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N MODERN ENVIRONMENT STRUCTURE: ONTOLOGICAL AND FACTOR MODEL

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Abstract. The article proposed the analysis of evolutionary variations for the formation of human environment. The preconditions and consequences of technosphere historical emergence are analyzed. The transformation the technical system role is demonstrated from the perspective of social and cultural sphere element to the position of a primate sphere, the determinant of the human environment development vector. The properties of modern technosphere are analyzed, causing its assignment to a separate system in the habitat structure. The system openness, adaptability, self-organization and the ability to a non-linear development are proposed as the defining features. The paper presented a new look on the factor model of the human environment conditioned by the independence elements of the habitat and postulating intra-sphere production of influence factors for the environment elements. The result of the article is the attraction of attention to the need of environment modern vector study and research.
Keywords: human environment; natural sphere; social and cultural spheres; technosphere.
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СТРУКТУРА СОВРЕМЕННОЙ СРЕДЫ ОБИТАНИЯ: ОНТОЛОГИЧЕСКАЯ И ФАКТОРНАЯ МОДЕЛЬ

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Аннотация. В статье предложен анализ эволюционных вариаций формирования среды обитания человека. Рассмотрены предпосылки и последствия исторического возникновения техносферы. Показана трансформация роли технической системы с позиции элемента социокультурной сферы на позиции сферы-примата, определителя вектора развития среды обитания человека. Рассмотрены свойства современной техносферы, обуславливающие ее отнесение к отдельной системе в структуре среды обитания. В качестве таких определяющих свойств предложены: открытость системы, адаптивность, самоорганизация и способность к нелинейному развитию. В статье представлен новый взгляд на факторную модель среды обитания человека, обусловленный самостоятельностью элементов среды обитания и постулирующий внутрисферное продуцирования факторов влияния для элементов среды. Итогом статьи становиться привлечение внимания к необходимости изучения и исследования современных векторов развития среды обитания.

Ключевые слова: среда обитания человека; природная сфера; социокультурная сфера; техносфера.
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A man's habitat as a biological species, included originally his biological (natural) environment with the characteristics of natural conditions, most of which belonged to a climate group.

The development of social relations was crystallized first as a characteristic, and then as a separate subsystem, social and cultural part of the environment - a complex and a dynamic formation, transforming the faster, the smaller its historical foundation is and including the causal bonds between social, cultural and political factors, and the facts that form a system, social relations and traditions.

The evolution of human thought, creates one of its product varieties in the socio-cultural subsystem of the environment i.e. technical innovations. Each of them becomes an event in the life of society and makes the part of cultural achievement historical descriptions. At this stage, the elements of a future technosphere are inseparable with society culture are the hallmarks of a number of national cultures. However, along with the technological advances the first man-made risks appear caused by the antagonism with the biosphere and human nature. Since they could not become a conscious purpose of people one has to admit: the technosphere was not under the full control of a man who created it, even at an early stage of its development [1].

The development of machine production puts technical innovations into a separate but not an isolated cluster from the social and the cultural environment of a subsystem - the union of technical products to meet human needs.

The development of production, the emergence and the implementation of risk associated with industrialization, may be considered as the starting point of the formation and the development of human environment subsystem - a technical subsystem. The transformation of social life, which entails the development of technology, does not allow us to refer it to the elements of culture, as it is not subject any longer to the laws and principles of the of cultural product creation (rather these principles may be used, but they are secondary ones): ethics, aesthetics, spiritual development, individuality, exclusivity, uniqueness, and more, but most importantly, ideally, it is the original lack of economic burdens (the benefits of creativity). But, at the same time it is not possible to distinguish fully between these two subsystems in a historical retrospective - the sociality of technical products, the function of human energy saving, the improvement of life, the aesthetics and the facilitation of work, make this subsystem an inextricably related with the social sphere.

The separation of the technical sphere happens on the stage of line production appearance for technical products and the development of domestic manufacturing sector. While maintaining the social function the products of the technical subsystem begin to solve the problems not only of paramount importance (faciliation of human life), but also the problem of the second, the third and the fourth order. Then a moment appears when a technical product induces a problem itself for which it is intended - two basic types of reproduction appear: an artificial creation of a technical request (making the technical problems of a lower order the most important ones (e.g., the boiling of eggs)), the solution of the request which occurs during the operation of technical subsystem products (ionizer, as the response to an air conditioner operation).

At the moment of the large-scale loss of skills «the non-technical existence» of a man, it is possible to talk about a full-fledged department of a technical subsystem, which acquires all the properties of an independent system like a natural and a socio-cultural environment subsystem (according to the laws of the system hierarchy and at the same time the law of emergence) (Fig. 1).

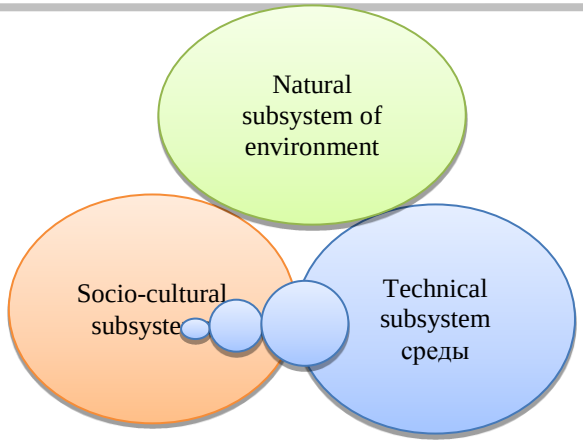

*Figure 1.*T he subsystems of the human environment

Like any artificial system, the technical area makes a series of steps for the formation and the acquisition of system properties, the strength of which continues to increase even now. During the development of the system properties, the technical sphere not only becomes a full member of a human environment, but also acquires the features of self-organization, characteristic of independent systems of natural or socio-cultural ontogenesis.

Perhaps, the property of openness is the defining feature of a technical subsystem (Fig. 2 (1)). This property was originally the basis of a young technical sphere evolution, then it becomes the key to its successful expansion within the natural and socio-cultural subsystem territory. A constant exchange and the focus on the evolution of the fraternal environment subsystems allowed to rise the subsystem analyzed by us to the rank of irreplaceable elements, and moreover, to move into the category of fundamentally hierarchical according to their properties and relations. The use of socio-cultural and natural subsystem request and the reciprocal nature of operation, gradually transformed into a life-support function and the safety of primary habitat subsystems through the scientific and technological progress. The openness of the technical system, its delicate response, first of all, on the socio-cultural trends and the natural origin of the natural and cultural systems, predetermined its resistance to any factors, including stochastic ones.

In the first place the paradox of this system is that a great openness did not make it vulnerable and, over time, it transformed such characteristic as «dependence» into «adaptability» (Fig. 2 (2)). The speed of technical scope adaptation to the operation request is so great that at this stage of development may be adapted to future changes, which are calculated on the basis of sustainable socio-humanitarian and environmental trend analysis. This phenomenon suggests to talk about a possible risk as a «technological singularity» - the possibility to calculate casual relations by the means of an artificial intelligence at higher speeds, and the appearance of an uncontrolled chain reaction that could destroy a human civilization [2].

A unique experience of «self inquiry» creation (described by us earlier) allowed the technical subsystem to use and develop the mechanism of «self-replication», self-reproduction, which led to the emergence of technical capacity for self-development and self-organization (Fig. 2 (3)). Then we shall refer to the scenarios of the technosphere development repeatedly, and the abovestated mechanism is the first harbinger of this system closing start in itself. The thing that was originally defined as the way of the system stability increase, may be the beginning of its end, going through all the stages of regression: the omnipotence and supremacy, uncontrolled self-reproduction, the loss of control and the subject and the object of servicing. Unfortunately, in this scenario, the expansion technological environment leads to the elimination of its nucleus - a man and to the complete destruction of his habitat.

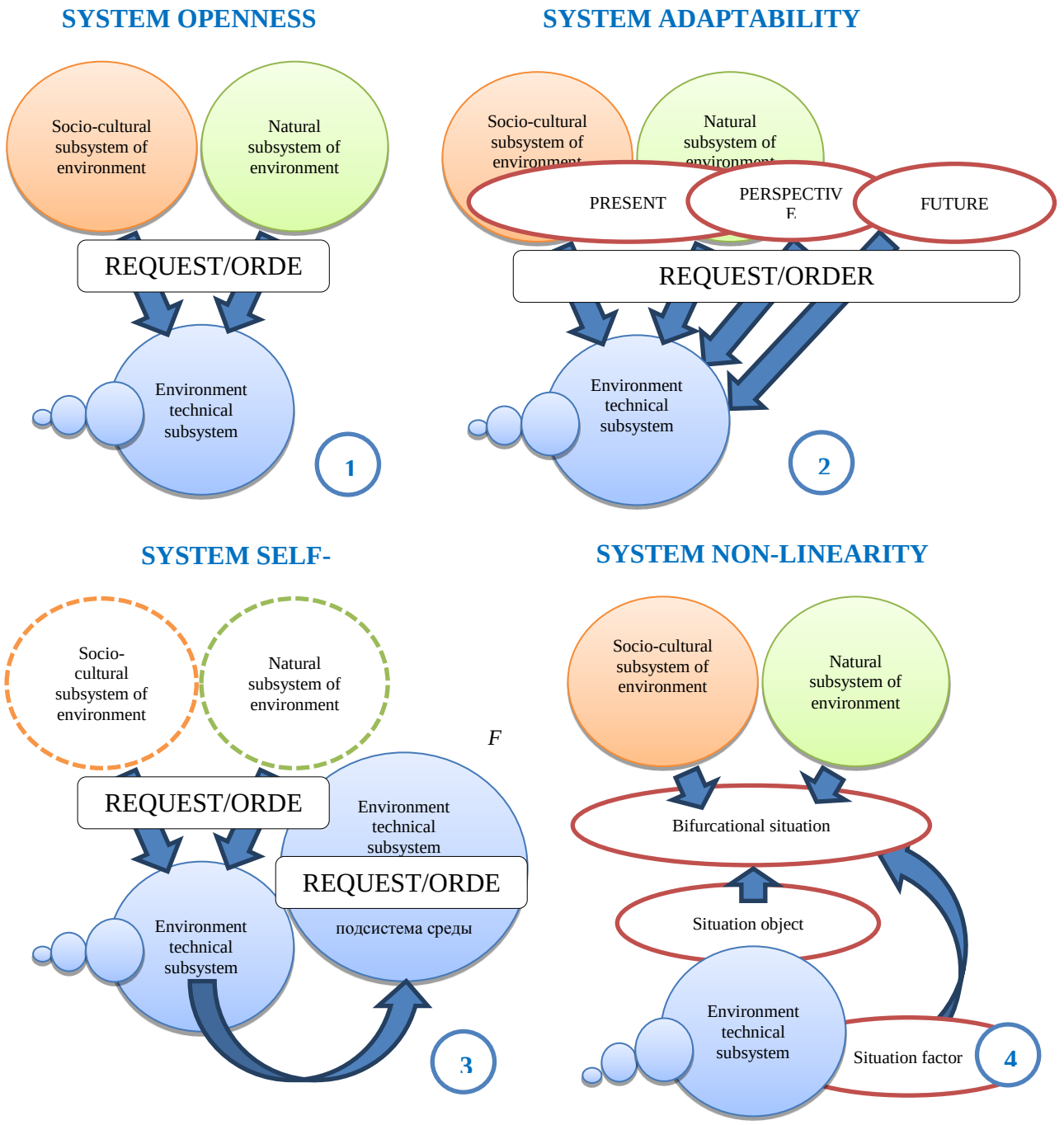

Figure 2. Acquisition of system properties by technical sphere

The independence of initially artificial technical subsystem at this stage of development increases so that such a property of natural systems as nonlinearity becomes an integral part of its existence. The effect of a technical subsystem presence in the natural and socio-cultural component of the environment allows it to be subjected to and included in the same bifurcation states. But the interest of such mimicry and the omnipresence in the fact that being in a state of bifurcation as a system, the technical sphere becomes at the same time the vector factor that determines the trajectory of natural system postbifurcational development.

The choice of such a trajectory is associated with a known technically progressive development scenario («progressive» in this case can not be used as «a positive moment for the environment development», rather as «a positive moment for the development of a technical sphere») (Fig. 2 (4)).

The abovestated conclusion makes researchers to perform in futurological predictions, although you can not ignore another point of view.

For example, D.V. Ivanov points to the ambiguity of epistemological analysis to establish the causal relationships in the modern human environment: «... whether the changes of social relations are the function of technological changes or whether social changes are a series of technological, economic, political and other developments, the correlation between which does not necessarily presuppose the existence of unambiguous causalities» [3].

The choice of the first one among two alternatives, obviously, means the acceptance of technological determinism concept (ithat is confirmed by the fact that no society may exist without a particular technology), the choice of a second one is the rejection of this concept, as «technology like any other single «factor» can not determine the development of society as a whole, especially «at all times»: it influences the society together with other social factors, closely related with them» [4].

In this regard, in terms of socio-cultural expertise, A.P. Nazaretyan thought is an interesting one [5]: describing the relationship of technology and society, the researcher formulates the hypothesis of the techno-humanitarian balance, «... the higher the power of the industrial and military technologies, the better cultural regulation means are needed to save the society. However, this idea does not exclude the things described by us and V. Vinge scenario, but is rather the basis for a new paradigm of social and cultural development of post-industrial society.

The technical development of civilization, as an object of study, led to the emergence of antagonistic views and the assessment of scientists. For example, D.M. Gvishiani highlights three trends in the evaluation of technological progress role during the development of society: 1) the technocratic-optimistic aspect: the limitless possibilities of science and technology development are approved that could lead to the solution of all economic and political contradictions of modern society; 2) Socio-pessimistic aspect: science and technology are considered as one of the evils inherent to any advanced civilization and bringing the destruction for human existence; 3) the trend, which is not adjacent to the extremes of technocratic optimism and social pessimism and includes a wide range of mindsets that constitute the social criticism of scientific and technological revolution negative effects, the calls for the humane use of science and technology achievements, or the proclamation of a harmonic fusion of science and technology gains of a man with a religious outlook, or dispassionate theories proposing the development ways of the modern «technological civilization» [6].

In our opinion, a different approach to the problem of the technical expansion is possible of our world: the scientific and technological progress is a necessary attribute and the condition for civilization development, and its speed and direction determines its global perspective, but as the product of human thought, it should be under control of constructive mind and be in harmony with the social and cultural development of mankind.

Thus, we may draw the following conclusion: the evolution of technical sphere took place along with the evolution of a man and society, and its progress is conditioned by the planned development of the following evolutional system parameters:

1. The change of a hierarchical status - the technical subsystem of sociocultural subsystem element becomes an independent self-hierarchically meaningful unit in the human environment;

2. The expansion and the modification of a functional field - the transition from a functional rank of a serving subordinate subsystem to the functional rank of life support and the determination of other sub-system status and their components;

3. The increase of the number and the scale of elements of its own structure, the penetration into all levels of the human environment through the variability and the quantity of products for subsystem functioning;

4. The transition from an artificial controlled subsystem state into a self-organizing system capable of self-evolution, and furthermore, to an evolutionary selection.

Different approaches to the retrospective analysis of technical subsystem development and its separation into a separate, significant element of the environment may be found in the works of such authors as A. Toffler [7], N.V. Popkova [8], A.N. Kochergin [9], Y.S. Vasilyev [10], I.S. Demidenko [11] and others.

Developing an environmental factor model in an external aspect, we find ourselves in the so-called «closed spiral of analysis». It's a paradox, but the habitat is probably one of a few systems, the structural and factor basic models of which coincide. As the subsystems (elements) of environment, according to the laws of hierarchy, act as independent systems with independent factor sets, then the consideration of influence factors for each of them, inevitably leads us to the consideration of other subsystem elements. Thus, considering a natural subsystem, we will talk about a group of technological, social, cultural, human factors, and certainly we will not ignore the direct factors of natural origin, thus «closing the spiral of analysis.»

The reason for this «closed» factor, in our opinion, is in the stage of civilization development - on the one hand, the development of the human environment reached the tops, which allow to specify a technical subsystem in some areas, and even the environment of existence, but on the other hand, the development is very weak currently and perhaps, such given vectors, which do not allow to expand this environment for the emergence of additional fields and factors of influence (cosmos, universe, other civilizations). Currently, the factors that we can refer to these megasystems are so rare and small, there is no reason to talk about the factor groups affecting the human environment.

On the one hand, this can be interpreted as a positive effect of megasystem non-interference in the human environment (if we're talking about stochastics influence of natural megasystem factors), since even the smallest (but important one) intervention fact in the environment on this side, may be the last fact in the history of mankind (the change of star orbits and planets, the collision of Earth with a comet). But on the other hand, new knowledge and goals, as well as new civilizational contacts, may have an incredible impact on the development of our civilization and environment (especially on technical and socio-cultural subsystems).

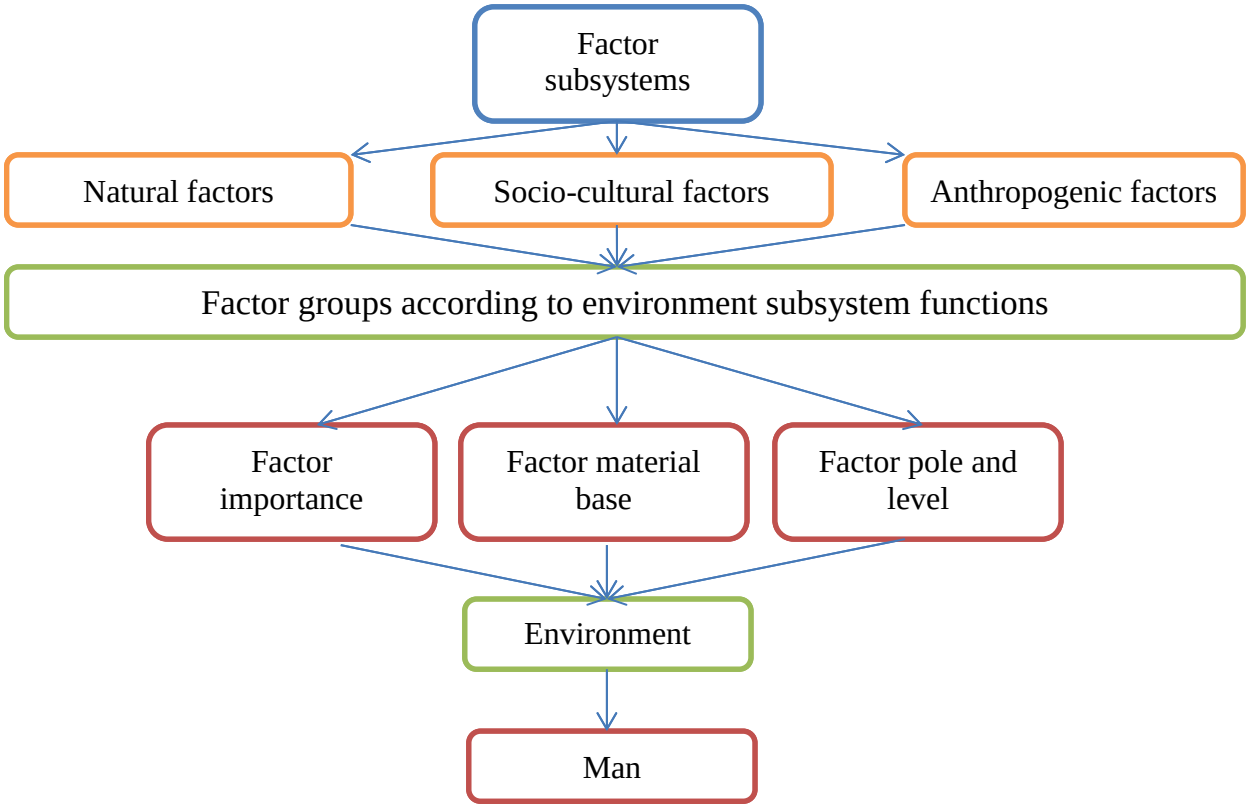

Figure 3. Factor Model of human environment

Considering the factor model of the environment in the inner aspect, when it produces the factor groups for its core, first of all, we define this nuclear component. Of course, the core of the environment is a human being, and all existing factor groups make an impact on it. The hierarchy of factor groups, first of all, starts with the subsystems and their structure (natural, socio-cultural, technological factors).

Further, there may be several reasons for the classification of factor groups in the factor model of the environment. For example, the material basis of a factor (tangible and intangible one); the level of need for a person (major, important, necessary and neutral); impact pole (positive and negative one) and the level of exposure as an option (very favorable, favorable, moderately favorable, neutral, moderately unfavorable, unfavorable, very unfavorable).

In our opinion, the most interesting could be the environment influence typology of factors, based on the functional model of environmental subsystems. This model deserves further theoretical study and

verification, and yet may be presented in the form of an alleged typological outline (Fig. 3).

Thus, the abovementioned analysis highlights the uniqueness of the human environment as a system, showing its scope and capacity for an internal reproduction of all actors of any collaborations, for the production of a subject and an object, and the means of a factor influence.

Returning to the issue of technical subsystem separation and the increase of its importance level, describing a technical subsystem as an element of human environment, we are talking about a pervasive and an all-consuming system, evolving expansively in a state of high resistance and maximum development of adaptive potencies. Weighing the importance and the reversibility of each factor from the abovementioned groups, we may confidently assert that the integral assessment of these characteristics concerning man-made group factors will multiply more than any other assessments.

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