

ENERGY OF DEVELOPMENT THE ORGANIZATIONAL SYSTEMS

Statement of the problem. Speed of the business environment, dynamic of changes caused by general processes of globalization poses new requirements for the management and organization of businesses, industries, social and economic systems. The nonlinear nature of organizational systems requires new methods of planning future activities through existing management approaches, the formation of new ideas about the possibilities of development. For this reason it is necessary a deeper understanding of the development process from the standpoint innovatization and energy that ensures the development process.

Analysis of recent research and publications. A lot of attention are attend for issue of organizational systems based on innovative in the writings of foreign scientists. Classics of innovation theory are Y.Shumpeter, M.Kaletski , H.Frimen, P.Sheko and others. They saw the foundation of the business in the innovative activity. Innovative development principles are presented in the works of Russian scientists as R.A.Fathudynov, S.D.Ilyenkova, V.M.Anshyn, P.N.Zavlin, A.M.Vlasova and others. For a long period of time the possibility of development of innovative principles is studied in the work of ukrainian scientists: O.O. Lapko, Y.M.Bazhal, V.M.Heyets, M.S.Danko , V.P.Solovyov, D.M.Chervanov and others. However, in existing theories the mathematical tools for estimate the impulses for innovative development of organizational systems are presented in limited volume This impulses create energy development.

Problem. The main purpose of this paper is to determine the content of the process of organizational systems from the standpoint innovatization and energy that provides organizational development.

The main material of the study. Understanding the nonlinearity of social systems occurred in the distant past. Historical heritage of many nations contain perception of both spiral line which extends upwards. A number of scholars from different times to support and develop the idea of the spiral nature of social and economic systems. Almost every one of the supporters of the theory of the spiral defines individuals as the main driving force of development.

Theory of Karl Marx leads to the idea of the dependence of economic development on the factors of personality, level of consciousness and freedom, which determine the nature and rate of development [1].

A theory of spiral dynamics was initiated in 70-90 years by Clare Graves and developed his followers Chris Cowan, Don Beck and Ken Wilbur. This theory is based on the idea of personal development and its dependence on the development of society. The basic idea of spiral dynamics is the claim that it is the people and their activities decide the fate of society and determine the nature of development. Changes occur when there are new ideas in the minds of people, when there is an understanding that "chaos is order, and this order is to find " [2].

Thus, social activities and the activities of each individual are the basis for further development. Each social formation is composed of people with different value systems and paradigms of thinking. Distribution to different paradigms like "bell " curve Gauss. The representatives of society who profess a separate paradigm, form mental level are interconnected, but the link between the scale polar levels are extremely low. Such a theory is offered by founders of spiral dynamics that offer imaginary division of society into seven paradigms. The representatives of each paradigms are suitable carriers intellectual capacity and systems of thought and values [2].

Actually the presence of various social media paradigms of thinking creates conditions for development because of the high potential differences of individuals. It requires a momentum for development. Mosaic paradigms of thinking involves structuring high and low entropy, which according L.N.Humilov is largely passionarity society, level of energy. According to the laws of thermodynamics, the greater the coefficient of performance can be achieved when the temperature difference is greater. Similarly, the impetus to development is higher when the potential difference is greater. According L.N.Humilova, this law is manifested "social thermodynamics " [4].

An opinion of S.Pereslehin, society will always consist of people living in different technological structure, which means that humanity will always consist of people who are carriers of various paradigms of thinking and values. Therefore, high structuring society and low level of entropy are the key ability for development [5].

Ken Wilbur in his book "Quantum Questions" shows the dependence of complexity thinking and complexity of society. He proved that the presence of speakers of different worldviews can increase the complexity of the system, but each stage of system development should focus on the work of the previous stage, harmonizing property of each of them [6].

Thus, one could argue that the potential difference can increase structuring of system and thus increase the energy of the system through the development of the creative energy of individuals.

The creative energy of an individual consists of two components - biological and social. Biological energy - the energy of the natural, which is inherent individual. This energy determined current and potential capacity for development. Social energy and measure its manifestation are determined by the degree of development of the society in which man lives and which formed the preconditions for the exercise of human biological energy [7]. The level of creative energy of individuals determines the level of development and the complexity of the social system. However, the level of each individual to change the system organization can manifest itself in different ways.

According O.N.Melnykov, when everyone starts to specific tasks, first of all he compares new knowledge about the test questions with the level of existing knowledge in it. At this stage the energy of creative reflection is used. The author calls it a potential energy that does not change the situation. However, due to the activity of individual biosocial data display provides new knowledge that can find solutions to the problem. This process provides creative energy management. When the direction to achieve goals is determined the creative energy of conversion included in the work. It uses the potential creative energy of reflected and management to carry out the necessary changes. This transformation is provided by the transition of creative human energy into other forms of energy of the material world, that provides the energy conservation law [7].

Referring to the theory of organizational knowledge Nonaka and Takeuchi [8], we can draw a parallel between the transformation of individual creative energy and the creation of organizational knowledge (Figure 1).

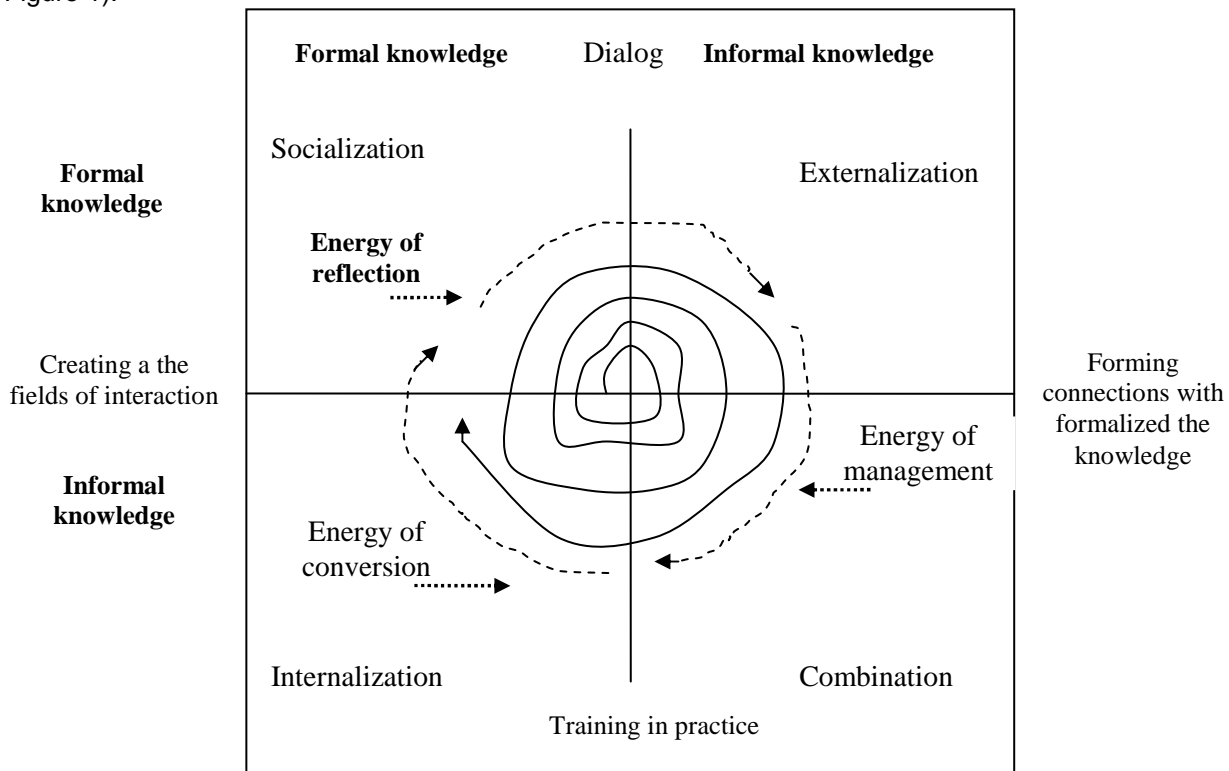


Figure 1 Energy for converting organizational knowledge
(Compiled by the author based on [7, 8])

Creative Energy of reflection is used for the process of perception specific situation and comparison of existing knowledge of the individual or the organization as a whole (existing formal knowledge) with the requirements their according to level situation. Already in the process of comparing there are the first trying to create new knowledge (informal knowledge). Appearance of new knowledge provides the basis for finding ways to address the problems or challenges. Thus, the energy of reflection provides the phase flow of socialization and externalization and assess of existing explicit knowledge and appearance implicit knowledge.

The creative energy of management is designed to find optimal solutions to problems, achieve goals. It will change development in the positive direction. The course of externalization phase is gradually transformed into a phase combinations. The formalized knowledge somehow ordered, defines ways to use them.

Creative energy of conversion is used to offer a real change, innovation by transforming creative energy into other forms of energy. It provided the emergence of new knowledge that has become formalized

and a specific performance to ensure progressive development of the organization and serve as a basis for further transformation processes .

It can be argued, one form of energy knowledge becomes in another on every step of converting. Formalized knowledge create informalized knowledge, create energy for future changes. Established energy is the creative energy of management, which allows to answer the question "how and what" should be done to ensure future changes. When the answers to these questions are found in the work includes energy of conversion, which use the potential energy of reflection and management, transforms it into real results, provides the energy conservation and presentation of its as the energy of the material world and the creative energy that is presented formalized knowledge.

However , in this case, the law of conservation of energy implies increasing energy potential, which provide future development. We can talk about energy potential as intellectual potential. At each new stage of organizational development potential of creative energy increases, the intellectual capacity of the organization increases and results of its use are provided.

According to physical laws of conservation of energy the total energy of the system consists of potential and kinetic energy. We propose to consider the law regarding energy that is created within the organizational system .

The potential energy of the organizational system formed by existing intellectual capacity that can be used to obtain specific results. This type of energy includes the entire set of formalized knowledge of the organizational system and the amount of creative energies of employees. It is known that the potential energy takes place under conditions of interaction elements together, in our case it is a commitment to active cooperation and exchange of knowledge and experience within the group organizational system, which is implemented in practice.

Intellectual potential is the result of a number of investment of time, efforts, etc., incurred by the person, its environment, team, organizational structure as a whole. However, the intellectual capacity is worthless until it starts to use it. Only then it will be able to perform effective work, which subsequently leads to relevant results.

Thus, the potential energy of the organizational system ($E_{\text{pot } i}$) on each level of the organizational system can be represented by the following expression

$$E_{\text{pot } i} = \ddot{I}_{\text{pot } i} = V_{\text{pot } i} + \sum_{j=1}^n \dot{A}_{\text{pot } ij} \times \hat{E}_{\text{pot } ij}$$

where $\ddot{I}_{\text{pot } i}$ - intellectual potential of organizational system for the i-th level of development;

$V_{\text{pot } i}$ - the amount of formal knowledge possessed by organizational system for the i-th level of development;

$\dot{A}_{\text{pot } ij}$ - the creative energy of the j-th employee at the i-th level of the organizational system;

$\hat{E}_{\text{pot } ij}$ - availability factor of the j-th employee to actively cooperate and exchange knowledge and experience within the team at i-th level of the organizational system;

n - number of employees of the organizational system.

At each successive level of development the intellectual capacity should increase due to the increase in formal knowledge and creative energy of employees. The ideal indicator of potential energy must constantly seek maximum.

Effective using of intellectual capacity is provided when there is amount of work on the transformation of resources (tangible and intangible) that is aimed at a specific set of results. Thus, the efficiency of intellectual capacity depends on the specific energy, which makes use of this capability. This is the energy of motion or kinetic energy of the system .

The kinetic energy takes place at a certain kind of movement. In our case it is appropriate to talk about the movement of the spiral upward trajectory, and hence the energy development. In the spiral nature of the organizational system motion is provided by centrifugal force, which depends on the mass, velocity and centrifugal radius.

Consider filling components that determine the centrifugal movement, due to the development of the organizational system.

$$E_{\text{kinet } i} = \dot{A}_{\text{kinet } i} = \frac{m_{\text{pot } i} \times (v_{\text{pot } i} + v_{\text{kinet } i})^2}{r_i},$$

where $E_{\text{kinet } i}$, $\dot{A}_{\text{kinet } i}$ - force or energy that provides movement to spiral upward trajectory at each stage of the organizational system. This is the energy of development that ensures efficient use of organizational resources through the use of intellectual capacity and adequate processing of external information, which is achieved as a result of properly constructed management system that allows you to

make quick, efficient and effective management decisions while minimizing the limitations that occur during development of organizational systems;

$m_{\text{z}i}$ - amount of information that is used to ensure organizational system development at every stage. This amount includes an array of formal ($C_{\text{oi}i}$) and informal knowledge ($C_{\text{iaoi}i}$) of system at each stage of development and the necessary amount of external information ($I_{\text{ci}i}$), which provides integrated administrative decisions for using the intellectual capacity and organizational resources of the system:

$$m_{\text{z}i} = \sum (C_{\text{oi}i} + C_{\text{iaoi}i}) + I_{\text{ci}i}$$

$v_{\text{ynp}i}$ - the speed of decision-making which based on the wealth of information at each stage of the organizational system. To ensure progressive development of this indicator should continue to grow.

$v_{\text{euk}i}$ - speed of an effective outcome at each stage of the organizational system.

Thus, the total energy of the organizational system at each stage of development will be determined by the amount of potential energy and energy providing movement.

$$E_{\text{cucm}i} = E_{\text{nom}i} + E_{\text{poz}i}$$

$$E_{\text{cucm}i} = V_{\text{fopm}i} + \sum_{j=1}^n E_{\text{meop}ij} \times K_{\text{com}ij} + \frac{m_{\text{inf}i} \times (v_{\text{ynp}i} + v_{\text{euk}i})^2}{r_i}$$

Filling ingredients that determine the nature of potential and kinetic energy development, is demonstrated their direct dependence on the effectiveness of management organizational system that identifies opportunities for development and use of creative energy workers through the development of organizational knowledge. We are talking about understanding the decision-makers the need to ensure appropriate conditions for the development of intellectual potential organizational system. This approach to the organization of work is possible on the basis of innovatization which is defined by us as a process of intensification of innovation by creating conditions for the ongoing development of organizational knowledge ... in order to ensure sustainable development of the progressive elements of the system and the consequent withdrawal of a qualitatively at new level of development and receiving an effect of transformational and innovative acceleration [9].

Findings from this study. This study made it possible to formulate the following conclusions: 1) the development of an organizational system based on innovatization ensured only if the intellectual capacity increases gradually, the total energy of the organizational system increases too and, consequently, there is a gradual transition to a new stage of development in a spiral while there is a gradual expansion spiral. An increase of qualitative and quantitative level of organizational systems are provided; 2) the potential energy of the organizational system, which is represented us in the form of intellectual capacity, determines the ability and opportunities for innovation. Kinetic energy is an energy management which in its effective use is converted to energy development, providing a practical application of existing intellectual potential.

The spiral nature of organizational systems have not been studied sufficiently. Therefore, conditions that ensure this development are needed studies in further. The main factors that contribute to the build-up of the total energy of the organizational system are needed studies in further too and so on.

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Haliuk I.B. ENERGY OF DEVELOPMENT THE ORGANIZATIONAL SYSTEMS

Purpose. It is determination the essence of the process of development organizational systems from the standpoint innovatyzation and essence of an energy that provides organizational development.

Methodology of fesearch. This paper uses a number of theoretical methods of scientific research. In particular, in a review of research on nonlinear nature of organizational systems and analyze the evolution of views on the spiral nature of organizational systems used the historical method of research. In the study of the nature of energy, which provides progressive development of organizational systems, decomposition is applied as part of a systematic approach. In determining the specific components of the power of development used the method of analogy. In the process of filling the content of mathematical formulas that define the components of energy development, the method of analogies and method of formalization are used. The method of analogies used in presenting the parallel process of converting the creative energy of the individual and process of creation the organizational knowledge. Study of systemic functioning organizational system is provided using the methods of analysis and synthesis. Application of extrapolation and generalization allowed to formulate appropriate conclusions from the study.

Findings. As a result of this research we formulated proposal to identify energy development, which provides a coiled nature of organizational system based on innovatyzation and expanded reproduction of knowledge.

Originality. Unlike existing approaches represent the nature of organizational systems we proposed to consider development as a continuous process of transformation of knowledge and power conversion that provides spiral nature of organizational systems .

Practical value. The theoretical results can use in practice to assess the level of progressivity of separate organizational system.

Key words: organizational development, energy development, innovatyzation, creative energy, organizational knowledge.