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## General theory of systems, cybernetics and evaluation of human competence by solving present crisis problems of civilisation

Ján Porvazník, Ivana Ljudvigová\*

University of Economics in Bratislava, Dolnozemská cesta 1/b, 852 35 Bratislava, Slovakia

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### Abstract

Present crisis problems of civilisation create the opportunity and need to analyse the possibilities of use of knowledge from system theory of cybernetics and evaluation of human competence, which has been accumulated and published up to now. Use of this knowledge should help, among other non-elaborated scientific knowledge to stop the impact of the global crisis and to ensure sustainable development of human civilization. Uses of this knowledge allude to several facts. Primarily, use of knowledge of cybernetics is in practice frequently connected with natural and scientific problems and their solving. Use of knowledge of the general theory of systems, however not all, collides with notional problems. Nevertheless, this knowledge can be used in wider scope of activities. And in expertise, even if knowledge is oriented mainly on evaluation of “non-living objects” and intellectual property, the evaluations of working competence occur more and more.

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### 1. Holism of the system – definition

The sickness of today’s world is directly related to our inability to see it as a single unit (Senge, 1995). Systemic management is considered as a discipline of the perception of units through their parts and structures or it is the

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\* Ivana Ljudvigová. Tel.: 00421911220425  
*E-mail address:* [ivana.ljudvigova@euba.sk](mailto:ivana.ljudvigova@euba.sk)

ability to perceive very fine interactions (relationships and links) which provide live, dynamic systems with the unique character of a unit.

Holism as a subsystem has a unique characteristics which is not common in any other part of a unit. It is something new, emergent, being created from the mutual interaction of elements (parts) and is considered as a holistic management competence. The competent manager is not and cannot be a manager, who is only professionally skilled, or a worker with enormous knowledge, but who is practically unable to apply.

A manager's competence is a holistic quality and emergent feature which is attributed a person due to his or her professional ability, social maturity, and practical skills in order to prevail over egoism and ignorance. On the one hand, the human being is the most perfect creature in the nature; on the other hand, they must continuously learn to be competent in relation to nature and to other people.

Systemic thinking is a discipline that teaches us to see structures, the relationships between competence elements and between the personal maturity, expert knowledge and practical skills which are not obvious all the time – but which are a basis for the understanding of competence as the holistic manifestation of a personality. If we succeed in perceiving competence as a whole, holism or emergent, we are able to “care for its health”; we can denominate and identify where to increase the level of our knowledge, skills or maturity by means of education – upbringing, study and training.

Ross Ashby (1954) presented real determination of aims for the unit and its parts, which is a basis of the function of planning in management by results of the research so-called homeostat (homeostasis). He came to the conclusion that the basic condition of homeostat (and thus of determining of aim of the unit and its parts) is an equality of all parts of the unit and use of relations of equality between them.

In the structures of the unit, individual parts have different hierarchical positions resulting from subordination of differentiated tasks of differentiated task of the unit. It is called the equifinality and was elaborated by L. Bertalanffy. Hierarchy of the parts in the unit is usually multilevel one. Equifinal organization of parts in the unit is oriented on securing of the fulfilment of set objectives by means of organizing function for particular hierarchically arranged parts and the unit, while using the relations of superiority and subordination for fulfilment of the aim. If for example the smallest part of the unit doesn't reach the objective resulting from its differentiated task, the objective is not reached by the part into which it belongs to, and thus the whole unit can't reach the objective (the example of the Greece and other states of the European Union).

N. Wiener (1960) suggested to divide all parts of the unit into two parts, in order to ensure the stability and equilibrium state. These two parts can be in a simplified way called the subject of the management and object of the management, among which vertical relationships are developed.

The subject of management monitors (checks) outputs (results) of the object of management through the feedback. By this, it monitors the activity of the unit as well as reaching the set objectives. Connection through the feedback in a vertical hierarchical unit composed of several parts passes through several subjects and objects of management in the given unit.

## **2. The links and relationships (their types) between the parts and units in a system's structure**

The basis of the building of any unit structure is to specify the differentiated task – or usefulness of every element or part and to look for such ordering by means of identifying the links and relationships which are most convenient for them all – element, part and unit.

In practice, however, the question of building the structures or networks of a unit's arrangement is done simultaneously in both ways:

- a) from the unit to its parts and elements
- b) from the elements and parts to the unit

The term interaction – mutual action of units, parts and elements in a system, doesn't determine the material, quantitative or contents aspect of interaction more closely. The orderliness of the units, parts and elements in the structure of systems, or the level of their orderliness depends on the knowledge and use of both aspects of interactions, i.e. the material, quantitative (formal). In this case we speak about the relationships between structural components.

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