

# Images of Organisation and Development of Information Society: Going into Metaphors

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## ABSTRACT

In the evolution of metaphors of organisation an interesting phenomenon can be observed. While the source fields of the first metaphors of machines and organisms were somehow "external" to the organisation, the source fields of subsequent metaphors and especially those of open systems, complex systems, *autopoietic* systems and learning organisation are overlapping with the concepts of organisation itself (the target field). The main aim of this paper is to study how this evolution and development of the Information Society influence the theory of organisation. The Information Society is characterised as a system with a growing capability of mapping the environment and itself onto its memory. A hypothesis is advanced that this characteristic of the Information Society can be helpful in considering self-reference in the methodology of neoclassical economics, which in turn, may prove helpful in deepening our understanding of the "New Economy".

## 1 Introduction

Metaphors and analogies taken from various fields are an important instrument of description and analysis of social systems at various levels, beginning from organisation at the micro-level (group, company, bank, etc.) and ending at the level of broadly defined international relations or even the global system. At the micro-level metaphors and analogies were predominantly used in the development of management theory and to stimulate changes in practice.

From among many analogies and metaphors applied in studies of organisation the following ones have been most useful in theory and practice: machine, biological system (living system), open system (partly related with the previous concept), complex system (fitness landscapes, simulated annealing, local maxima, patches, genera-

tive relationships), fractal organisation (related with the previous concept), *autopoietic* system, learning system.

In the evolution of metaphors of organisation an interesting phenomenon can be observed. While the source fields of the first metaphors, that of the machine and the organism, were somehow "external" to the organisation, the source fields of later metaphors, and especially those of the open system, complex system, *autopoietic* system and learning organisation are overlapping with the concepts of organisation itself (the target field).

It is commonly agreed that ability of self-observation and knowledge about itself is an important part of an organisation. For the "external" metaphors the self-referential mechanism is either non-existent or easier to identify. For the "overlapping" metaphors this phenomenon has been studied predominantly for "second order cybernetics" and for *autopoiesis*, and the results show that the knowledge about itself influences the organisation in a very intricate way, e.g. the concept of re-entry in the works of Niklas Luhmann (1987).

The main aim of this paper, which is an introduction to further research, is to study how this evolution of the application of systems metaphors influences the theory of organisation. The title and topic of the paper specifically refer to the ideas developed by Gareth Morgan (1997, 1997a). The research approach proposed herein constitutes a logical continuation of Morgan's ideas, both in a theory of organisation, and perhaps in practice, especially in management. A preliminary hypothesis is that the proposed approach can be also helpful in introducing self-reference into the methodology of neoclassical economics, which in turn, may prove helpful in a deepened understanding of the "New Economy". In order to support this introductory hypothesis, the concepts of utility and contractual approach in microeconomics will be the subjects of a preliminary discussion.

The paper is an introductory research programme, or even a kind of "scientific manifesto", in which basic issues of social theory are being presented in an unrefined version. It must be also added that several concepts of systems thinking and complexity science have been purposively omitted since they are discussed elsewhere, including in other writings of the author (Mesjasz, 1988, 1993, 1994).

## **2 Metaphors, Analogies and Theory of Social Organisation**

### **2.1 Specificity and Limitations of Applications of Systems Analogies and Metaphors**

Analogies, metaphors and mathematical models drawn from systems thinking can be used in the following approaches:

descriptive - based upon mathematical models and/or qualitative descriptions,  
explanative - resulting from mathematical modelling and/or qualitative explanations,  
predictive - resulting both from mathematical modelling and/or qualitative predictions,  
normative - resulting from mathematical systems modelling,  
prescriptive - including norms resulting from mathematical modelling and norms  
resulting from qualitative predictions based on systems analogies and metaphors.

While an interpretation of a predictive approach in social sciences seems rather indisputable, differences between normative and prescriptive approaches should be exposed. In their studies in decision theory, Bell, Raiffa and Tversky (1988) distinguish between the normative approaches resulting from mathematical models, predominantly game models, and the prescriptive approach reflecting practical recommendations resulting from decision analysis, including also qualitative aspects.

An additional specific regulatory approach is proposed. In management this approach is expressed in the way the dominant analogy or metaphor influences control of a system, i.e., it differs for mechanistic, evolutionary or learning systems, e.g. (Senge, 1990), (Palmer & Dunford, 1996), (Tepper, 1996).

Four classes of social systems (organisations) can be taken into consideration:

- micro-level - the domain of interest of microeconomics and management theory (company, bank, non-profit institutions, regions within a country, etc.),
- mezo-level I - state level, the domain of domestic policy in relatively coherent social system (country),
- mezo-level II - international system, predominantly the systems of states and international governmental and non-governmental organisations, the domain of interest of international relations studies, international political economy, security studies, peace studies,
- global level - processes influencing social phenomena in the global scale: globalisation of economics, development of the „Information Society”, influence of global ecological limitations.

In this paper attention is predominantly paid to micro- and meso-level I systems, which are also called “organisations”.

Systems analogies and metaphors acquire a specific normative sense while used in social theory and practice. Due to their origins in "rationalist" disciplines - mathematics, physics, chemistry and biology - they are treated as objective and scientific in a rationalist sense. Thus their applications, in addition to an enhanced explanatory validity, by definition obtain supplemental "sound" predictive and prescriptive legitimacy. Consequently, in those applications, their metaphoric sense is neglected or misinterpreted. The metaphors are "reified".

Analogies and metaphors used in providing recommendations for actions are always associated with specific frames of reference, which cannot be absolutely "objective" and which always reflect more or the openly declared views and interests of the authors of a particular language. It is of particular importance in social studies where the language is a part of the system under consideration. Development of a specific language can directly influence the actions in the system. This situation can be perfectly illustrated with applications of metaphors of change in management. The choice of some metaphors of change may stimulate a change itself in an organisation (Palmer & Dunford, 1996), (Morgan, 1997a). The similar phenomenon can be also observed in other systems especially at the meso-levels I and II, but the mechanism of the interplay between the language and the system is much more complex. In that case the direct relationship between the authors of the language and the addressees is not like that between management and employees within an organisation. Specifically different are the ways of communication with science and the media playing a dominant role at the meso- and global levels.

Applications of systems analogies and metaphors in social sciences expose two basic weaknesses. First, in most of their applications it has been omitted that they can be predominantly used solely as descriptive and explanatory instruments. Application of those analogies and metaphors for prediction and norms-setting is always limited by their reification. It has led to dual consequences. In theoretical research many futile efforts were made to make them more "scientific", "objective" and "analytical". Practice, in turn, has been enriched with "objective" terms with various hidden normative loading, e.g. "stability", "equilibrium". Some of these problems could be avoided if the following phenomenon were taken into account. It can be ironically called "The Law of Metaphorical Infinity of International Systems":

**Any theory and/or model elaborated in physics, chemistry, biology, automatic control theory, etc., in order to study collective phenomena ("systems thinking", "complexity theory"), can be applied as a source of analogies and metaphors in various attempts aimed at description, explanation (sometimes even prediction and prescription), of phenomena taking place in social systems, beginning from small groups, and ending with the world system.**

The Law can be supplemented with an observation that large-scale social systems seem particularly tempting for such efforts. It is easy to compare a society to a machine or biological system. It will be much more difficult to do the same with a small group or family. The meaning of the term "society" is much broader and more distant from our everyday experiences. In the case of a smaller group we can easier identify the humans as elements of the system.

Second, along with the differentiation, pluralization and multipolarity associated with the democratisation and expansion of the market economy together with the con-

viction about their inevitability and efficiency - "The End of History"- , more interest is paid to concepts drawn from systems thinking, which facilitate the representation and explanation of that kind of social reality. However, stress must be put not only on the "objective" soundness of these concepts. Instead, they should be seen as analogies and metaphors reflecting observer-related, emotionally-laden and normative understandings of the world. Thus in studies which intend to deal with the old and new systems-thinking related terms: *autopoiesis*, chaos, complexity, equilibrium, fluctuation, homeostasis, non-equilibrium, self-organization, stability, synergy, turbulence, ultrastability, etc., it is necessary to concentrate on the semantic foundations before any applications in the analysis of social systems.

## 2.2 Main Deficiencies of Applications of Systems Thinking and Complexity Studies in Social Sciences

Systems thinking and complexity studies are difficult to define and therefore several barriers to their application in the social sciences can be identified. This phenomenon can be called the mutual “rediscovery of the wheel”.

1. Research labelled by its authors as systems research and/or “complexity science” frequently omits the existing body of knowledge in philosophy, especially in the methodology of science; this can be even found in the discussions of the ancient world or in Oriental philosophy.
2. Too frequently, in the studies of systems, significant contributions from the non-English language sphere are omitted. It is worthwhile to mention here such authors as A. Bogdanov, V. Sadovski (Mesjasz, 1988), B. Trentowski (Zeleny, 1996), H. Willke (1993, 1994, 1995).
3. Research on social systems referring to systems thinking and complexity studies frequently lacks adequate foundations in established social disciplines, such as sociology, economics, political science, etc.
4. In social sciences such concepts as system, complexity, chaos, fractals etc. are predominantly regarded as broadly defined analogies and metaphors that make more specific studies impossible. It can also lead to abuses and even ridicule. Here it is worthwhile to recall some subtle aspects of the use of metaphors in social and natural sciences. The transfer of analogies and metaphors from “hard” science to science was ridiculed in the famous Sokal hoax (Sokal, 1996, 1996a). A closer look at the “hoax”, however, shows that the diffusion of analogies and metaphors between social and natural sciences was frequently mutual and ideas from the former stimulated elaboration of formal, rigorous models in the latter (Beller, 1998).
5. Insufficient attention is paid to the problem of the distinction between dyadic interaction and systemic properties. In one class of approaches, e.g., studies in communication, meaning, or in two-person game theory, conclusions resulting from the analysis of dyadic interactions are extrapolated as systemic properties. In an opposite class, parameters described as reflecting properties of the entire system, e.g., models of entropy applied to social systems, are analysed separately from relationships between elements.

## 2.3 Going Into Metaphors

The significance of metaphors in modern science and their applications in the theory of social organisation have been described in numerous writings - see fundamental concepts presented by Lakoff & Johnson (1980, 1995), applications in economics (Mirowski, 1989, 1994), (McCloskey, 1998) and in organisation theory (management theory) (Morgan 1997, 1997a), (Lissack, 1999).<sup>1</sup>

In a discussion of the application of metaphors, two approaches should be discerned, which could be initially labelled as classical and modern. They are expressed in the concepts of “first-order cybernetics” and “second-order cybernetics”.

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<sup>1</sup> For the sake of brevity in the remainder of the paper attention will be focused upon systems metaphors.

In the classical approach the observer is treated as external and it is solely the relationships between the objects taken from the source field and the target field that are taken into account. This fundamental approach is associated with “first order cybernetics” and “hard systems thinking”.

In the modern approach, which has become dominant in systems thinking at least since the late 1970s, the role of observer is taken into account. It is expressed in “second order cybernetics”, “soft systems thinking”, cognitive approach and constructivism.

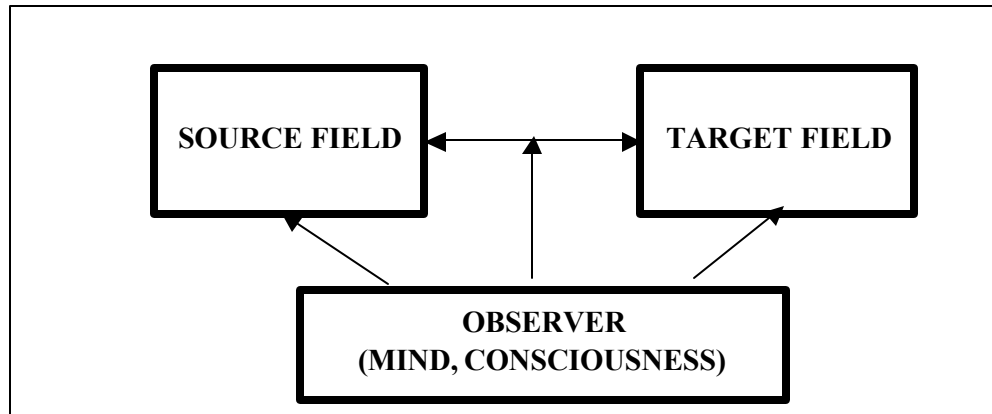


Fig. 1. Traditional approach in studies of metaphors

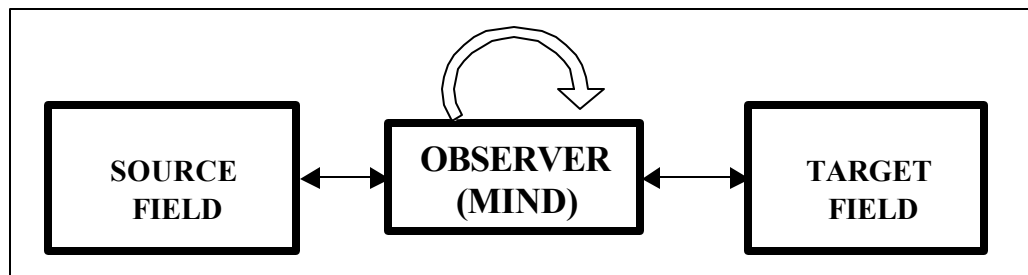


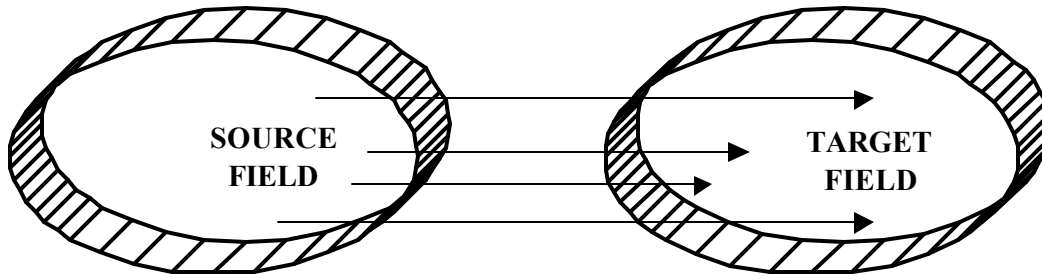
Fig. 2. Contemporary approach in studies of metaphors

These two approaches are well known. A new common conviction that is gaining ground in studies of the role of systems metaphors in the theory of social organisation, is that it is necessary to consider the role of consciousness (mind).<sup>2</sup>

Usually, to strengthen a scientific value of metaphor-based ideas, it is stressed that they are “going beyond metaphors”. It means that the ideas are presented not as metaphors useful for descriptions but also for explanation, prediction and norm-setting (Church, 1999). The concept of “going into metaphors” can be described differently in reference to the two above approaches. In the first case the source field and the target field are separated. It means that patterns taken from the source field bring

new interpretations to the patterns from the target field. In the second case, in addition to concepts taken from separated fields, depending on the degree of overlapping, ideas also exist which belong to both fields.

### I. SEPARATION OF SOURCE FIELD AND TARGET FIELD



### II. OVERLAP OF SOURCE FIELD AND TARGET FIELD

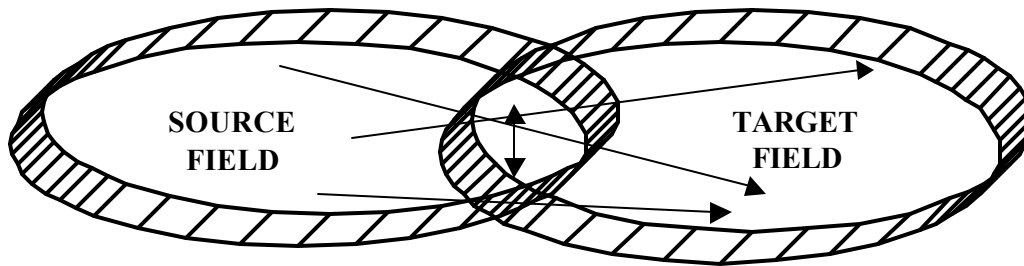


Fig. 3. Relations between source field and target field

The concept of overlapping source field and target field introduces several fundamental problems of the theory of social organisation. It immediately brings about such concepts as observation, self-observation, distinction, self-distinction, self-reference, or even hierarchical self-references. This has been widely discussed since the onset of philosophy. Here such names as Aristotle, Eubulides, Epimenides, J. Buridan, Nicholas of Cusa, B. Russell, A. Tarski, L. Wittgenstein, K. Gödel can be recalled. It also touches the ontological and epistemological grounds of various trends of post-modernism and its applications in social sciences. These topics have been also discussed in symbolic interactionism, constructivism, second order cybernetics, anticipatory systems (incursion and hyperincursion), social *autopoiesis* of Niklas Luhmann (1994, 1997, 1997a). It must be also stressed that such an approach often loses its rationalist origins and finds a common ground with various versions of mysticism and meditation.

The journey into the metaphor is at the same time the inquiry into the processes of thinking, mind, consciousness, self-consciousness, etc. They have already been

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<sup>2</sup> The links between observation, communication, norms and action are left for separate considerations.



widely analysed in applications of systems approach and complexity science in the theory of social systems. The growing complexity of social systems, which is briefly described as the development of the Information Society, brings about new consequences for modern social theory. It makes the “journey into metaphor” especially useful for studies of contemporary social organisations, beginning from micro-level, and ending at least, at the meso-level.

### **3 Evolution Of Metaphors of Organisation and Relations Between Target Field and Source Field**

**Table 1:** Relations between source fields and target fields for metaphors of organisation

<b>Metaphor of organisation</b>	<b>Relations between source field and target field</b>
Machine	Separated
Biological system (living system, Open system)	Partly overlapping (determined by biological features of humans)

<b>Metaphor of organisation</b>	<b>Relations between source field and target field</b>
Organisation-brain  Learning system, Knowledge system	almost completely overlapping (operations of the brain reflected by different phenomenological models almost completely overlapping (concepts built upon various phe- nomenological interpretations of knowledge)
Network organisation (Social networks)	Partly overlapping
Virtual organisation (based on Internet and Intranet)	Partly overlapping
Complex adaptive system (fractal or- ganisation)	Partly overlapping (limits of intersection difficult to de- termine)
<i>Autopoietic</i> social system of Niklas Luhmann (system of meaningful communication)	Completely overlapping

The theory of social organisation has been based upon the use of applications of analogies and metaphors. Relations between source field and target field for each metaphor can be described with the use relations between the source field and the target field. Distinction between the relations is of a very preliminary character and is based on the only criterion - the use of concepts relating to the functioning of mind in the source field. The distinction is obviously of a very preliminary character and requires further investigations. Four relations between source fields and target fields can be discerned: separated, partly overlapping, almost completely overlapping and completely overlapping.

#### **4 What is the Information Society?**

Similar to terms such as globalisation or the New Economy, the concept of “Information Society” has become another buzzword of modern social practice and theory. Development of information technology and its consequences can be viewed in two perspectives:

1. Changes which affect social systems at all levels of a hierarchy:
  - increasing capabilities of retrieving, processing, storing and transmitting information understood primarily as mapping of external reality (and of the self!) onto consciousness (mind) of human beings and more or less developed memory systems of computers,

- development of information technologies changing patterns of manufacturing, finance, trade, management and everyday life,
- acceleration of applications of advanced, AI-based computer systems,
- decreasing role of traditional branches of industry - manufacturing of low- and medium-processed goods and development of knowledge-based New Economy as the key determinant of competitiveness and prosperity,
- decreasing importance (real or illusory) of environmental barriers in policies of economic development. It is especially visible in neoliberal (neoclassical) economics. According to this theory, or even ideology, which can be labelled as “liberal-techno-info-fix”, all economic and environmental problems could be solved solely with free trade and curbing inflation at the macroeconomic level, as well as increasing wealth of shareholders and enhancing competitiveness at the microeconomic level,
- accelerated development of information technologies, nanotechnology and genetic engineering - forecast of a forthcoming “New Brave Information Society” based - nano-geno-vision” (or “ info-nano-geno-fix”),

2. Development of social theory relating to all levels of hierarchy of social systems. The most important new theoretical concepts are as follows:

- growing awareness that existing models of social systems rooted in physics-based central metaphors and mathematical models stemming from them are not relevant for the studies of social systems. This opinion is also gaining ground among representatives of the mainstream, neoclassical economics, e.g. the development of incomplete contracts theory, which is a synthesis of neoclassical economics and transaction costs theory, which, in turn, is a part of neoinstitutional economy - see (Hart & Moore, 1989, 1998), (Hart, 1995),
- increasing capabilities of modelling of social phenomena with the use of bottom-top simulation models, e.g. works published in the JASSS (Journal of Artificial Social Systems Simulation), development of agent-based modelling,
- development of theory of Artificial Intelligence; AI is understood in a twofold way: firstly as a theory of human thinking, and secondly, as a universal theory of mind, “thinking” and consciousness,
- increasing significance of theoretical discourse in social sciences referring to discourse , meta-logic, consciousness, meaning (cognitive approach, constructivism, post-modernism, post-structuralism),
- development of new concepts of organisation - networks, virtual organisations and applications of complex adaptive systems theory,

- emerging possibility of development of a “monoparadigmatic” social science built with the use of advanced mathematical models of complex adaptive systems (the “bottom-top”), game theory, (advanced agent-based modelling).

## 5 The Information Society and Metaphors of Organisation

### 5.1.1 Challenge of Self-Reference for Theory of Organisation

The above collection of attributes of the Information Society can be developed in further research. The proposed model, illustrated with the concept of “going into metaphors”, identifies the primary tendencies in the changes in organisation and direction of development of the theory of organisation. Although all attributes exert their impact on the functioning of contemporary organisations and on a theory of organisation, yet a broad interpretation of information as mapping constitutes the most important attribute of the Information Society. It should be added that this phenomenological approach is but an introduction to further, more precise studies.

The enhancement of our capabilities of mapping has two consequences for all metaphors used in the description and analysis of organisation in the Information Society, except the mechanistic and simple biological ones. First, the scope of overlapping of source fields and target fields is increasing with complete identity for *autopoietic* system. Second, the relations between the source field and the target field, or more precisely, relations between concepts belonging to a common part of both fields, are becoming more complex.

The already known issues, which can be found in the “journey into metaphor” are gaining more importance under the impact of changes induced by the Information Society. They can be summarised as follows:

- any analysis of organisation must consider various kinds of self-reference,
- development of the Information Society will enhance capabilities of social systems as anticipatory systems with strong anticipation (incursion and hyperincursion),
- decreasing significance of physical attributes or organisation may lead to solutions which in the macroscale could have negative impact on environment - consequences of “liberal techno-info fix”,
- increasing capabilities of mapping contribute to the disappearance of the borders between organisations as well as between humans and organisations, and between humans themselves (“carriers of consciousness”, “carriers of meaning”),
- extrapolation of existing trends allows a conclusion that in future studies of organisation more attention has to be paid to the processes of human (machine) thinking,
- growing importance of self-reference and decreasing borders between organisations and between mind and organisation brings about the issues of distinction and identity as determinants of self-reference and self-identification. It concerns individuals (“conscious units”) as well as social entities. With growing homogenisation of the world (globalisation) along with the development of the Information Society, they will become the key challenge both for individuals and social entities, beginning

from organisations at the micro-level and ending with“ international (global) systems.

## 5.2 A Few Questions for Economic Theory

The increasing role of self-reference in the social sciences cannot leave unaffected the main fortress of positivist thinking in social sciences, i.e., neoclassical economics. In this case the following issues will be likely taken into account:

- acceptance of the increasing role of self-referential aspects of economics in mathematical models based upon game theory. It is especially visible in the concept of “common knowledge” and its formalisations - “I know that you know that I know.....and *so ad infinitum*” (J. Eatwell et al., 1989, p. 74 - 85),
- analysis of the impact of self-reference on the theory of utility,
- the use of incomplete contracts theory as a foundation for further studies of dyadic interactions in social systems. In this case the merger of studies of implicit contracts along with studies of “meaning” appears as the most promising direction,
- for further discussion and studies, an idea of “negotiated meaning” can be proposed herein as an introduction to further research on utility and contractual relationships,
- a contractual approach drawn from modern microeconomics merged with discussion on self-reference, consciousness and meaning could lay the ground for studies of emergence and change of social and economic norms. Therefore the concepts used in sociological discourse on information, communication and meaning in social systems, e.g. (Giddens, 1976, 1984), (Habermas 1984, 1987), Luhmann (1994, 1997), (Leydesdorff, 2000) should be combined with discourse on incomplete contracts in microeconomics, e.g. (Buchanan, 1975), (Hart, 1995), (Hart & Moore, 1989, 1998).

## 6 Conclusions

As was mentioned earlier, this paper is but an introduction to a broader research project. Therefore the conclusions are at the same time assumptions of further studies. The first general conclusion is that a theory of social organisation in the Information Society must refer to self-reference in social systems at all levels of their hierarchy. This assertion has been already accepted in sociology, in management theory and practice, in finance and to some extent in theory of international relations. It is particularly challenging for neoclassical economics. A kind of prediction can thus be made that mainstream economics will have to come to terms with the subjective, self-referential character of economic processes.

Perhaps this situation will create a new chance for a revival of applications of systems thinking and complexity studies in the mainstream social sciences. To achieve the goal of restoring cybernetics and systems thinking as instruments of analysis of the

Information Society and the New Economy it is necessary to elaborate more coherent definitions of social systems and their attributes. Without a common language, the models frequently reflect the ideas of “social systems” comprehensible solely to the authors themselves. It is not necessary to strive for any unifying concepts. It must be taken into consideration that social systems cannot be viewed as billiard balls external to the observer.

Cognitive determinants and constructivist aspects of those systems must be born in mind in any definitional attempts. The task is not easy because it is not simple to decide what “social systems” could be - communication networks, sets of specific cultural norms, systems of events, actions, etc. It must be taken into account that any kind of “social system” is a result of intricate interactions of physical (tangible) aspects of reality along with ideas about that reality in the minds of individuals and of the society.

Attempts have been already made on methods of studying the processes of self-organisation in society regarded as processes of evolution and co-evolution of organisms, genes, species or technologies (artifacts) (Maynard Smith, 1982), (Kauffman, 1993, 1995). Similar efforts have also been undertaken to elaborate models of “societies” composed of rational units (Epstein & Axtell, 1996) or “agent-based modeling”. It is, however, still a long way to study society as collections of self-conscious units (“minds”).

We still find ourselves between the two “black boxes” - that of “mind” and that of social systems, composed of those “minds” (carriers of consciousness or of symbolic attributes), and tangible attributes. Any constructs created in between those two boxes - institutions, regimes, states, international organisations, etc., are but approximation and are based on metaphoric language. The more we know about those boxes, the better we can understand their interactions.

There is another ontological and epistemological aspect of a theory of social organisation, which will gain additional importance in the Information Society. In studies of social systems more attention must be paid to the analysis of the links between dyadic interactions and overall systemic properties. An approach based on recognition of the role of self-reference in social systems theory, along with adequate analysis of the links between dyadic interactions and systemic properties hypothetically could be helpful in elaboration of “monoparadigmatic” social sciences.

Results of a preliminary journey into metaphors shows that identity will be the most significant challenge the Information Society will be facing. It will result from the difficulties with distinction and self-distinction. The elements (humans and groups) of social systems will have developed increased capabilities to map the external world within their minds, and these selves will face the challenge of identity at the individual and social levels. This conclusion results from a recognition of current

trends in technology and biology, as, for example, the already mentioned “info-nano-geno-fix”. It is also another example of consequences resulting from a general conclusion of the increasing capabilities of information gathering and mapping experienced by the Information Society.

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