Biological Evolution Anticipates the Social Development towards Creative Society

(In the View of Organized Systems Theory)

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Abstract

Bio-theoretical analysis of the evolution of living systems on the basis of organized systems theory suggests that social development of the human beings is a succession towards the increasing technological creativity. The community of primates evolves from a creative individual through the creative social layer (creative class) towards the creative society. The creative class is a socioeconomic layer that is the key driving force for the economic development of post-industrial regions. The organized systems theory, based on the principle of the informational closed-loop coding-decoding control (CL-CDC), suggests that the creative class is only the first step to the new social formation – creative society, the society that specializes to generate information. The economic growth is only the production of resources for the generation of social information. Information could be understood as a phenomenon, which is completely different from matter and energy, since informational control determines the main property of the organized systems that is the ability to reduce entropy. The organized systems are immersed in the space of problems, which need to be solved, and information is a means to solve the problems. It controls the behavior of the organized systems. Both the living system and the social system could be understood as organized problem-solving systems. The living cell is the primary and the simplest organized system on the Earth based on genetic information, and genotype-phenotype duality. The essence of the evolution of the human society is the evolution of the brain-based information technology. The concept of CL-CDC as an approach to life and society on the basis of evolution of information technologies combines and extends the concepts of nomogenesis (Berg, 1922), noogenesis (Teilhard de Chardin, 1955), Lamarckian in the human evolution (Yčas, 1993), holistic Darwinism (Corning, 2005), technological singularity (Kurzweil, 2005), creative class (Florida, 2002-2008) and converting NBIC(Nano-Bio-Info-Cogno) technologies. Biological evolution enables us to anticipate social evolution towards creative society.

Keywords: creative class, creative society, problems solving, information, CL-CDC, NBIC

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1 Introduction

Wide range of Darwin's 200 years celebration marks the importance of the bio-evolution theories, especially today, at the beginning of the twenty-first century and the new socio-technological post-industrial era, and calls us for new scientific approaches to assess not only biological evolution, but, in extension, the evolution of human society, in anticipation of its future. In the year of Ch. Darwin's birth, J. B. Lamarck, in Paris, has announced the concept of the evolution of life, which, after half a century, was rejected by the publication of Darwin's concept of the evolutionary selection. New biology pioneer M. Yčas claims that "*Darwin's ideas about somatic evolution are the right ones, but Lamarck is also right when the later stages of human evolution are discussed*" (Yčas, 1994).

Celebrating the Ch. Darwin's year, and paying tribute to his concept of the evolution phenomenon, the attention should be drawn to the idea of phenotype-genotype that was pronounced 100 years ago. In 1904-1911, at first in Danish and then in German and English, W. Johansen published the constructivist idea of holistic functional organization of life as a dynamical genotype-phenotype system. W. Johansen concluded that this distinction is similar to the difference which exists between a project and its physical implementation, and represents therefore a dichotomy of the living world which is as deep as the Cartesian dichotomy between *mind* and *body*. It was in fact proposed that the organism is a closed-loop coding-decoding (genotype-phenotype) system, *i.e.* that life does not have only an "informatics" (genetic coding) but also a "semantic" (decoding) logic at its heart. It is to be regretted, this idea got the scientists attention only after over half a century, when DNA structure was revealed and genetic code was established.

The scientific approach to the evolution has given a rise to the concepts of nomogenesis (Berg, 1922), noogenesis (Teilhard de Chardin, 1955), Lamarckian in the human evolution (Yčas, 1993), holistic Darwinism (Corning, 2005), technological singularity (Kurzweil, 2005), and the creative class (Florida, 2002-2008).

Bio-theoretical analysis of the evolution of living systems on the basis of organized systems theory suggests that social development of the human beings, the evolution of human society, is the technological development and the proceeding towards the increasing technological creativity.

The representatives of the humanities and social sciences states that the behavior of any human social groups or society can not be explained and interpret by the analogy to bioevoliution, because social and human phenomena, the human society and human behavior, is based on the special principles, different from the biological ones. Physicists and chemists strive to explain all life only by the interpretations of natural phenomena based on the laws of material and energy conversion. They argue that all real natural systems are made of atoms, and therefore the biological systems and human behavior can be interpreted in physical and chemical laws, since all natural systems are material, *i.e.* consist of atoms and molecules. Since Aristotle, the biotheorists dealing with this problem fall into two groups: either dualistics-vitalistics or realistics-materialists. Although, it seemed that cybernetics has solved this dilemma by

introducing the information and control concepts, but so far different interpretation of biosocial evolution thrives. It could be expected, that the explanation of the emergence of life and the evolution of living systems from the point of view of the organized holistic systems theory, will consolidate these different theoretical approaches. The organized systems theory explains the existence of the living systems as the complex dynamic metabolism of matter and energy. However, sustainable existence and evolution of living systems is determined by virtual information procedures, in addition to material metabolism. Therefore, the evoliution of living systems should be looked at through the evolution of information technologies.

The generalized scheme of the evolution of living systems as engineered symbiotic development of information technologies is represented in Fig. 1. The origin

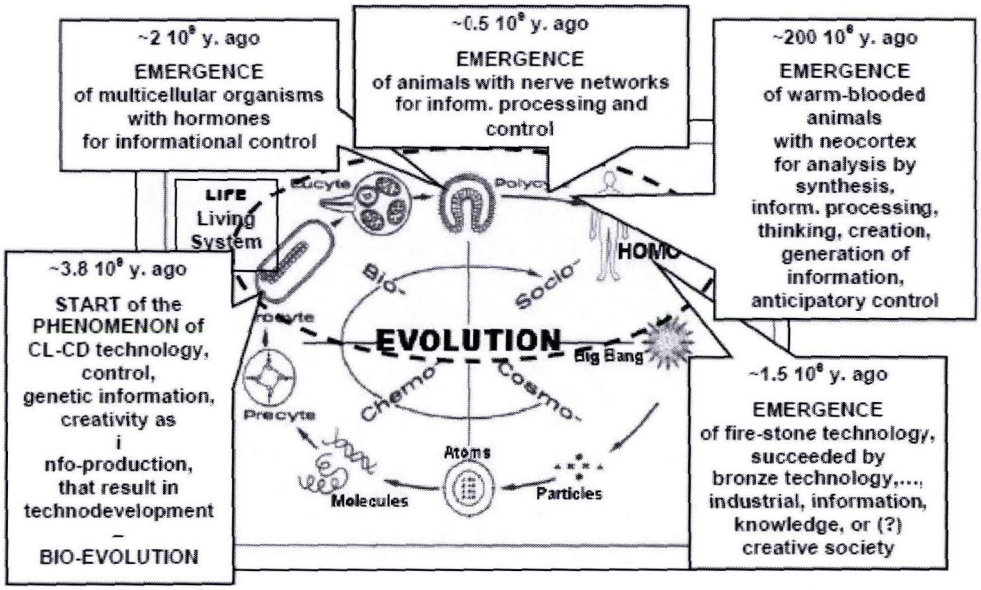

Figure 1: The generalized scheme of the evolution of living systems as an engineered symbiotic development of information technologies

of life marked the start of the phenomena of technology, technological control, genotype-phenotype system on the base of genetic information. It determined bio-evolution (the creation of new species) on the population level as stochastic production of information on the principles of genetic algorithms. The origin of life is the emergence of a new sort of the organized systems. Its functioning is determined by informational control based on the principles of closed-loop coding-decoding (CL-CD). That results in the development of biological technologies related to production of

information as bio-techno-creativity, and that is evolution. The emergence of multi-cellular organisms carried in the cellular hormonal subsystem of informational control (regulation) that works on the agent principles. The emergence of animals brought in the nerve subsystem that carries out the information processing and controls the organism by special connections of the neural networks. The warm-blooded animals (mammals and birds) developed the neo-cortex of the brain, as a new neuro-informatics technology that pursues the thinking procedures. The thinking is an extreme information processing through analysis by synthesis, that permits the creation (individual generation of information) and anticipatory control. The developed human brain, as extreme neuro-information technology for information production in the human society, has created and implemented the fire-stone technology, which evolve to the bronze and iron ages, the industrial society, and now it steams ahead the so-called information-, knowledge-, or creative-society.

Obviously, the phenomenon of life is the result of the complex systems that consist from the several subsystems that is working as a whole holistic system.

2 The phenomenon of life consists of the phenomena of organization, technology, information, control and evolution

It is accepted, that 3.8 billion years ago the life as a qualitatively new form of matter organization has emerged in a process of chemical evolution. The complex living world that consists of hierarchically organized biosphere and noosphere has appeared as a result of the latter evolution of life.

The life is a member of the class of phenomena which are open or continuous systems thermodynamically able to decrease their internal entropy (S) at the expense of substances or free energy taken in from the environment and subsequently rejected in a degraded form,

$$\frac{dS}{dt} < 0, \text{ for living systems, and } \frac{dS}{dt} > 0, \text{ for non-living nature.}$$

The life, living systems, in contrast to non-living nature, are antientropic, or extropic, systems.

Two hundred yars ego A. Sniadecki in "The theory of organic beings" wrote: "*If the matter is organized and alive, a special force should be operating that connects, controls the matter and makes it alive. We shall name this force the organic or organizing force*". Today, we may name this "organic, organizing forces" as *information*, which *controls* technologies.

The phenomenon *organization* are studied by researchers from several disciplines, such as sociology, economics, political science, psychology, management, and organizational communication. The broad area is commonly referred to as organizational studies, organizational behavior or organization analysis. The organization is understood as a purposive process or action, functional systems; a

permanent structure; an institution. In most cases, *organization* means the social system or social phenomenon. However, in the context of living systems theory (J. G. Miller, 1978), the concept of *organization* should be extended and considered as the general subject of any organized system. The life is seen as the technological phenomenon.

Technology is a broad concept that deals with tools and techniques as a whole for a purposive mass serial transformation and production of matter (chemical or material technologies), energy (physical or energy technologies) and information (information technologies). Life in a proper sense is a perpetual use and reproduction of natural (biological) technology. Life in a broad sense is a perpetual evolutionary adaptation (through darvinistic processes by natural selection) of these technologies as a reaction to biotic and abiotic changes of the environment. The life in its entirety is a system of different organized complex technologies, holistically organized to a purposeful technological system.

Technology as a phenomenon appeared on the Earth 3-4 billion years ago, when life (information, control, complexity and adaptivity) originated. The first technology was formed when matter/energy transformation and information control merged together by purposeful CL-CD. The initial technology was based on the genetic informational control and enzymatic material conversion principles. This point of view allows us to interpret the biological evolution as a natural engineering, natural technical and technological development of biosphere. Parallelism of natural (biological) and artificial (technical) technologies is seen in such fields as bionics/biomimetics.

It is evident that life (a functionally organized purposeful system) is in principle different from non-living (non-organized) systems. The last-mentioned systems could be fully explained by physics and chemistry entirely, *i.e.* by the laws applied to the energy conversion and the matter transformation, since these systems are the traditional isolated thermodynamic systems, which follow the laws of energy conservation and entropy increase. Meanwhile, the living systems are characterized by decreasing entropy or increasing level of organization, which is a qualitative leap in the system complexity demanding the emergence of new technologies. This is an evolution.

Biosphere and human society (noosphere) may be represented as the systems of natural or artificial technologies, respectively. The biological species may be regarded as a natural technological system that lives, adapts and self-reproduces using the existing environmental resources. In bio-systems of all hierarchical levels starting from cells, it is possible to allocate two, essentially different, but functionally closely inter-connected natural biotechnologies: (a) a subsystem of matter/energy transformation (controlled subsystem) and (b) a subsystem of informational control (controlling subsystem). Since living or organized systems must be able to reduce the entropy, *i.e.* enhance the functional effectivity and stability, they require special instruments that create and support organization. This is information that controls the purposeful technological procedures by means of information technology.

The non-organized system is simple, for it does not need the information procedure, because its processes follow the second law of thermodynamics, and are restricted to the natural spontaneous movements toward the lowest level of the system energy state.

Information phenomenon is not inseparable from phenomenon of *control*. Information is necessary only for technological control. The purpose of the informational control is the directions of the matter/energy transformation and the flow of information at proper time and proper places of the organized system. The ideas of *life, information, control* and *organization* are inseparable in a scientific understanding of living systems. Evolution of living systems could be analyzed as evolution of technologies of informational control.

Phenomenon of the *evolution* of living systems has emerged as a property of an organized system to change, and adapt biological technologies in the volatile environment.

At a glimpse, all these phenomena look different and separate, but at a closer approach, they are parts of a general result produced by the functioning systems organized on the principle of CL-CD.

3 The closed-loop coding-decoding (CL-CD) technology as a base of the evolution

The comparative analysis of the living and techno-cybernetic systems reveals many of analogies. There are analogies on the genetic, hormonal, neural, psychical, social, robotic systemic levels of the organized systems. Dualistic material↔informational equivalence manifests the following systems: signal↔information; phenotype↔genotype; body↔soul; brain↔thought; hardware↔software; biosphere↔noosphere; social group↔management; state↔government. (Fig. 2.)

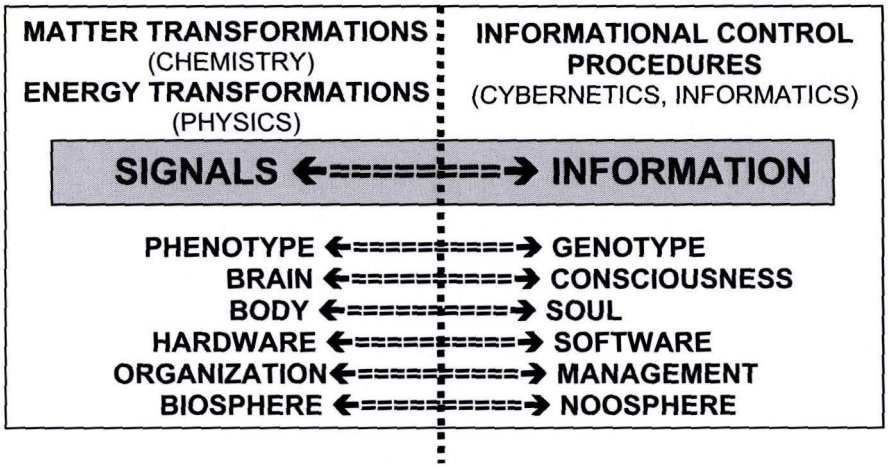

Figure 2: Material-informational dualism in the organized systems

Such the organized systems include two functionally different subsystems: the controlling one (a controller) that processes the information; and the controlled one that carries out transformation of matter and energy for goal-oriented actions (Fig. 3). That is a systemic CL-CD structure.

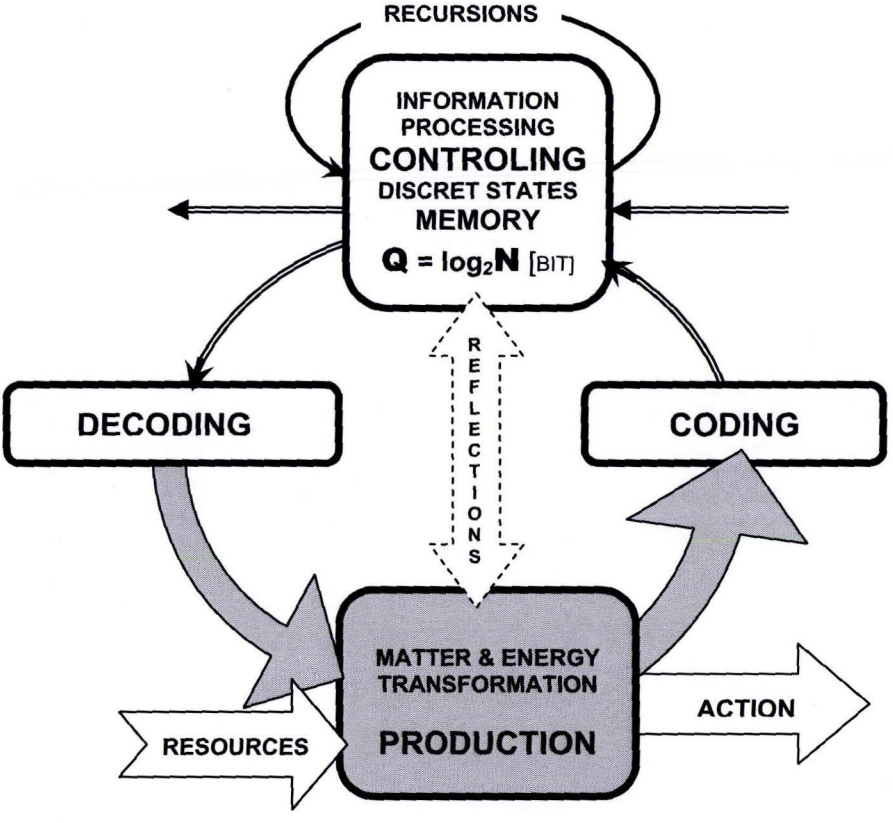

Figure 3: Principle functional scheme of the organizationally closed, matter-energy-information open or informational CL-CD system

According to the CL-CD scheme, the material subsystem of the real world may be represented by encoding (coding) procedure to the formal (abstract, mathematical, virtual, computer) world as a model of the material subsystem. The model or the formal system operates with the special rules as recursion. The coding procedure corresponds to observations, measurements, analysis, representations or reflections. Accordingly, the decoding procedure is the de-reflection or synthesis of the material subsystem under informational control of the model in the formal subsystem. The decoding accompanies the procedures of interpretation, control, prediction, synthesis and anticipation.

Coding (*encoding*) should be understood as a reflection of a real system (nature or a technological process) in a virtual form on *memory* structures (DNA, hormones, neural networks, programs, books, *etc.*) in such a form, that the de-reflection of the virtual to the real was by possible. The model in memory is represented in discret finite stable states, which limit the precision of control and functioning of the organized system. The quantity of the states of the memory structure not only determines the operational accuracy of the organized system, but can also expand its functionality. This is an evolution.

The coded reflection in the memory is a model or a technological project of the real system. This model or a coded representation for control is the essence of information. *Decoding* is the realization of such a project or control of natural biotechnological procedures following the information. In the process of decoding, the activated coded states of the memory structures or the projects for synthesis of reality are reflected in the dynamic states of the real world, real structures of body, *etc.*

The systems that function according these principles are organizationally closed and informationally open. Organizational closeness causes the functional compatibility of coding-decoding and functional sense (semantics) of coded reflections. Informational openness means ability to join additional information about the environment to the pool of already existing models of the real world ("informational metabolism" in analogy of mater and energy conversion).

The discrete CL-CD systems operate in discreet time as recurrent procedures. Many organized systems, *e. g.* cellular and neural subsystems, behave anticipatory: on the basis of the present state, the controlling subsystem forms hypothetical state $\boldsymbol{H_{j+1}}$ of the system model at the next time moment (extrapolates) and compares it with the necessary state of the system at the next time moment. Perceptual tools $\boldsymbol{P_j}$ are used for comparison of these states. According to the comparison of the results, the commands to the controlled subsystem are generated and sent. These commands initiate material changes in the controlled subsystem that decrease or eliminate disagreements between present→hypothetical and necessary future states. States and disagreements are a part of the gnostic model that represents the real system.

All this recurrent behavior of the whole system is described by equation:

$$ACTION = D_i\{C_i\{C_{i-1}\{...C_1\left\{[H_0 - P_1], \begin{bmatrix} NewH_1, & if \quad H_0 \neq P_1, \\ D_1, & if \quad H_0 = P_1, \end{bmatrix}\right\},$$

$\boldsymbol{H_0}$ –an initial hypothesis, *i. e.* gnostic model of the expected state at future moment. Formulation of the gnostic model in active organized system is an anticipatory action. Model is *a priori* information based on the last percepted sensory data $\boldsymbol{P_0}$ of the present system state and the earlier states;

$\boldsymbol{P_1}$ – gnostic model of initial percepted state, that is compared with H_0;

$\boldsymbol{C_j}$ – procedure of informational comparison of states of two models $[\boldsymbol{H_{j-1}}\text{-}\boldsymbol{P_j}]$;

$\boldsymbol{D_i}$ – ***i***-ties decision making, action model, where $\boldsymbol{H_{i-1}} = \boldsymbol{P_i}$ after one or several recurrent comparison cycles.

This equation means an algorithm of recurrent informational modeling of future states of the system and similar states of the same system after corrective actions. All organized systems that work on CL-CD principle use this algorithm.

The functional elements of the organized systems must also be dualistic, consisting of the conversion of matter/energy and information-signaling components. The basics elements for organized and non-organized systems are presented in Fig.4.

Any organized system and its elements must be based on this dualistic principle. The parallel, in series, feedback and hierarchic combination of such elements may produce the systems of higher complexity. The elements may consist of cells, organs, humans, electronics or optic devises, *etc.* Such systemic thinking could be applied to the interpretation of human society and for the anticipation of the development of the society.

The new coming converging NBIC (Nano-Bio-Info-Cogno) technologies in post-industrial society must to extend the scientific visibility of economics, to change the ethical values in public life and business concept also. The NBIC technologies are the strategic policy to future in USA and ES (Bainbridge, 2003; Nordmann, 2004; Obama, 2008; Orca, 2010; Bedau at all, 2010).

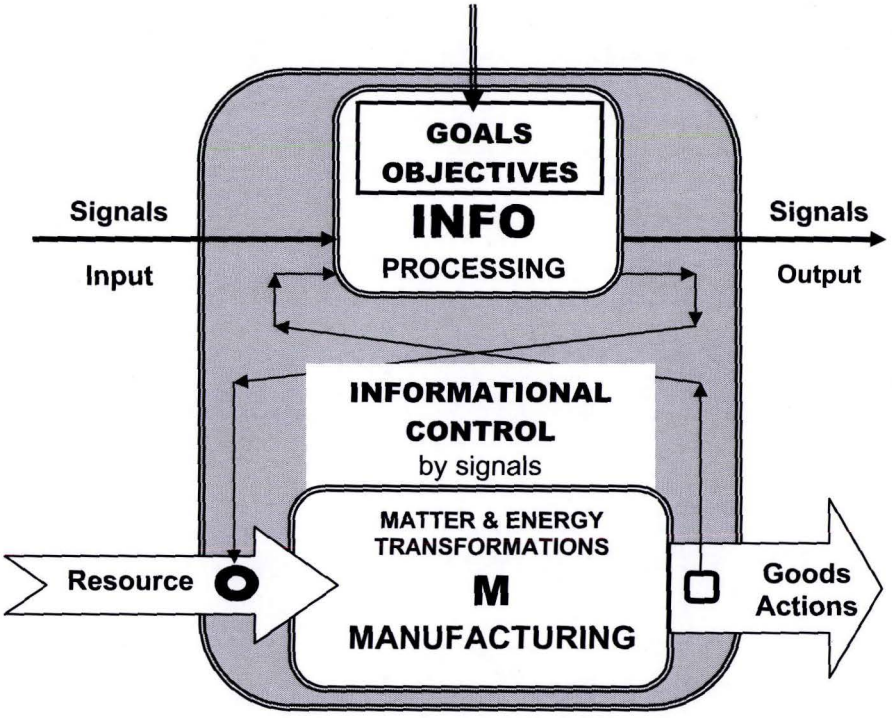

Figure 4: The functional schemes of the basic components of the organized systems: - management, controller or information processing subsystem; - manufacturing or matter-energy transformations subsystem

The concept of CL-CDC and converging NBIC technologies as an approach to life and the human society on the basis of evolution of information technologies combines and extends the concepts of nomogenesis (Berg, 1922), noogenesis (Teilhard de Chardin, 1955), Lamarckian in the human evolution (Yčas, 1993), holistic Darwinism (Corning, 2005), technological singularity (Kurzweil, 2005), and the creative class (Florida, 2002-2008). Biological evolution enables us to anticipate social evolution towards the creative society.

4 Creative class (social layer) as a social subsystem of informational control

The Creative Class is socioeconomic layer that, according to the social scientist R. Florida, is a key driving force for economic development. R. Florida describes *the Creative Class* as workforce, and breaks the class into two broad sections:

- Super-Creative Core: This group is workers from science, engineering, education, computer programming, research with arts, design, and media workers making a small subset. Those belonging to this group are considered to "fully engage in the creative process" (Florida, 2002). The Super-Creative Core is considered innovative, creating commercial products and consumer goods. Their primary job function is to be creative and innovative. "Along with problem solving, their work may entail problem finding"
- Creative Professionals: These professionals are the classic knowledge-based workers and include those working in healthcare, business and finance, the legal sector, and education. They "draw on complex bodies of knowledge to solve specific problems" using higher degrees of education to do so (Florida, 2002). Additional to these two main groups of creative people, the usually much smaller group of Bohemians are also included in the creative class.

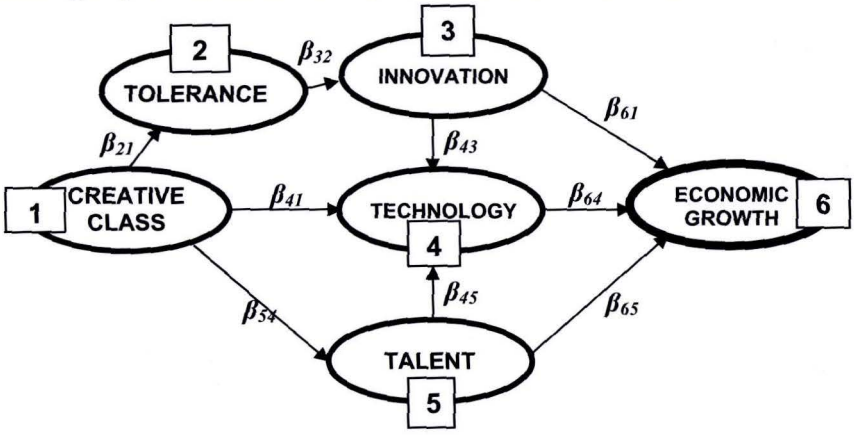

Figure 5: Schematic model of the influence of the creative class to the economic growth

The creative class is the core force of economic growth in our future economy. After the scheme, presented in Fig. 5, the talents of the creative class generate ideas (information) that in tolerant society influent inovations and creation of new technologies. The implementations of new technologies in the society life determine the economic growth.

This model is a base for construction of a mathematical model for the estimation of social creativity and anticipation of the economic growth. The similar models were used for estimation of the regional creativity or human capital in Sweden (Mellander, Florida, 2006).

The model is the simple system of algebraic linear equations. The coefficients are calculated on the base sociological experimental data as coefficients correlation matrix.

$$\begin{cases} [Economicgrowth] = \beta_{63} \cdot [Inovation] + \beta_{64} \cdot [Techno\log y] + \beta_{65} \cdot [Talent] + e_6 \\ [Inovation] = \beta_{32} \cdot [Tolerance] + e_3 \\ [Techno\log y] = \beta_{43} \cdot [Inovation] + \beta_{41} \cdot [Creativeclass] + \beta_{45} \cdot [Talent] + e_4 \\ [Talent] = \beta_{21} \cdot [Creativeclass] + e_2 \\ [Tolerance] = \beta_{51} \cdot [Creativeclass] + e_5 \\ [Creativeclass] = const. + e_1 \end{cases}$$

It is obvious that a mathematical algorithm for the assessment of the social creativity and the economic growth is over-simplified. Particular attention must be paid to the creative human psychological characteristics. They need to be understood and evaluated. Obviously, each individual creative human could have an influence on the economic growth in the non-linear character. In addition to all of this, the feedback effects could take place in the creative chain, and they could radically change the model characteristics.

Special interest should be taken in Maslow's hierarchy of human motivations and needs. The lower four layers of the pyramid represent what Maslow called "deficiency needs" or "D-needs": physiological, safety and security, love and belonging, and esteem. With the exception of the lowest (physiological) needs, if these "deficiency needs" are not met, the body gives no physical indication but the individual feels anxious and tense.

The peoples of fifth Maslow's level needs feel the pleasure to create, formulate problems, develop models for problems in the search for solutions, made the decisions, simulate to predict and anticipate. That means thinking, create, problems solving or production of information. It is the neuro-informational technological procedures of the human brain, of the neo-cortex. Those peoples are the members of the creative class that guide to the new creative society.

1. *Physiological needs*: breathing, homeostasis, water, sleep, food, sex, clothing, shelter.
2. *Safety and Security needs*: personal security, financial security, health and well-being, safety net against accidents/illness and the adverse impacts.
3. *Social needs*: friendship, intimacy, having a supportive and communicative family.

4. *Esteem needs*: to have self-esteem, self-respect.
5. *Self-actualization needs*: The motivation to realize one's own maximum potential and possibilities is considered to be the master motive or the only real motive, all other motives being its various forms. In Maslow's hierarchy of needs, the need for self-actualization is the final need that manifests when lower level needs have been satisfied. This needs is the essence for creative class.

5 The creative class guide toward creative society

The modified scheme presented in Fig. 5. that shows how the creative class affects the social evolution toward the solidary creative society is represented in Fig. 6.

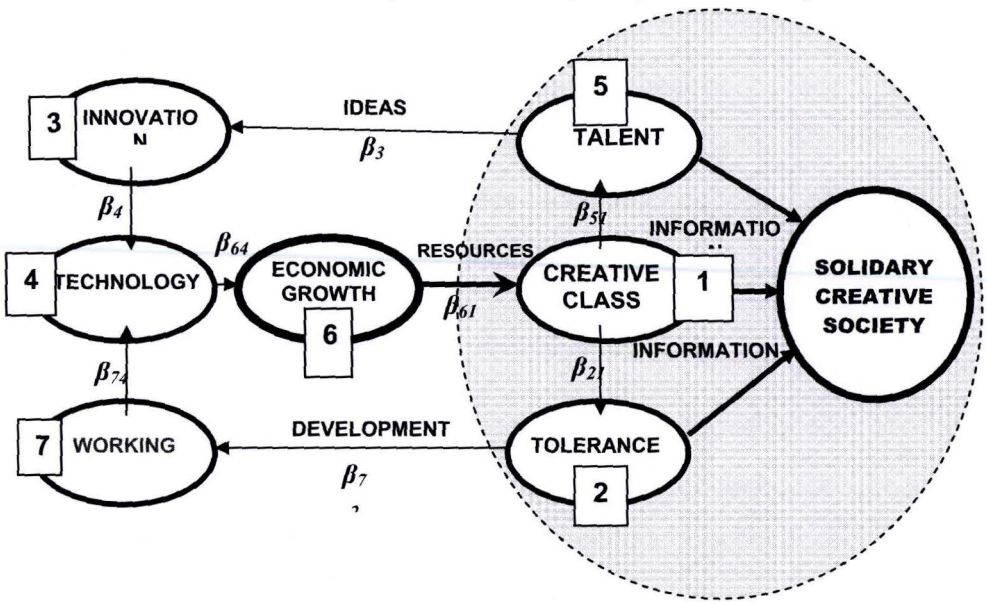

Figure 6: The scheme of the social evolution - from industrial society of competitions through creative class of cooperations towards solidary creative society

The creative class increases tolerance of the society and promotes talents for work stimulating the development of new ideas and new innovations. The employment and innovation activate the new original technologies; the new technologies drive the economic growth, which leads to even greater growth of the creative class.

The mathematical model constructed on the presented scheme shows the gross influence of the creative class to the social evolution toward solidary creative society.

$$\begin{cases} [Creativeclass] = const. + \beta_{16} \cdot [Economicgrowth] + e_1 \\ [Tolerance] = \beta_{21} \cdot [Creativeclass] + e_2 \\ [Talent] = \beta_{51} \cdot [Creativeclass] + e_5 \\ [Economicgrowth] = \beta_{64} \cdot [Techno\log y] + e_6 \\ [Inovation] = \beta_{35} \cdot [Talent] + e_3 \\ [Techno\log y] = \beta_{43} \cdot [Inovation] + \beta_{47} \cdot [Working] + e_4 \\ [Working] = \beta_{72} \cdot [Tolerance] + e_7 \end{cases}$$

The particular contribution reflects recurrence procedures of the creative class in the social evolution of the social system.

6 Consideration

Development of human society could be interpreted as continuance of biological evolution. A century ago, H. Spencer had seen many analogies between organism and well-organized state. Today the analysis of vision, reality and forecasted future of EU and especially evaluation of Lisbon strategy lead to understanding that development of live nature (biosphere) and social systems continuum (noosphere) are strongly influenced (maybe canalized) by technologies that are created and implemented. Technologies here are interpreted in an extended way. The concept of *organized system* looks promising for comparative analysis of development of technologies and prognoses of evolving social systems.

Organized system is a case of complex system that have features of cybernetic system (purposeful system), and especially if it have features of second order cybernetic system according H. von Förster. Organized system consists of two closely connected qualitatively different subsystems – *controlling subsystem* and *controlled subsystem.* Here controlling subsystem stores, collects processes and sends information, and controlled one handles the material and energy transformations.

Systemic analysis of interacting biological populations of different species corroborates that these interactions form three distinctly different classes of symbiosis – competition, cooperation (mutualism) and predation/parasitism. Mathematical and computeric modeling of these kinds of symbiosis discloses further evolutionary possibilities of them (Kirvelis, 1998):

- Competition refines existing system usually by simplification of structure. Plain competition doesn't have a potential to generate qualitatively new properties, and the systems with dominating competition display monopolization (Gause's law of competitive exclusion), and differentiation and anti-cooperation reveal themselves.
- Cooperation is contrary to competition by joining of various elements and structures to more complex entities where property to generate new qualities and possibility to reshape to qualitatively new system emerge. But such system is

more unstable, it becomes multi-component macro-system. Individual components are less adaptive and less able to compete in existing conditions. Some of new multi-component systems acquire a hidden possibility to become more adaptive in a changing environment then earlier systems.

- Predation systems have a possibility to become cooperative systems when a specific regulation phenomenon emerges in them. In this case predator and prey populations system can evolve to organized system, where predator population becomes a controlling subsystem (it becomes a specialist in information processing), and prey population becomes a controlled subsystem (producer). Further evolution of such system transforms to evolution of functional organization of informational control system.

The same tendencies can be found in social history also. Multi-component social systems can be analyzed by special mathematical methods (e.g., quantitative matrices) that give a possibility to evaluate proportions of competitive, cooperative and predatory interactions in system. These ranked proportions (from the largest one to the least one) represent important characteristics of multi-component social system:

- Social system with dominating predation corresponds to agrarian feudal society;
- Social system with dominating competition corresponds to industrial capitalist society;
- Social system with dominating cooperation corresponds to socialist society of information and knowledge.

Intermediate forms of symbiosis where influence of two interaction other forms rank differently are possible also.

Human history can be schematically represented according implemented technologies of interaction.

1. In primitive communal society the mutual cooperation dominated because alone people could not exist with existing technologies. The biological example is lichens in what algal and fungal cells live together by sharing each other products.
2. Domestication of animals and formation of settled agrarian societies caused domination of predation and formation of feudal society. War became important business because wealth acquired in war was recognized as ethically pure. History of feudal society was history of wars. The biological example is ecological pyramid where organisms of higher pyramid level feed on organisms of lower level.
3. Accumulation of technologies was basis of formation of industrial capitalist society where importance of competition had risen and importance of warfare (predation) had subsided. The interference (competitors interacts directly, e.g., by use of weapons) dominates in imperialistic capitalism, and exploitation (competitors interacts through depletion of resources or markets) dominates in later forms of capitalism. Mass production of goods and ruthlessly competition gives a trend to monopolistic degeneration. The wealth you have got through collapse of competitor and interception of his market is recognized as ethically permissible. The biological example is any food web.

4. Today the attention and values center move from plain production of material goods to production of information and knowledge. At the same time the cooperation returns to first place also. The tendency to solve communities' problems by cooperation begins to dominate and importance of plain competition slowly fades. It is beginning of noosphere formation according Teilard de Shardin (1955). Further stage of evolution is change of informational control systems from monarchic hierarchal commanding to more distributed collective based control.

The analysis of biological evolution from point of view closed-loop coding-decoding (CL-CD) concept can be applied to macro-sociological researches. This analysis show, that social technological evolution develops in the same way, towards an information production or a creative society direction. The macro-sociological researches have shown, that on social-economic development of a society deciding influence has a special social layer – creative class (Florida, 2002). Such conclusions also give theoretical researches of living systems (Miller, 1978), development their genetic and especial neural structures of the functional development, bio-informational and neuro-informational control procedures (Kirvelis, 2008). It seems, bio-informational technologies are created and improved during evolution naturally in wildlife, such as genetics and neurons nets, that carry out programming control of the biotechnological procedures. Those bio-informational technologies are capable at the certain level of organizational development to create *i.e.* to generate the information. The information is understood as specific the program - project about the certain (purposeful) technological procedures, written down on special structure of memory by special symbols (signals) by the certain rules of coding - decoding. The information emerges in organized systems as a necessary component of control technology. Such understanding of the information is suitable for an explanation of behavior both biological psychological and social systems. The genetic algorithms and neural nets that carry out control in biological systems, in social systems (in the organizations) it are doing commands, teams, groups and in the states - creative class. The high-grade creative class and creative society can be formed only in the big cities or conglomerates (Florida, 2002). For this purpose it is necessary, that the society on TTTT (tolerance-technology-talent-territory) principles would be formed as solidary creative organized system.

Conclusion

1. In the view of the organized systems theory, the development of humankind (human society), which is based on the creativity, *i.e.* the discoveries and implementation of new converging technologies is the continuation of biological evolution.
2. The new coming converging NBIC (Nano-Bio-Info-Cogno) technologies in post-industrial society must to extend the scientific visibility of holistic economics, to change the ethical values in public life, as human capital business concept. The cooperation will dominate against competition.

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