Section 4. Political science

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PROBLEMS OF GENERAL SYSTEMS THEORY

Abstract. The system approach was the adequate answer to a call to a classical science. Thanks to interdisciplinary character of system researches in science development there was a tendency of a universalisation of knowledge that has helped to lower duplication of theories, it is more rational to distribute forces of scientists and to concentrate resources on priority directions. The category "system" has proved the operational and high potential. The system methodology has been recognised by the effective research tool which can be applied as in natural, technical, and in humanitarian sciences.

Keywords: the system analysis, system, environment, "inputs", "exits", «a black box», "feedback", requirements, support, cybernetic model of political system, political system,

Since the mid-twentieth century, systems research and the problems of general systems theory have become increasingly important in scientific knowledge. Three reasons have led to this result. First, most of the traditional scientific disciplines, such as biology, psychology, sociology, have significantly transformed their subjects, which, as a rule, are a set of interrelated elements, representing holistic entities (systems and structures). Secondly, technological progress in the mid-twentieth century and the wide introduction of automation principles to technology have led to the fact that the main objects of modern technical design are control systems (large systems), which by their structure and the process of their creation are typical patterns of system objects (it should be noted in this connection the appearance of a whole complex of new disciplines, such as cybernetics, information theory, bionics, etc., whose main tasks consist in the study of systems of different types). Thirdly, the realization of the fact that the tasks of systems analysis were widely introduced in modern science led to the emergence of a number of generalized concepts that sought to construct a general theory of systems, a systems science, a methodology of systems analysis.

While the speech of Ludwig von Bertalanffy dedicated to these problems at the IX International Philosophical Congress in 1937 was actually overlooked, twenty years later, in his speech at the XII International Philosophical Congress, he was able to summarize certain results of developing a general theory of systems in its various variants.

It is expedient to distinguish three main stages in the development of the problems of the general theory of systems:

1) Immediate predecessors (late nineteenth-first third of the twentieth century), of which various variants of organismic concepts, the theory of integrative levels (G. Brown, R. Sellars) and the

universal organizational science of A. Bogdanov are of the greatest interest.

2) L. von Bertalanffy's general systems theory (40–50-ies of the XX century), which is characterised by a clearly expressed interest in the general worldview aspects of the general systems theory, by its focus on biology, and by the isomorphism of laws, which forms the basis of the concept.

3) the modern stage of development represented by a number of competing variants of the system-wide approach (L. von Bertalanffy. M. Mesarovich, R. Akof, W. Ross Ashby, L. Zadeh, O. Lange, A. I. Uemov). While agreeing in their understanding of the general tasks of the theory of systems, the above authors differ significantly in their characterization of the ways of constructing this concept.

It was only after World War II that we can actually talk about the organization of the systems movement. The first step in this direction was the creation in 1954 in the United States of the Society for General Systems Research that emerged largely as a result of the scientific and organizational activities of L. von Bertalanffy. During his theoretical struggle against mechanistic and vitalistic ideas at the end of 20-ies and beginning of 30-ies, L.von Bertalanffy formulated a number of principles for studying living objects as open systems, i.e. as complete sets of interconnected elements which are in the process of constant exchange of substance and energy with the environment. In the 1930s he generalized this concept, formulating the task of building a general systems theory – an interdisciplinary scientific field, aimed at developing principles for the study of systems of any type and any complexity. However, the intellectual climate of the period was not conducive to a favourable reception of these ideas, and Bertalanffy postponed the publication of material on general systems theory until better times.

The post-war period brought with it important changes in the theoretical and methodological orientation of scientific research. The emergence of cybernetics and the whole complex of related sciences significantly increased the value and generalisation in science. Bertalanffy's first publications on general systems theory were met with great interest from the scientific world.

In this environment, the Society for Research in General Systems Theory was established at the annual meeting of the American Association for Advancement of Science in 1954. Its founding members were L. von Bertalanffy, the famous philosopher, psychologist and expert in mathematical biophysics A. Rapoport, the economist C. Boulding and the biologist R. Gerard. The Society set itself the following objectives: 1) to explore isomorphisms of concepts, laws and models in different fields of science in order to transfer them from one discipline to another; 2) to contribute to building adequate theoretical models for those fields of science where they do not exist; 3) to minimise duplication of theoretical research in different scientific fields; 4) to promote the unity of science by establishing links between specialists in different sciences.

Since 1956, the Society for General Systems Research has been publishing a yearbook called General System, edited by L. von Bertalanffy and A. Rapoport. The yearbook publishes studies devoted both to the analysis of the principles and methods of systems approach, and to specific developments in applying systems theory to the problems of biology, sociology, cybernetics, psychology, and international relations. In the 50's numerous research groups of systems emerged. Such groups pursued purely practical goals, in particular, solving specific problems of systems engineering. In the USA the most powerful of these groups are the RAND Corporation, the Systems Development Corporation and others.

In the USA, along with the Society for General Systems Research this work is carried out by the System Research Center, established in 1959 at Case Western Reserve University. The leading figures of this Center were the founder and former director of the Center D. Ekman, director M. Mesarovich – a specialist in mathematics and computer engineering, R. Ackoff – one of the founders of the method of operations research, D. Fleming, I. Lefkowitz.

The Case System Centre has set itself the task of stimulating and coordinating research in systems science, systems engineering and mathematical systems theory, as well as training personnel in these fields of science. The centre focuses on systems theory problems (decision-making, multi-level multi-objective systems), as well as modelling of system processes

The widespread use of the term "system" in modern science symbolises the commitment of a certain group of scientists to a systems worldview. The emerging trend can be termed the systems movement, as it brings together representatives from different fields of science and technology has an interdisciplinary character. The methodology that guides the latter can be termed the systems approach.

Systems analysis is one of the methods of investigating complex organised objects, which consists in considering them as holistic entities with integrative qualities. The bankruptcy of the mechanistic worldview has put on the agenda the development of new principles of scientific cognition, which focus on the integrity and complexity of the objects under study.

Another methodological prerequisite for the formation of the systems approach was an attempt to overcome elementarism. Elementarism proceeded from the fact that the problem of researching complex objects acted as a problem of reducing the complex to the simple, the whole to a part, and if a researcher did not know the initial atom, a simple element, it was regarded only as a sign of weakness and undeveloped cognition. On the contrary, the concept of integrity insisted on the irreducibility of the complex to the simple, of the whole to the part, on the presence of the integrated object of such properties and qualities, which could not be attributed to its parts and the nature of which often was trying to find out the reasons [1].

Another prerequisite for the systems approach was the expansion of the scientific notion of causality that emerged in the process of criticizing mechanistic ideas. The basis of the mechanistic worldview is the principle of unambiguous determinism, in which each cause necessarily produces a single consequence, cognition was carried out within the dichotomy of 'necessity-accident'. Such a straightforward determinist approach could not provide satisfactory answers to the questions posed by biology, psychology and sociology.

Also most influential in breaking down the mechanistic worldview was the creation of statistical physics and the theory of relativity. Statistical physics proved the high value and accuracy of the probabilistic approach compared to the principle of unambiguous causality. The theory of relativity was a direct challenge to the mechanistic picture of the world, as it disproved all its postulates.

The relevance of the emergence of the systems approach was strengthened by the need to create conceptual schemes that could facilitate mutual understanding between representatives of different sciences, avoid duplication of theoretical work, and increase the effectiveness of scientific research.

What is the concept of a **system**?

The science has not yet worked out a unified position, a generally accepted definition. I. Blauberg and E. Yudin believe that, from the methodological point of view, the meaningful way of defining **the concept of a system** through an interrelated sequence of features, when adding each new feature increasingly limits the class of objects falling under the definition, but at the same time the remaining objects receive a more and more detailed substantive characteristic [1], seems promising.

R. Ackoff believes that a **system** can be defined as any entity, conceptual or physical, that consists of interrelated parts [2]. A. Hall and R. Feigin define a system as a set of objects together with relationships between objects and between their attributes (properties) [3].

L. von Bertalanffy gives the following definition: a **system** is a complex of interrelated elements, so interconnected that if you change one element, the rest will also change and, therefore, the whole totality will change [4].

Several definitions of a **system** can be found in Webster's Dictionary:

1. A complex unity formulated by many, usually different factors and having a common plan or serving a common purpose.

2. A collection or combination of objects united by regular interaction or interchangeability.

3. An orderly functioning wholeness, totality [5].

A. Rapoport believes that a **system** is not simply an aggregate (totality) of units (particles, individuals) where each unit is governed by the laws of causality acting upon it, but an aggregate of relations between these units. Rapoport makes an interesting observation. He writes: the more organised a system is, the more opportunities it has to counter perturbations with respect to 'achieving its chosen goal'.

Cybernetic approaches to understanding a system. According to M. Drenik, a **system** in the modern language is a device that takes one or more inputs and generates one or more outputs. R. Kershner's view, a system is a collection of entities or things, animate or inanimate, that takes some inputs and acts on them to produce some outputs, while pursuing the machinations of certain functions of inputs and outputs [6].

L. Blumenfeld recognises the quality of systemicity only when four conditions are met: A system is a totality of real or imaginary elements separated from the rest of the world in any way. This totality is a system if: 1) the links existing between the elements are given; 2) each of the elements within itself is considered indivisible; 3) the system interacts as a whole with the world outside the system; 4) when evolving through time, a totality will be considered as one system if an unambiguous correspondence can be drawn between its elements at different points in time [6].

V. Sadovsky and E. Yudin distinguish four criteria: 1) a system is an integral complex of interrelated elements; 2) it forms a special unity with the environment; 3) as a rule, any system under study is an element of a higher-order system; 4) elements of any system under study in turn usually act as lower-order systems [5].

Thus, a system is a theoretical construction and an actually existing property of some class of objects, characterized by the following features:

1) the system is characterized by integrity, interdependence of elements (subsystems), leading to the emergence of an integrative quality;

2) the system is distinguished on the background of the environment;

3) the system communicates with the environment as a whole;

4) When one of the elements (subsystems) changes, the quality of the whole system changes.

The most important thing, according to L. von Bertalanffy, about the systems approach is its **interdisciplinary nature**. Bertalanffy wrote: "If you carefully look through the yearly periodicals of the Society for General Systems Research, you will easily find the following important fact: similar and even identical in structure reasoning applies to phenomena of very different kinds and levels – from chemical reaction networks in a cell to animal populations, from electrical engineering to social sciences… Moreover, in many cases there is formal correspondence, or isomorphism, of general principles and even special laws. The same mathematical description can be applied to very different phenomena. From this, in particular, it follows that the general theory of systems, among other things, also facilitates scientific discoveries: a number of principles can be transferred from one field to another without having to duplicate work, as was often the case in science in the past" [4].

System concepts

"Environment". As noted by A. Hall and R. Feigin, the environment is the totality of all objects whose properties change affect the system, as well as those objects whose properties change as a result of the behavior of the system [3].

The term **"subsystem"**. From the point of view of cybernetics, a subsystem is a set of elements united by a single process of functioning, which in interaction implement a certain operation, necessary to achieve the goal of the system as a whole [7].

"Inputs" and "outputs". Communication between the system and the environment takes place through "inputs" and "outputs". Energy, substance or information enters the system through the "input" and the processed energy, substance or information is output to the environment through the "output". Information is understood in a cybernetic sense, as "the designation of content received from the external world in the process of our adjustment to it and the adjustment of our senses to it. The process of acquiring and using information is the process of our adjustment to the contingencies of the external environment and our living in that environment [8].

"Black box". There are systems in nature which are very difficult to study because of the fundamental impossibility for the researcher to look inside them. The application of the research black box principle, can prove very useful. The black box principle originated in electrical engineering, but has since spread to all fields of scientific knowledge. The essence of the method is this: the researcher, manipulating at will the inputs and making any observations on the outputs, must infer what is inside the box [9]. This approach opens up a wide range of possibilities for studying systems whose structure is either unknown or too complex to be able to infer their behaviour from the properties of the constituent parts of these systems and the structure of the links between them [7].

The term **"feedback".** N. Wiener defines feedback as "the property that allows future behaviour to be regulated by past performance of orders", or as "a method of controlling a system by incorporating the results of its previous performance of its tasks" [8].

Feedback is the influence of the outputs of some system on its inputs, expressed in the influence of the results of the functioning of this system on the nature of its activities. Unlike direct communication, which is the transfer of information from a controlling subject to a controlled object, feedback performs the function of informing a subject about the results of commands and serves as a means of correcting the activity of a controlling subsystem and stabilizing the functional parameters of the whole system. Forming a closed circle of information circulation, direct and feedback communication contributes to more effective achievement of goals by the system. According to academician V. Arnold, management without feedback always leads to disasters [10]. Without feedback we cannot even talk about governance.

The understanding and concepts of the political system

To begin with, it is necessary to understand that the systems approach in political science is to perceive political systems as organisms that are in their environment and respond to impulses coming from them. All human actions and behaviour are treated as a systemic order phenomenon in their entirety.

The systems methodology comes from sociology, thanks to T. Parsons. Parsons laid the foundations for a systemic analysis of social life as a whole, presenting society as an interaction of four subsystems: societal community, fiduciary subsystem, politics and economy. The first subsystem consists of norms and has the function of integration; the second includes values and is responsible for the reproduction of the pattern; the third is composed of collectives and serves to achieve goals; the fourth has roles as structural components, and the main function is adaptation of the social system. Parsons developed a structural-functional model of the social organism. According to his theory, society is an infinite set of human interactions, with aspects of it that are relatively stable (structures) and have specific roles and meanings (functions). Social institutions, according to Parsons, are a set of patterns and models that determine the expected behavior of members of society, and which form the foundation of the structure of the social system, being relatively stable formations that order social actions. Parsons also introduces the notion of process, which is paired with the notion of structure. Function links structure and process and establishes their meaning for the system.

Parsons views society as a social system comprising four subsystems: adaptation (economics), purposefulness (politics), latency (institutions of socialisation) and integration (social community).

Politics, according to Parsons, as a subsystem of society includes the definition of collective goals, the mobilisation of resources and the decision-making necessary to achieve these goals.

Parsons identifies three institutions in the political subsystem: leadership, authority and regulation.

The institutionalisation of leadership is understood by Parsons as a model of 'a normative order through which certain sub-groups, by virtue of their position in a given society, have the permission and even the obligation to take initiatives and decide for the sake of achieving community goals together with the right to involve that community as a whole'.

The second institution is the institution of government. Power accumulates in the institutions of government and comes from there.

The third institution of politics is regulation. It consists in issuing norms and rules, which create a clear basis for social control. This category includes the law itself, professional norms, party and association statutes.

Thus, the political system is an autonomous and open system It maintains constant relations and exchanges with the rest of the subsystems of society. As in the economic system, the same kind of exchange of factors (inputs) and products (outputs) can be found.

Tolkott Parsons laid the foundations for systems analysis of social life in general, David Easton applied general systems theory to the analysis of politics. According to Easton, politics is a 'volitional distribution of values'. A political system can be defined as a set of interactions through which a volitional distribution of values occurs.

Easton sees political life as 'a system of behaviour embedded in the environment and thus subject to its influence, but with the capacity to respond to it'. "Systems analysis of political life is based on the notion of a 'system immersed in the environment' and subject to its influence … Such analysis assumes that the system, in order to survive, must have the capacity to respond.

The political system is seen as a black box. Easton leaves out what goes on inside it, as systems analysis covers mainly the system's relationship with the environment. The latter is seen as the intra-social and extra-social environment.

The intrasocial environment includes non-political systems that are part of the same society as the political system: ecological, biological, psychological, social systems.

The extra-social environment includes all those systems that exist outside global society: international political, ecological and social systems.

The political system is not a 'closed' but an 'open' system, maintaining numerous and diverse interrelations and interchanges with the environment, immersed entirely in it and in complex relations with it. Easton compares the political system to the economic system. The political mechanism functions in the same way as the economic mechanism. There is also what goes into the mechanism ("inputs") and what comes out of it ("outputs"). There is what feeds into the system and what the system produces.

"Costs" ("input"). Easton distinguishes between two types of input: requirements and support. They must be continuously fed into the system, otherwise it will cease to function due to 'underloading'. Excessive demands on the system's ability to produce relevant outputs (i.e. value distribution) can lead to system overload or potential stagnation. A high level of support is highly desirable for the system, but if it fails to meet the requirements, it loses support and self-preservation. It is a question of a certain dynamic balance of requirements and support.

1. Demands. Demands can be defined as a form of expression of opinion on the legitimacy of a binding distribution by actors of power. A demand can be narrow, specific and simple. Flooding can stimulate a demand for a dam; the revelation of corruption in government can stimulate a demand for greater control over lobbying activities. In addition to demands, a lot of different information is introduced into a political system: expectations, opinions, motivations, ideolo-

gies, interests and preferences of the members of a given system. All these may coincide with the demands.

The accumulation of a large number of demands creates an overload. This overload can be quantitative if the requirements are too numerous and qualitative if they are too complex. Quantitative overload relates to the actual accumulation of numerous demands, which the over-saturated system can no longer cope with: parliament cannot consider all the texts of bills that are submitted to it; government cannot consider all the demands that beset it, etc. Easton compares this quantitative overload to airport congestion.

Qualitative congestion relates to the complexity of the demands placed on the system, which relate to difficult problems that take a long time to resolve.

Easton identifies three main functions of demands:

a) Expression of demand. Through this function, various demands are articulated, addressed to the political system predominantly through pressure groups. The process by which individual groups and individuals make demands on those who make political decisions is called articulation of interest by Almond.

b) demand management. Demands can quickly overwhelm the system if their flow is not filtered, channeled and regulated. Easton divides regulation into structural and cultural regulation.

Structural regulation refers to the exercise of specialised functions in the filtering and transmission of demands. Access to the political system is through structural doors guarded by gatekeepers. At the entrance to the political system, they channel, that is channelise and filter demands. The number and diversity of these gatekeepers and doors increase with the development of society. Parties, the upper classes and parliamentarians are the structures that regulate demands.

Cultural regulation relates to norms, values and attitudes that do not allow or restrict certain demands. Such cultural prohibitions may concern both the content of the demands (some demands are considered (unreasonable, immoral, etc.) and the form (e.g. Western political culture prohibits the use of violence to express political demands).

Nevertheless, the system, despite its dual regulation, may face overload. In this situation, the system has two choices: to increase the capacity of communication lines by increasing the number and diversity of information channels (through specialisation of personnel, growth of bureaucracy, etc.), or to recycle demands in such a way as to lead to a reduction in them.

c) Reducing demands. With this function the flow of demands is systematised, streamlined, reduced to a limited number of alternatives which are provided to the political system. A multitude of identical demands are reduced to a single demand. Easton calls this a combination, a 'combination of demands', while Almond calls it an aggregation of interests. Political party programmes serve this process. In Western systems, parties are the main structures of demand reduction. By aggregating the demands of those whose interests it expresses, the party formulates a single demand which is put before the authorities.

2. Support. In addition to the demands which tend to weaken the political system, the latter enjoys support which strengthens it. Support encompasses all positions and behaviours favourable to the system: patriotism, respect for institutions, loyalty to the leadership in power, demonstrations or campaigns in support, fulfilment of military duty, payment of taxes, etc.

Easton names three types of support:

a) support for the political community as a whole (loyalty to the collective, the national community);

b) support for the regime;

c) support for the authorities.

"Outputs". Everything that "enters" the political system is responded to by an "output": it satisfies demands or evokes support. The "output" of the system can be new laws, regulations, subsidies, information campaigns, public allocations. According to Easton, the system responds with its "product" to the impulses it receives; these "products" are decisions and actions. Decisions are enforced by law. Actions are not coercive, but they also affect the lives of citizens (economic and social policy, foreign policy).

The importance of the emanating factors of a system is that they serve to conceptualise the way the system responds to the environment. Outputs are not final factors. Rather, they are a fragment of a continuous loop of action ("feedback loop") in which the "input" and "output" directly or indirectly affect each other, the entire political system and the environment.

"Feedback loop". This concept was introduced to refer to the return of information and how to take advantage of it. Feedback is the main mechanism for resolving tensions in society, but it only fulfils this function because of the ability of power to respond to impulses coming into the system. Feedback is referred to as "the property of regulating patterns of action in the future, based on the past".

Feedback allows the system to make sense of how close it has come to its goals and how it should change its behaviour to get as close to those goals as possible. Without feedback, each 'outgoing' factor would be devoid of interconnectedness with the other factors. Each interaction – an "interaction" with the environment in the form of an "outgoing" factor, followed by feedback information about the consequences, complements the knowledge of the system coming from the decision-making centre. This information is about the nature of the system itself, its environment, its resources, the resistance it encounters in exercising its will. Feedback allows the members of the system to learn to know themselves.

If the power ignores feedback, the effectiveness of the implementation of its goals is low, because it will not be able to weigh the level of support of the system's representatives. Feedback is fundamental both to eliminate errors in order to improve the system and to find new goals and ways to achieve them.

Proponents of the structural-functional approach in the study of the political system are G. Almond and D. Powell. Their names are associated with the development of comparative analysis of political systems, which involves the transition from the study of the formal components of the political system to the concrete manifestation of political behaviour.

For Almond and Powell, structure and culture take centre stage in their analysis. By "structure" they mean the activities that shape the political system. That part of people's activity that is involved in the political process is called a role. Roles are the units from which all social systems, including political systems, are composed. Therefore, one of the main components of the political system is the political role. Specific sets of interrelated roles constitute structures. A judge is a role, a court is a structure of roles.

Almond and Powell define the political system as a set of roles and their interactions, carried out not only by government institutions but also by all structures in their political dimension. By structure they mean a set of interrelated roles.

Almond and Powell liken the political system to a global society: they view it by immersing it in its environment. Almond and Powell's functional approach distinguishes three analytical levels in the political system: considering the system in its interaction with its environment, in its internal functioning, and in its maintenance and adaptation. Almond and Powell divide the functions of the political system into incoming and outgoing. The study of incoming and outgoing functions reveals the importance of two important mechanisms that are necessarily present in any system of governance. First, there is the supervisory mechanism, which captures the demands and support that make the system work. Secondly, attention is drawn to the fact that there must be a conversion (transforming) mechanism which transforms incoming impulses into outgoing products in the process of selection, limitation and ordering.

A specific feature of Almond's structural functionalism is the comparative study of political systems that compares system capabilities, conversion functions, support and adaptation functions and relationships between levels of functioning. G. Almond studied the negative consequences of the practice of transferring Western systems to developing countries in the 50 s and 60 s. Caught in an economic, cultural and religious environment different from that of the West, the political institutions were unable to perform many functions and achieve sustainable development of society. This practice gave impetus to development of comparative studies of political systems.

G. Almond and D. Powell expanded the scientific horizons of political system theory. Almond enriched political system theory by examining the role of cultural factors, as well as the comparative study of different types of political systems.

Karl Deutsch, a professor at Harvard University, proposed a highly daring system of cybernetic analysis of the political process. Politics and government are presented essentially as a process of managing and coordinating the efforts of people to achieve set goals, with the political system being identified with a projectile pointing at a target.

The political system is like a cybernetic self-tuning system. Control lies in piloting, which depends on information about the position of the target, the distance left to cover, and the results of previous actions. K. Deutsch gives an analysis in terms of feedback, in terms of managing actions based on experience of previous mistakes.

According to K. Deutsch, the political system includes four blocks (receptors, memory and values block, decision-making centre, effectors), which are responsible for different levels of processing incoming information. There are several stages in the process of intra-system conversion:

1) First, information from the internal and external environment is received by receptors (sensors). In addition to simple interception, the receptor carries out coding, information selection and data processing.

2) The information then enters the memory and values block, where it is processed and serves as the basis for the DMC (decision-making centre) block. The memory and values block accumulates and stores information, comparing new information with information about already existing experience.

3) Based on the findings of the memory and values block, the DMC prepares decisions and gives orders to the effectors, i.e. executing units.

4) The effectors implement the decisions of the DMC. There is also a feedback in the scheme. Receptors receive information not only from the environment, but also from effectors, which inform them about the results of implementation of decisions and about the state of the system itself. Information on the correction of decisions is returned to the system as a new input, new inputs and is processed. The processed information is fed back into the DMC memory block.

According to K. Deutsch, the system is not in "equilibrium". It is involved in a constant search for, and refinement of, a goal, the realisation of which depends on the ratio of four quantitative factors:

1) The information load on the system. It corresponds to the extent to which there is a change in the position of the target in relation to the search system. In politics, it corresponds to the magnitude, scale and frequency of change that the government must deal with.

2) Lag (delay) in the response of the system. It refers to the time lag between receiving the information about the position of the target and the action of the search engine. K. Deutsch gives the example of the time lag that elapses between receiving information about the position of the enemy aircraft and the moment when the anti-aircraft guns are actually pointed at the spot where it will be shot down. In politics, there may be a lag that will force the government or party to respond to a new emergency.

3) Increment, i.e. the sum of the changes in one or another of the functioning parameters as a result of corrective operations. If the increment is large, there is a danger that over-adjustment will deviate the system from the desired direction. An overreac-

tion deviates from the desired goal. In politics, increment means the responsiveness of the political system to new facts.

4) Precedence is the distance between the correctly predicted position of a moving target and its actual location at a given moment according to the latest signals received. Considering the bias, the hunter shoots ahead of the flying bird, he does not aim at the bird itself, but at the point ahead along the trajectory of its flight.

When reaching the target, says K. Deutsch, possibility of success is always inversely proportional to information load and delayed reaction of the system. Up to a certain point, the chances of success can be related to the magnitude of the increment, but when its level is too high, the relationship becomes reversed. The chances of success are always related to "anticipation", to being ahead of the curve.

Thus, a political system acts as a cybernetic system: it makes its own decisions, based on information about the external environment and about its own state. The importance of information for the stability of the system cannot be overestimated. It is necessary for information to nerve the system with its many networks, the "nerves of control". The value of Deutsch's theory lies in the fact that it makes it possible to assess the effectiveness of political systems without excessive ideologicalism.

Therefore, the **systems approach** was an adequate response to the challenge of classical science. Due to the interdisciplinary nature of systems research in the development of science, the trend of universalization of knowledge appeared, which helped to reduce duplication of theories, to distribute the forces of scientists more rationally and to concentrate resources on priority areas. The category of system proved to be operational and of high potential. Systems methodology has been recognised as an effective research tool that can be applied in both natural, technical and human sciences.

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