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THE APPLIANCE OF AN OPEN SYSTEM IN THE PROCESS OF SOCIO-ECONOMIC ORGANIZATIONS MANAGEMENT

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Abstract. The article covers the concept of open systems. The specific feature of these systems resides in their ability to develop consistently at the expense of material and informational interconnection of system elements with the environment. As a result of this interrelation new and more complicated elements are formed. These elements comprise the basis for the complete system development. The foundation of open systems development and self-organization is composed of its “active” elements that are able to generate and implement innovative ideas. The article highlights the rationality and efficiency of open system methods appliance in the process of socio-economic systems management factored in its complicated inconsistencies between the individual as an active element and the overall society.

Keywords: objective laws of systems theory, managerial control, open system, system analysis, systems theory, management.

INTRODUCTION

In an effort to comprehend the living systems principles of functioning and development L. von Bertalanffy suggested the concept of an open system and organismic approach.

K. Bouldin's classification system considers social systems above the biological ones. In accordance with recapitulation law of E. Gekkel - F. Muller social systems pass all development stages, but in social systems a new regularities and behaviors algorithms are appearing at the top levels of system hierarchy in the correspondence with A.M. Butlerov researches.

In the same time, the socio-economic systems (SES) management uses the fundamental methods and principles of the system automatic control for the lifeless closed systems: the programmed control, compensation (proactive) control, control with feedback and their combinations, it is possible but not sufficient for the efficient management in the socio-economic open system.

Therefore, it is proposed to investigate the feasibility of using the concept of an open system in managing socio-economic organizations

L. VON BERTALANFFY'S OPEN SYSTEM CONCEPT

L. von Bertalanffy describes the open system model using the example of biological metabolism process [1, c. 41]. In open systems some materials are going constantly from outside into the system where they participate in different chemical reactions, which are named as “metabolism”.

Final products of these processes are extracted from system - “catabolism”. Thermodynamic regularities appear in the open systems as distinct from closed ones (isolated from space). They seem paradoxical and constructional to the Second Law of Thermodynamic, which leads the general sequence of physical events to the entropy enlargement.

The same processes exist in open systems because of energy and information correlation with the surrounded space. Actually, the informational exchange is the basis of the socio-economic system development.

In accordance with Bertalanffy, organismic approach to the open system, in contrast to closed, can reach in special conditions the state of the “mobile equilibration”, when the system structure remains constant. In contrast to ordinary equilibrium the mobile one

exists in the conditions of continual moving of the material, energy and information in the exchanging processes.

Before Bertalanffy time, the organism was considered as a system, which reacted only on external stimulus to keep the current state of system. Bertalanffy takes into consideration not only external stimulus but also internal activity as a source of development, that he considers the organism as a spontaneous active system. Bertalanffy concept shows *"The organism is in state of mobile equilibration of its chemical components and its cells"*.

Then in accordance to R. Akoff [1] on the level of alive organisms only a "system on the whole" can be purposeful, but independent purposeful systems elements are not desirable because it can lead to the uncontrolled development of separated components of organism (type of development of cancerous tumors, polyps or other formations not consistent with the concept of the organism as a whole). That is why in normally functioning organism the purposes of elements have to be under the whole system purpose.

In the same time in the socio-economic systems separate elements are purposeful as well as the whole systems, this fact leads to the issue of solving the contradictions between active elements and the whole system. Methods, approaches and means of Bertalanffy open system model realization are problematic for time being, that is system development model, "which provides the conditions ("reactions" - in Bertalanffy biological model) for the production high levels complication components" and for keeping the mobile equilibration state. Still it is not clear if this problem can ever be solved. But for the concise open systems, like socio-economic, there are many researches, devoted to solving the problem of contradictions between the different levels of organizations and its active elements.

SUBSYSTEM INTERACTION MODEL

The living system model in biology is conditionally hierarchy organized system with some relatively independent subsystems: circulation of blood, respiration, stomach and so one.

These subsystems themselves also have complicated organization. It is shown in medicine researches that these subsystems have not direct interrelations, which could be dangerous for normal organism functioning,

These facts make problematical using the structures with horizontal contacts in the socio-economic systems of M. Mesarovich "echelon" or "system central control" kinds, which can be useful in special cases, but can lead also to dangerous consequences.

It became obviously thanks to Hrushev (Russian leader) economical reforms in USSR of 60th. Decentralization of national economy have led to the strengthening of horizontal correlation between regions and generation of the regional economic control centers - "sovnarhoses", which entered to contradictions with high levels of national governmental hierarchy - sectoral ministries, Counsel of ministry and CK KPSU. Finally, these reforms were stopped.

When investigating the possibility of applying the network-centric and sub-sided principles of management in the activities of society, the state, etc., when managing territorial entities, the economy of the country, special attention should be paid to the essence of these management principles: "Solve problems as local as possible and as global as required". It means that the tasks of management can be solved at the level of organization, where it is the most effectively [7]. But signification and complexity of these tasks have not to be in contradictions with the purposes and tasks of the system in whole [8].

APPLICATION OF THE LAWS OF THE THEORY OF SYSTEMS FOR THE MANAGEMENT OF SUSTAINABLE DEVELOPMENT OF ORGANIZATIONS

The concept of an open system and the regularities of the theory of systems, explaining the fundamental features of such systems and complementing this concept, also make it possible to study the problems of sustainable development of socio-economic systems.

The entropic-negentropic processes manifest themselves ambiguously. On the one hand, negentropic tendencies,

realized in the form of innovations, are the basis of development, but at the same time they destabilize the system - "creative destruction" according to J. Schumpeteru [10] and V. Sombart [6]. And entropy tendencies, considered as a manifestation of disorder, on the contrary, stabilize the state of the system because the minimum energy state, to which the entropic processes lead, is the most stable.

Understand these contradictions helps the patterns of the systems theory - the regularity of integrity (emergence), hierarchical ordering, self-organization, which allow us to assess the degree of manifestation of entropic and negentropic tendencies in the system [4].

On the basis of his information approach, A.A. Denisov [5] introduced comparative quantitative estimates of structures from the point of view of the degree of integrity

$$\alpha = - C_v / C_o$$

and the coefficient of use of the elements as a whole

$$\beta = C_c / C,$$

where C is the system information complexity estimate $C = J \cap H$; J - information of perception; H - information essence (potential); C_v , C_o , S_v - system, own and mutual complexity conformably.

Researches A.A. Denisov showed that any developing system is in between the state of absolute integrity and absolute freedom of elements. $\alpha + \beta = 1$.

Integrity provides stability, freedom - the development of systems.

At the same time, the increasing of the integrity degree and suppression of the

freedom of elements is provided not only by regulation "from above" in hierarchical systems, but also by strengthening the coherence that limits the freedom of elements in social networks. At present, this is realized and manifested as "communicative totalitarianism".

Thus, already manifested phenomena and processes indicate that it is necessary to manage the sustainable development of socio-economic systems using the systems theory laws. To study the problems of sustainable development are introduced: system categories - "freedom", "manageability", "stability", "inertia"; measures of "stability margin"; types of stability - adaptive stability, stability of substitution; mechanisms for ensuring sustainability - spatial, temporal [3, 9].

MAIN CONCLUSIONS

Thus, based on the reviewed state of the concept of an open system, it can be concluded that the most important problem at present and future times remain: the modeling of the open (alive) systems with a taking into account complicate behavior of its active elements in the processes of information and material exchange inter and outside.

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