Sense Units of Information and Multimodal Concepts for Intelligent Information Integration

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1. Introduction

A creation of effective working multimedia intelligent IS anticipate the solving of key methodological question about sense unit of information (SUI) and methods for its representation in IS. Must be taken into account such parameters of sense: its virtual nature, its transcendence and intentionality, its multi-dimensionality, invariance under the sign transformations, inter- and meta-subject-area character. SUI of this kind is a complex dynamic object, and for effective interaction with it is necessary an existing of correspondent 'subject' - that is an intelligent adaptive human-computer interface in which construction a model of user as virtual culture agent has been realized.

These requirements can be realized in framework of object-oriented approach to creation of Intel-IS.

For full definiteness SUI it is necessary to identify SUI with some epistemological entity. From point of view conceptology, being developed by us [1], the best implementation of SUI is a concept - an universal culture multi-modal sense-oriented formbuilding which have a notion representation.

The concepts (in our understanding of this term in distinction to existing in modern science literature) - there are just those multi-modal quasi-objects with varied geometry which are simultaneously both a bearers of sense and can be a basic elements of (multimedia) intelligent IS.

2. General requirements to the sense unit of information

2.1. For conceptual modeling of interest to us information system we must proceed from the nature and phenomenology of sense, as well as from some methodological principles of its representation.

(1). A sense is discrete, i.e. it has own (fuzzy) structure and the sufficiently determined outer boundary of its existing. (2). A sense discreteness can be understood as a *specific non-linear system effect* of complexly built sign's system, as a quasi-particle in continuous sense space, or even as a quantum of sense in a quantized sense field. (3). An integral part and a source of both non-linearity and discreteness of this signs' system is an actualization of some external «culture agent». (4). Each culture sign may become, *in certain conditions*, a bearer of above mentioned non-linear system and (or) quantum effect - and by that a bearer of sense. (5). A sense is actually existing only at the moment of its sign incarnation and execution (it is evidently, for example, for a musical composition). (6). Sense is transcendence - it always presents the orientation beyond the limits of that concrete content in framework of which it is actualizing. (7). Sense is intention - i.e. it presents *a trend to some another* content. (8). Sense is *multi*-dimensioned and *other*-dimensioned, in comparison with a dimension of related sign. (9). The same sense have non one, but some forms of its sign representation - i.e. presents itself an «invariance» relatively on some «group» of sign transformations. And vice versa, the same sign may have a several its manifestations. (10). 'Sense' is inter-objective and inter-disciplinary on its nature, it includes itself a disposition to the subject areas integration, to the heuristic translation from one subject area into another one.

2.2. The items (1)-(5) present in fact more or less unfolding form of the thesis about virtuality of sense.

In the items (6) and (7) are described the same property of sense, but at first (in the (6) in relation to some «initial» content, and in the (7) in relation to some «another» content. In the item (8) there raises the question on the conceptual description of sense space.

In the item (9) we are dealing with a reciprocally non-simple connection of the sense, in one hand, and of the sign as a bearer and manifestator of this sense, in other hand.

In the item (10) is accentuated a key role of sense in the maintenance of inter-subject-areas and simultaneously meta-subject-areas connections of various subject areas of human activity. Without such (sense-oriented) connections it would be impossible either unity of culture or unity of intelligence, because neither culture nor intelligence are not decomposition to the «disciplines» and not equal of their sum.

3. The 'concepts' as a sense units of information

3.1. For the full definiteness of SUI it must be solving the important methodological question: to identify SUI with some epistemological entity. From point of view developing by us conceptology [1], [2] the role of SUI is better played by **concepts** - multi-modal sense formbuildings, represented notionally and terminologically and at the same time existing in all types, kinds and levels of human activity.

3.2. We proceed from the following statement. Man communicates, thinks and acts in the world of "notions", "images", "behaviour standards" and other, similar to those, parameters of his existence. Simultaneously, at a more deep level of being, Man communicates, thinks and acts in the world of **concepts** with respect to which the traditionally understood notions, images, behaviour standards and etc., act as their particular, projective, reduced forms. By this the last ones can be interpreted as secondary and derivative formations of human being-in-the-world; as signs, symbols, representatives of corresponding concepts. We use the term "concept" in the meaning considerably different from that one of modern scientific literature. And we suppose to use this term in more widely and more depth sense. Concepts are considered by us as sense quanta of human being-in-the-world which, depending on specific conditions, are transformed into different specialized subject matter formbuildings. From the point of view of concepts proper being and structure, they are the multidimensional (and multimodal) functional-system formbuildings leaning upon the notional (either *pseudo-,* or *pre*-notional) basis, fixed in the meaning of any sign: scientific term, or word (word-combination) of a natural language, or more complicated lexical-grammatical-semantic structure.

3.3. The main thing in concept, as we understand it, is the multi-dimensionness and multi-modality (in comparison with correspondent sign) and discrete wholeness of sense, existing, nevertheless, in the continuous cultural-historical space and, therefore, being disposed to the cultural (and culturogenic) translation from one object field into another one. Thus, we are dealing with a discrete, but rather universal and multidimensional phenomenon which is able to permeat into the most diverse spheres and aspects of human being-in-the-world.

3.4. The concept synthesis and analyses (the forward and the reverse tasks of *conceptology*) can be arranged in a traditional way, i.e. «by hand» – by Man in his theoretical-methodological and then, in applied activity (for instance, in methodical one). But in the spirit of the times, one could make an attempt of computerizing those processes – in the frameworks of *conceptual in general (and conceptological, in particular) computer processing of information:* we lead a conversation towards the development of concept-oriented intelligent shells over the databases, concept-oriented knowledge bases, the tutorial, expert, analizing, modeling systems and etc.

4. Concept-oriented intelligent information systems in humanitarian sphere

4.1. The *intelligent information systems* (Intel-ISs) are designed for usage within the framework of the goals and tasks where conceptual-sense processing of information prevails over concrete information content. These Intel-IS should be oriented on modeling and explication of sense, on its relevant extraction and representation, on the translation of sense from one field of knowledge to another. Creation of intelligent information systems for scientific and educational goals in the sphere of humanitarian knowledge is not only separate case within the general task described by us, but the exact case which highlights related problems. The problem is that specific features of humanitarian cognition stem from its original fundamental orientation not to the content, but to the *sense,* its understanding and interpretation, to various forms of object manifestation and (which is obligatory) within the frames of a certain cultural-historical context. We choose philosophy as «testing stone» for working out and approbation of conceptual, methodological and technological problems of creation of intelligent information systems for scientific research and education.

4.2. On the basis of conceptological approach the problem of creation Intel-IS becomes narrower ut gets more complicated: we suggest creating *concept-oriented* intelligent information systems, the task of which is to perform the search process within the database according to the preset concept (or their summary) and present the results in the forms suitable for further operation

4.3. In «Centroconcept» for some years already there has been operating a research project «Intel-TDB «Philosophical classics» [3]. The tasks of the project are: working out of theoretical basis for the *conceptual processing* of text information; creation of *full-text database*, which represents original texts from classical and modern philosophy; working out of *intelligent concept-oriented information-search system* on the text database.

References

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