

STRUCTURE OF THE SET

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ABSTRACT: THE ARTICLE PRESENTS A THEORETICAL MODEL OF THE MAIN ELEMENTS THAT MAKE UP THE SET OF A SYSTEM. THE SET IS A BASIC CHARACTERISTIC OF A SYSTEM. THIS CHARACTERISTIC INCLUDES THREE KEY INGREDIENTS: FIXED, NEUTRAL AND VARIABLE. THE FIXED, NEUTRAL AND VARIABLE SETS EXPRESS THE INITIAL DIFFERENTIATION OF THE STEPLIKE STRUCTURE OF THE SET. THE SECONDARY DIFFERENTIATION FORMS A HIGHER DEGREE OF SMOOTHNESS OF THE TRANSITION FROM ONE TO ANOTHER ELEMENT OF THE SET. THE SECONDARY DIFFERENTIATION IS A RESULT OF A SECONDARY CYCLE OF DEVELOPMENT OF THE STRUCTURE OF THE SET OF A SYSTEM. THE SET IS A COMPLEX SYSTEM OF INFORMATION CONVERTERS. THEY ARE CONSISTENTLY LINKED IN THE ORDER OF THEIR FORMATION. THE SET CAN BE DEFINED AS A CONTENT OF A SYSTEM PER UNIT OF ITS CONTACT WITH THE EXTERNAL ENVIRONMENT.

Introduction

The structure of a system determines its behavior. The study of the structure of a system has an important matter for the understanding of the mechanisms which form its behavior.

The article presents a theoretical model of the main elements that make up the set of a system.

Uznadze defines the set as a complete state of the subject. This is a moment of dynamic determination. This is an entire purpose of a particular side and a specific behavioral activity of a given object.¹

The set is a basic characteristic of a system. This characteristic includes three key ingredients: fixed, neutral and variable. These ingredients are complemented by coherent whole.

The fixed set (attitude) manages the strategic purpose of the behavior of the system. The fixed set is as a manifestation of the individual development of the system or as a modulation of its behavior by instinctive reactions.

The variable set manages the tactical direction of the behavior of the system. This purpose is manifested as a purposeful behavior of the system.

The neutral set is a mediator between the fixed and variable set of the system. The neutral set forms a relatively smooth transition between tactics and strategy in the behavior of the system.

¹ Узнaдзe Д.Н.(1961) Экспериментальные основы психологии установки, Изд. АН Грузии, Тбилиси, с.81 [Uznadze D.H. (1961) Experimental foundations of the theory of the Set, Edition of the Academy of Sciences of Georgia, Tbilisi, p. 81].

The transition from strategy to tactics increases the variety of methodological principles used in the process of searching for a solution. The degree of concreteness in the behavior of the system increases accordingly.

The proposed ideas about the structure of the set are synthesized on the basis of a multi-annual analysis on the information about the human behavior.

Method

The structure of a particular system is formed first and then its interaction with the external environment is formed.

The fixed structure of the system, represented by its fixed set is born first.

Then a need for integration with the external environment appears. A part of the fixed set forms the neutral set, that it provides a contact between the system and environment.

In the process of interaction between the system and the environment a part of the neutral set quickly forms reaction, that stores the system. *This part is converted to a variable set.*

On the basis of the ancient Yin-Yang principle, it follows that in one pole there are elements of other pole and vice versa. This means that the structure of the variable set includes elements that characterize a fixed set. And vice versa: the structure of the fixed set contains elements that characterize the behaviour of the variable set. These ingredients are not distinguished sharply. There is a data buffer between them under the form of a neutral set.

This means that:

- there are projections of fixed and neutral set in the structure of the variable set,
- there are projections of variable and neutral set in the structure of the fixed set,
- there are projections of the fixed and variable set in the structure of the neutral set.

The fixed, neutral and variable sets express the initial differentiation of the steplike structure of the set. The secondary differentiation (fig.1) forms a higher degree of smoothness of the transition from one to another element of the set. The secondary differentiation is a result of a secondary cycle of development of the structure of the set of a system.

Structure

The development of a particular system or process is according to the Hegel's law for a negation of the negation.

The differentiation of the structure of the set slows down the transitional process that flows through the set. The delayed introduction of the external impact increases the resistance of the system.

In the process of the individual development of a system change the proportions between the components of the set. They adapt to the start program of the system. For example, the child, the young and the old man exhibit different behavior under the influence of the same problem.

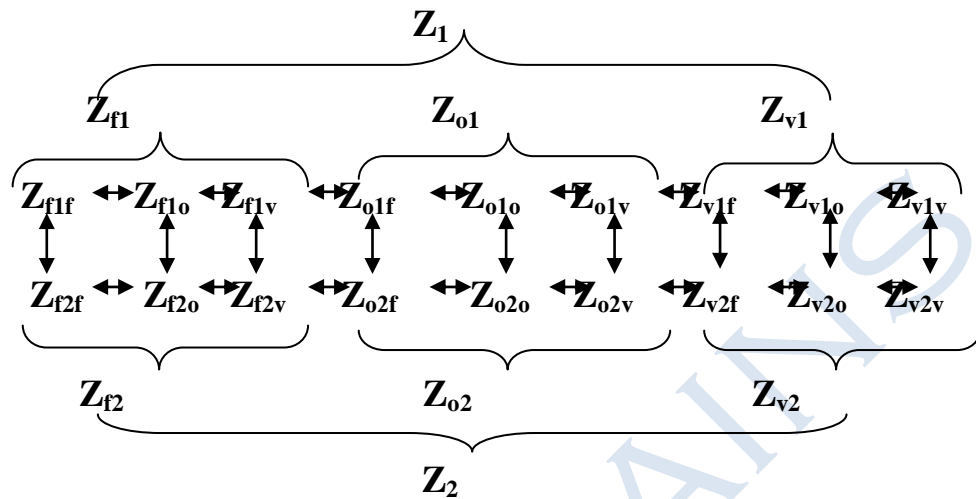


Fig.1. Main direct links \leftrightarrow \blacklozenge between subsystems of the set Z of a system

Z_1 - content

Z_2 - form

Z_{f1} - essence

Z_{f2} - connectivity

Z_{o1} - neutral condition

Z_{o2} - neutral relation

Z_{v1} - condition

Z_{v2} - relation

Z_{f1f} , Z_{f1o} , Z_{f1v} - essence: fixed (f_{1f}), neutral (f_{1o}), variable (f_{1v})

Z_{o1f} , Z_{o1o} , Z_{o1v} - neutral condition: fixed (o_{1f}), neutral (o_{1o}), variable (o_{1v})

Z_{v1f} , Z_{v1o} , Z_{v1v} - condition: fixed (v_{1f}), neutral (v_{1o}), variable (v_{1v})

Z_{f2f} , Z_{f2o} , Z_{f2v} - connectivity: fixed (f_{2f}), neutral (f_{2o}), variable (f_{2v})

Z_{o2f} , Z_{o2o} , Z_{o2v} - neutral relation: fixed (o_{2f}), neutral (o_{2o}), variable (o_{2v})

Z_{v2f} , Z_{v2o} , Z_{v2v} - relation: fixed (v_{2f}), neutral (v_{2o}), variable (v_{2v})

The variable set has three main varieties:

- typical: Z_{vf} ,
- specific: Z_{vo} ,
- unique: Z_{vv} .

The known systems are information open to the external environment. The external impact determines their behavior. The external impact is in the entrance of each system. The projection of the external impact upon a particular system is perceived by it as relation to this impact.

The adaptation of the characteristics of the system to the external impact formed its condition. It is evident in the reaction of the system of external impact.

The ratio between output and input signal represents a gear ratio. The gear ratio is the relatively sustainable characteristic of the system. The gear ratio identifies the the object and harmonizes it to the external environment.

The ratio between condition and relation of the system forms a variable set of this system:

$$(1) \quad \mathbf{Z}_{vf} = \mathbf{Z}_{v1f} \cdot \mathbf{Z}_{v2f}^{-1},$$

$$(2) \quad \mathbf{Z}_{vv} = \mathbf{Z}_{v1v} \cdot \mathbf{Z}_{v2v}^{-1},$$

$$(3) \quad \mathbf{Z}_{v0} = \mathbf{Z}_{v10} \cdot \mathbf{Z}_{v20}^{-1},$$

where:

\mathbf{Z}_{vf} – fixed (f) component of the variable (v) set of a system,

\mathbf{Z}_{v1f} – condition (1) of the fixed (f) component of the variable (v) set of a system,

\mathbf{Z}_{v2f} – relation (2) of the fixed (f) component of the variable (v) set of a system,

\mathbf{Z}_{vv} – variable (v) component of the variable (v) set of a system,

\mathbf{Z}_{v1v} – condition (1) of the variable (v) component of the variable (v) set of a system,

\mathbf{Z}_{v2v} – relation (2) of the variable (v) component of the variable (v) set of a system,

\mathbf{Z}_{v0} – neutral (o) of the component of variable (v) set of a system,

\mathbf{Z}_{v10} – condition (1) of the neutral (o) component of the variable (v) set of a system,

\mathbf{Z}_{v20} – relation (2) of the neutral (o) component of the variable (v) set of a system.

The neutral set characterizes the transformation of information that is results from the life experience of the system in the process of its individual development and there are three main varieties:

- typical: \mathbf{Z}_{of} ,
- specific: \mathbf{Z}_{oo} ,
- single: \mathbf{Z}_{ov} .

Examples for neutral set:

- The fluid is transition between gas and solid body.
- Sodium-potassium pump realises active transport of ions (Na^+ and K^+) through the membranes.
- The Money are an mediator between the running costs of the people (their variable set) and their wealth (their fixed set).

$$(4) \quad \mathbf{Z}_{of} = \mathbf{Z}_{o1f} \cdot \mathbf{Z}_{o2f}^{-1},$$

$$(5) \quad \mathbf{Z}_{ov} = \mathbf{Z}_{o1v} \cdot \mathbf{Z}_{o2v}^{-1},$$

$$(6) \quad \mathbf{Z}_{oo} = \mathbf{Z}_{o1o} \cdot \mathbf{Z}_{o2o}^{-1},$$

where:

\mathbf{Z}_{of} – fixed (f) component of the neutral (o) set of a system,

\mathbf{Z}_{o1f} – condition (1) of the fixed (f) component of the neutral (o) set of a system,

\mathbf{Z}_{o2f} – relation (2) of the fixed (f) component of the neutral (o) set of a system,

\mathbf{Z}_{ov} – variable (v) component of the neutral (o) set of a system,

Z_{o1v} – condition (1) of the variable (v) component of the neutral (o) set of a system,
 Z_{o2v} – relation (2) of the variable (v) component of the neutral (o) set of a system,
 Z_{oo} – neutral (o) component of the neutral (o) set of a system,
 Z_{o1o} – condition (1) of the neutral (o) component of the neutral (o) set of a system,
 Z_{o2o} – relation (2) of the neutral (o) component of the neutral (o) set of a system.

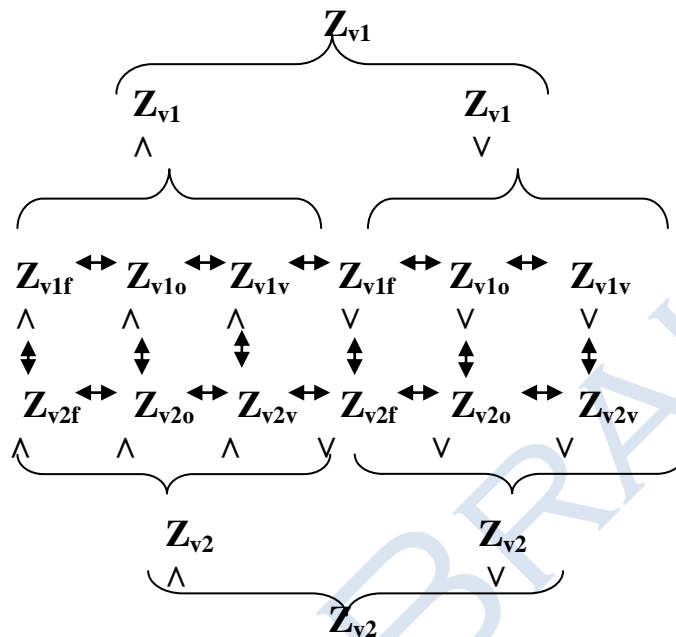


Fig.2. Main direct links ↔ ↕ between subsystems of the variable set Z_v of a system

$Z_{v1f}, Z_{v1o}, Z_{v1v}$ - internal condition: fixed (v_{1f}), neutral (v_{1o}), variable (v_{1v}),
 $\wedge \quad \wedge \quad \wedge$

$Z_{v1f}, Z_{v1o}, Z_{v1v}$ - external condition: fixed (v_{1f}), neutral (v_{1o}), variable (v_{1v}).
 $\vee \quad \vee \quad \vee$

$Z_{v2f}, Z_{v2o}, Z_{v2v}$ - internal relation (to himself): fixed (v_{2f}), neutral (v_{2o}), variable (v_{2v}),
 $\wedge \quad \wedge \quad \wedge$

$Z_{v2f}, Z_{v2o}, Z_{v2v}$ - external relation (to the environment or to specific objects from it):
 $\vee \quad \vee \quad \vee$
 fixed (v_{2f}), neutral (v_{2o}), variable (v_{2v}).

The degrees of manifestation of the internal condition have a projection in the classification of biologically active points of the body:

- The points wire are inherent in healthy organs or systems. They characterize the internal variable set. This condition is adequate of the processes in the external environment and manifests itself as a vital balance.

- The semiconductors-points are inherent in a sick organ or system of the body. They characterize the internal neutral condition. This condition is characterized by deviation from the relatively stable steady state of the organism.
- The insulator points are inherent in chronic diseases of the body. They characterize the internal fixed condition. This condition is characterized by large deviations from the relatively stable steady state of the organism.

The degrees of manifestation of the external condition have a projection in the classification of extra funds to form a resistance to the organism:

- The external fixed condition can be illustrated by technical means, which are continuously connected with the body and form its sustainability.
- The external neutral condition can be illustrated by technical means that are periodically connected to the body and form its sustainability.
- The external variable condition can be illustrated with medication or stimulants, which, if necessary, be included in the body and form its sustainability.

The degrees of manifestation of the internal relation have a projection in the classification of the subject's relationship to itself:

- The internal fixed relation can be illustrated by the self-confidence of the subject – sustainable assessment of his own value.
- The internal neutral relation can be illustrated by the periodically formed subject's self-esteem in the transition between two current arising self-esteems.
- The internal variable relation can be illustrated by the current self-esteem of the subject that is a result of a specific situation.

The degrees of manifestation of the external relation have a projection in the classification of the subject's relation to the external environment or to its components:

- The external fixed relation can be illustrated by a sustainable subject's idea to the external environment or to its components.
- The external neutral relation can be illustrated by periodically formed subject's idea to the external environment or to its components.
- The external variable relation can be illustrated by current formed subject's idea to the external environment or the to its components.

The influence of positive attitude of family and friends on the body of the subject is known. The external variable set of the subject carries the signal to the internal variable set and it stabilizes the set of the subject.

The rise of the value of the positive relation reduces the value of the internal variable set of the system. The reduced variable set reduces the entropy of the system and increases its viability.

There are systems that are characterized by a high level of fixed behavior. These systems quickly change the main factor that formed their behavior to adapt themselves to the external environment.

The fixed set has three main varieties:

- solid fixed (for example: genetic, instinct, genius, handicap): Z_{ff} ,
- weak adaptive (for example: character): Z_{fv} ,
- middle - between the solid fixed and weak adaptive behavior: Z_{fo} .

For example: when a person is stressed, it is good, he to do what he can do i. e. to return to a known, stable, solid program that is characteristic of instinct behavior.

$$(7) \quad \mathbf{Z}_{ff} = \mathbf{Z}_{f1f} \cdot \mathbf{Z}_{f2f}^{-1},$$

$$(8) \quad \mathbf{Z}_{fv} = \mathbf{Z}_{f1v} \cdot \mathbf{Z}_{f2v}^{-1},$$

$$(9) \quad \mathbf{Z}_{fo} = \mathbf{Z}_{f1o} \cdot \mathbf{Z}_{f2o}^{-1},$$

where:

\mathbf{Z}_{ff} – fixed (f) component of the fixed (f) set of a system

\mathbf{Z}_{f1f} – essence (1) of the fixed (f) component of the fixed (f) set of a system

\mathbf{Z}_{f2f} – connection (2) of the fixed (f) component of the fixed (f) set of a system

\mathbf{Z}_{fv} – variable (v) component of the fixed (f) set of a system

\mathbf{Z}_{f1v} – essence (1) of the variable (v) component of the fixed (f) set of a system

\mathbf{Z}_{f2v} – connectivity (2) of the variable (v) component of the fixed (f) set of a system

\mathbf{Z}_{fo} – neutral (o) component of the fixed (f) set of a system

\mathbf{Z}_{f1o} – essence (1) of the neutral (o) component of the fixed (f) set of a system

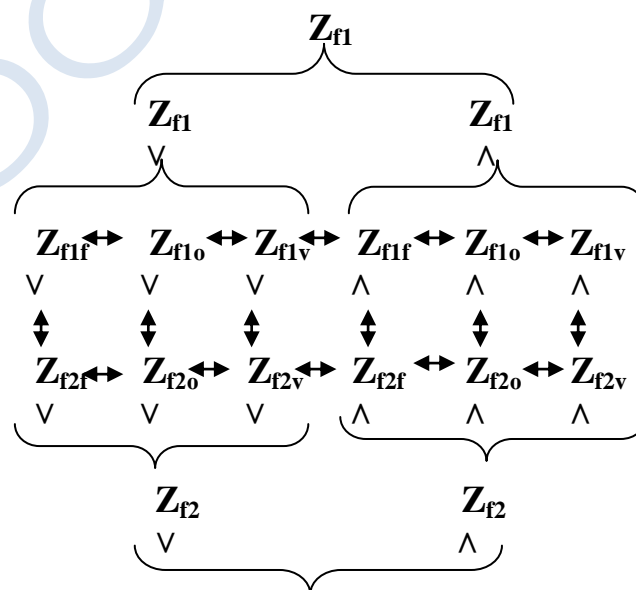
\mathbf{Z}_{f2o} – connectivity (2) of the neutral (o) component of the fixed (f) set of a system.

The fixed set can acquire leading significance in the behavior of a system, if it is associated with:

- the realization of specific vital cause or of religious doctrine,
- stress.

The great diversity of fixed behavior types of human illustrates numerous modifications of the existence of a fixed set.

The fixed set of a system is determined in particular by external factors, that are not identified in general. For example: the influence of cosmic factors on the human and animal behavior. On this basis the fixed set of a system has an external structure (fig.3).



Z_{f2} **Fig. 3. Basic direct links \leftrightarrow \updownarrow between subsystems of the fixed set Z_f of a system**

Z_{f1}, Z_{f1} - essence: external (\vee) and internal (\wedge),
 $\vee \quad \wedge$

Z_{f2}, Z_{f2} - connectivity: external (\vee) and internal (\wedge),
 $\vee \quad \wedge$

$Z_{f1f}, Z_{f1o}, Z_{f1v}$ - essence external: fixed (f_{1f}), neutral (f_{1o}), variable (f_{1v}),
 $\vee \quad \vee \quad \vee$

$Z_{f1f}, Z_{f1o}, Z_{f1v}$ - essence internal: fixed (f_{1f}), neutral (f_{1o}), variable (f_{1v}),
 $\wedge \quad \wedge \quad \wedge$

$Z_{f2f}, Z_{f2o}, Z_{f2v}$ - external connectivity: fixed (f_{2f}), neutral (f_{2o}), variable (f_{2v}),
 $\vee \quad \vee \quad \vee$

$Z_{f2f}, Z_{f2o}, Z_{f2v}$ - internal connectivity: fixed (f_{2f}), neutral (f_{2o}), variable (f_{2v}).
 $\wedge \quad \wedge \quad \wedge$

The internal fixed set has a projection in the structure and functions of the system:

- The internal variable essence can be presented through the current change of genetically fixed structure of the organism as a result of intense or prolonged external impact.
- The variable internal connectivity can be represented by current major readjustment of the organism, for example as a result of acute stress.
- The fixed internal essence can be manifested by the genetically fixed structure of the organism.
- The internal fixed connectivity can be manifested through genetically fixed algorithms of behaviour of organs and systems of the organism.
- The external variable essence may be presented through food and energy which the organism perceives from the external environment.
- The external variable connectivity can be presented by the instinct for the extension of the genus.

The external fixed essence and external fixed connectivity can be conditioned by factors belonging to the other dimensions.

The equalities (1) ... (9) can be combined into a equality for the set Z of a system:

$$(10) \quad Z = Z_1 \cdot Z_2^{-1},$$

where Z_1, Z_2 – content (1), form (2).

The form is a system of relationships that form the configuration of the system.

The form of the system determines the contact surface of the system with the external environment.

From equality (10) follows that the increasing of the contact surface of a system is a consequence of increasing of its energy. For example, the increase of the energy potential of the organism manifests itself as expanding space, which fills the biofield.

On the basis of (10) the set can be defined as a content of a system per unit of its contact.

RESULTS:

- 1. The set is a complex system of information converters. They are consistently linked in the order of their formation.*
- 2. The management of the set of a system realizes itself with highest speed by modifying the relation of the system and to a lesser extent by changing the condition of this system.*

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