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## **Infologic and Ecologic Aspects of Sustainable Development and the Society's Access to Information and Knowledge\*\***

### **1. Introduction**

Education and access to information, with the information use skills, become the driving mechanisms of all social transformations. Without a democratic access to information and knowledge, sustainable development of information and knowledge society is not possible.

The idea of the sustainable development of information and knowledge society appears as an attempt at giving answers to a complex of threats presented by uncontrolled information and knowledge generation and its influence on man. A growing concern regarding that phenomenon creates a need to work out a global strategy for counteracting that negative phenomenon.

Without going into the origin and interpretational differences of *sustainable development*, presently, that phrase refers to a conception of such social and economic development that does not interfere with natural eco(info)systems making up the anthropoinfosphere in which man operates [14]. An essential element of that conception that determines a future method of information and knowledge society's operation is the development of human information environment, understood as a reduction of currently existing inequalities and threats related to access to information.

Previous achievements in that area may be fairly good indications of future states achievable as a result of currently planned activities devoted to sustainable development of information and knowledge society.

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## 2. Essential Information Problems at the Beginning of the 21st Century

The most essential information problems of the early 21st century can be specified as: information and knowledge excess (flood), information chaos, difficulties in reaching information and knowledge, relativization of information and knowledge significance, ethical dilemmas and low information competence of information and knowledge senders and receivers [5].

Concerns of excessive information and knowledge supply have been known for long. A new climax, however, has been reached in our days. In fact, we live in the world in which the information waves threaten us with a flood. How the situation is serious is noticed by the American media critic Neil Postman who is concerned that the information flood can cause a "breakdown of the human and social immunological system." With the arrival of the age of information, the supply of various types of information (in text, image and sound forms) is getting out of our control more and more often and it becomes illusive. It is stimulated by a constantly growing information demand and treating information as commodity.

New information technologies caused a tremendous quantitative leap of information processes (information and knowledge gathering, processing and distribution). That has become possible primarily owing to a drastic reduction of the costs of information storage on electronic media which caused a considerable reduction of previous technical and financial barriers to information gathering. At the same time, the costs and problems related to the access to information resources are growing.

Some try to resolve the problem of information flood mentioned above by adopting proper technical means. In the Internet, such tools are the search engines, using various methods of information indexing. The effectiveness of such means turns out to be inadequate. Despite creation of innovative specialized search tools, information retrieval is still based mainly on intuition and it seems that, even in case of "smart" tools, intuition cannot be eliminated from information search processes.

Most probably, we are standing only at the beginning of the electronic information processing era. What is the most essential in the search processes is man, or rather his mind, including the capability of associating facts and of logical thinking.

Anything else may only support man in search processes, but not replace him. We find that our minds are not helpless under the pressure of external information. Owing to the evaluation system, man can cope with excessive information. The specialists involved in brain anatomy determine mind as an hypertext system for information processing.

According to many researchers, hypertext reflects a model of limited thinking similar to that of our memory<sup>1</sup>.

A social context of the information excess and flooding phenomenon under discussion was probably presented in the best way by Peter Drucker. He maintained that the basic resources in the present world were information and knowledge. "The governing group will consist of knowledge workers, knowledge managers and knowledge specialists and entrepreneurs who have intuition how to allocated knowledge to be used in the same way as the capitalists know where to allocate capital. Owing to Norbert Wiener's cybernetics and Claude E. Shannon's information theory, information became a measurable category next to matter and energy. Thanks to the application of advanced technologies, information became a commodity, while information resources of an organization are its strategic resource." [9] The development of information science and telecommunication, information and communication technologies, as well as the rise and development of the information and knowledge society, bring high hopes for the solution of many still unresolved problems. Such phenomena are accompanied, however, by numerous concerns and threats. [3] They require fundamental scientific analyses, including a systemic approach. Infologic can be very helpful for that purpose.

Infologic interpretation of information was developed and has been practiced in the Scandinavian countries. Bo Sungren, Börje Langeforsa and R. Ramstroem [12] are considered to be the originators of that process. Their infologic theory intends to clarify the significance of information in the practical aspects by examination of its properties, especially from the viewpoint of the requirements specified by its users.

### 3. Influence of Information on Man

Talking about the social influence of information on man, we think of either positive or negative influences. The very information and/or the means of transmission can be the source of such influence.

Information can be not only a stimulator of development, but it can also pose threat to development.

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<sup>1</sup> Bionics (from Greek *bios* – life and *mimesis* – imitate; other names: biomimetics, biomimicry, or bionic engineering) is involved in the learning and use of the processes which control the living organism operations in various fields of technology, mainly in automation, electronics and mechanics. That is an interdisciplinary science examining the structure and principles of living organism operation, with their adaptation in technologies, especially in automation and construction of technical equipment modelled after living organisms. The patents prepared by the scientists use the solutions found in nature. Preparation of new solutions owing to biomimetics allows to reduce fortuity in research and makes it easier to generate new solutions. Exact examination and copying of structural solutions from living forms is very promising as it is found that such forms have been highly developed, while hardly any solutions modelled after nature exist in equipment. Biomimetic studies in information science have been applied in cybernetics, artificial neuron networks and miniaturization of silicon subassemblies modelled after natural neurons [13].

Taking into account the threats coming from information, we mean the threat to specific information attributes, primarily information should be true, current, accurate, complete, clear and easy to communicate. The undesired attributes of information would be: incomplete, general, lengthy, or unclear. The strongest threat is posed by untrue, invalid or unimportant information, offered with the omission of the essential information, or very important information framed as hardly important or insignificant, or fabricated information resulting from intended actions to make understanding difficult, or ambiguous, contradictory and abundant information disseminated to cause the so-called information chaos. Those types of information can be reduced to the so-called parainformation, pseudoinformation or disinformation [10].

Threat can also come from such modern information technologies as the sources and channels of information distribution. Such threat can have various features:

- social, e.g. atomization of the society, reduction of the social function of information, new social divisions caused by uneven access to information;
- psychological, e.g. escape from the real world into the virtual world of imagination, feeling of loss in a network (loss syndrome), or alienation;
- medical, related to broadly understood human health.

There are also legal or technical threats of that kind as well [2].

#### **4. Shaping of the Human Information Environment as a Condition of the Sustainable Development of Information and Knowledge Society**

Whether information presents threat to us depends largely on ourselves, our information selection, as well as individual and social responsibility for what information is disseminated (or generated) and what information we make use of. A certain proposal for controlling the information flood (or explosion) and opposing information threats is presented by the so-called information ecology. That field is treated here as a specific type of metaphor for the protection of the natural human information environment (anthropinfosphere).

Information ecology is a discipline of knowledge, or rather a speciality in information sciences, whose task is to discover the laws governing the information flows in biosystems, including man and society, as well as the laws' influence on mental, physical and social health of people, with development of proper methodologies intended to shape the human information environment rationally [8]. Its final goal is to protect man and his natural information environment [4]. Identifi-

cation of the external factors affecting information, protection against information pollution and examination of information influence on man serve the attainment of that goal [7].

Therefore, information, its quantitative and qualitative criteria, information needs, information quality, information service quality, responsibility for information, as well as individual and social effects of such responsibility, together with the examination of information influence on human health are the objects of studies conducted within information ecology [1].

## **5. Sustainable Development of Information and Knowledge Society as an Information Management Task**

The effects of the previous activities designed for sustainable development of information and knowledge society should be recognized as unsatisfactory. The process which is a social development on the one hand, but does not satisfy adequately the most elementary information needs in the present-day society on the other hand is not a sustainable development process. The grounds for a critical evaluation of "non-sustainable" development of information and knowledge society are primarily the phenomena perceived as threats of information and modern information technologies, as well as non-sustainable access to information.

It seems, however, that the global community has proper means to satisfy the most basic needs in that area, although such means are not used properly. For that reason, we are still looking for new solutions relating to the change of the existing status quo. It is not enough to prepare new information and communication technologies and/or introduce strict limitations of the use of human information resources to resolve the problems mentioned here. The key importance seems to be attached to realization that those problems are primarily of social nature, and, therefore, the methods of solving them lie in the sphere of social relations, that is in making arrangements that will cause that individuals and groups will stop to claim the right to exclusive disposal of collected information and knowledge resources, limiting by that the access to other information being common commodity.

A vision of a system being in homeostatic equilibrium is used in the idea of sustainable development of information and knowledge society. However, it is not possible to isolate such a specific area, and such isolation against external influences in the form of information interference is not possible; we are not aware of the type and scale of changes that may become unintended results of present and future human information activities. The performance of the idea of sustainable

development of information and knowledge society is rather based on sustainable development as a tool for harmonization of contradictory values and objectives, owing to which it will be possible to maintain not only present eco(info)systems, but also present relationships that are beneficial to some people and deeply disabling to others. Proper information management seems to be a suitable tool.

## 6. Conclusion

Sustainable development of information and knowledge society should assure to everyone a wide access to information and knowledge resources, with careful protection of the “neutrality” of the human information environment at the same time [11]. “We have to treat information as our natural environment in which we live, similarly as we treat nature, and, consequently, we should care for it, without polluting it. Otherwise, we will be flooded and sunk under the waves of bits that we are unable to process [...]” [6].

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