

SOCIAL SYSTEMS, THEIR OBSERVATION AND DESCRIPTION

Full paper

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INTRODUCTION

Einstein (Einstein et al 1930) considered that to understand the cause's one level of description is insufficient. Systemism being holism and individualism (Bunde 1996) makes system science to be at the same line. Paritsis and Stewart (1983) regarding the brain, namely that for the description of the brain processes concluded that it is better to make a description at the level of neurons, at the level of their relations and at the level of global properties of the neural network.

Social constructionism presents an analogous view. In the sense that the perception and representation of a point of view rests upon the contribution of three levels that interact. The level of views of the person(s) in a socio-cultural system, the level of their communication (communicative relations) and the level of the culture itself

Social constructionism (e.g. Berger and Luckmann 1966) is related to a certain extend, conceptually, to constructivist point of view that reality is constructed, that in turn is related with the autopoietic perception and epistemology (Maturana and Varela 1980). According to the last view the autopoietic systems -mainly the living systems- have the ability to maintain their characteristic structure and function independent from the different environments they may live. Thus, when the environment is perceived by a living system, a transformation takes place on the perceived environment. In this way the outcome of perception is more influenced by the structure of the system than by the environment itself. As a result "reality" is more constructed than mapped into the organism.

In metamodern thinking (e.g. Foucault 1972, Lyotard 1984) there is a critical stand of any description of "reality" and the different points of view have not a priory any advantage of one over the other largely due to that the meta-modern thinking basically accept the social construction of reality.

The objective of the paper is to present the outcome of perception of social systems by living intelligent systems such as man, social systems or science. Relevant to the existence of social systems reality, as perceived by their observers.

SOCIAL HOLONs

A definition of a system

A system can be defined as the interdependent and interacting sets of elements, of their properties, of their relations, and of the emergent properties, in a given context. This definition is one among many others with the advantage of having logical consequences useful for the consequent discussion.

This definition takes, among others, into account that

- There is no system in isolation. A major point in systems thinking is that the context of a system has to be taken into account, since it in principle, influences the system
- The relations among the elements (together with the elements and their properties) determine the emergent properties of the system.
- A system cannot be conceptualized in one level. Since the elements are in one level and the system as a whole is at another level, different than the sum of their parts and of a different logical type.

A definition of a social system

Following the above definition of a system in general, a social system can be defined as the interdependent and interacting sets of persons and their artifacts, of their properties, of their relations including their communication, of the emergent properties including possibly culture, in the their social and physical environment. In this sense social systems include families, groups, organizations, societies, nations and supranational systems.

Holons

Holons (Koestler 1967), are hierarchically organized systems within other systems that have analogies among them. Holons at different levels influence their neighborhood levels and thus each level influences the others (Baum 1984).

Social holons

Social holons here are considered social systems according to the previous definition that are organized in holons. A family, a community, a town, a county, a nation, a sociocultural system belong to a social holon.

THE INTELLIGENCE OF A SOCIAL SYSTEM

Intelligence of life

Intelligence of a living system is considered “the ability of a system to achieve its goals by receiving inputs, integrating them together with its adaptive responses, through coded information or other representations and by increasing its compatibility with the environment through its improvement (e.g. through evolution or learning)” (Paritsis 2003). This definition of intelligence holds for all living systems from cells to social systems. Namely, those systems which are considered by Miller (1978) as living ones. At each step of higher level of life with the addition of an increasing complexity new emergent properties of intelligence are added.

Intelligence is related to the process of information by the system and there are sub-systems that are specialized with the process of information rather than matter-energy. In order to have information the presence of a code or otherwise of a representation is needed. What is processed in the information processing is not the represented which can possibly be matter-energy but its representation. In this way the above definition of intelligence presupposes the process of information.

This definition of intelligence is close to other classical definitions of intelligence and gives some emphasis to the influence of environment and to the improvement of the living intelligent system.

Social intelligence

Beer (1972) wrote a book about the brain of the firm, examining the intelligence process of a firm. Miller (1978) includes groups, organizations, societies and supranational systems into the living systems. Those living systems have (as all living systems) subsystems specialized in information processing. Those systems have

the same general subsystems processing information and for each level of the above mentioned living systems which in general are regarded as belonging to social systems Miller gives details of their information processing. Miller also recognizes that parts of those systems are also artifacts. According to Miller (1978) in the chapter about organizations as subsystems of society he regards culture as reflecting among others beliefs, values, science and art. In the chapter about society he presents culture as an abstraction like personality in man.

In this paper it is accepted that each social system has its own intelligence according to the previous definition of intelligence. Families or natural groups, have their beliefs, myths, knowledge, decision making and behavior as a whole. This intelligence can be regarded also a collective intelligence (Paritsis 1998). In this paper the parts of collective intelligence include all the parts of the human intelligence. An approach similar to that of Miller.

Collective intelligence of course according to the definition of a system it is not simply the addition of the intelligence or knowledge of the members involved. It includes their relations e.g. that of power, and most importantly their communicative ones. The outcome of a decision making for example of a group, e.g. through voting, is not the same before and after a discussion. The outcome of a collective or social intelligence is an emerging property of the social system as a whole. Culture in this sense is regarded as part of the intelligence of a developed social system.

TOWARDS AN EPISTEMOLOGY OF SOCIAL SYSTEMS

An epistemology of auto-synthesis and co-synthesis

Compatible to the presented definition of intelligence as a characteristic of life, are not the property of autopoiesis and the lack of purpose in living system (Maturana and Varela 1980), an autopoiesis that enables the system to maintain its structure in spite of the different environments. Compatible with the presented definition of living intelligence is the concept and process of auto-synthesis which enables the system to maintain itself in different environments, under limits, and at the same time adapts and changes itself, namely its structure, function and behavior, towards its compatibility with its environment.

Besides, the system replicates itself not in a vacuum but by using components from the specific environment where it lives. This is applied for both the matter-energy processing subsystems as well as for the information processing sub-systems including the cognitive ones and perceptual processes and their products. Living systems are regarded here as open systems that have continuous interaction with, and adaptation to, their environments. And that additionally have an effort to control and benefit from the environment. Hence, the perception of the environment in a realistic way is important, in order the living system to survive, control the environment and at the same time to adapt itself to the environment. Otherwise, the living intelligent system will have problems up to the extent of its death. If the system ignores its environment the environment will "ignore" the system.

According to the above discussion the living system does not freely construct its reality but it forms and synthesizes a reality to the extent that enables it to control and be adapted to its environment.

Maturana and his colleagues (Maturana et al 1960) did not succeed to map through a mathematical transformation, or otherwise, the eye's sensation to the brain's perception in the frog. Maturana then concluded that the construction of reality of the brain is independent from the sensation of the sense organs.

However, Paritsis and Stewart (1983) succeeded to make this map for the macaques' eye and brain and draw different conclusions for the perception of reality,

namely an international one. In particular, the recordings from macaque in its retina at the level of cones formed three absorption curves with peaks at the blue, green and yellow areas. The recordings at the level of the brain (Lateral Geniculate Body) show six curves, with peaks at red, blue, green and yellow areas. Plus one kind of cells excited when there is light and another kind of cells reacting to darkness. By applying third order regression equations Paritsis and Steward (1983) were able to mirror each of the six responses of the colour coding cell in the brain on the basis of the responses of the three cone retina cells in the eye. Thus the perception of the colour perceived in the brain after a specific transformation, depending on the type of the animal. They concluded that reality, different for each type of living systems, is formed or synthesised by the contribution of both the environment and the living system enabling the living systems to survive, live, satisfy, adapt and evolve within their environments.

Each living system perceives an aspect of reality (and reality is the observed world), provided that the so perceived type of reality contributes to the

- a) survival and development of the living system,
- b) control of and adaptation to the environment.

Thus, in a sense, *the degree of usefulness of the result of perception, determines the degree of "truth"*.

At each level of living systems perception of reality the perceived reality is more complicated and useful for the holons involved at the lower levels. Thus the brain's perception in man is useful for the cells of the body (e.g. contributing for their food) and science as a result of the social system is useful for the individual man.

Social systems and their perception

The epistemology of social systems will be examined from three aspects. The first is the usefulness of description at three levels, the second is the consideration of the international epistemology and the third is that in the case of human and social world the meta-systems knowledge and aspect has to be taken more into account.

In the case of living holons including the social ones, all lower holons contribute to a certain extent in their own way to the formation of reality of higher holons. Even the cells contribute to the formations of scientific knowledge. In the sense that the cells at the retina determine and put constraints to what is seen. The man's brain determines and put constraints to what is possible to be perceived by science. It is necessary to consider the definition of a system and to see that at each level of holons the perception is an emergent property of the processes at the lower level. Which in turn influence the process at the lower levels.

The knowledge being at the internet and the cyberspace when documented is a contributor to the perception of reality from the social holons. In addition from the availability of huge amount of information offers the interaction between different levels of intelligent social holons and integrates social intelligence.

DISCUSSION

According to the above, the aspect of the social construction of reality is part of the story. The formation of reality in man and social systems is a result of interaction between the levels of the living holons involved and between the members at each level. The emergent property of science and its perception of the world and the resulting technology it is the more valid and strong description of reality. Thus the meta-modern view of critical stand it is useful up to a point. The degree of critical stand has to be different for different levels of living and social holons. For example the lower level cannot take equally critical stand for the perception of an individual

without being expert (having metasystems knowledge) and with that of the expert in a field. Because in this way treats all levels of holons as equal while there are not.

The interactional or aspect of epistemology of co-synthesis of a useful reality departs from the epistemology of autopoietic system that construct their reality. This interactional aspect of epistemology have also elements from the classical cybernetics. However, it is by no means first order. The consideration of the role of environment and of a more complex interaction between the different levels of perception of holons and of a more valid and valuable description from the higher holons leads to a more enriched view which is beyond the first or second order cybernetics. This is because first order cybernetics does not in general takes into account the observer. Second order cybernetics takes into account the observer giving emphasis to it. The present interactional aspect, states that from all possible to be constructed realities due to the structure and function of the observing system, the environment and the relations of the living system with its environment selects a description of a reality that is compatible with the relation of the system with its environment. In other words this approach puts constraints in epistemology of living and social intelligence that are not present or in the best case are not emphasised by second order cybernetics. In addition, a social holon e.g. a group of therapists, have a description of the observed object on the basis of the:

- sub-systems, sense organs, beliefs, myths of the participating humans
- interactions and discussions between the present humans,
- culture in which the members of the group belong,
- scientific knowledge of the members of the group.
- scientific knowledge in artefacts that the group have access such as books, or internet
- past experience of the members and the group as a whole
- other persons views not belonging to the group such as clients

Other factors

For the above reasons this approach can be regarded as beyond second order cybernetics.

In a very simplified way in order to make distinctions to the issue, it can be said that in the case of the first order cybernetics reality rests on the observed object, in the second order cybernetics reality rests on the observer and in the present (third order cybernetics?) reality rests on observer, the observed and their relations (past, present and future) and on the intelligent holons in which the observer is a part. In this way the perception of reality rests on a system of a higher order than the observed and/or the observer and thus this approach may be termed as third order cybernetics.

Social constructionism takes into account mainly the systems at the same level and the higher holons namely the involvement of the sociocultural system in which a man belongs.

Under the present way of thinking the most valid and important contribution to reality of man and its systems is the contribution of the higher intelligence namely science and technology. Science have the advantage of being at the higher level of social holons, especially today which is related to the intelligence of supra national systems. This does not mean that science has the absolute, real truth. The truth of science like the cases of knowledge coming from other levels of living human holons, rests upon the interaction of society with the wider environment of universe, helping the social systems to survive, evolve, control and adapt in the context of the wider environment. According to this view scientific knowledge is superb, higher than the knowledge from other sources, but it is not absolute. This view takes, however, more

seriously the contribution of to day science and technology and gives more value to the cyberspace than other epistemological approaches.

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