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10th International Conference of Sociocybernetics

SOCIOCYBERNETICS AND THE INCREASING COMPLEXITY OF SOCIAL LIFE

Cracow, Poland, 20-25 June 2011

Official opening – Senate Hall, Main Building;
All other sessions, Room 8, Sport-Didactic Building

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Stanislaw Drozdz, Department of Complex Systems Theory, Institute of Nuclear Physics, Kraków

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Book of abstracts

Session 1, Chair: Bernd Hornung

1. Using the logic of life to reduce the complexity of life,

Bernard Scott, formerly Reader in Cybernetics, Cranfield University, UK,

BernCES1@gmail.com

This paper presents a thesis about how the logic of life can shed light on how to understand the complexity of life in such a way as to how allow some degree of predictability about how possible futures for mankind might unfold. The expression 'the logic of life' is used to refer to how the abstract truths of cybernetics can delimit both what is possible ontologically and also what is possible epistemologically. The ontological limits may be thought of as first order truths about observed systems that delimit what may happen and what may be done. The epistemological limits may be thought of as second order truths about observing systems that delimit what they may come to know. The expression 'the complexity of life' refers to the perceived complexity of an observing system's world. For example, for a given human individual, this would encompass all they believe they know as general truths about 'how the world works' and their particular beliefs about states of affairs (geographic, economic, social). The general form of the argument is that the 'logic of life' allows us to reduce the perceived complexity of life. In particular, it allows us to consider what are the likely range of outcomes with respect to the prediction and management of the forms that our worlds might take, both from the first order perspective of the human species as a complex adaptive system subject to lawful changes in its environment and from the second order perspective of human life as complex systems of social interaction.

2. How meaning-constituting systems both reduce and preserve complexity,

Diane Laflamme, Université du Québec à Montréal, ad.laflamme@sympatico.ca

Cybernetic system theories describe the relationship between system and environment in terms of a difference in complexity. System and environment are seen as two possibility domains, with a difference in degree of their relative complexity. This difference is continuously altered as the system chooses to attend to some of the possibilities rather than others and organizes these selections internally. This is how a system transforms unorganized complexity into organized complexity. With each one of its operations, the system is changed, the environment as a host is modified, and the difference in their relative complexity is altered. In sociocybernetics, Luhmann's theory examines how meaning contributes to the transformation of unorganized complexity into organized complexity. According to Luhmann, this is the function of meaning: to make possible the reduction of complexity, while simultaneously preserving complexity. The constitution of meaning requires reflexivity: by "selecting its selections", a meaning-constituting system develops internal processes and structures. Using these processes and structures the system can preselect possibilities for choice and connect more easily one system event (thoughts or communications) to the next one. The system knows what to expect. Expectational structures can also be used reflexively. Meaning-constituting systems can expect expectations. Luhmann distinguishes four levels for establishing expectations that are expected: persons, roles, programs, and values. Meaning-constituting systems use these in order to transform unorganized complexity into organized complexity. When operating at this meta-level of expectations that are expected, a meaning-constituting system displays a capacity for innovation.

3. Innovation as an evolutionary process,

Eva Buchinger, Austrian Institute of Technology AIT, eva.buchinger@ait.ac.at

In social system theory (N. Luhmann), the dynamics of an interaction sequence between two persons are explained by contingency and expectation. Contingency arises because persons are complex systems that are "black-boxes" for each other. A person will never know exactly what the other will do next. The reciprocity of social situations results in double contingency. Since the black-box-problem is solved by expectations – i.e. condensed forms of meaning structures – double contingency requires that expectations become reflexive. Expectation-expectation means that one person must be able to expect what the other expects of him, to make his own expectations and behaviour agree with the others expectation. Expectational nexuses such as persons, roles, programs and values are stabilizing factors, because they are not an event (like expectations), but do have duration. Variation and selection occur inevitably in interaction systems (although expectational nexuses usually guide interaction more in the direction of traditional selection and less in the direction of newness). But variation and selection in interactions systems are necessary, but not sufficient for evolution. "Evolution, meaning a change of structures by variation, selection, and restabilization, is possible only on the level of the societal system and its subsystems." In this paper, innovation will be explained as an evolutionary process on societal level. Thereby, it will be shown, how the societal systems science and economy – on basis of the symbolically generalized communication media "truth" and "money" – developed different programs to govern variation, selection, and restabilization.

Session 2, Chair: Eva Buchinger

1. The continuing quest for better ways of conceptualising, mapping, measuring, and harnessing social forces,

John Raven, eye on society, www.eyeonsociety.co.uk

The author hopes to provoke a further discussion of issues he has raised at previous RC51 and systems conferences. The problems with which *socio*-cybernetics needs to engage elude such systems thinkers as Forrester and Meadows. Their proposed solutions to the eco-biological problems they discuss almost invariably rely on centralised, hierarchical, intervention … not on diffuse *organic* intervention of a kind that would required in an ecological niche. And the fact that they usually conclude that there is a "lack of political will" to implement their proposed solutions indicates that *they have failed to include in their models the* **social** *forces which primarily determine social action – and almost invariably undermine and negate common-sense based intervention.* At root, socio-cyberneticians have failed to develop ways of thinking about, measuring, and assigning weights to, the contributions made by the social forces depicted in systemogrammes like those developed by Morgan. The task of depicting this network of forces is analogous to that which physicists use to map, measure, and harness the invisible forces which control the movements of sailing boats and the planets. Such systems are not there for all to see and the actions they point to defy "common sense". The author will summarise what has been accomplished. But he will further underline the importance of making further progress by referring to the work of Bookchin. He has shown that such forces have consistently undermined all previous attempts to introduce *organic* … multiple-feedback-loop based… socio-cybernetic (viz governance) systems to manage organisations and society more effectively.

Preparatory and follow-through material:
- http://eyeonsociety.co.uk/resources/scio.pdf
- http://www.eyeonsociety.co.uk/resources/Bookchin.pdf
- http://eyeonsociety.co.uk/resources/cwc.pdf

2. An index of social well-being as a measurement of system's performance,
Dario Menanteau-Horta University of Minnesota, USA

During the last decades social scientists have made significant efforts to develop valid and reliable tools to measure the concept of social performance. Among some of the early contributions to this task is the still open discussion about the importance of social indicators to evaluate the relative success or failure of social systems. In the United States, early efforts on this research area were sponsored by the American Academy of Arts and Sciences, and social indicators, since their origins, have contributed to define social development and examine the quality of life of societies. Social indicators are tools to measure a social system's performance and determine the relative impact of public policies and functions in the satisfaction of social needs. They also serve as a measure of quality of life and social achievement, or general measures of standard of living. From a sociocybernetic perspective, the three main functions of these research tools are: (1) monitoring social conditions; (2) reporting for civic education; and (3) social forecasting. This paper reports the construction of an Index of Social Well-Being in the state of Minnesota. The study utilized data from each of the 87 counties of that state located in midwestern United States. The index uses eleven factors that measure economic, social and physical well-being. The paper discusses characteristics and social performance of counties, as small social systems, determined by the Index of Social Well-Being scores.

Session 3, Chair: Chaime Marcuello Servós
1. The three inevitabilities of human being - A conceptual hierarchy model approaching social complexity,
Louis Klein, Systemic Excellence Group, Independent Think Tank for Leading Practice, Berlin, louis.klein@segroup.de

„The three inevitabilities of human being" are a conceptual hierarchy model for approaching social complexity. The three inevitabilities are the first conscious mind, second the living body and third the social other. For the human being these three aspects prove to be an enlightening access to the conditio humana. We are looking at a complex hierarchy of embedment and structural coupling as the condition of all possibilities that come with human nature describing the possibilities and limitations of any social system and its complexity.

At the moment we stand at the beginning of enlarger exploration of the model of the three inevitabilities. The special excitement in the model is the interdependence that comes with the structural coupling of operationally closed levels in a hierarchy that only works through the complex dynamics of being part and whole at the same time and being limitation and constraint at the same time. The implications of the model have so far being surprisingly pragmatic in their application in change processes based on exploring social systems for next practices. Here it can enrich a perspective that in the popular notion is labelled as being holistic or integrating. The model gives a good understanding of the fine structure of these terms leading to an in-depth understanding and fruitful applications, be it in management, politics or education to name but a few.

2. Unmanageable organization: The consequences of complex responsive processes of relating,

Marek Ćwiklicki, Department of Organization and Management Methods, Cracow University of Economics, Marek.Cwiklicki@uek.krakow.pl

Applications of Complex Systems Theory to social sciences have different forms, but mostly they are used to explain phenomena for better understanding and managing (Mesjasz, 2003; Rowland 2007). One of the most frequent research areas is organizational learning (Eijnatten, 2004; Eijnatten and Putnik, 2004). It is argued that knowledge creation in daily communication processes involving workers is the key for the successful management of organization. But what if we consider that these processes are not manageable at all? That they are unpredictable, spontaneous, and create patterns crossing the boundaries of small group and influence larger groups, and in consequence – the society? Such an unorthodox approach against "mainstream thinking approach about knowledge creation in organizations" is proposed within the framework of Complex Responsive Processes of Relating (CRPR) elaborated by R.D. Stacey (2000). The aim of the paper is to present the consequences of applying CRPR reasoning that questions many assumptions in the learning organization paradigm and the direct management of the organization. This is supported by the applicability of CPRP theory for analyzing various areas of organization and management where social interactions appear, especially: leadership, work group, management control systems, business processes, and stakeholder analysis.

3. Complexity dynamics shaping life and society,

Helmut K. Loeckenhoff, Loeckenhoff.HellK@t-online.de

By its roots cybernetics is connected to life. Social cybernetics in particular are to be understood from the emergence of life and the rules to its survival and development. They form and control any social system: individuals, social networks, institutions, global as well as local agglomerations. Simplified, inquiry leads into two research lines. The first horizontal one centres on actual social phenomena in situ. It e.g. analyses the impacts and regularities they seem to be governed by. It works with actual models, statistics and value connected interpretations. The other vertical one focuses on the emergence and evolvement of life in evolution. Beginning with the potentiality field it traces the main systems of evolvement and the resulting evolvement of systems up to Higher Consciousness. Cogently the approach argues in terms of transdisciplinarity. Evolvement needs be studied but from the base models of transdisciplinarity. The essential processes appear that of complexity dynamics and semio-dynamics. On the fundament of matter contracting and the dynamics of systems models lead to Higher Consciousness and the spheres of mental constructs. Thus evolvement of life and social systems can be investigated from the intertwinement, the entailment of complexity and semiosis. The following discourse will focus on the dynamics of complexity evolvement as the main point of relevance. The term 'complexity' will concomitantly be defined by these contexts.

Session 4, Chair: Michael Paetau

1. If versus if and only if - seven orders of complexity reduction,

Marilena Lunca, Alumni Network, Utrecht University, m.lunca@planet.nl

The paper advances orders of reducing complexity through understanding. Because complex objects are definable only by second-order properties and distributed-mutual conditionalities, subordinations of such properties and conditions are difficult to render intelligible. An empiric-theoretic understanding reduces the unintelligible to intelligible, without reducing the objects' components or relations. The distinction between the property of being complex and generalising its manifestations into the object complexity dispels confusions, and explains away sources for rising more than one complexity while memory makes size matter to social complexities. The proposed reduction orders originate in three different, though related, complexities. The object-based complexity emerges with those second-order relational properties which do not lead from if conditions to an if and only if condition. The observing-generated complexity consists of reading the object's complexity in terms of what the observing conditions (instruments and accessibility) allow for. The language-embedded complexity derives from scientific languages that precondition the selection of observing conditions. The seemingly natural reduction order 'object → observing → language' becomes workable in reverse by identifying first the language own internal feedbacks, then the language ⇄ observing feedbacks, and then the (language ⇄ observing) ⇄ object feedbacks. On sociocybernetics' behalf, adaptation and control exemplify this reversed order. It turns out that attempts toward complexity reduction reveal new sources of complexity, so, per total, complexity increases, but so does the scientific understanding of what means to be complex. On a reviewer's request, an additional note dissects and corrects the assumption that sociocybernetics is understood as constructivist.

2. An agenda for sociocybernetics,

Felipe Lara-Rosano, Cybernetics & Complex Systems Group, Center for Applied Sciences and Technology& Institute for Social Research, Universidad Nacional Autonoma de Mexico (UNAM), flararosano@gmail.com

We propose to adopt the Complex Systems approach as well as social analysis theories based on the interaction of the social systems elements as well as self-organization processes and social emergence as the new approach to Sociocybernetics. Among these social theories we may consider the generative social science, social network analysis, the theory of social structure, the postmodern version of symbolic interactionism, the complex responsive processes of interaction, the Luhman's theory of complex social systems, the computational sociology and the British school of sociology and complexity. Moreover, considering that in the social sciences because of ethical and economic reasons it is not feasible to use experimental research on human subjects, the experimentation should be replaced by computer simulation of social systems through mathematical – computational modeling. The results of these simulations can generate valuable information for both the theoretical advance of the Social Sciences and decision analysis in organizations. It is therefore necessary to assess the methodological possibilities and limitations of different modeling and computer simulation techniques, as well as the comparative advantages each offers to different types of problems. In this way, the application of computational modeling techniques to social problems such as agent-based models, social network models, system dynamics models, game theoretic models, Petri nets models, artificial neural networks, cross-impact models, fuzzy system models, and second-moment dynamic models must be evaluated. Based on former considerations in this paper an agenda for the Sociocybernetics is presented in order to provide the basis for a meta-methodology of social complexity.

Session 5, Chair: Bernard Scott

1. Structural-functional model of self-organizing economic system,

Julia Fomina, The Department of Economics, Omsk State Transport University, Russia, email: fomina-u-a@ya.ru

Eduard FominThe Consumer society "The system of electronic sales", Russia, www.ses.ru, email: project-ses@ya.ru

It is known that self-organizing systems are highly adaptive and can survive even in conditions of extreme instability. The national economies, markets and enterprises are trying to achieve sustainability and adaptability. Therefore, the task was to develop a structural-functional model of self-organizing economic system. The task is solved on the basis of the system approach, in particular the Synergetics and Cybernetics, Automatic Control Theory, as well as Institutionalism, theories of Schumpeter and Tugan-Baranovsky. The developed model is being tested and used in practice in Russia for the following projects: Electronic commodity market system "System of electronic sales", Electronic external document circulation system, System of efficient accommodation management (for homeowner associations).

2. Dynamic phase space construction for social analysis: A sociocybernetic approach,

José A. Amozurrutia, LabCOMplex-CEIICH-UNAM, j.amoz@yahoo.com

Phase space in physics and natural sciences is a conceptual space in which phenomena states as system conditions are represented. Each possible state of the system corresponds to one unique point in the phase space. It is also a map of possible system trajectories and may be used as a conceptual tool that let you know a better understanding of process transformations. In this paper I make an analogy between a Physic phase Space with *Social phase Space* (SpS) to get similar approximation but from social data, space and conditions. *SpS* is derived from the Empirical Complex delimitation processes and the structuring of the Cognitive Complex concepts. *Its* construction is based on a hierarchical meaning level structure of variables and categories associated to a specific social problem. From the Second order cybernetic point of view, *SpS* information is equivalent to a Knowledge Data Base. In our case, this is integrated to an Adaptive System oriented to Social Analysis. The information is organized in a matrix arrays and follows a heuristic approach construction which is based on Grounded Theory strategy. *SpS* construction implies and establishes a concatenation or continuum operation from the observables domine to system representations i.e. as graphs, trajectories or text statements, obtaining some degrees of system self organization.

3. Sociocybernetic lessons for business management – from steering and control to culture and emotions,

Bernd R Hornung, University Hospital Giessen and Marburg GmbH, Data Protection Office, Marburg, Germany, hornung@med.uni-marburg.de

Not a new topic, the paper outlines how a set of basics, like structure, process, hierarchy, and feedback, extended by concepts like matter/energy, information, actor, culture, and values, can be used to develop a conceptual model providing a coherent picture of a contemporary business company. A company is goal-oriented, to some extent self-organizing, and to some extent organized by management. Both kinds of organizing are self-referential. One refers to a self-organization not carried out by a specific unit for planning, the other to intentional and planned steering and control of the company's activities. A company is set up for a specific purpose, and there are units dedicated to intentional management. In addition to this rational aspect there are both phenomena of genuine self-organization, which escape management control, and there is the complexity of the organization itself along with the complexity of

the environment which limit the rationality of planning and action. Thus decisions are taken under insecurity with at best partially predictable results. (Corporate) culture, ethical codes, and environmental and social responsibility of business companies add to the imponderabilities of company life. In a sociocybernetic framework, however, orientation theory and systems theory of culture can provide a consistent theoretical framework for conceptualizing also these apparently intangible phenomena like different psychologies, values, and motivations of different members, all closely linked to emotions. The paper concludes with a number of suggestions – or lessons – for running a business organization in a sociocybernetically informed way.

Session 6, Chair: José A. Amozurrutia

1. Critical incidents, theory and analysis: Strategies for coping with the ambiguous products of chaos,

Bob Hodge, Centre for Cultural Research, University of Western Sydney, NSW, Australia, b.hodge@uws.edu.au

This paper will describe methods and strategies for analysing complex social systems under stress, connecting familiar language and experience with the often recondite theories of chaos and complexity. Its basic premise is that chaos and complexity are primarily properties of the real world, social and physical. Mathematical models are useful but have no privileged status in explaining them. Critical incidents are unexpected events whose effects unfold exponentially to produce large-scale, surprising consequences. They have the form of a Lorenz Butterfly Effect, and can be modelled through other ideas from chaos and complexity theory, e.g. far-from-equilibrium dynamics and fractals. Importantly, Critical Incidents do not rely on these theories to demand attention from system managers. They are carriers and proof of the omnipresence of chaos, key entry points to diagnose system functions and limits. Analyses of actual critical incidents will provide the basis for the paradoxical judgement, developed from Zadeh's Principle of Incompatibility, that whenever a system has gone beyond a certain threshold of complexity, attempts to impose crisp concepts and linear logic will produce greater incoherence, less relevance to aims and purposes of system managers. Empirical data comes from a larger study of the Sydney Metropolitan Railway system. It includes several Critical Incidents, and analytic strategies that draw on and are compatible with mainstream methods from the social sciences. One aim of this project is to embed a chaos and complexity framework within the social sciences, in a mutually beneficial dialogue about all forms of chaos and complexity.

2. Evaluation of social and public policies: A sociocybernetic approach,

Chaime Marcuello Servós, Universidad de Zaragoza, Fac. Ciencias Sociales y del Trabajo Zaragoza, chaime@unizar.es

There is an old debate about the role of the State in societies. Nowadays, there is a special interest in its financial situation. This old issue has been used to discuss about the "size" of the government and its institutions and its capabilities as an agent in the market system and other social logics. Recent global economic crisis has increased the questions about this topic. Iceland, Greece, Ireland, Portugal, Spain... and more are going through turbulent paths, in their economical and financial situation. The global crisis has increased the public debt in many of these governments and their societies. However, public and social policies are not just as decoration, or as ideological embellishments. For this reason, and manage their proponents accountable for their results, have an obligation to evaluate what they are doing and what left to do... Discourses on social action must be confronted and contrasted with derivative works of their practice. In this context, this paper proposes (i), a review of the discourses about the cur-

rent "complex" situation from social and public policies perspective, (ii), deepen the research tools, analysis and socioeconomic evaluation of an applied sociocybernetical approach and (iii) a model for impact assessment of public and social policies to implement.

Session 7, Chair: Fabio Giglietto

1. Cibercultur@ and action research strategies to deal with complexity in environmental controversies: A case of waste disposal management,

Patricia E. Almaguer Kalixto, CEIICH-UNAM, palmaguer@labcomplex.net

What ideas drawn from Sociocybernetics and Cibercultur@ can help action research in achieving a better understanding and performance in complex environmental controversies? The paper proposes to analyse environmental deliberative process from a systemic approach in order to better understand process of decision making and conflict resolution related to environmental issues. The paper refers an empirical case of complex environmental controversy related to municipal waste disposal management, in a rural area of Mexico (San Luis Potosi). In the first part, we analyze the case from a systemic approach to address the interconnection of different socio environmental subsystems engaged in the selection of a place for municipal waste disposal from geological, hydrological and biophysical characterizations to legal frameworks, institutional practices, and the intervention of different stakeholders in the decision making. The second part of the paper, discusses how through an action research framework based in Cibercultur@ stakeholders in the case worked towards a different path of conflict resolution. In this process, Sociocybernetic concepts such as self-reflexivity entities, self-observation and positive and negative feedback where used to strength second order observation in the action research process. The analysis evidences how environmental knowledge claims are defined and used to move forward specific stakeholder positions in relation to the environmental controversy and suggests that concepts coming from Cibercultur@ and Sociocybernetics can be a valuable addition to approach traditional institutional practices where discretional decision making enhances exclusion of local communities in the debate.

2. Complexity of social life and violence against women: A sociocybernetical approach,
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Violence has many faces. It is a complex, polyhedric and intricate social phenomenon. It has been studied from different perspectives: micro dimension, meso or macro-social aspects. War, terrorism, crime… weak or strong, soft or hard, cold and hot violence are some of the possible considerations of violence as a trans-cultural human behavior… Inside this complex field of social life, violence against women (VAW) in a relationship is a transnational and trans-social classes problem. It is a challenge for governments, institutions, individuals and civil societies, anywhere, especially in democratic societies. In this paper, we present a sociocybernetical approach to the VAW. This has been elaborated inside a pilot program of reeducation of convicted male abusers. It was developed during half year. Mainly, there was a psychological intervention program, which applied test and questionnaires, group therapy in different stages of the program, monitoring the changes and "effects" of the designed program. The paper is divided in five sections, including an introduction and conclusions. First, we describe the framework of the

general investigation and its particular context. Second, we show the researching strategy and its main results. Third, we present the structure of the adaptive system and its possibilities in order to analyze and represent the information.

3. How to govern migration? Diversity of cultures in a postmigration society,
Michael Paetau, Center for Sociocybernetics Studies Bonn, Germany,
www.sociocybernetics.eu, michael.paetau@sociocybernetics.eu

As well in politics as in science since some years it is emphasized that the governance of migration will be one of the most important tasks of the coming decade. Within the EU in different countries evolved various and temporarily modified concepts how to realize such a governance. On success or failure one can dispute. But from a sociocybernetics point of view there is to state a fundamental deficiency because unidimensional and causal approaches are still dominant which do not meet the requirements of the problem's complexity, as well they rarely consider feed-back processes of the empirical fact of migration and the particular political measures to society in whole. In my paper I try to demonstrate this deficiencies in dealing with complexity exemplarily at the current discourse of migration in Germany. For a large part of people with a migration background migration itself is not part of their individual experience. But it survives as a biographical element, either as part of the family legend, or by attribution from outside because their appearance, accent, clothing or their names. And often these attributes will initiate other people to suspect the affiliation of migrants to Germany. On this problem in last time came up a new discourse around the term »post-migration« (Foroutan 2010).

Session 8, Chair: Karl H. Simon
1. Complexity and tradition in the oasis communities. A discussion about research methodology from a sociocybernetical approach,
Pedro José Escriche Bueno, Departamento de Psicología y Sociología, Facultad de Ciencias Sociales y del Trabajo, Universidad de Zaragoza, pescrich@unizar.es

Nomad communities in the historical region of Tafilalet (Southeast Morocco) answered to decolonization by changing their ancestral way-of-life for sedentarization. Nowadays, their organisation is mainly based on the construction and maintenance of the infrastructures that pick up water (khettaras) and the management of its distribution, an example of a complexity system rooted in tradition that has guaranteed up to now the sustainability of these communities. In the last decades, with the improvement of the communications, the isolation is broken and tourists arrive in huge numbers. The social and environmental changes that consequently affect these populations have unpredictable consequences in the long term, but undesired effects can be already noticed, such as massive migration and environmental and social unsustainability of the touristic activity. It is now necessary to propose development policies to help these communities to improve their way of life without destroying their environment and culture. Nevertheless, any successful development policy must start with an in-depth research of these societies. This paper aims to analyze how to carry out this research, taking into account the different barriers that social researchers are going to find in the process of observing oasian reality: unknown language (Tamazigh), different culture (Amazigh), a singular environment (Sahara desert), ... They also will have to forget their own stereotypes and fight the population's in order to achieve true collaboration and involvement.

This paper also intends to discuss different approach methodologies to this social system, analyzing the pros and cons of a systemic versus methodological individualism.

2. Second-order observation of the increasing socio-cultural complexity: A difference theoretical approach,

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To describe the uncertainty of modern society, this paper pays attention to Niklas Luhmann's sociological systems theory which redefines an observation as an operation which consists of a distinction and an indication. The important thing for second-order observer is to describe what kinds of distinctions are drawn in observers' observations including social systems' observations. We can call these distinctions "codes" or "communication codes" and also can call second-observation to social systems "difference theoretical approach".

As for the increasing complexity, the appearance of new meaning can be understood as the emergence of new communication codes. This paper, however, focuses on another type of socio-cultural change without the emergence of new codes. It is concerning the "crossing" of codes and "technization". Luhmann defines technization as the phenomenon that the negative side of an asymmetrical code of communication becomes positive in the communication process, for example, big/ small, young/ old, center/ periphery, male/ female and so on. Crossing of the borderline was originally defined as the cancellation of it; however, in the case of technization crossing does not mean the cancellation of distinction, but re-activation of distinction. In relation to technization and crossing of codes, increasing socio-cultural complexity can be understood not only as emergence of new social order but also maintenance or reinforcement of existing order. To make this point clear, we will see this phenomenon through an overview of Japanese political scene and discuss it by distinguishing between vagueness and ambiguity based on Kenzaburo Oe's view on Japanese culture.

3. On user generated content, teleology and predictability in social systems,

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During the last few years the Internet has been increasingly used by people as a read-write medium. A large share of this information is today exposed to so called, networked publics (Ito 2008), on the Internet. This data could be easily searched, retrieved and analyzed with qualitative and quantitative techniques. During the last few years several studies focused on testing and developing the idea of using social big data for sociological research, has been carried on both in the field of communication studies and computer science . This emerging interdisciplinary field of study is often referred as computational social science . Leveraging on recent studies carried on by research laboratory at Google (Shimshoni, Matias, and Labs 2009) and Yahoo! , the paper will extend this idea of computational social science in order to exploit the forecast potentials of user generated content in understanding not only the past but also to predict the future of social systems. The paper will frame this kind of studies within the theory of social systems and will present the results of an ongoing study aimed to explore the correlation between candidates number of Facebook fan/likes and electoral success in the upcoming administrative election that will be held in Italy the 13th and 14th of May.

Workshop

ISO 26000 on social responsibility supports systemic/cybernetic behavior,

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Due to the lack of systemic/cybernetic behavior the practical decision making has a one-sided and therefore misinforming basis. This has lasted for the entire industrial and information society periods. The dangerous climate change, over-population, lack of natural resources, and destruction of nature, including waste – all result from this absence, or lack, of requisite holism. The recent decade has seen official awareness of this dangerous absence of holism: United Nations and European Union launched documents supportive of social responsibility. In 2010 the ISO 26000 went a crucial step further: it calls (1) holistic approach and (2) interdependence the two common denominators of social responsibility. Thus, these documents are asking for innovation of habits for humankind to overcome its dangerous economic theory of so far – the neo-liberalistic abuse of Adam Smith's liberalism. Seven topics are addressed: (1) governance, management and organization, (2) human rights, (3) labor practices, (4) natural environment, (5) fair business practices, (6) customers, and (7) involvement and development of community. Social responsibility is offering a replacement for neo-liberalism of so far in socio-economic relations, although only organizations, but no governments and individuals, are mentioned explicitly. ISO 26000 is not meant for certification, but for self-assessment and self-innovation reaching beyond technology to crucial non-technological topics. In the current trends, innovation may not be reduced to IIDP of products and services; it must rather cover the non-technological issues, too, or even first of all. Technology is an important tool, but only a tool of humans.

(Full version will be distributed separately)

Session 9, Chair: Matjaz Mulej

1. Transformations on a National Researchers System Scientific Culture: A Sociocybernetic Approach,

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National Researchers System (SNI for its acronym in Spanish) in Mexico was created in 1984 as a politics of economic incentives to avoid the massive "brains drain" during the great economic crisis in 1982. Nevertheless, the SNI system has more than 16 thousand members (approximately the 30% of the researchers in the country). Its membership and permanency is determined by a committee of evaluation formed by academic couples divided in 7 different areas. The role of the committees is to evaluate projects and printed products according to the following criteria: Entail work, quality and impact of the research, transcendence of the work, originality of the work, innovation, influence in the academic or social world, consolidation of the research area, measurable productivity in papers or patents, leadership in academic environment and training of new researchers. In the last 40 years, with the creation of the National Council of Science and Technology (CONACyT for its acronym in Spanish) and specially in the last 25 years (since the creation of the SNI) there have been scientific politics that aim to change the liberal vision of science in the scientific national system (science for science with little evaluation of results) and implement instead a techno-economist vision (science and technology to contribute to the socio-economical development with constant evaluation). Since its origins, the SIN has been object of strong critiques among which stand out the ones aimed to their evaluation mechanisms that, according to their critics, assume the existence of a unique model of researcher. This study searches, the changes

that the researchers, individual and collectively, have made in their scientific practices and how different scientific cultures have had to adapt so as to coexist with the model proposed by the SNI. A sociocybernetic perspective of The National Researchers System (SNI) organization and criteria in terms of code valuations inside its operational closure coupled with system perspective of research community as a group and as individuals with their own codes will let us define main elements of their organization structure and their interactions. A challenge will be to have an epistemic knowledge of their transformations and forms of adaptation, all of this in order to have a better understanding of national scientific culture. In the first part of the paper I will present General characteristics of SNI and Researchers and their representation as systemic organizations and their properties. Then I will present the strategy to get the empirical data and finally some preliminary conclusions about the actual national scientific culture.

2. Analyzing emergent interdisciplinary research communities network from sociocybernetics perspective,

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The centre of this paper is to discuss the theoretical, epistemological, methodological and technical development that sustains the Emergent Interdisciplinary Research Communities Network (RED-CEII by its acronym in Spanish). RED-CEII is a research network proposal launched by LabCOMplex (Laboratory of Research and Development in Complex Communication, UNAM) in 2010 to organize in a further level, the research and local knowledge communities that LabCOMplex has promoted and worked within in recent years. The network is a new configuration of those communities organized with academic multidisciplinary groups, working with a shared epistemic framework at the frontiers of their discipline, to build interdisciplinary research and study objects. The RED-CEII proposal is to build up new relations among the existent and new knowledge communities engaged (network nodes) in the project in order to enhance their work through first and second order reflexivity of their activities performed in different places of Mexico where they are doing empirical research. The network building process implies a collective reflection on the permanent process to configurate and re-configurate the shape and density of the network. This process of balancing, un-balancing and re-balancing is analyzed through Sociocybernetics framework addressing the challenges of the collective approach on the parallel process of building up the network while analyzing the process. The paper uses a Sociocybernetical frameworks to explain the structure of the network as a larger complex knowledge system based also in Marcuello (2006), Hornung (2001), Paetau (2006) and Amozurrutia (2005) contributions to the field.

3. Cracow University of Economics at the edge of chaos – a preliminary study,

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Chaos theory is a field of study based on exact sciences that examines the chaotic behavior of nonlinear differential equations. Although the widely accepted definition of chaos does not exist, some common characteristics can be noticed among the various approaches. According to the theory, chaos is not a state of randomness. In fact chaotic systems are nonlinear, deterministic, complex, sensitive to initial conditions, bounded and they possess fractal strange attractors. Chaos theory has become very popular and has been widely implemented, with more or less success, in many different disciplines. One of the most significant application of the theory elements to the economic sciences is known as the "edge of chaos organization". Many scientists agree that social sciences are sentenced to undergo a paradigm shift resulted from the discrepancy between the current state of knowledge, methods of research and the coveted solving of studied problems. Many traditionally managed organizations are now unable to operate on the global, dynamic and complex markets. Edge of chaos organization is a response to the earlier unidenti-

fied problems created by multiple social and economic systems. The main characteristics of such organizations is the constructive confrontation, self-learning ability, free flow of information and the unique culture. By the proper combining of this elements, the edge of chaos organizations can work and compete effectively in the rapidly changing environments. Many alarming changes have touched the Polish system of education that, on the on hand, in some aspects started to imitate the production process with the education as a merchandise, but at the same time has to deal with many fundamental problems, on the other. The purpose of this paper is to answer whether the Cracow University of Economics possesses the major characteristics of the edge of chaos organization or whether it can be shifted to the edge of chaos in the future. By analyzing the structure of the Cracow University of Economics some ideas showing the possible direction of changes can be developed.

Session 10, Chair: Margarita Maass Moreno

1. On some early experiments in participatory decision support and decision making – from wicked problems to ORAKEL and beyond,

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From the very beginning in the 1940s systems research was overburdened with enormous expectations about problem solving capacities. In the early phases of development the aim was: "attacking problems of planning in a rational, straightforward, systematic way". When the approach was applied to real-world the „era of hope" followed an "era of disappointment". C. West Churchman, Horst Rittel and other scholars tried to explain that outcome and developed measures to deal with that situation. Rittel pleaded for a systems approach of the second generation. In that approach some of the constituents are – beside others – the following: (1) expertise is distributed over many people, (2) a "maximized involvement" of peoples affected should be guaranteed, (3) "ought-to-be statements" are unavoidable, and (4) an intense communication of premises, measures and solutions is part of the endeavor. As a contribution to the history of those developments early reactions are described, namely the idea of "maieutics" (to help people in developing their own problem descriptions and ideas about possible solutions). Krauch and his co-workers developed the system ORAKEL (after the Greek word for answering questions about the future) and aimed at a combination of ideal democratic decisions processes and cybernetic techniques. Gaming simulation, expert panels, voting by telephone calls are components of a system ORAKEL (composed of the German words for "organized conflict", „representatives", „articulation", „critical", „development", „gaps"). Applications of the method are documented and the technical basis at the time of the original experiments will be discussed, especially under the viewpoint of success achievable when more recent techniques (like web 2.0, internet in general, visualization methods, etc.) became available.

2. Invention – innovation diffusion process (IIDP) as a basis for realization of potential of the cultural and material development,

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No result is attained without dreaming about, first. This includes cultural and material development. Though: +99% of dreams/ideas fail. Reasons for this include:
- Lack of the requisite holism (N.B.: real/total holism reaches beyond human capacities) in thinking/behavior;
- Lack of understanding that attainment of the requisite holism is extremely rarely possible, if one single viewpoint/profession/experience is considered, rather than a dialectical system (all crucial

viewpoints/professions/experiences, their relations and resulting synergies);

- Lack of capability of specialized professionals to listen to each other, when and because they disagree, and lack of their capability to understand that they are complementary to each other, when they work on the same events, experiences, insights, and processes from different viewpoints resulting from their different specializations;
- Etc.

The point we are concentrating upon here is the general need to understand requisitely holistically the invention-innovation-diffusion process through which every idea must unavoidably go to result in new benefit/development. The process sketched in our contribution does not apply to technology only, but to all types of new ideas. Law is passed in parliament, decision is passed by managers, etc.; this is not enough for the underlying idea to make development. The invention-innovation-diffusion process is always unavoidable and requires innovation management; otherwise extremely few ideas (one of 3.000) reach their final destination/goal.

3. Management of a system: example of an economic zone,

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The management of a system requires understanding of what kind of system one is facing. The paper presents the hierarchy and emergent levels of human organizational systems in which different managerial approaches are needed. Especially valuable is understanding of the way the system is constructed: organizmal or modal. This influence strongly the management practices towards the system behavior.

Session 11, Chair: Dario Menanteau-Horta

1. Analysis of gradients cybercultur@ the training through the use of an adaptative system,

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In this paper, I present the results of a prototext analysis using the adaptive system model proposed by José Amozurrutia (LabCOMplex, 2007). The aim of this study is identifying the level of training in cybercultur@ (KC@) in an Emerging Community of Local Knowledge (CECL) located at Charcas, San Luis Potosi, Mexico. The cybercultur@l training developed in this CECL has generated evidence on processes of organization. Each one of these communities has ethnographic data files, stories, photographs, and descriptive and reflective literature produced both by community members and the LabCOMplex team. In this study, I use this set of materials as prototext, i.e. as texts explaining the cybercultur@ formation process and its gradients in CECL. According to Amozurrutia (2007), the system has the feature of collective self-construction through processes of distributed intelligence. Based on this premise, I am applying a workflow-oriented second-order analysis on KC@. Using KC@ as a metacategory, to facilitate working with categories and subcategories, I develop indicators to approach the the CECL's KC@ training process. Based on the KC@-oriented actions proposed by the LabCOMplex team, and the adaptive system approach, I show the construction processes of collective knowledge in this CECL. The paper is organized in three parts, the first one presents an overview of the empirical material for analysis (prototext), the second part describes the collective process of building the KC@ categorical scheme, and in the third section I show the gradients of KC@ in the CECL-Charcas applying the adaptive system approach.

2. Violence as an adaptive system: An example in Mexico,

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Violence is usually seen as an act of aggression, a form of hostile power that usually causes a certain degree of pain. Much of the literature on violence emphasises evident acts of violence performed by clear identifiable agents and tends to see this as a perturbation of 'normality' (cf. WHO, 2002). However, Žižek (2008) explains that very often there is an inherent violence in the 'normal' state of things. This violence disguised of normality is named systemic violence. In this paper, I explore how systemic violence could be studied using an adaptive system approach. To achieve my aims, I look at some concepts of sociocybernetics (Geyer, 1995; Amozurrutia, 2007, 2011) and see how they could work approaching systemic violence. Besides, using Corsi et al (1996) as a map, I also explore how the Luhmann's (1988, 1994, 1995, 1996) concepts of structural coupling and inclusion/exclusion could work in explaining systemic violence. Geyer, (1995) explains that second order cybernetic concepts such as self-organization, self-reference, self-steering, autocatalysis, and autopoiesis can be helpful to understand complex systems following processes of adaptation. In this paper, each one of these concepts will be explored to see how they work to design a research proposal about violence.These concepts will be exemplified in the current Mexican context. The purpose of this presentation is to gain feedback to design a research line, as studying these concepts may provide some guidance for better understanding the reproduction of violence and may help to dismantle it.

Session 12, Chair: Bob Hodge

1. Is topological invariance an acceptable compression of complexity? Reflexions on (self-)organization in Boolean network and autopoiesis,

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Leaned on robust grounds (von Neumann's theory of self-reproducing automata during the fifties, Ashby's work on self-organization and tessellation, and cellular automata during the sixties) during the seventies Kauffman on one side and Maturana and Varela on another side developed independently their theories of (self-)organization: the random Boolean network and fitness landscape theory (hereafter NK-FL) by Kauffman, and the theory of autopoiesis (hereafter TA) by Maturana and Varela. Both perspectives have epistemological and methodological claims, though TA modelization didn't proceeded so far as NK-FL, which indeed has been significantly applied to biology and economics as methodological tools of formal analysis, without almost any epistemological implication. Conversely, TA has been extensively developed in sociology and management mostly as an epistemological novelty and very rarely as a methodological device. Strangely enough, though TA was advanced for explaining biological phenomena its scientific diffusion is proceeding only into social sciences. Both approaches have in common two crucial, though not yet well explicit, ideas: 1) a system's organization is its network, and 2) a system's identity coincides with (is defined by, requires and lasts long as its) topological invariance. Shortly stated, identity is topology. This latter property means that, over time, the system's (network's) elements (nodes) should remain the same without increments or decrements or substitutions, and that its connections do not change, neither as presence/absence nor in its direction. Noteworthy, the NK-FL appears as the most appropriate and consistent methodology for the TA. The stable state of TA corresponds to the attractor in NK-FL. These two ideas have a lot of remarkable implications, especially in reference to the problem of coping with complexity. A first one is that nodes' attributes is irrelevant for organization. In NK-FL node's variability is reduced to the number of states in which nodes can stay or to its sensitivity

to the incoming connections. In TA the concrete specification of the system, that is the matter of which its nodes and connections are made, pertains to the system's structure and not to the system's organization. A further consequence is that the system's environment is supposed to be not able to influence the system's topology, because for both TA and NK-FL if this happened than the system (network) would change identity (topology). The second implication derives strictly from the previous one, and refers to the fact that only one type of relationship among the many that can hold among the system's elements can be taken into account for computation and analysis. A further consequence is that any influence between types of relationships is excluded. As well, any influence between nodes' attributes and between relationships and attributes. A third set of implications has a strict methodological nature, because though in principle is not impossible to consider complex nodes in practice there are strong computational boundaries that for even minimal complexity make computation unfeasible. Consequently, the system cannot have memory, learning processes, and neither any co-evolution with other connected systems. The focal points of this paper are the following two: 1) is topological invariance an acceptable compression of complexity? And if yes, then 2) could TA supply an epistemology to NK-FL, and vice versa NK-FL be the methodological framework for TA?

2. On the nature of exaptation and the complex co-generation of objects and functions, Lucio Biggiero, University of L'Aquila; biggiero@ec.univaq.it, Antonio Mastrogiorgio, University of L'Aquila; a.mastrogiorgio@unibo.it, Knownetlab Research Center, www.knownetlab.it

When we admit that an artifact exists because it has a function we are implicitly claiming an evolutionary explanation of its existence. In fact an artifact can be seen as a casual mutation in the domain of artifacts that has been selected and retained in a given environment because its better fitness. Evolutionary explanations –based on the concept of adaptation– represent probably the unique considerable attempt of facing such kind of affairs: by identifying some criteria to explain the ontological diversity of nature, evolutionary theories aim to find a theoretical plausibility to the problem of "origins". But the concept of adaptation is not "beyond discussion", and as Gould (2002) suggests through the concept of exaptation, it can be useful to reflect on the complexity of real world related to the increasing presence of human artifacts. The word "exaptation", –'ex-aptation' etymologically contrasts with 'ad-aptation'– refers to the process through which existing traits, originally developed for a certain use, are employed for uses that are completely different from the original one. Kauffman (2000) points that many artifacts can be seen as exaptations; for example CD-roms, which were originally developed as memory devices and then co-opted for musical purposes. If we admit that some artifacts can have new uses other than that for which they was developed, the question we ask is what about the origins of new uses?In this work we want to propose a hypothesis –about the origins of functions– that could be subsumed by the concept of exaptation but that has not yet been well articulated. The concept of exaptation tells us that many artifacts can be co-opted for a different use; but what about new uses? For example, we know that Facebook was born for a different use and then was co-opted for its current function of "creating social relationship using internet"? So our questions are: when and how these new functions did emerge? In this work we want to reflect on the possibility that the genesis itself of a function is a consequence of the state of nature: we are conjecturing that a function of an artifact can be an effect of the existence of the artifact, not its cause. According to our reflection, a function could not pre-exist to the artifact but could emerge as a possibility only after that its related artifact has come into being. So, functions could be seen as epiphenomenal possibilities enlightened by the current state of nature embodied in the domain of artifacts. In our example of Facebook, the function of "creating social relationship using internet" has emerged only after that its underlying technology had come into being. Hence we are conjecturing that the logic of invention could not be based on the human desire of solving existing problems but it

seems more the invention of some problems given their solutions. According to this perspective, invention is not (only) in creating new things but in finding a new sense of the already existing ones.

3. Complexity of social systems as consequence of awareness of limits of human knowledge,

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The terms complexity and complex systems, used frequently as "buzzwords", have gained a specific role in the language of modern social sciences and social practice. It may be concluded that whenever the term complexity is used, it is an expression of awareness (self-awareness) of "ignorance" (limited knowledge or absence of knowledge). In the paper a proposal is put before that the uses of utterance "complexity" should be interpreted as a consequence of increased awareness of limitations of human knowledge. It is even reflected in evolution of systems thinking/cybernetics/sociocybernetics. In the earlier research attempts were made to comprehend behaviour of systems, e.g. holistic approach. After discovering barriers of that approach attention is now paid to "complexity" and "complex systems". The aim of the paper is to develop new interpretations of complexity of social systems which could allow for unification of various ideas presented in the framework of "hard" complexity studies based on mathematical modeling of elements of social systems and "soft" complexity studies. "Hard" complexity studies are based on mathematical modeling while "soft" complexity studies are developed with narratives relating to analogies and metaphors deriving from mathematical modeling as well as narratives indigenously developed for studying social systems. The proposed approach referring to moderate constructivism and intersubjectivity will include a survey and deepened interpretations of existing definitions of complexity which can be applied in studying social systems. The survey will cover a wide scope of issues, beginning from semantic considerations and ending with advantages and limitations of mathematical modeling of social systems. It will be used as a point of departure for elaboration of new interpretations of complexity of social systems which will result from awareness of epistemological (cognitive) barriers of studies of social phenomena.