

## BEGINNINGS OF THE UNIVERSE MODEL AND DEDUCTION OF INITIAL SYSTEM OF INFORMATION CONCEPTS

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**Annotation:** *For the first time the initial system of information concepts is deduced in the paper from the most general properties of our Universe. For this purpose for the first time by means of Universe Methodology the Universe Model that is externally and internally consistent with the observable Universe and modern Science is obtained. Definitions of the basic concepts of computer science, presented in the natural language and structural logic forms allowing their effective application in manual research and development are obtained. For the first time the application of the obtained system of concepts allows to solve a lot of complicated problems of modern computer science and Science as a whole. The results of the paper have general scientific importance of uniform world scientific standard. The specified Model is actually a universal meta-theory, allowing to generate secondary applied theories of many subject domains according to the common universal methodology permitting subsequent realization. Unlike philosophical reasoning the offered system of concepts concerns exact sciences and allows complete formalization in essence.*

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### 1. Introduction

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#### Deep System Crisis of Modern Computer Science

The modern computer science is in such a condition that it cannot solve the most serious problems that are set by Mankind, and the number of them is increasing all the time. In spite of the fact that computer science became a leading area of modern Science quite a long time ago, in the process of its development the number of unsolved problems is being stored up hindering further progress. In the long run it leads to both system crisis of computer science itself and Science as a whole.

There is an interesting paradox: despite the accelerated growth in new knowledge, there has been more progress in relatively simple areas and relatively less – in difficult ones, which develop more likely at the expense of indirect influence of the adjacent more rapid simple areas. Such typical manifestations are:

- Long-term operation of dependence of Moore' law on the elementary conductor width parameter for making computers more complicated instead of essentially new decisions on their architecture;
- Huge excess of the computing possibilities reached over the ability of their full-fledged use;
- Low intellectual data processing and many other things.

The increasing discussions of initial concepts and computer science definitions in scientific publications and forums are one of the signs of such a crisis. It was suddenly found out that according to the principle of "greedy algorithms" at the beginning the scientific world has developed the areas of computer science that were the simplest and had a quick effect and left fundamental questions until later. As a result, it turned out to be that:

- There are no common definitions of important initial concepts;
- A very wide interpretation is given to the terms used;
- The initial list of terms is not clear enough;

- There is no the general information theory up till now;
- In fact, there is no uniform structure of this major area, both in the field of system of concepts and the methodology of their application.

It is natural that to work in such conditions is just the same as to erect a building without initial building blocks.

The analysis of the content of such discussions shows that they are usually insufficiently substantiated and reflect the particular points of view of some experts in this area and cannot be accepted for all the computer science as a whole. In recent years the situation has worsened so considerably that practically every well-known scientist, who has some experience, offers their own systems of concepts and their interpretation in this or that form. At the same time it is significant that such systems are more and more often connected with the attempts of creation of general cosmological theories, from which they should to be deduced in a natural way. However, it is believed that it is carried out rather in unconsciously associative way because of the general coherence than meaningly within the scope of formally substantiated methodological approach.

The reference to generalizing sources (the New Encyclopedia Britannica, 15th Edition, Chicago (NEB), Wikipedia and some others) also clears up the situation very little. Their authors try to avoid strict definitions in difficult cases (and those are all the initial definitions) and evade direct answers as they are obliged to reflect standard statements, which are usually absent or insufficient in scientific literature. Owing to insufficient explanation of concepts, their generalizing definitions in the process of concretization start to contradict each other and cannot be used for exact formalizations, which returns us to the specified problem.

Thus, classical Methodology inconsistently defines *induction* (NEB, Micropedia, Vol. 6, induction, p. 301) as "method of reasoning from a part to a whole, from particulars to generals, or from the individual to the universal" so long as 1) a part is always less than the whole, 2) but something detailed is always larger than general, and 3) something individual may not be comparable with universal. *Deduction* is well and adequately defined (NEB, Micropedia, Vol. 3, deduction, p. 954) as "a rigorous proof, or derivations, of one statement ... from one or more statements". But then it is not clear how it differs from the definition of close to it *axiomatic method* (NEB, Micropedia, Vol. 1, axiomatic method, p. 747) as "a procedure by which an entire system ... is generated in accordance with specified rules by logical deduction from certain basic propositions (axioms or postulates), which in turn are constructed from a few terms taken as primitive", in which there arises a blurred definition of *axiom* (NEB, Micropedia, Vol. 1, axiom, p. 747) as "an indemonstrable first principle, rule, or maxim, that has found general acceptance or is thought worthy of common acceptance whether by virtue of a clame to intrinsic merit or on the basis of an appeal to self-evidence", which serves to confuses the meaning further. And the criticism grows further beyond all bounds.

### The Problem of Absolute Definitions

The problem of definition of concepts arises from the fact that they must be deduced from some initial postulates according to some substantiated rules. These requirements naturally turn us to a certain initial system of knowledge, in which these postulates and rules must be well-grounded. Owing to generality of the investigated concepts, the problem of their formal definition naturally leads to the problem of creation of the substantiated generalized model of the Universe, which must contain a full set of initial components from the very beginning of its design. It is necessary to recognize that it still remains a big problem generating many derivative problems, including the problem of definition of information concepts.

The standard scientific scheme of definition of concept (definition of definition) has the following form and is illustrated in Fig.1:

$$\text{def } e = f (\text{def } e1 : \text{not def } e1 (e, \dots); \text{def } e2 : \text{not def } e2 (e, \dots); \text{def } e3 : \text{not def } e3 (e, \dots); \dots)$$

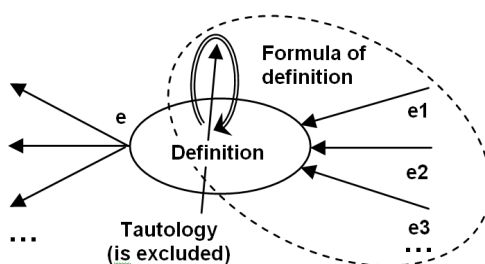


Figure 1 - The Scheme of Scientific Definition

The definition of each concept (category, abstract) has two parts: the left and the right. In the left part there is a defined concept  $e$  (concept definition), and in right – a formula from initial concepts  $e_i$ ,  $i = 0, 1, 2 \dots$  so in order to avoid tautology the defined concept cannot be in the right part. Thus, the sequence of definitions is formed according to this recursively applied formula. In the left side such a recursion is limited to the required concept, and in the right side it does not define the initial concept.

Owing to uncertainty of initial concepts of our Universe, the scientific community has made a compromise decision for each subject domain to put some standard (but artificial, subjective) concepts (axioms), the validity of which does not raise doubts in this area at the beginning of the sequence of definitions. It is natural that all the derivative definitions are true only within the limits of these axioms. The last remark allows to create systems of adequate formalizations within these framework, but it is the source of 1) conceptual division and incoherence of various subject domains and 2) subjectivity in subject domains owing to non- singularity of the axioms, which do not reach the beginning of the Universe. A famous case of such a problem is a well-known revision of classical axiomatics of geometrical spaces by Poincare and Lobachevsky and the important consequences of that such as the relativity theory.

The axiomatic methodology has played an important role in Science. However, subjectivity of axioms does not allow to develop this methodology outside this framework and is a source of the above-mentioned problems, including a problem of objectivity of definitions. Such definitions must be deduced in some other ways proceeding from the generalized model of the Universe.

### The Theory of Absoluteness

So far as the Universe by definition is unique, uniform and is the beginning of all the things, it acts as the natural Absolute for all of its entities (Fig. 2). Therefore, we are more correctly going to name the objective system of definitions absolute, as the objectivism (as the relation of object and object) does not guarantee accuracy on its own account.

The term "absolute" means belonging to the Absolute. To facilitate the understanding it is possible to apply the equivalent to it term "complete and exact". Though they are actually equivalent concepts in essence (it can be fully proved) and they are offered just to satisfy scientific habits.

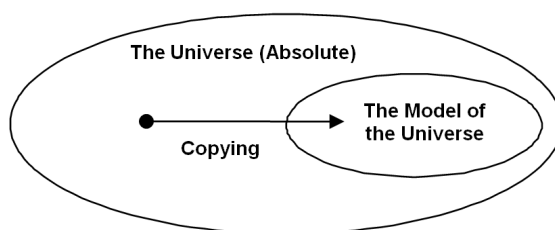


Figure 2 – The Scheme of Correlation between the Universe and Model as Its Copy and a Part

All the entities by definition are absolute in the sense of this property and reflect a part of the Universe. But as far as entities are generally casual partial copies of the Universe, they are relative being initially absolute too as they copy the Universe not directly but through other entities and divergences with the Universe accumulate inside an entity, depending on distortions of the intermediate entities. The smaller part of the higher initial entities remain purely absolute owing to complete transparency of interconnections, and the lower part (after formation of STM-Complex – Spaces, Time and the Matter), adds inexact connections and becomes absolutely relative. The important concepts of absoluteness and relativity go far outside the framework of this theme and they are investigated in the other works of the author.

Objectivism as the carrier of relativity is not a guarantee of accuracy, and it is necessary to rise to the Universe beginnings for absolutization of entities. As we are going to show below, definitions are full-fledged (abstract) Universe entities. It compels computer science and other similar to it sciences to penetrate into the higher areas of the Universe. But they are historically occupied by essentially inexact classical philosophy that is deprived of exact methodology and they remain unusual for classical representatives of exact sciences at the present time. It is necessary for absolutization of system of concepts today, without which the computer science is impossible as the scientific area that implies exact formalization for execution by completely formal computers. It is necessary to get used to such a synergism of different sciences that was earlier unusual owing to growing universality of models and theories that include in process of their development many earlier different scientific directions for the purpose of approaching absolute formalizations and methodologies.

## 2. The Model of the Universe

### The Concept of the Universe Model

Apparently the crisis is defused by the creation of a certain generalized Model of the Universe, from which the required system of concepts is deduced by a certain natural method and thus it is explained. The so-called Artificial Intelligence that has been synthesized everywhere by all the scientific community cannot work at all without such a Model in particular. Moreover, it can in no way be synthesized without such a Model.

It is necessary to distinguish between the Universe as the Absolute and its copy named the model (formula, theory, image, reflection, etc.) of the Universe (further – Model). As we are going to show further, such a copy (usually partial) is basically every entity of the Universe (located in the Universe). Therefore, the term “the Model of the Universe” (the Universe Model, UM, Model) usually supposes the Universe as a whole, i.e. its complete (generalized, universal, etc.) model as far as it is possible.

The limit of development of such a model is the Absolute Universe Model (AUM), which is (absolutely, completely) equivalent to the Universe (Fig. 3). It should be noted that the AUM has several conditions of the equivalence, the strict definition of which goes far outside the framework of the theme of the given paper.

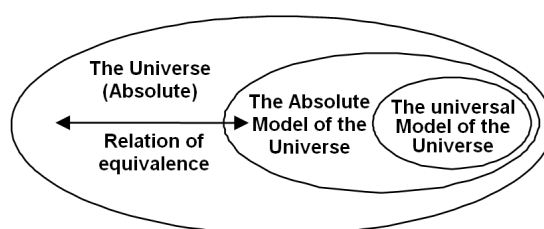


Figure 3 - The Scheme of a Relation of the Universe with the Absolute and Universal Models

Thus, the UM is a certain simplifying approach to the AUM. The Universal Model is relative to questions to it. They are a criterion of its universality. If the UM answers some class of questions consistently, then it is universal

relatively to this class. Besides, universality can be internal (inside the UM) and external (the UM with the Universe). If a question arises, which it cannot answer consistently, the UM loses its universality and it should be universalized more until the consistency (universality) is restored. Hence, discrepancy (as well as consistency) is the criterion of universality of the UM. If it answers all the possible questions in the Universe consistently, then it becomes Absolute.

Thus, the UM is a complicated developing concept, and it has a great number of conditions, which ends with the AUM condition. All the research and developments in this area must stipulate precisely what kind of UM concept they work with and to define its limits.

Mankind from the moment of its appearance has always striven for creation of the UM, as it has multiple important applications. In the beginning the UM had the form of myths and religions, then philosophy, and then Science that divided into a great number of specialized Sciences afterwards. Today the UM it is represented by the entire world Science as the most developed and substantiated.

However, with the growth of Science the demands made on it raise, which during the last decades have exceeded the current level reached and consistently reduce the degree of its universalization. If in the first the Universe Models any scheme of the emergence of our world was enough, today the formal definition of initial concepts of computer science requires more exact formalization of the beginnings of the Universe and description of ways of achievement AUM, which have not been reached by our Science so far. Moreover, even the approaches to this process are not clear.

The author succeeded in developing the concept of the UM generalizing the results of research and developments since the 1970s in the field of machine modelling, computer-aided design and computing experiments that allows to deduce a well-founded required system of definitions. For this purpose it was necessary to change the point of view on the Universe arrangement drastically and to introduce (or more correctly – to open) a lot of new concepts and actually to offer another reform of Science and Scientific Methodology [1-7].

First of all, the suggested UM was created for substantiation of research and development of Artificial Intelligence, for which in modern Science there is no necessary conceptual base at all. Such a UM must naturally create the initial system of information concepts and within its framework – the system of intellectual concepts. In fact, the obtained UM reaches the top of our Universe and deduces all the system of initial concepts of existence, which conditions its high degree of universality for all the areas of Science as a new general scientific standard.

The basic component of the UM is a concept, which is understood as a structure of relations. The concept develops consistently from elementary initial structures to all sorts (up to infinite) of conditions. The conceptual models are naturally represented by structural and logic schemes, which can have different graphic forms. Together with the text support some graphic forms as the most visual are applied in the given paper as far as motionless flat graphics allows. It is possible to show that all the material also allows more exact, but not visual formalization.

The suggested concept of the UM is based on a hypothesis of the Universe origin from the only concept-axiom of Nothing, from which all the variety of our Universe has arisen. Such an approach solves a lot of problems of explanation of the Universe. The concrete definition of this hypothesis allows to explain all the phenomena of the observable world and to deduce the required system of concepts consistently. Four main well-founded principles (theories) of arrangement of the Universe are deduced from this hypothesis:

- Absoluteness;
- Abstractness;
- Harmonicity;
- Cognoscibility.

### Starting System of Concepts of the Universe

The cognition of Universe begins with its nearest environment and that is the conditions of existence of every subject. In the beginning by means of primary elementary methodologies the subject reveals the nearest concepts, a great number of which it later expands to the final condition. The final condition is the goal state of cognition of environment by the subject. Ultimate cognition is a complete cognition of the Universe in the form of the AUM, which is achieved within the limits of development of Mankind.

The starting system of such concepts that allows to design the UM consistently is described in the given section.

**Definition.** The Universe is a complete totality of entities that are mutually related, directly or indirectly (Fig. 4).

According to the concept of an origin from Nothing the Universe 1) has an infinite source of all the things in existence, 2) has an infinite number of entities, 3) does not have space and mater limits and 4) is heterogeneous.

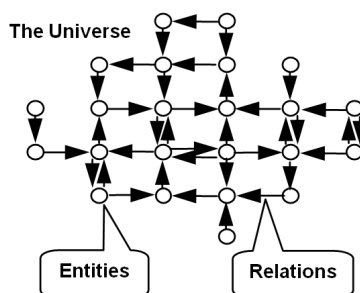


Figure 4 - The initial Scheme of the Universe

**Definition.** Entity is a part of the Universe singled out by a certain relation as a comprehensive whole (Fig. 5).

It turns out to be that an entity is 1) an internal homogeneity in relation to itself and 2) external in relation to environment heterogeneity of the Universe.

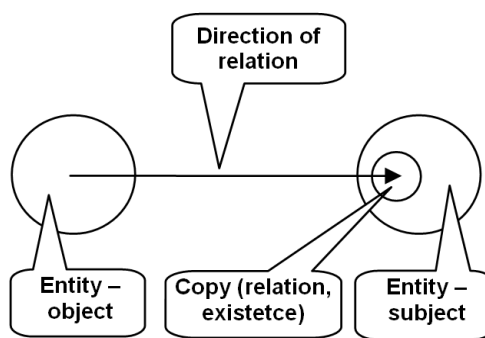


Figure 5 – The Scheme of an Entity, Relation and Existence

**Definition.** Relation is a copy of one entity (object) in another entity (subject).

It turns out to be that relation is an entity transferring a copy of one entity to another entity. Relation is unidirectional from the object to the subject.

**Definition.** The relation strength is a correlation of the copy with the subject.

**Definition.** The relation transparency is a correlation of its white part (see below) with the original.

**Definition.** Existence is the relations of entities.

It turns out to be that existence has gradations (measurement) in the above-mentioned senses.

**Definition.** Property is the structure of relations.

Consequence. It turns out to be that the Universe (and its each part (entity)) is an infinite totality of relations and nothing more.

Consequence. In case of typification (equivalence) of properties, the Universe (or its parts (entities)) can have a final totality of properties.

In the real part of the Universe (RW, see below) there are no elements, they are formed only within the limits of an infinite hierarchy of enclosure of entities. The real hierarchy forms the fifth dimension of the Universe (three dimensions of Space and the fourth is the dimension of Time). It denies the antique doctrine of atoms and confirms the Vedic concept of a prana.

In abstract part of the Universe (WAP, see below) there are final elements (abstracts), out of which all the design of the Universe is constructed. The abstract hierarchy forms the sixth dimension of the Universe in the form of an abstract semiaxis from the central concept (the Universe Center) of Nothing to the Real World. It confirms (probably accidentally) ancient doctrines about blocks (elements) of the Universe.

The entities can be the objects and subjects of any number of relations (Fig. 6).

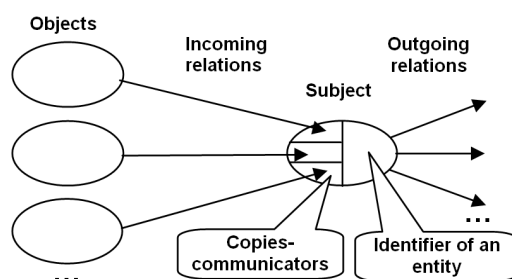


Figure 6 - The Scheme of Multiple Existence

### Classification of copies

Definition. A copy is a repetition of relations of some entities in the other entities.

Different combinations of repetition of relations generate classification of copies by means of the following definitions (Fig. 7):

1. A complete copy – all the relations of the original repeat;
2. Partial – a part of relations of the original repeats, but there may be some relations alien to the original;
3. White – only part of relations of the original repeats;
4. Grey – together with white there are the relations, which are absent in the original;
5. Black – all the relations in the copy are absent in the original.

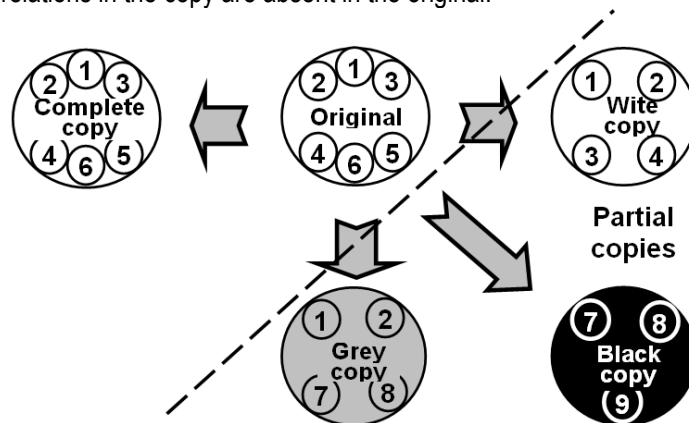


Figure 7 - The Scheme of Classification of Copies

### Absoluteness of the Universe

**Definition.** Absoluteness is the property of originality of the Universe, all the entities of which are its (partial) copies (Fig. 8).

The Universe is the only absolute criterion of the validity and measure of the whole existence:

1. The Universe is uniform and unique;
2. The Universe is the Absolute (Original) of the whole existence;
3. All the entities are partial copies of the Universe;
4. Any knowledge (and Science) is one of such copies;
5. Scientific copying aspires to be white;
6. Item 5 ensures the unity of all the copies and generality of actions on them;
7. Item 6 ensures cognoscibility of the Universe.

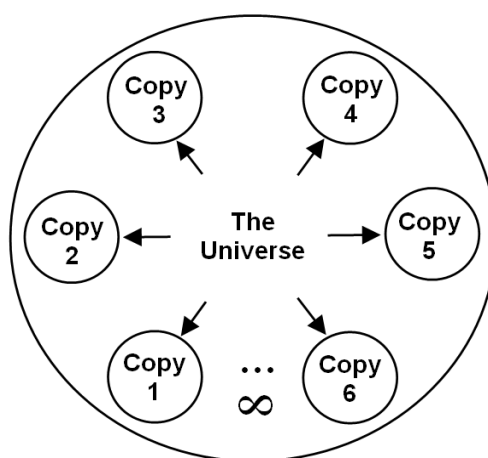


Figure 8 - The Scheme of Absoluteness of the Universe

Copies can differ arbitrarily, but they come from the general original. It generates inheritance of (a part) of parental properties and thus their initial unity among themselves. It, in its turn, ensures (partial) generality of all actions on copies.

The Negation of the postulate of Absoluteness leads to the complete distinction and non-interaction of entities dividing the Universe into unrelated parts that contradicts the initial definition of the Universe as a complete totality of all of its entities and thus confirms the given principle, making it deducible from the basic properties of the Universe.

### The Concept of Science

**Definition.** Science (in its basic part) is the copy of the Universe in Mankind that aspires to be white (Fig. 9) dividing into two parts: 1) Knowledge and 2) the Methodology of processing of Knowledge (as a part of Knowledge) that meet the following requirements:

1. External consistency of the Science of the Universe (whiteness);
2. Internal consistency of Science (the control of whiteness);
3. Accessibility to all the subjects of Mankind (transparency of Science to Mankind).

Science as the highest form of human knowledge concretizes (develops) the concepts of relation, cognition and thinking in the direction of active harmonization (see below) of the inhabited part of the Universe. Therefore, Science is considered in the given place of successive exposition in advance to explain the sense of scientific research and development, including the given paper.



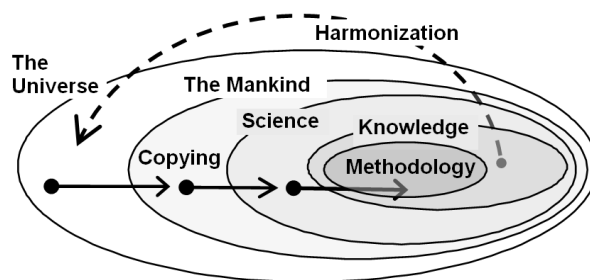


Figure 9 - The Scheme of Science

### The Abstractness of the Universe

**Definition.** Abstractness (in its general sense) is the property of division of the Universe into 1) abstract (Abstractness in its concrete sense) and 2) real (Reality) parts in the form of the Universe Abstract Pyramid (UAP), beginning with the initial Nothing abstract that consistently produces the system of the Abstract Worlds (AW) and ends in the Real World (RW, Reality) (Fig. 10).

**Definition.** The World is the part of the Universe possessing basic similarity.

**Definition.** Phenomena are the entities of the RW.

**Definition.** Abstracts are the entities of the AW.

Owing to the increase in coherence from the top to the bottom in the UAP, the entities (Abstracts) raise the level of existence to the ultimate at the real level (the level of phenomena).

Abstracts are consistently mutually built in the UAP from the top to the bottom and are invisible at derivative (bottom) levels as they do not exist in their pure form and require singling out on the pattern (typical signs) for identification. For direct recognition of the abstract its sample must be copied from the level of its existence to the (bottom) level where the recognition takes place.

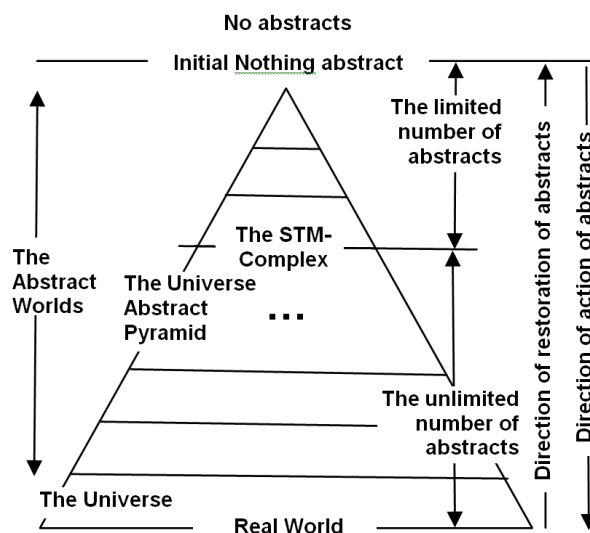


Figure 10 – The Scheme of the Abstractness of the Universe

There is a formula for Nothing and the mechanisms of its disharmonization in the UAP, and those mechanisms generate all the variety of the Universe consistently. The physics of this process is still latent, but the basic design is obvious enough.

**Definition.** The mechanism of synthesis of derivative abstracts from initial abstracts under the above-mentioned scheme of existence is called concretization.

Definition. The mechanism of singling out of initial abstracts from derivative abstracts is called abstracting.

Definition. Mechanism is the main rule of formation of a property.

The pyramidal structure of the UAP (Fig. 11) is formed from Nothing by the 1) starting disharmonization and 2) subsequent harmonization of the forming parts 3) by means of their linkage and concretization 4) with generation of every possible system of abstracts in the form of the UAP. Owing to the one-way orientation of this process, some strongly coherent groups of abstracts come into being, forming corresponding abstract Worlds that grow from the beginning to the RW, after which the operation of the generating mechanism stops (or becomes invisible).

The top part the UAP begins with the ideal AW with finite quantity of ideal abstracts that are absolutely harmonized among themselves. Starting with the abstracts of the STM-Complex and below in the UAP there arise disharmonized abstracts, forming infinite AW up to the RW.

Property. The higher abstract in the UAP is, the wider is the area of its operation.

Property. The higher abstract in the UAP is, the weaker it singles out in the lower Worlds.

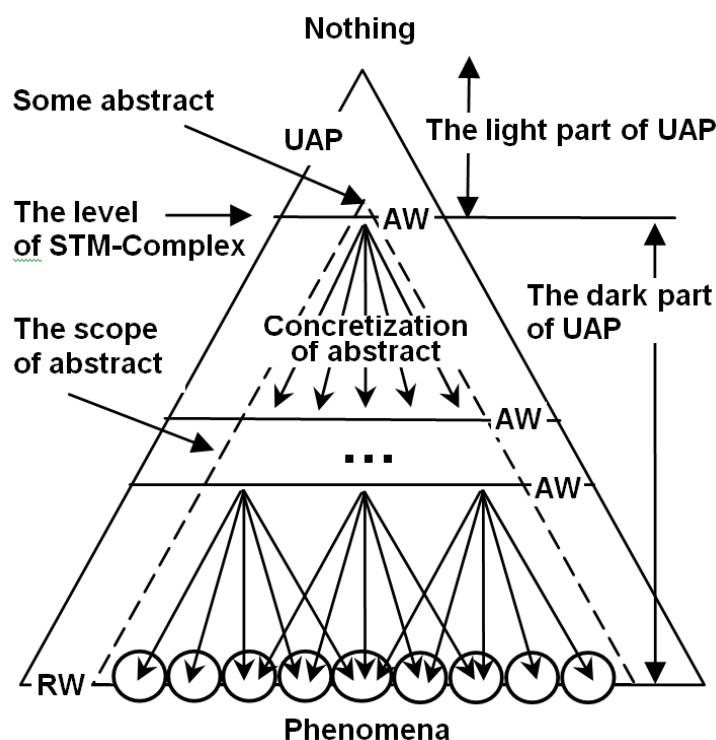


Figure 11 – The Scheme of the UAP

### The Classification of Nothing

Definition. Nothing is a vacuous entity without relations.

Nothing is the highest abstract concept of the Universe that naturally has the lowest concretization and implementation. It is necessary for fundamental closure of the Universe (see below) and the growth of adequacy of the UM. This concept is the most unusual in the UM as it is the least visible in the UAP, but all the properties of the Universe indicate its presence. Nothing is the Center, from which the Universe comes from.

There arises the following natural classification of Nothing, depending on the degree of non-existence (limitation of relations).

## 1. The Absolute Nothing.

Definition. The Absolute Nothing (Fig. 12) is the result of condensation (condensate) of a Harmon in entity with the absolute internal symmetry (homogeneity) and absence of distinctions, structure and relations:

$$\text{Absolute Nothing} = \text{Condensate (Harmon)}.$$

Definition. Condensation is the coalescence of absolutely identical entities into a uniform entity (condensate) owing to absolute impossibility of their distinction and identification:

$$\text{Condensate (entity)} \leftarrow \text{Condensation (entity 1, entity 2, ...: entity 1 = entity 2 = ...)}.$$

## 2. The Harmon.

Definition. The Harmon (Fig. 13) is the result of decondensation (reverse condensation) of the Absolute Nothing into infinite recursion CIG (CIG) of infinite CIG  $(X) = \lim_{n \rightarrow \infty} \text{CG}(X_n)$ ,  $n \rightarrow \infty$ ; complete CG  $(X) = G(X_n, Y_m)$ ,  $m = n * (n-1)/2$ ; graph  $G(X_n, Y_m)$  with a multitude of tops  $X_n = \{x_i\}$ ,  $i = 1, n$ ; and relations  $Y_m = \{y_j\}$ ,  $j = 1, m$ ;  $m < n * (n-1)/2$ ; among them, the tops of which are the same infinite recursions (Harmons):

$$\text{Harmon} = \text{CIG (CIG)}.$$

The characteristic feature of the Harmon is that it is impossible to add any external or internal relation to it, and it is the only known such a construction. Any movement of the Universe leads to it.

The concepts of Nothing and Harmon are on the frontier of our Universe, and consequently the mechanisms of condensation-decondensation of Nothing are hypothetical, depending on our point of existence and probably go outside the limits of the Universe. But the subsequent events permit more substantiated formalization.

The consideration of disharmonization mechanism of Nothing leads far outside the limits of our theme. It should be noted that this mechanism follows from the properties of symmetry-asymmetry, reversibility-irreversibility, stability-instability, harmonization-disharmonization and leads to the internal disharmonization of the Harmon with the formation of the Universe with the UAP and Chaos in form of the RW.

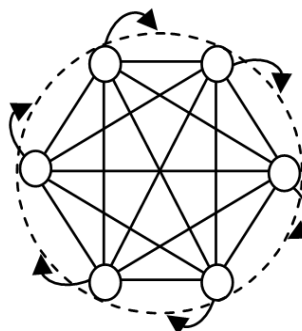


Figure 12 - The Scheme of Absolute Nothing

Figure 13 - The Scheme of a Harmon, Directing the Number of Entities  $n$  from 6 to  $\infty$ . The arcs symbolize similarity of components to the Harmon itself

## 3. The Universe.

Definition. The Universe (Fig. 14) is the result of Harmon disharmonization with the formation of internal existence.

Definition. The internal existence is the closure of relations inside a group of entities.

Thus, Nothing exists in three mutual virtual forms – 1) the Absolute condensate, 2) the Harmon and 3) the Universe with temporary subjective existence.

All the relations of the Universe are localized inside and do not go beyond its limits, outside of which the Universe remains Nothing. The Universe can have infinite set of the realisations one of which is our Universe.

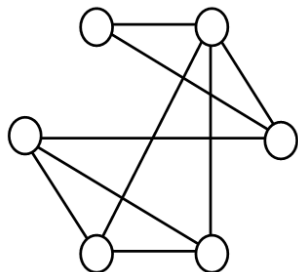


Figure 14 - The Universe Scheme (Partial Chaos),  
Directing the Number of Entities  $n$  from 6 to  $\infty$

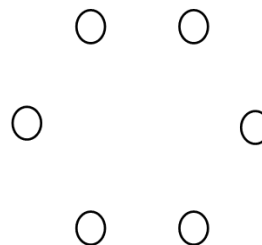


Figure 15 The Scheme of Complete Chaos, Directing  
the Number of Entities  $n$  from 6 to  $\infty$

#### 4. The Chaos (Liberty).

**Definition.** The Chaos (Liberty) (Fig. 15) is the property of independence of entities from the others entities that are not related to them.

The Chaos always arises at any disharmonization. Chaos is a measurable property, depending on the degree of disharmonization from absolute Chaos to absolute Harmony.

#### 5. The Ocean of Nothing.

**Definition.** The Ocean of Nothing (Fig. 12) is a complete totality of Nothing.

As far as Absolute Nothing does not have any properties, it is hypothetically possible to assume that it is an infinite source of the Absolute Nothings (of the Ocean of Nothings), each of which can have its own original cosmology. The generality of the received formula of Nothing allows the possibility of their joint coexistence through the abstract of the Absolute Nothing.

### The Harmonicity of the Universe

**Definition.** The Harmonicity is the property of entities to possess Harmony.

**Definition.** The Harmony is the size of relations of entities.

Owing to the classification of relations, Harmony has a great number of various properties: 1) measurability, 2) a relativity among entities, 3) internal Harmony, 4) external Harmony, etc.

**Definition.** The harmonious potential of the entity is the quantity of Harmony of the entity.

**Consequence.** Harmony moves on entities following relations.

**Definition.** The movement of entities is directed by the Superlaw of general Harmony.

**Superlaw definition.** Each entity strives for the condition with maximal Harmony:

$$\begin{aligned} \text{Harmony (Entity (State (Time)))} &\rightarrow \max \\ &\text{Entity (State (Time))} \\ &\text{as a part of Universe} \end{aligned}$$

The Harmony have a complicated formula, by which (as a rough approximation) it is possible to understand the size of constant relations of the entity (Fig. 16).

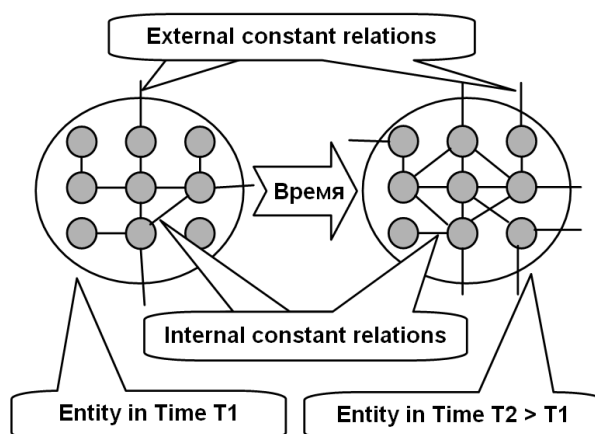


Figure 16 – The Illustration of the Operation of the Super Law of Harmony

**Definition.** The super purpose of the Universe is the achievement of absolute Harmony of Nothing.

The abstract to Harmony comes second in the UAP after the abstract of Nothing and directs the movement of all the entities, including the Universe itself. It develops the laws of thermodynamics for the inanimate nature into the general law of all the entities according to the harmonious classification (see below).

### The Cognoscibility of the Universe

**Definition.** Cognition is the obtaining of a copy of one entity in the other the entity.

**Definition.** The subject of cognition is the copying entity.

**Definition.** The object of cognition is the entity that is being copied.

**Definition.** The starting is the entity, with which the cognition begins.

**Definition.** The quality of cognition is the properties of a copy (for example: volume (copy quantity), degree (transparency – the correlation between the copy and the original), purity (the correlation between the white part of the copy and the original), etc.

**Definition.** The cognoscibility of the entity is the sufficiency of mechanisms for copying the entity by those who cognize the subject.

**The remark.** Cognoscibility is a relative quantity for each pair of object – subject.

**The remark.** The Universe can be the object of cognition.

**Definition.** Cognoscibility of the Universe is the sufficiency of the Universe mechanisms for copying any object by any subject.

**Definition.** Relative cognoscibility of the Universe is the sufficiency of the Universe mechanisms for copying any object by a subject.

**Definition.** Abstract cognoscibility of the Universe is the sufficiency of the Universe mechanisms for copying the UAP by any subject.

**Definition.** Absolute cognoscibility of the Universe is the sufficiency of the Universe mechanisms for absolute copying any object by any subject.

Cognoscibility is a complicated concept, and it has a lot of aspects of cognition: 1) of the Universe as a whole, 2) of separate entities, 3) by all the entities and 3) by separate entities, etc. The visible structure of the Universe hypothetically substantiates absolute cognoscibility with the following properties:

1. The Universe and all its entities are cognizable by any subject from any starting entity within the limits of the existing system of relations according to the Universe definition (Fig. 17).
2. The degree of cognition of the Universe and its entities is determined by the transfer capability of interrelations and internal cognition ability of the subject.
3. The cognition below the STM-Complex takes place in Time with the change in transfer capability and cognition ability of the subject.

The absolute cognition by means of transfer capability is allowed by the Super Law of Harmony below the STM-Complex that increases relations infinitely.

The absolute cognition by means of cognition ability is allowed by the phenomena only owing to their internal infinity that is equivalent to the Universe.

1. Consequently, the Universe allows absolute self-cognition.
2. Cognition does not have any threshold of the start of cognition and it is possible from any starting volume of knowledge of the subject beginning with zero.
3. The Universe possesses full-fledged (up to absolute) built-in mechanisms of cognition.
4. Any cognition leads to the Universe Center – the Nothing abstract.
5. The main object of cognition of the Universe is the absolute UAP.
6. The limit of cognition of the Universe by the entity is the AUM.
7. The limit of cognition of the Universe by the Universe itself (by all the entities) is the Harmon.

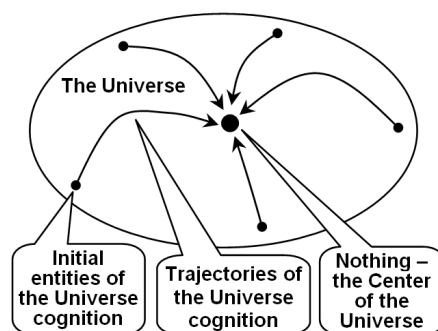


Figure 17 - The Scheme of Independence of Complete Cognition of the Universe from the Initial Entity

### The Harmonious Cosmology

Initial principles deduce the following general Cosmology of the Universe in the form of cyclic change of the four consecutive phase conditions (Fig. 18): 1-2) the virtual pair of the Absolute Nothing – Harmon, 3) Chaos, 4) the Universe.

1. The absolute Vacuum in the above described form of the Absolute Nothing is unstable because of the equivalence of virtual symmetric conditions, going out of the limits of which there arises an asymmetry in the form of the Harmon and accelerating disharmonization towards the UAP and the Chaos of the RW.

Chaos under the control of the UAP begins self-harmonization and forms the observable Universe, in which there is a partially harmonized constant (rigid, subject) part and a partially disharmonized moving (soft, process) part, mutually passing one into another with the increase in the general degree of harmonization (rigidity).

General harmonization leads to the formation of general fully related parts and to the accelerating approach of the Universe to the form of the Harmon, the transition to which takes place by leaps and bounds with the return to item 1.

It is impossible to come out of this recurrence except by 1) artificial degradation, 2) cessation of current harmonization or 3) transition to another Nothing during the moment of disharmonization.

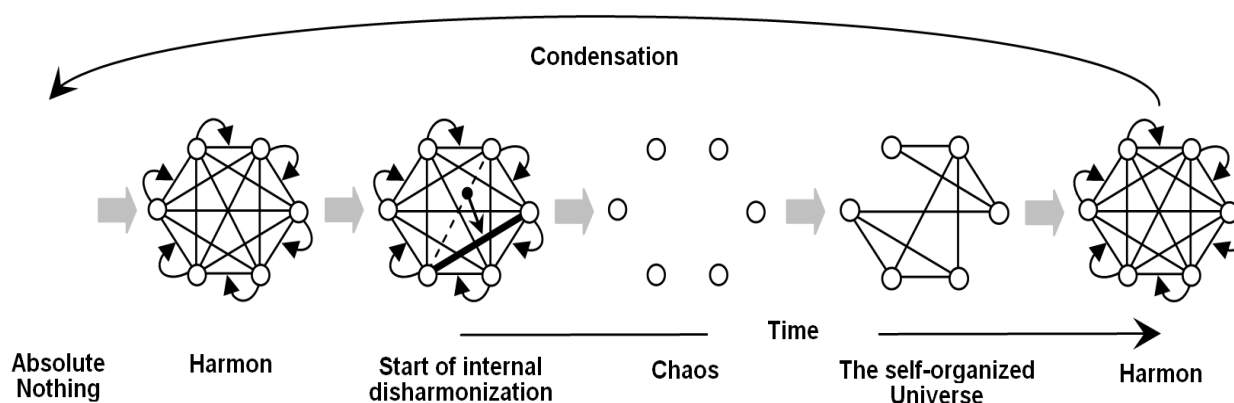


Figure 18 - The Scheme Cyclic Harmonious Cosmology

### The Universe Centre and Frontiers

Definition. The Universe center is the initial entity, from which all the Universe comes from.

Consequence. The Universe center is the Nothing abstract.

The concept of the Center is of great importance for the closure (see below) and ensuring the integrity of the Universe and all of its UMs up to the AUM. The achievement of the Center universalizes Model and drastically changes the Universe cognition, reforms Science and Methodology. Universalization requires specification of all the parts of the Model and expands its application infinitely.

The given definition rejects standard points of view on the Universe origin. The Big Bang, the origin of the Universe from one point is rejected as well as continuing expansion that is supposedly proved by the so-called "red shift". Indeed, the Universe has begun simultaneously with the infinite space and has been developing consistently from the condition of quasi Chaos in a class of a living organism and further (see below), passing the so-called «thermal death» up to the End of the World that transfers to the following singularity of Nothing.

Definition. The frontier is the absence (partial or complete) of relations.

Consequence. Each entity has a frontier in the form of change of properties.

Consequence. The only frontier of the Universe is the Nothing abstract that is also its Center.

### The Purpose and Task of the Universe

Definition. The Purpose of the Universe is the condition of the Harmon.

Definition. The Task of the Universe is a guaranteed achievement of the condition of the Harmon.

Hypothesis. The Universe possesses sufficient internal means to perform its task.

Consequence. There is no necessity for the Universe to contain components beyond its task.

Hypothetically, the Universe is capable of independent synthesis and application of internal means of the guaranteed achievement of condition of the Harmon in the sense that all the possibilities of its failure are excluded under correct internal control. That condition makes necessary and sufficient demands to the Universe structure taken into account in the UM, consideration of which goes outside the theme of the given work.

## 2. The System of Information Concepts

### The Space-Time-Matter Complex

**Definition.** The Complex is a qualitatively homogeneous (identical properties) part of the Universe, with which each entity is related.

The Universe is formed by three such Complexes: 1) Space, 2) Time and 3) Matter. They mutually supplement each other and make a uniform STM-Complex. The UAP and the STM-Complex form the entire Universe.

The Complexes are classified by the general scheme in Fig. 19.

**Definition.** The Space Complex is a regular constant part of the Universe.

**Definition.** The Time Complex is a regular variable part of the Universe.

**Definition.** The Matter Complex is an irregular part of the Universe, which is divided into Processes and Subjects.

**Definition.** Processes are a variable parts of the Matter.

**Definition.** Items are a constant parts of the Matter.

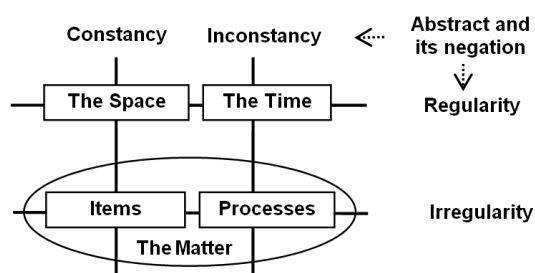


Figure 19 – Classification of the Universe Complexes

### The Structure of the Time Entities

**Definition.** Time entities are the entities below the STM-Complex up to the phenomena of the RW.

The time entities have 8 classes of components (Fig. 20): 1-3) Space-Time-Matter (the STM-Complex), 4) enclosed entities, 5) relations (internal and external), 6) movement, 7) laws and 8) purpose.

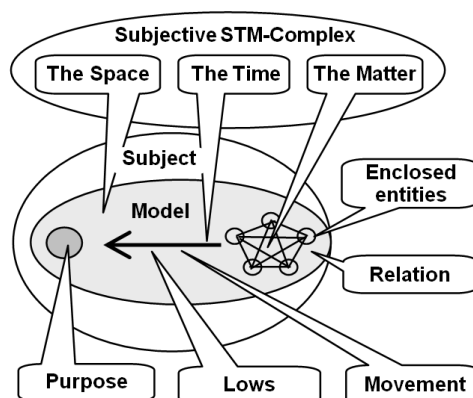


Figure 20 - Phenomenon Structure

**Definition.** Enclosed entities are the entities that are included together in the structure of an entity.

The concept of the relation is defined above.



Definition. Movement is the change of relations in Time.

Definition. Laws are (directed) relations in Time (from the Past through the Present to the Future).

Definition. Purpose is a required condition of relations.

The purpose is formed as a projection of the Super Law of Harmony on the level of an entity.

### The Structure of Time Entities in the Form of a Process

Definition. Process is the form of the time entity with singling out of temporarily motionless (subjects) and temporarily mobile (subprocesses) parts.

The time entities and their components possess some harmonious potential that stabilizes the parts of those entities into items. As the harmonious potential changes in Time and passes from some parts of an entity to the other, a part of the objects can continuously break into processes, and a part of processes – harmonize back into subjects. In addition, the general harmony of the entities grows in the free (isolated) condition and can vary in any direction in the dependent (non-isolated) condition. The general scheme of the process is shown in Fig. 21.

Definition. The process definition is an initial property (subject) of an entity with some harmonious potential that is sufficient for existence.

Definition. The process axis is a principal direction (trajectory) of development of the definition towards the purpose.

Definition. The development cone is the harmonizing concretization (development) of the entity definition.

Definition. The degradation funnel is the breaking of the entity while the definition is preserved.

Definition. The process end is the destruction of the entity definition as a result of exhaustion of its harmonious resource.

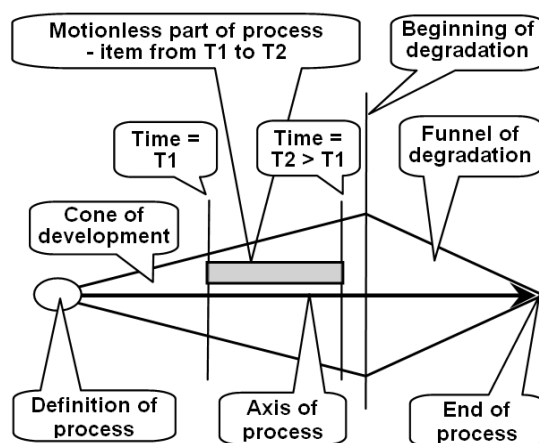


Figure 21 - The Structure of the Phenomenon in the Form of a Process

### The Abstract of Cognition

The abstract cognition concretizes (develops) the abstract of relations (existence) in the direction of more harmonization through four stages of advancement of an object copy (Fig. 22): 1) information, 2) knowledge, 3) understanding and 4) research.

Definition. Information is a condition of a copy of an object on the frontier of the subject.

Definition. Cognition is a condition of a copy of an object inside the subject.

Definition. Understanding is an internal harmonization of knowledge with other knowledge.

**Definition.** Research is an external harmonization of knowledge at the expense of reception of additional knowledge from an object.

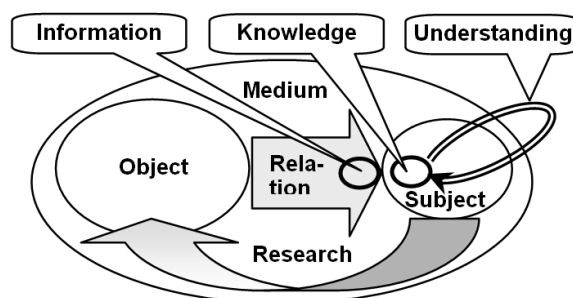


Figure 22 - The Cognition Scheme

### The Time Complex

Our Universe is an entity with divided Time. The Time Complex divides the Universe into three parts: 1) the Past, 2) the Present and 3) the Future.

**Definition.** The past is the fixed part of the Universe that consistently contains motionless copies of the Present.

**Definition.** The present is the moving part of the Universe harmonizing the last copy of the Past by laws and adding it to the Past.

**Definition.** The future is the part of the Universe containing virtual harmonized copies of the Present.

The movement of relations is possible only in the Present by laws of the UAP concretized to the RW. The movement in the Past is absent. The movement in the Future is only virtual (admissible or inadmissible).

It is convenient to represent the Time Complex by an axis with a moving point of the Present, the left semi-axis of which corresponds to the Past, and the right semi-axis – to the Future (Fig. 23). The Universe in the point of the Present is represented by a vertical line.

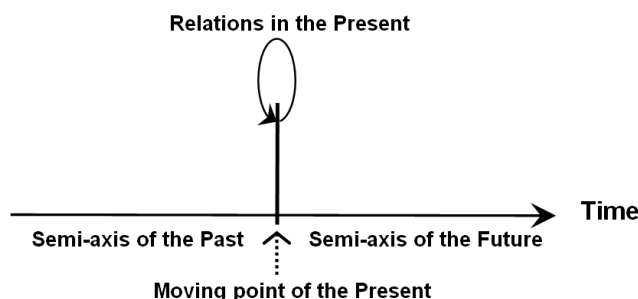


Figure 23 - The Scheme of Time Complex

### Virtualization of Relations in Time

**Definition.** Virtual relations are those that exceed the properties of the originals at the expense of supernatural (additional) resources of entities.

**Definition.** Virtualization is the exceeding of properties of an entity at the expense of additional resources.

Real relations can move (and consequently be harmonized) only in the Present and cannot – in the Past and Future. However, the latter can be done virtually if, while passing the Present along the Past, to copy (remember) the Past into the current Present and to create virtual copies of relations in it – the Past → the Present and the Present → the Past. Such copies can be arbitrarily changed in both directions, and the originals remain invariable at that.

Similarly, at the expense of forecasting (extrapolation) of relations on virtual copies it is possible to obtain virtual forecasts of relations in the current Present – the Present → the Future and the Future → the Present.

Both possibilities give an additional resource for distribution of the Super Law of Harmony from the Present to the greater parts of Time (the Past – the Present – the Future) and increase the harmonious potential of entities, which can use it. The entities can establish relations to a different extent along the axis of Time and thus transform it into a full-fledged dimension (Fig. 24).

Virtual relations by means of copying have inexact implementation in comparison with the original and smaller area of adequacy, but they exceed real possibilities of the original limited by the Universe.

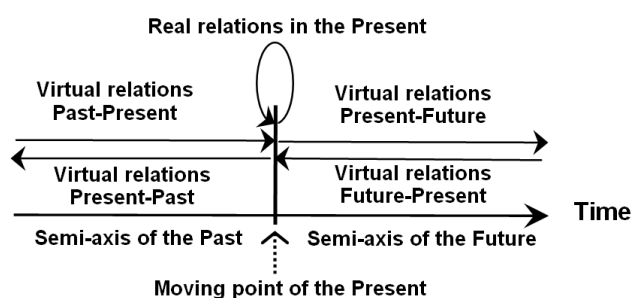


Figure 24 - The Scheme of Time Virtualization

### The Harmonious Classification of Entities in Time

**Definition.** The time harmonious classification is a classification of entities, depending on the use of components of the Time Complex.

The time harmonious classification defines five natural classes of the Universe entities, presented in the Table 1.

Table 1. The time harmonious classification of entities as per the degree of use of the Time Complex resource

Class №	Class name	Class definition	Harmonization class
1.	Thermodynamics	Real relations in a moving point of the Present only (Fig. 25)	Starting
2.	Natural selection	Item 1 + virtual relations on an interval of the semi-axis of the Past (the Past – the Present and the Present – the Past) (Fig. 26)	Passive
3.	Life (Intelligence)	Item 2 + virtual relations on an interval of the semi-axis of the Future (the Present – the Future and the Future – the Present) (Fig. 27)	Active
4.	The Highest Reason (God)	Item 3 + on all the axis of Time and a multitude of the Present (Fig. 28)	Highest
5.	Nothing	Item 4 + real relations on all the axis of Time (i.e. Time disappearance) (Fig. 12 - 13)	Absolute

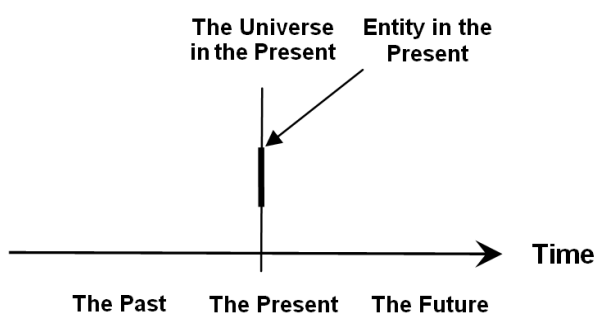


Figure 25 – Thermodynamics Scheme

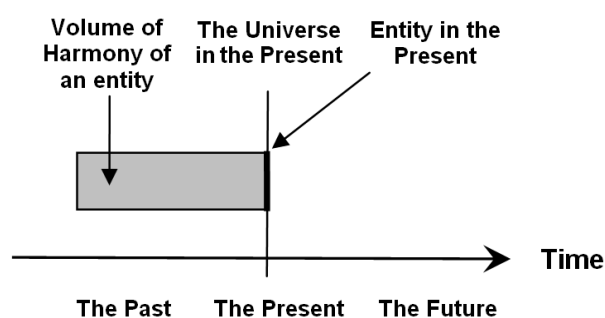


Figure 26 – The Scheme of Natural Selection

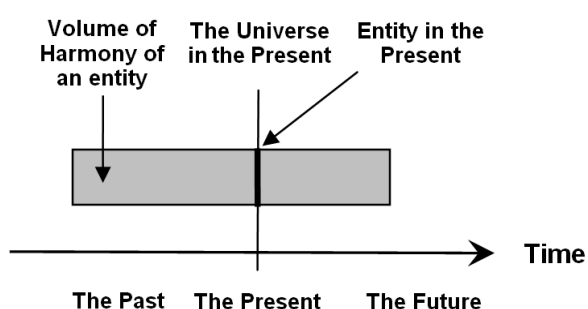


Figure 27 – Life Scheme

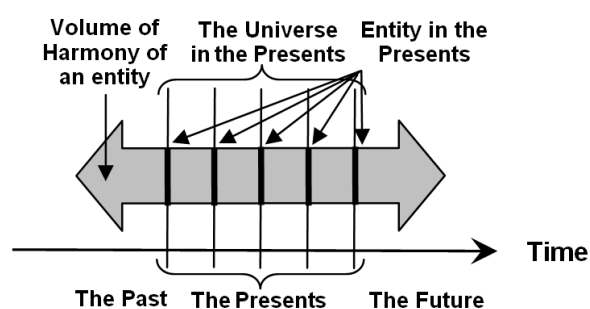


Figure 28 – The Scheme of the Highest Reason

### The Abstract of Intelligence

**Definition.** Intelligence (an active Harmonizer of the 3rd class) is the abstract of the 3rd time harmonious class (Life), using virtual relations on an interval of the axis of Time with real harmonization through a moving point of the Present (Fig. 29).

**Definition.** The length of the time interval used is the radius of Intelligence.

**Definition.** The number of components that are used in virtual copies is the size of Intelligence.

**Definition.** The complexity (number of states) of virtual copies used is the volume of Intelligence.

**Definition.** Reason and consciousness are the synonyms of Intelligence.

Intelligence consistently develops harmonization in Time from the point of the Present through the Time interval into a full-fledged accessible dimension of the Universe to the level of the 4th class with the only point of the Present. Intelligence differs by the last property from the following 4th class of Harmonizers that assumes multiple Present.

The Abstract of Intelligence contains a universal set of harmonization procedures in the corresponding class of entities that do not depend on the material nature of their implementation.

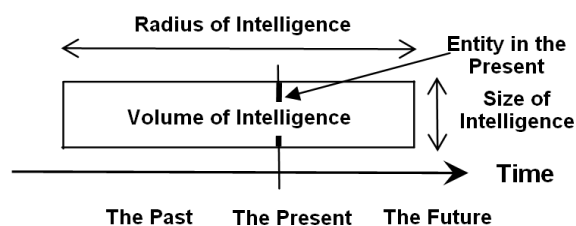


Figure 29 - The Scheme of Intelligence Parameters

## The Scheme of the Act of Thinking

Definition. Thinking is the process of virtual time harmonization by an intelligent entity (subject).

Definition. The intelligent property is the entity possessing the property of Intelligence with an internal (subjective) analogue of the STM-Complex.

Definition. The act of thinking is one cycle of mechanism of thinking operation.

Virtualization is carried out by the cyclic action of Intelligence under the following time scheme:

the real Present → the virtual Past → the real Present → the virtual Future → the real Present.

The thinking mechanism consistently carries out three procedures in each cycle (Fig. 30):

1. Virtualization of the Past – Present relations. The cognizable object is observed and copied by the subject within a real period of time through the moving point of the Present to the full satisfaction of the current purpose of the subject. The received copy (object history) is represented in the Present by the past interval of the process of the object with abstract, real, object and variable parts containing subjective analogues of all the components of the object that are relevant to the purpose of the subject. Virtuality means variability of this copy unlike the real fixed Past.

2. Virtualization of the Present – Future relations. The subjective Time accelerates passing ahead of the real Time and inside the subject the development of a copy of the object is carried out according to its laws up to the achievement of the purpose of the copy on that copy. The continuation (forecasting, object extrapolation) of the object process into the Future is restored in such a way. Virtuality means variability of this part of the copy unlike the real unique Future.

3. Virtualization of the Future – Present relations. Virtual parts of the process of the object with the Past and Future unite in the current the Present, and a complete virtual copy of the object is recreated by the subject with the assessment of the ways of harmonious purpose achievement. Unlike implementation of the original, virtuality means the variability of this copy.

As a result of each cycle of the mechanism operation, an elementary act of thinking (of the 3rd class active harmonization) of the intelligent entity is carried out. The previous classes 1) Thermodynamics and 2) Natural (passive) selection consistently reduce this mechanism by the removal of corresponding parts of a time interval and procedures. The following classes 4) the Highest reason (God) and 5) Nothing consistently develop this mechanism all over the axis of Time, a multitude of the Present and direct real relations.

The reverse motion of (subjective) Time is a sign of thinking.

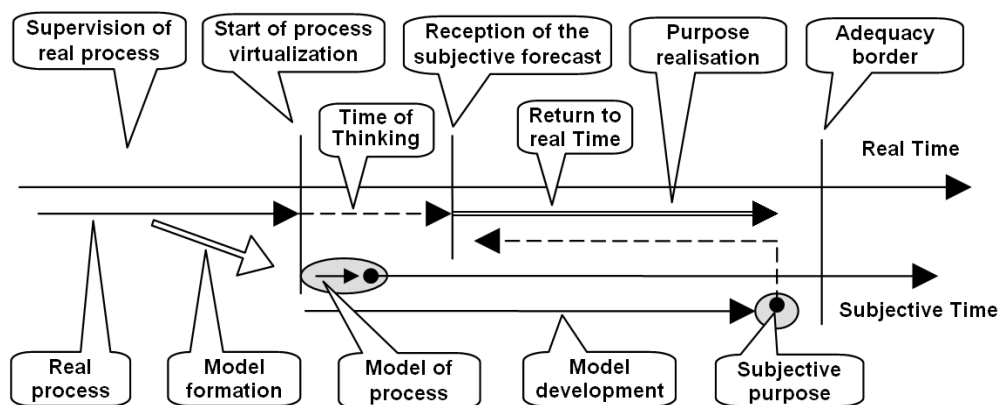


Figure 30 – The Scheme of the Act of Thinking

### The Scheme of the Act of Existence

Definition. The existence mechanism is a set of initial rules of existence of an entity.

Definition. The existence act is one cycle of operation of the mechanism of existence.

The existence of phenomena takes place cyclically under the general scheme. This scheme develops consistently in each harmonious class of entities.

The active existence in class 3 assumes the presence of the pair “the object that is being harmonized – the harmonizing subject” (the altruism scheme). In the particular case the object coincides with the subject, and then the purpose (a required harmonious condition) of the subject is inside this subject (the egoism scheme). The existence in classes 1 and 2 is a deep reduction of this scheme.

The existence mechanism consistently carries out three procedures in each cycle (Fig. 31):

1. The cognition of the object by the subject according to the current purpose of the subject under the classical scheme of the act of thinking. The subject creates a virtual copy of the object in an interval of Time with the achievement of a required harmonious purpose state.
2. Decision-making on the harmonization of the process of object existence on its virtual copy. The subject determines external influence on the object for its harmonization.
3. Implementation by the subject of the harmonious decision in the course of object existence during a Time interval. The subject implements external influences according to the decision made.

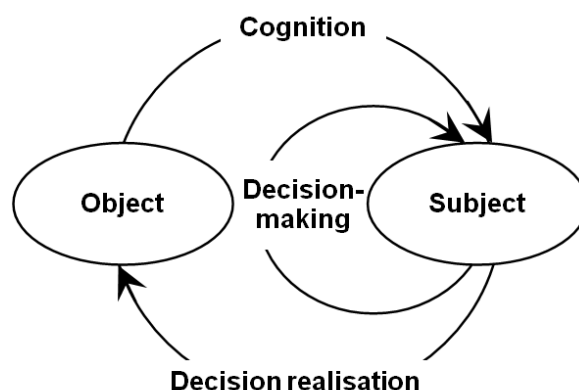


Figure 31 – The Scheme of Act of Existence ‘the Object – the Subject’

### The Scheme of the Process of Existence

Existence continuously changes 1) the object that is being harmonized and 2) its environment. Therefore, the process of existence has a recurring scheme (abstract), in every cycle of which the subject must choose temporary for this cycle 1) purpose, 2) moment and 3) harmonization interval, and then it carries out the act of existence. All of them must comply with the Super Law of Harmony for the object. Any deviation from the Super Law entails disharmonization of the object.

The subject operates the process under the following general scheme (Fig. 32):

1. At a moment of the Present it in a way chooses the nearest interval of the Future of the object.
2. It cognizes the object and predicts its self-development and the purpose during this interval.
3. It operates the process of harmonization till the end of this interval.
4. It repeats items 1-4 before the termination of support of the object.

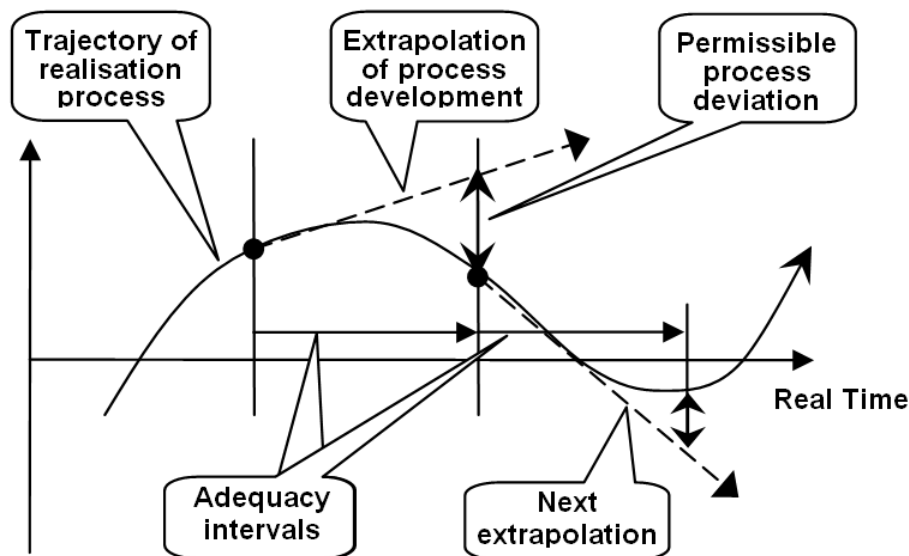


Figure 32 – The Scheme of Process of Object Existence

This scheme has multiple concretizations, depending on the properties of the object and possibilities of the subject to choose the moment and length of an interval of Time, object and subject purposes, etc.

The subjective and objective trajectories of existence of the object compete in the process. The former approaches, but usually diverges from the latter. The difference between the fact and the forecast generates the following classification of the degree of object disharmonization: evolution (distinction), problem, contradiction, crisis, revolution, and catastrophe.

Definition. Evolution (distinction) is an insignificant difference between the fact and the forecast while achieving the purpose.

Definition. The problem is a reparable adequacy loss by the resources of the object – subject pair while achieving the purpose.

Definition. The contradiction is an irreparable adequacy loss by the resources of the object – subject pair while achieving the purpose.

Definition. The crisis is the balance of harmonizing and disharmonizing forces of the object.

Definition. The revolution is the change of a class of the object.

Definition. The catastrophe is the destruction of the object definition.

### 3. Universe Methodology

#### The Concept of Methodology

Definition. Methodology is a totality of mechanisms of work with the Universe entities.

Remark. All the Universe as a whole is a special case of an entity.

Definition. The Universe Methodology is a totality of mechanisms of work with the Universe entities by means of the UM.

Definition. The Absolute Methodology is an absolute (full and exact totality of mechanisms of work with the Universe entities by means of the AUM).

Remark. The Universe Methodology aspires to the Absolute Methodology.

Remark. The methodology of class 3 operates in the current Present but with the virtual Past and Future.

Remark. The basic part of the UM is concentrated in the UAP.

The Universe Methodology (Fig. 33) has two parts: 1) the cognition of the Universe entities in the form of the UM and 2) the application of the UM. The cognition of the Universe entities is carried out in two ways: 1) by the study of the Universe entities and 2) training the subjects in the UM. The application of the UM has also two stages: 1) making harmonizing decision and 2) decision implementation.

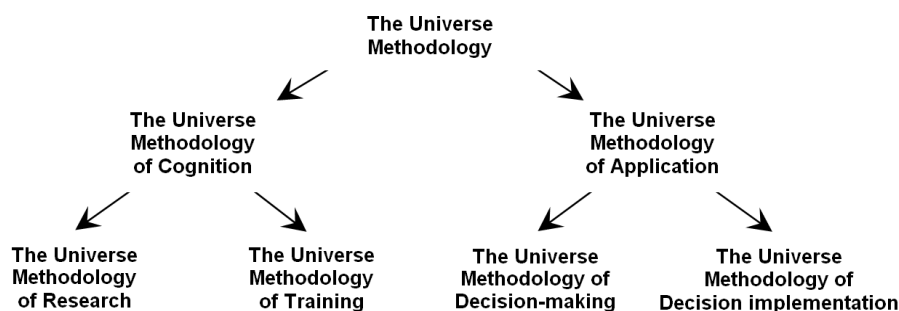


Figure 33 – Classification of the Universe Methodology

### The SubUAP of Entities

Definition. The subUAP of entities is a part of the UAP for this entity.

Every entity (both abstract and real) is a part of the Universe and contains relevant to it part the UAP (subUAP) (Fig. 34). The subUAP begins with the definition of this entity, and it concretizes itself in many different ways by the derivative entities up to the phenomena. The definition of the entity refers to the enclosed definitions of components, which are above the corresponding entity. The concretizing components of the entity also have their own subUAPs. All this totality of subUAPs finally covers the entire UAP.

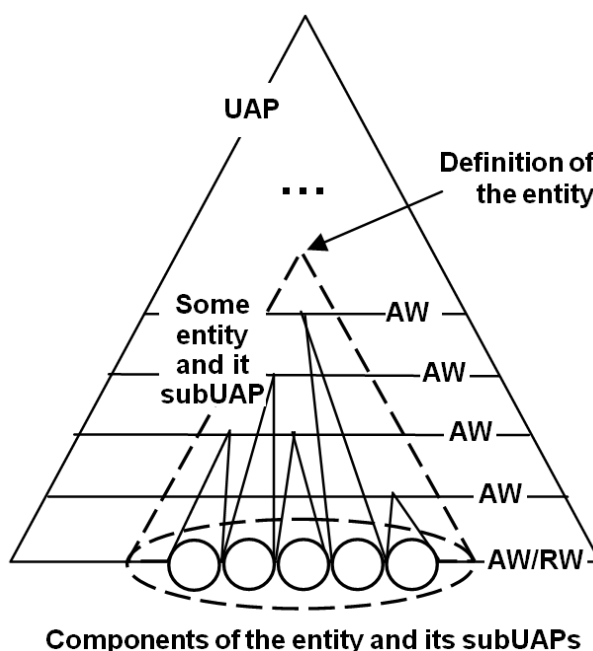


Figure 34 – The Scheme of the subUAP of an Entity



The concept of subUAP arises in the processes of harmonization for the restriction of complexity of work with the copies of entities. But all the entities and their subUAPs are connected with the entire UAP by the Universe definition, the complexity of which is infinite. There arises antagonism of these two properties.

This problem is solved by the restriction of the subUAP in different appropriate situational ways: 1) upwards from the concrete phenomenon to the entity definition, 2) downwards from the entity definition to the intermediate abstract level, 3) by the part that is relevant to the current purpose of the entity, etc. Consequently, the subUAP of an entity is a variable quantity that depends on the purpose of work with it and at the limit it merges with the UAP.

### The Expanded Scheme of a Subject

The initial scheme of an entity in the form of the subject with multiple existence (Fig. 4) is developed by the restoration of the subUAP components of this entity (Fig. 35).

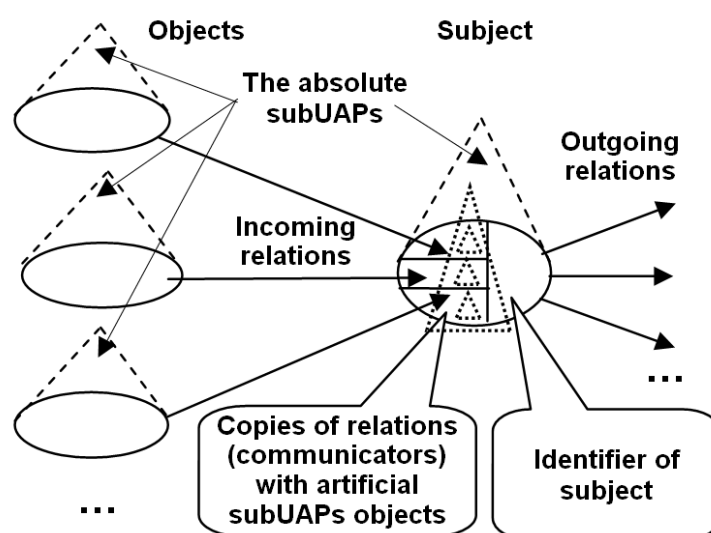


Figure 35 – The Scheme of Entities as a totality of Copies of the SubUAP

All the entities and their components are the carriers of their own absolute (natural, objective) subUAPs. Besides themselves, owing to some external relations the entities contain the subjective copies of objects, which can well contain the subjective (artificial) subUAPs of those objects. The latter according to the black-and-white classification are usually inexact and together form the summary subjective subUAP within the limits of the absolute subUAP of the entity.

Thus, entities co-exist with the absolute subUAPs and subjective subUAPs. The distinction between the latter and the former is the source mutual disharmonization of entities.

### The Closure of a SubUAP

Definition. The closure of the subUAP is the highest abstract of an entity.

Definition. The highest abstract is the abstract providing integrity of an entity in the UAP.

Remark. The closure of the subUAP is a variable quantity, depending on the level of the entity purpose.

The Absolute UAP is united by the closure at the top by the abstract of Nothing that ensures 1) integrity, 2) internal consistency and 3) absolute formalization of the Universe. The absolute (objective, natural) subUAPs of

the Universe entities are also closed by the corresponding abstracts at the top. The subjective (artificial) copies of the subUAP of the objects in the cognizing subjects must also be closed.

The artificial subUAPs are usually restored from natural subUAPs by parts upwards and often do not reach their tops, limiting by that 1) accuracy, 2) formalization and 3) cognition of corresponding entities. Therefore, to ensure the completeness of those qualities it is necessary to cognize the maximum levels of abstraction of entities up to the achievement of the highest abstracts, which is called closure of copies.

The closure of subUAP depends on the level of use (virtualization for finding harmonious solution) of abstract relations an entity. The level has the following conditions: 1) below the entity definition, 2) entity definition and 3) closure of abstract trajectories (probably partially) of entity components and above up to Nothing. The latter is done in the given paper for obtaining the UM.

The problem is deepened by the complexity of entities, consisting of a lot of (up to the infinity) components, for each of which it is also necessary to close copies. Therefore, the summary subUAP of the object must unite the subUAPs of all its components through the highest point of closure of all the trajectories of abstracts of those components (Fig. 36).

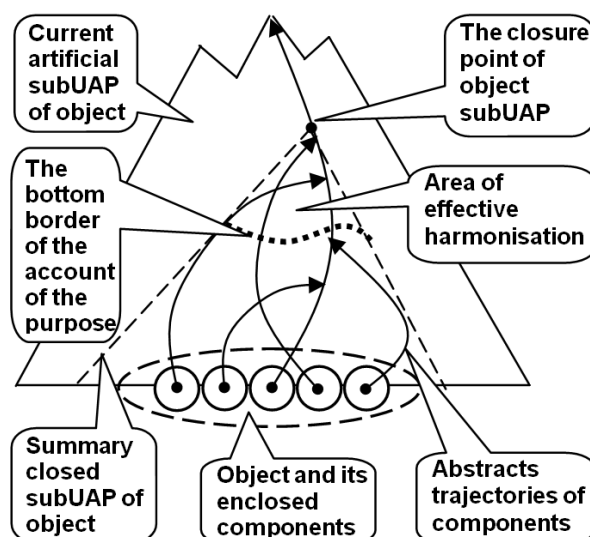


Figure 36 – The Scheme of Closure Mechanism of Artificial subUAPs of Objects

The closure of artificial subUAPs opens up an opportunity of formal generation of derivative bottom artificial abstracts downwards by special methodologies. There is a bottom frontier of the purpose account of the cognizing subject in the subUAPs. The part of an artificial subUAP from that frontier to the closure point is the area of different degree (from zero to maximum) of object harmonization decisions.

### The Universe Methodology of Research

**Definition.** The Universe Methodology of research of the Universe entities is a totality of restoration mechanisms of subUAPs of entities.

**Definition.** The restoration of subUAPs of the Universe entities is cognition (copying) of a part of the UAP of entities by a subject.

The Universe Methodology of research has a multilevel hierarchy, in which we are going to single out three initial levels.

1. The Super Law of Harmony, which determines the condition and movement of the entire Universe and all its entities at every moment of Time and at all the stages of existence is the highest mechanism of research. The concept of the Super Law is defined above. The Super Law determines the structure of the Universe and its UM.

2. Then the Super Law concretizes three cooperating restoration mechanisms of the subUAP of entities (Fig. 37).

2.1. The initial Dog-mechanism is called by the analogy with the research on the phenomenon of a conditioned reflex on dogs of academician Pavlov, the Nobel Prize winner. The Dog-mechanism begins scanning the Universe phenomena with a zero level of Knowledge in the specified object domain (entity) and singles out repeating parts in them, presumably like Abstracts of the first lower level of abstraction, which are the first hypothetical  $AW_1$  of the repairable copy of natural subUAP in this area. Then the same procedure repeats for a newly reached level of abstraction and recursively forms the higher level of  $AW_2$ , etc. up to the achievement of a terminal level, which the procedure does not appear to process. As far as such restoration of the subUAP takes place inaccurately with the accumulation of errors with the growth of the level of abstraction, it is applicable only for the lower levels. The entities with such a mechanism we are going to call Dog-entities as they use low-level purposes. That mechanism develops the classical induction.

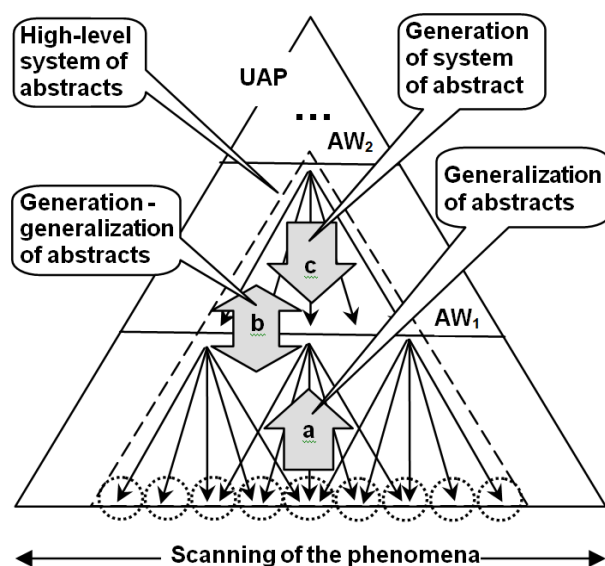


Figure 37 – The Scheme of Dog- (a) God- (b) and God/Dog- (c) Methodologies of Cognition (the account of the AW is upwards)

2.2. The God-mechanism (the anagram of the word *Dog*) is reversing to it. That mechanism recursively deduces back all the possible derivative Abstracts from the obtained abstracts according to the regularities observed, beginning with a current condition of a copy of the subUAP up to the level of the RW and compares them with those received at ascending recursion. Thus, the missing at ascending restoration Abstracts and divergences of recognized abstracts are discovered in such a way, which creates the reason for their subsequent more precise definition. We are going to call the entities with such a mechanism the God-entities as more complete and lifting the purpose level. That mechanism develops classical deduction.

2.3. The combined God/Dog mechanism cyclically applies both mechanisms upwards-downwards and sectionally in the areas of a restored copy of the subUAP to reduce the detected divergences of all the abstracts found and maximum possible expansion of a copy.

3. The mechanism of elimination of internal contradictions in the artificial UAP/subUAPs indicating their incompleteness by the addition of the missing entities is the next from the previous ones. The contradictions are resolved by additional inserts of hypothetical abstracts binding irredundant entities, which are checked for internal and external consistency then by finding natural Universe analogues or deducing other abstracts from them (Fig. 38). This methodology is not declared classical, but is actually applied in natural sciences (physics, mathematics, etc.).

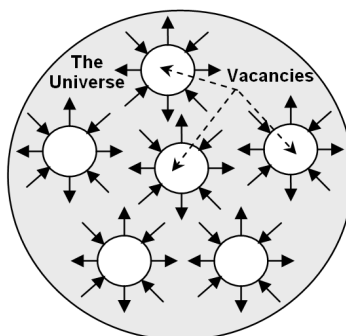


Figure 38 – The Schematic Representation of Incompleteness of Entities (the UAP/ subUAP) and Vacancies as the Source of Internal Contradictions

### The Universe Methodology of Training

**Definition.** Training is copying of entity copies by the other entities.

**Definition.** The Universe Methodology of training is a totality of training mechanisms of subjects by the Universe entity.

**Definition.** The entity that is being copied is called a teacher.

**Definition.** The copying entity is called a student.

Training is an indirect mechanism of cognition of the UM through other entities (Fig. 39). It allows 1) to investigate the entities that are not achievable by direct relations, 2) to use earlier received and kept copies for the subsequent cognition by other entities and 3) to save harmonization resources.

By the definition of the Universe, training is a universal mechanism of cognition and together with research is applied in all the acts of cognition and harmonization, in which the Universe is the main teacher demanding its research [8].

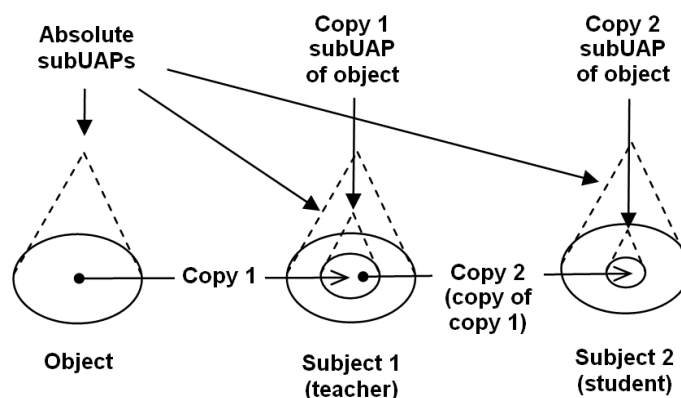


Figure 39 – The Training Scheme

### The Universe Methodology of Application

**Definition.** The application of the UM is taking actions for 1) making (a choice of) a harmonizing decision on the copies in the subjects (virtualization) and 2) decision implementation in the objects (implementation).

**Definition.** Making (a choice of) a harmonizing decision on the copies is 1) determination of the harmonizing purpose of the object and 2) a finding a way from the current into the goal state.

**Definition.** The methodology of making (the choice of) a decision is a totality of mechanisms of items 1 and 2 of the previous definition.

**Definition.** Decision implementation is a purposeful change of entities (objects).

**Definition.** The methodology of implementation of a decision is a totality of mechanisms of real achievement of the chosen purpose in entities (objects).

The application is carried out after cognition as the (second) final part of the act of object existence under the harmonizing subject control. It carries out the last three stages of the object existence: 1) a purpose choice, 2) making (choice of) a decision on its achievement and 3) decision implementation.

The first two actions are virtually carried out on copies, and the third one – on a real object (Fig. 40). The decision choice is carried out by the virtual and implementation – by the real transformation of the object relations from the initial into a goal state by means of intermediate relations 1) in Time (laws), 2) object environment (external relations) and 3) internal relations of the objects.

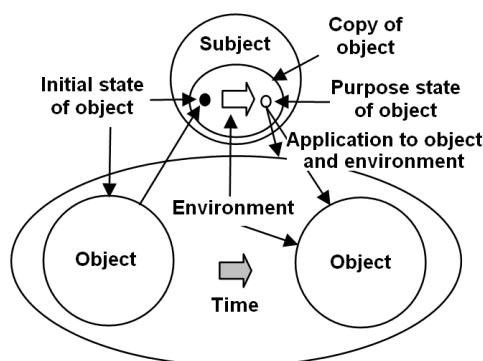


Figure 40 – The Application Scheme

### Conclusion

1. In the paper a hypothetical Model of the Universe is stated which allows for the first time to deduce the system of information and, in particular, intellectual concepts from the highest concepts of our Universe.
2. The obtained system of concepts is universal in sense of internal (among themselves) and external (with the Universe) consistency (harmonization) and fully agrees with the standard scientific concepts.
3. Definitions of the basic concepts of computer science are presented in the natural language and structural logic forms, allowing their effective application in manual research and development.
4. For the first time the application of the obtained system of concepts allows to solve a lot of complicated problems of modern computer science and Science as a whole.
5. The obtained system of concepts has general scientific importance of world scientific standard.

6. The specified Model is actually a universal meta-theory, allowing to generate secondary applied theories of many subject domains according to the common universal methodology permitting subsequent realization.
7. Unlike philosophical reasonings the offered system of concepts concerns exact sciences and allows complete formalization in essence.

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