The calculated values of functional competence indicators demonstrate sufficient experience and skills (7.51), as well as the ability to plan and organize work (7.09), which is a very important characteristic of master's work. The indicators of managerial competencies are valued as 7.43-8.47, which is higher than basic and functional competences. This shows evidence of existing reserve of management personnel and compliance of evaluated masters to the requirements of enterprises.

Conclusions

Thus, we can conclude that the estimation of employees in terms of expertise promotes an optimal choice of a particular group of experts for the quality performance of the project under the schedule with the aim of successful achievements of the strategic advantages of the company.

The mechanism of the competence estimation according to represented factors can be used in the evaluation of lower-level managers. The company can use the proposed algorithm of calculation of the specific competencies of the employee:

— as a basis for comparison ("Plan" compared with the "fact") that gives senior management a choice between candidates for the vacant position on certain criteria;
— to set the size of individual awards to employees based on their professional abilities;
— to determine whether the employees' compliance with requirements of the enterprise;
— to determine the strengths and weaknesses of each employee, their potential and career prospects;
— to plan further development of employee's interest in the company which saves money on staff training. The training of certain workers for specific requirements will reduce costs compared with the general approach of training all employees.

It is important to note that competence evaluation gives the employee certain advantages, such as:

— a better understanding of the requirements of the enterprise to the performed work, obtaining of information about the qualities required for this post;
— implementation of feedback, manager's idea of their strengths and weaknesses, and opportunities for advancement.

The management system, which is based on the use of the present competence estimating mechanism, will lead to significant cost savings due to the alignment of competent employees to management positions and reducing staff turnover.

Abstract

The competence estimation as a part of management system of industrial enterprise is discussed. The aim of the article is to justify the need for development of estimating mechanism of lower-management personnel which is required to improve the quality of management in an industrial enterprise. A comparative analysis of approaches to the management system in the second half of the last century and the beginning of the XXI century was conducted where some changes in the external environment were presented and their impact on the enterprise was assessed. The modern management concepts were analyzed, which proved the need for competence estimation in order to increase efficiency of management system in domestic enterprises. On the example of a particular company, a mechanism for calculating of competence estimation, based on the use of factors which characterize the competence of personnel, was proposed. For the calculation, five factors which determine the activities of the three levels: basic, functional and managerial competencies, were used. The research outcomes can be applied not only in industry, but also in small business, because the calculation method has an applied focus, and proposed competence factors are universal. The proposed mechanism of competence estimation will lead to significant cost savings at the expense of placement of competent employees to management positions.

JEL Classification: O15, O24.

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Надано до редакційної колегії 10.03.2017

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Посилання на статтю / Reference a Journal Article:
Competence estimation as a crucial component of enterprise management system [Електронний ресурс] / T. V. Yemelyanova, S. A. Tubaltseva // Економіка: реалії часу. Науковий журнал. – 2017. – № 1 (29). – С. 48-54. – Режим доступу до журн.: http://economics.opu.ua/files/archive/2017/No1/48.pdf