

THE ECONOMIC ANALYSIS AND QUALITY OF THE SYSTEM OF MANAGERIAL DECISION-MAKING

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Abstract: The article provides the historical analysis of the formation of the concept of “system”; the contribution of the system analysis in managerial decision-making is considered. The role of feedback in the evaluation of managerial decisions is examined. The general conclusions on the impact of the systems analysis on the results of management decisions are drawn.

The human society represents the system and includes the whole complex of social and economic systems which interact between each other at different levels of management.

The society is a set of people united historically by the developed forms of interrelation and interaction (social groups, social institutes) in order to satisfy their needs. It is characterized by the integrity, self-reproduction and self-sufficiency, self-adjustability and self-development, the achievement of such level of culture when it has special norms and the values forming the basis for the interrelation and interaction of people [9, p. 43].

Thus, the human society is an active system having the ability for self-development. The whole complex of internal and external factors influences the development of any social and economic system (on macro-, meso- and micro-levels).

The system analysis plays a significant role in multi-variant approach to the decision-making. The system analysis can be considered as a proper response to the need for the research and creation of complex systems, decision-making in conditions of uncertainty, incompleteness of the information, lack of resources and time.

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Scientists put forward a set of definitions of the system. In the Big Soviet Encyclopedia (**BSE**) the concept “system” is defined on the basis of a direct translation from Greek and it is defined as “compound”, i.e. something made of parts [1, p. 158–159]. L. von Bertalanffy characterizes the systems as “a complex of co-operating elements” [6, p. 21]. The definition of the system offered by S. Beer is quite interesting: “A system is one of the order names contrary to chaos” [6]. B.Z. Milner believes, that the system is limited in space and time area, in which the parts, i.e. components are connected by functional relations [3]. R.L. Akonff defines the system as “a set of the actions (functions) connected in time and space by a set of practical problems on decision-making and an evaluation of results, that is management problems” [6, p. 21]. S.L. Optner characterizes the system as the means of problem expression in terms of objects, properties and communications [3]. E.P. Golubkov offers the following concept of the system: it is “a way to find simple in difficult with the purpose of the analysis simplification” [4]. W.R. Ashby was the first to mention the observer in the definition of “the system”: “Any set of variables which the observer chooses from a number of the variables peculiar to the real machine” [6, p. 22]. Ya.I. Chernyak included the observer in the explicit form in the definition of the system for the first time: “The system is the reflection in the consciousness of the subject (the researcher, the observer), the properties of objects and their relations in the problem solving of the researcher, knowledge” [10]. V.N. Popov defines the term “the system” as the solution to the problem which “represents the set of functionally co-operating elements, principles and relations caused by the researcher”¹ [6, p. 22].

The analysis of the evolution of the definitions of the concept “system” enables to come to the conclusion that this term has become wider in its meaning in the process of the system research development. We can identify three historical stages of the investigated concept development [8].

– The first stage is the characteristic of the system from the point of its content and structure (for example, definitions in BSE, L. von Bertalanffy [11], S. Beer, B.Z. Milner).

– The second stage of the development the definition of the system extended and included not only the elements and links, but also the purpose (for example, the definition of the system offered by R.L. Akonff, S.L. Optner, E.P. Golubkov).

– At the third stage the concept of the system included the observer of the system (for example, the description of the analyzed term of W.R. Ashby [12], J.I. Chernjak, V.N. Popov).

Hence, the complete definition of the system should include the system elements, their links, the purpose and the observer. According to the author, the definition of “the system” should be specified in terms of the development of the information on the investigated object, which is based on subjective representations of the researcher.

Having said that we can formulate the following definition of this concept – the system is a set of elements co-operating with each other, the

¹ The given list of the definitions of the term “system” is not complete, as it includes more than 200 definitions.

representation about which is generated on the basis of the subjective point of view of the observer in order to solve the given problem.

From the point of management structures the system analysis should be considered as a complex of studies which are aimed at revealing the general tendencies and factors of the organization development and working out the measures for perfection of management system and all industrial-economic activities of organizations [7].

The system analysis is reduced to precise setting of the problem, the selection of the method (the tool), which meets the given task to the greatest degree.

Social and economic systems are defined as big and complex systems. Big systems include systems which cannot be investigated, without dividing them into subsystems. The main difference of complex systems and big systems is their purpose as they are created for the solution of a multipurpose and multidimensional problem [7].

The model creation is an auxiliary way used in conditions of impossibility to lead an experiment enabling to replace the initial system and to study the reactions of the system to the influence or disturbance.

In the course of the system analysis it is necessary to consider its reaction to the direct coupling and feedback.

The impact the system made by the system management is called influence. The reaction of the system to the operating influence, i.e. the feedback is of greater interest.

The feedback can be both positive and negative. If the feedback is positive, it strengthens the direct influence on the system. If the feedback is negative, it makes a negative impact on the work of the whole system, and it can also weaken the direct influence or even neutralize it. It is necessary to consider the impact of the feedback on the system in the course of innovations development. Infringement of feedback in the social and economic systems can lead to heavy consequences for many reasons. For example, destruction of the former USSR led to the rupture of former commodity-raw relationships between manufacturers and suppliers, which caused the decrease in the volumes of production, reduction in the number of jobs and unemployment growth. It took several years before the new commodity-raw relationships between suppliers, manufacturers and consumers were created.

The feedback provides the following functions in the system.

1. Resistance to the purposeful influence on the system.
2. The presence of inertia in the system.
3. Unpredictability of the feedback.
4. The system has entropy. The entropy is the internal and external indignations in the system which causes the system imbalance. The bigger is the size of the system the higher is the level of its entropy.
5. The mechanism of the operating influence on the system isn't always formalized. For example, the financial crisis (2008) in the USA made the negative impact on the growth of unemployment in Russia. The higher the complexity of the decision is the higher demands should be made to the decision-making.

In social and economic systems it is difficult to make an experiment and study the behavior of the system. In order to solve the problem it is necessary to

design the model of the examined system. Thus, the key problem of the system analysis is the construction of the model. A lot of tools are applied to modeling of big and complicated systems including strict mathematical methods, as well as methods based on intuition and experience of experts.

The system analysis is characterized by the use of a fundamentally different approach to the solution of the problem:

- 1) the solution depends on the task rather than on the method;
- 2) the most effective set of methods to solve a specific problem is selected.

The construction of the model of the system is a process of its description and formalization which can be reached at the expense of studying the system, as well as partial simplification of its real structures, links and relations [2, p. 53].

Decision-making is preceded by the research into the behavior of the system model when considering possible solutions to the problem. The results of the reaction of the system model are compared with the desirable result, and preliminary estimations of experts. The solution which is the most adequate and suitable for decision-makers is selected.

The evaluation of the quality of the taken decision will be made by its feedback. Experts compare the result received by means of the system model with the reaction of the real system. In the reaction of the real system is significantly different from the model data, the completion of the system model should be made. In practice this process is carried out continuously as social and economic system possesses the ability for self-regulation and self-development. Therefore there is the necessity of continuous work on the system model aimed at updating of the system model of the investigated object.

In the process of decision-making special importance is given to the conditions in which decisions are made. Depending on the degree of certainty of the problem situation there can be decisions taken in conditions of probability as well as decisions made in the conditions of uncertainty.

In the course of the system analysis it is possible to use a variety of methods which are recommended to be applied depending on decision-making conditions [5].

The choice of the decision on the basis of the system model is more reasonable as the risk of making a mistake is reduced. Thus, the application of the system analysis allows improving the quality of taken decisions.

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Экономический анализ и качество системы принятия управленческих решений

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Ключевые слова и фразы: обратная связь; система; системный анализ; управленческое решение.

Аннотация: Приводится исторический анализ формирования понятия «система», рассматривается вклад системного анализа в процедуру принятия управленческого решения. Анализируется роль обратной связи в оценке результатов управленческого решения. В заключение формируется обобщающий вывод о влиянии системного анализа на результаты принимаемого управленческого решения.

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