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In cooperation with

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And

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Institute for Entrepreneurship and Small Business Management (EPF IP)

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THE VALUE ADDED TAX POLICY OF BANGLADESH
A Systemic Analysis

Md. Abdur Rouf

Abstract

The Value Added Tax (VAT) policy of Bangladesh will be analyzed here applying General Systems Theory (GST). The VAT policy will be found to be a VAT system. The VAT system will be verified in terms of the basic features of GST i.e., 'hierarchy', 'homeostasis', 'equifinality' and 'non-summativity'. From structural and functional perspectives of GST, the VAT system will be seen. 'Hierarchy' and 'homeostasis' falls under structural perspective while 'equifinality' and 'non-summativity' falls under functional perspective. Hierarchy is a structural feature of a general system. It refers to an ascending order by which the components of a system remain arranged. The hierarchy theory studies the hierarchical structures within a system and the relations between the structures. Hierarchy theory can be applied to understand and develop the complex systems like the VAT system of Bangladesh. There is an administrative hierarchy, a policy hierarchy, and so on in the VAT system of Bangladesh. There are levels in each of these hierarchies. Relations among these levels will be examined and problem areas will be identified. Homeostasis has been another structural aspect of general system. It refers to the tendency of a system of maintaining steady state. A homeostatic system maintains stability by means of a multiplicity of dynamic equilibria rigorously controlled by interdependent regulation mechanisms. Homeostasis is there in highly complex open systems, e.g., ecological, biological, social, economic, political system etc. Once the homeostatic function is understood, with proper inputs in the system a desired output can be obtained. Equifinality has been a functional principle of general system, which states that the same final condition (output) of a system may be reached from different initial conditions (inputs) and in different ways (transformations). According to the principle of equifinality, there are many different ways that an open system such as a person, team or organization can behave and still achieve the same outcome. This holds true with regard to many other systems, particularly natural, man-made, open, dynamic, or conceptual systems like the VAT system of Bangladesh. Applying the concept equifinality in the VAT system of Bangladesh, we can maximize revenue output with minimum cost. To achieve a desired level of revenue growth, costs of several inputs can be assessed; their outcomes can be evaluated and one option can be chosen for adpotion. The principle of non-summativity has been another functional aspect of general system that emphasizes upon understanding the hole. It asserts that the system output is greater than the sum total of the outputs of its parts. This is because of the functional relationships among the components of the system. Such principle of system is called non-summativity. In the VAT system of Bangladesh if such relations among components or levels can be properly established, the total revenue generated by the VAT system can be much higher than the revenue given by all units in totality. Those are some points pursuing which, limitations with the VAT system of Bangladesh can be identified. The findings taken care of by the policy makers, there can be significant growth in the revenue generation of Bangladesh.

Key Words: General Systems Theory, System, Value Added Tax System of Bangladesh, Hierarchy, Homeostasis, equifinality, non-summativity.

1. Introduction

In Bangladesh, the area of Value Added Tax (VAT) has not yet been researched adequately. The academicians find the area difficult for conducting research since people concerned do not like to answer tax-related questions with ease and the practitioners remain occupied with the objective of revenue target realization. Against this backdrop, this article is rather a guideline for further work in the area. From the perspective of a general system, lights have been shed here upon the VAT system of Bangladesh where enthusiasts may find points of interest to begin their works. There have been plenty of scopes for exploring the area from other perspectives as well. There have been various approaches to the interpretation of things. For the analysis of public policy, there have been a number of approaches of them Thomas R. Dye (1978:19-39) lists the following as theoretically more tenable and empirically relevant. Institutionalism has been an approach to public policy analysis, which views public policy as activities of politico-administrative institutions. Rationalism describes public policy as efforts towards efficient goal achievement. Incrementalism sees public policy as variations on the past policy. Group theory considers public policy as group equilibrium. Elite theory views public policy as elite preferences. Game theory asserts public policy as rational choice in competitive situations. Systems theory describes public policy as system output. Fiscal policy enumerating the income and expenditure guidelines of government is a major public policy of any country. VAT policy of Bangladesh is an important ingredient of our fiscal policy. In this article, the VAT policy of Bangladesh will be examined in terms of the systems approach. The introductory paragraph will be followed by a discussion on General Systems Theory (GST). In the third part, the VAT policy will be found to be the VAT system. The applicability of GST upon the VAT system of Bangladesh will be focused upon. In the fourth part, the GST will be applied upon the VAT system of Bangladesh. In terms of the basic features of the GST, i.e., hierarchy, homeostasis, equifinality and non-summativity the VAT system will be verified. The article is concluded with the observation that GST can be applied to the VAT system of Bangladesh for better functioning of VAT system. From structural and functional aspects of GST VAT system of Bangladesh will be highlighted. The first two features: hierarchy and homeostasis falls under structural features and the other two features equifinality and non-summativity falls under the functional features. Those will be applied to find out the extent of similarities and dissimilarities within the VAT system compared to a general system. Those dissimilarities could be considered as the problem areas to be taken care of by the policy makers. Now let us have a look upon the GST.

2. The General Systems Theory

Systems approach is one of the major approaches for analyzing social science phenomena. Derived from biological sciences, the approach has been adopted in social sciences as a convenient tool for analysis. The systems viewpoint has in fact penetrated and proven indispensable in a variety of scientific and technological fields of physical, biological and social sciences. It represents a new paradigm in scientific thinking and enquiry. GST is a broad view - a visionary outlook – a reorientation that has become necessary in almost all fields of scientific research. In different sciences it operates with varying degrees of success (Bertalanffy, 1968, 2003:vii-viii). The phrase ‘general systems theory’ had been introduced by eminent German biologist-turned philosopher Ludwig von Bertalanffy in the 1950s borrowing the concept from biology (http://www.bsu.edu/classes/flint/systems.html). Since then, it has been a new paradigm in social science research. It ushered a new horizon for the academicians, researchers, and thinkers alike to look at phenomena in a systematic way not looked so far. Opposition to one-way causal analysis, the GST is a wholistic approach to look at things. David Sills (1972, v. 15:452) rightly holds that the universe ‘is a strictly determined

clockwork, whose operation would be completely understandable to an intelligence, sufficiently vast to grasp the totality of its components and the relations among them'. All systems function to achieve some objectives. There is an ideal way of the functioning of systems. When a system ideally functions, it can easily achieve the objectives. There are some elements that disturb smooth functioning of systems. To the extent system malfunctions, to that extent troubles and nuisances exist in society. So, the pursuit of man is to identify the elements contributing to the malfunctioning of systems and to eliminate them. Sometimes, systems function to produce something where we get an input-output relation in the system. The introduction of systems approach in the study of political science has been a recent phenomenon. The political scientists adopted it drawing from the works of social scientists, physical scientists, biologists and engineers. Eminent sociologist Talcott Parsons developed the idea of 'social system' from where several political scientists have come to employ this approach in the study of politics; namely; Almond (1956, 1966), Easton (1957, 1965a, 1965b), Mitchell (1962) and others. Due to the historical closeness of public administration to political science, the works of some students of organizations, namely; Chester I. Barnard (1938), Herbert A. Simon (1947) exerted ultimate influence upon the political scientists preparing the ground for viewing politics in terms of 'environment', 'demands' 'supports', 'inputs', 'outputs', 'outcomes', 'feedback' etc. According to GST, these systemic elements constitute the 'black box' where the inputs are transformed into outputs i. e., public policies.

System

The concept of 'system' is a 'new philosophy of nature' contrasting the 'blind laws of nature' of the mechanistic world view (Bertalanffy, 2003:xxi). From an atomic particle to the great universe, everything falls under system. The universe is a hierarchy of hundreds of thousands of visible, invisible; full-fledged, formative; independent, overlapping; small, big systems. System is a bundle of structurally and functionally interconnected components. A system can be separated from other systems around it. According to David Sills, (1972, vol.15:453), 'In common usage, the word refers to widely separated concepts. Engineers are concerned with systems as functionally related aggregates of technological devices. Physiologists single out functionally related portions of living organisms (circulatory, digestive, nervous systems). Social scientists speak of economic and political systems; philosophers about systems of thought.' All these diverse types of systems possess something in common. As stated by David Sills (op. cit.) the definition of a system is (1) something consisting of a set (finite or infinite) of entities (2) among which a set of relations is specified, so that (3) deductions are possible from some relations to others or from the relations among the entities to the behavior or the history of the system. For instance, in a solar system, the entities are the sun and the planets; the relations among them are specifiable as position and velocity vectors and forces of gravitational attraction. In a social system, the entities are individuals, families, institutions and relations among them are communication channels, influence, obligations etc. All systems are not of same nature. While contrasting system similarities and dissimilarities Blanchard and Fabrycky (1998:4) classify systems by several dichotomies as: natural and man-made systems, physical and conceptual systems, static and dynamic systems, closed and open systems. In terms of space, systems can be classified into three types as supra-system, system and subsystem. Some observers find systems as soft and hard systems while some others find as simple and complex systems. Under each system there can be dozens of subsystems which themselves are again systems as well. For instance, under economic system, there could be a monetary system, a demand system; a supply system, a revenue collection system; under the revenue collection system, there stands the VAT system – our area of investigation. The man-made, conceptual, dynamic, open systems have structures, boundaries, inputs-outputs and processes. Without structure there can be no system. There lies

the difference between a system and an arbitrarily circumscribed portion of the real world. To find out a system and to separate it from other systems of from other aggregates around it, a scale of observation is needed. This is more applicable to distinguish a conceptual system. With a scale of observation, we find the levels or components of a system. We find the functions of each level and functions among the levels. A system is self-contained, distinct from its environment, having observable boundaries. In case of conceptual system, it is difficult to observe the boundaries and distinguish the system from others. It is hardly difficult to find any completely isolated or closed system without external influences, particularly in social sciences. Systems analysis is concerned with detecting relationships across boundaries, i. e., inputs and outputs. David Easton (1957, 1965) for the first time described the idea of political system at great length. His conceptualization of political system consists of demands and supports as inputs into the system; the political and administrative institutions form the political system; the decisions and actions are the outputs of the system. Reactions from the pressure groups, the civil society, the NGO's form the feedback which again serve as inputs into the system, again to be processed as outputs. Such insertion of input, processing and production of output is a continuous process in a system. This entire system functions within an environment (Sapru, 1998:35). In the following part the VAT policy is seen as the VAT system and indications have been made regarding the applicability of GST upon the VAT system of Bangladesh.

3. Applicability of GST upon VAT System of Bangladesh

The VAT policy is a part of the fiscal policy of the Government of Bangladesh (GOB). Fiscal policy constitutes income and expenditure policy. The VAT policy is a component of government's income policy. The other components of the income side of the fiscal policy are the income tax policy, customs duty policy, wealth tax policy, gift tax policy, land revenue policy etc. The VAT system has been a conglomerate of hundreds of smaller VAT policies represented by the Value Added Tax Act 1991, the Value Added Tax Rules 1991, Statutory Regulatory Orders (SRO's) of the National Board of Revenue (NBR), different Standing Orders etc. All these are policies of different magnitudes. When put in practice, these policies together make a machine for generating VAT. The machine can be called the VAT system. In it's formation of the system it also includes VAT payers and VAT collectors as components of VAT system. Thus, the VAT system can be more vividly described as a bundle of several components; namely: the VAT payers, the VAT collectors, the VAT rules and procedures etc. In an hierarchic order it can at first be divided into the VAT administration and the VAT-paying business community. In the next lower hierarchy, the VAT administration can be divided into the VAT collectors and the VAT rules and procedures. The VAT-paying business community can be divided into the direct VAT payers and VAT payers at source. Thus, there can be many more hierarchical levels within the VAT system. These layers or components function independently and they interact with other layers or components. Thus the VAT system functions in totality. The VAT system can again be viewed with input-output relations. This means that there is a system; some inputs are given inside the system; the system processes the input and some outputs are produced. A system functions for the production of outputs. Here the VAT system functions for the production of revenue - more revenue. Since VAT policies form the major portion of the VAT system, so it would be in the fitness of things to study VAT system applying GST. This has been the rationale of this article to explore VAT policy perceiving it as a system and applying GST upon it. We have found the VAT system in terms of a conglomerate of VAT policies. So, studying VAT system we can better understand VAT policy – the constituent part of the VAT system. Applying GST any system of physical, biological and social sciences can be analyzed. GST stipulates the basic features of an ideal system. Applying GST to the VAT system of Bangladesh, we

can see to what extent the VAT system of Bangladesh fits or unfits to a general system. The extent to which the VAT system fits to a general system should be kept unchanged but the extent to which the VAT system unfits to a general system should be reshuffled in the manner that systemic laws can operate in VAT system. Herein lies the scope of making efforts by the policy makers to develop a modern and ideal VAT system in Bangladesh for generating more revenue.

4. The Basic Features of a General System Applied to VAT

Characteristics may vary from one type of systems to another. However, some characteristics are found in common. There are some additional characteristics with each category of systems. The basic characteristic features of a general system that can be found in almost all observable systems particularly in man-made, conceptual, dynamic, open systems are outlined below. Those features are applied to VAT system of Bangladesh to find whether there exists the same in the VAT system of Bangladesh. If those exist, points are made to strengthen them; if do not exist, indications are there to bring about the characteristics in VAT system of Bangladesh for better functioning of the system aiming at generating expected rate of revenue growth.

Hierarchy

Hierarchy refers to an ascending order by which the components of a system remain arranged. In human organizations, hierarchy means the vertical authority structure or a pyramidal structure of management. Hierarchy is a system of ranking and organizing things. In hierarchy theory, the layered structure of natural phenomena are described in the layered structure of theories. The hierarchy theory – an offshoot of GST studies the hierarchical structures within a system and the relations among the structures. The hierarchy theory views system as a set of ordered levels with governing-governed relations between these levels. The hierarchical levels within a system can be defined with the scale of observation chosen by the researcher and exploring this process of choice of scale is of prime interest of hierarchy theoreticians (http://www.isss.org/conferences/cancun2005/sigcalls.html). So, the scale of observation to define the hierarchical levels; the levels; the functions of each level; and relations among levels are of utmost importance in the understanding and practice of hierarchy theory. From an atomic particle to the great universe, there is a hierarchy of systems. These are the physical systems. The biological systems are again organized in such hierarchic order. From an organic cell to the entire biota there is a hierarchy of systems. This applies to all complex hierarchical organizations for instance, administrative bodies, business firms, governments, universities, churches etc. All those systems; physical, biological, conceptual and others remain intertwined making the universe a conglomerate of complex systems. Hierarchic relations are of several types, namely: part-hole, containment, inheritance, responsibility and control hierarchy. Many aspects of the world can be analyzed from a hierarchic perspective. In biology, organisms are commonly described as an assembly of parts or organs, which are themselves assemblies of yet smaller parts, and so on. In linguistics, words or sentences are often broken down into hierarchies of parts and holes. In ethics, various virtues are enumerated and sometimes organized hierarchically according to certain brands of hierarchy theory. Linnaean taxonomy in biology; genealogy tree in genealogy; Chomsky hierarchy in linguistics; Maslow hierarchy of needs in psychology are some examples of the application of hierarchy theory (http://en.wikipedia.org/wiki/Hierarchy). In the modern world, most systems, particularly the man-made systems are complex - sometimes very complex ones. The existence of these systems is very often disturbed by forces from neighboring systems. Systems remain closely intertwined today demanding thorough and professional knowledge

regarding the law, nature, and basic features of complex systems. Hierarchy theory has been an attempt towards that end. It can be applied towards understanding and treating the complex systems of today like the VAT system of Bangladesh.

A practitioner with thorough knowledge in hierarchy theory, i.e., the structure, operation and general behavioral pattern of complex systems can understand the systemic behavior under study and can predict the behavior. Measures accordingly can be taken. Hierarchy theory can be applied towards understanding and treating the complex systems like the VAT system of Bangladesh. The types of hierarchies can be identified to know what type of hierarchic relations are there among different levels of VAT system. It can be examined whether there is a part-hole or containment or inheritance or responsibility or control hierarchy. There is an administrative hierarchy, a policy hierarchy, and so on in the VAT system of Bangladesh. The administrative hierarchy may be said to have started from VAT Circle Offices and goes upwards to Divisional Offices, VAT Commissionerttes, National Board of Revene (NBR) to the Internal Resources Division (IRD) of the Ministry of Finance. There is such five-tier administrative hierarchy in the VAT system of Bangladesh. There is both a top-down and a bottom-up relations among these administrative hierarchical levels. The laws in the flow from the top to down loses some extent of spirit. Those can not be implemented in totality. There remain the problems in the hierarchical levels. There lies a gap between policy and implementation. This can be an important area of research in VAT. The research findings may as well be generalized to other administrative tiers of the government. In the policy hierarchy, there is the VAT Act, the VAT Rules, the Statutory Regulatory Orders (SRO's), the Standing Orders and field-level activities. Relations among these levels can be examined. It can be studied whether the basic tenets of hierarchy operates there among these levels. Problem areas can be identified to be attended by the policy makers. There can be a comparison between the administrative and policy hierarchies. Their comparative limitations can be an area of analysis.

Homeostasis

Homeostasis refers to the tendency of a system of maintaining steady state. If a system is disturbed by any endogenous or exogenous forces, it automatically tries to reshuffle itself to maintain stability. If any new element is added to the system, it absorbs the element and maintains steady state. If any element is taken away from the system, it soon readjusts within itself and maintains stability. Systems show such tendency of self-stabilization. Homeostasis is a dynamic self-regulation and the condition of a system when it is able to maintain its essential variables within limits acceptable to its own structure in the face of unexpected disturbances. It refers to a process of interaction or mechanism which balances various influences and effects in a manner that a stable state or a stable behavior is maintained. Systems tend to maintain themselves through various processes when they are disturbed. Therefore, homeostasis can as well be termed as a systemic tendency of resistance to changes. All systems do not have homeostasis. Highly complex open systems, e.g., ecological, biological, social systems are characterized by homeostasis. Eminent American physiologist Walter B. Cannon, in 1932 coined the word 'homeostasis' from two Greek words meaning to remain the same. Cannon in his book 'The Wisdom of the Body' (1932) greatly influenced social scientists giving currency to the term 'homeostasis' to describe a crucial property of biological systems which has been highly suggestive in the study of social systems. Homeostasis is one of the most remarkable and most typical properties of highly complex open systems. A homeostatic system namely: an industrial firm, a large organization, a cell is an open system that maintains its structure and functions by means of a multiplicity of dynamic equilibria rigorously controlled by interdependent regulation mechanisms

(http://pespmcl.vub.ac.be/HOMEOSTA.html). Such complex open system reacts to every change in the environment and to every random disturbance, through a series of modifications. The basic objective of such modifications is to maintain the internal balances i.e., homeostasis. If the system fails to maintain the internal balances, i.e., to reestablish its equilibrium, it starts another mode of behavior. If the disturbances persist, such new mode of behavior can lead to the destruction of the system.

For a complex system, to endure is not enough. It must adapt itself to modifications of the environment and it must evolve. Otherwise outside forces will soon disorganize and destroy it. All those people responsible for the evolution and maintenance of a complex system, whether the system be a state, a large organization, or an industry are to keep this in mind. Like biological systems, homeostasis is there in conceptual systems; namely social system, economic system, political system, revenue collection system, VAT system etc. To understand these systemic behaviors, we need to understand the homeostatic functions within these systems. Once such function is understood, with proper inputs in the system a desired output can be obtained. If the system faces instability, again with proper inputs the system can be put on order. If there is no homeostatic tendency in the VAT system, new elements can be suggested to be added to the VAT system to bring homeostasy. In the VAT system, the accounting method more specifically the credit mechanism has been such a regulation mechanism, a rigorous control of which can lead to dynamic equilibria in the system. Works may be undertaken to identify the existing such regulation mechanisms in the VAT system, point out if there is any limitation with these mechanisms and suggest new mechanisms to be instituted for proper functioning of the VAT system of Bangladesh.

Equifinality

Equifinality means final equality - different initial causes may lead to equal, final outcome. Equifinality or multicausality has been a principle of systems, which states that the same final condition of a system (output) may be reached from different initial conditions (inputs) and in different ways (transformations). In a business sense, it would be best to discover all the possible ways to achieve the set goals, and then distinguish the best by considering all the factors involved with each possibility and then choose the most efficient. According to the principle of equifinality, there are many different ways that an open system such as a person, team or organization can behave and still achieve the same outcome (http://www.ksg.harvard.edu/leadership/imperatives_for_leaders.html). In psychopathology, it is possible to end up with same disorder for many different reasons. For example, one may suffer from major depression because of his experience of learned helplessness, while another person may suffer from depression because he has too little serotonin in his brain, and again another person may suffer from depression because of a lifetime history of unsatisfactory relationships. In a physical organism, for instance, human body to cure a disease there are different methods and techniques: traditional-modern, medicinal-surgical etc. meaning in a human body infusing different causes same goal can be achieved. This also holds true with regard to many other systems, particularly natural, man-made, open, dynamic, or conceptual systems. In man-made, conceptual, open, dynamic systems, for instance, the political system of the USA, the economic system of Cuba, the monetary system of Bangladesh, there exist such principle. The VAT system of Bangladesh is no exception. From Dhaka if one needs to go Chittagong, he can go by airplane, by train, by bus or by driving his own car if he has any. Each mode of transportation has distinctive advantages and disadvantages in terms of costs, convenience, vulnerability to weather delays, and the possibility of working while traveling. Each of the above mode of transportation would eventually reach him at Chittagong. The system theorists call such state as equifinality. Ludwig von Bertalanffy first proposed the term

equifinality in 1940. Bertalanffy argued that equifinality characterizes the behavior of biological organisms and social systems (Sills, 1972, Vol.-15: 453)

This characteristic is found more acutely in man-made, open systems rather than natural, static systems. Equifinality can be related with the VAT system of Bangladesh. In the VAT system, we want that more revenue are generated with less efforts, costs, and less reaction from the people. How such objective can be achieved with different inputs? This can be a promising area of research. For systems practitioners, equifinality has been of utmost importance. Equifinality is a very important principle of open systems. It applies to every single social organization ever to exist, be it an army, a government office, a commercial enterprise or a charitable organization. The VAT system of Bangladesh is no exception. Applying the concept equifinality in the VAT system of Bangladesh, we can maximize revenue output with minimum cost. To achieve a desired level of revenue growth, costs of several inputs can be assessed and their outcomes can be evaluated. A comparatively better policy measure (input) can be suggested towards achieving the desired level of revenue growth (output). For instance, there may be three separate inputs to achieve 30% growth in the collection of VAT. Those are 10% increase in manpower or 15% increase in logistics support or motivation of the VAT concerned people at the cost of 03% VAT revenue earned. Any of these three inputs may lead to 30% growth of VAT collection (final output). There can be a study regarding the feasibility of the alternatives.

Non-Summativity

Classical science in its diverse disciplines (namely; chemistry, biology, psychology or other social sciences) tried to study elements (chemical compounds and enzymes, cells, elementary sensations, freely competing individuals) of the observed universe in isolation with an expectation that, again by putting those elements together conceptually or experimentally the whole or system (cell, mind, society) would result and be understandable. Our knowledge has broadened today and we have learned that for an objective understanding of the whole, it is not enough to understand the elements but understanding the interrelations of the elements is important; such as the interplay of enzymes in a cell, of many mental processes conscious or unconscious, the structure and dynamics of social systems and the like (Bertalanffy, 2003:xix). The principle of non-summativity of systems emphasize upon understanding the hole. It is the assertion that the system output is greater than the sum total of the outputs of its parts. This is because of the functional relationships among the components of the system. Five people may write down possible solutions to a problem in seclusion. A group consisting of the same five people will generate more and better solutions by group brainstorming (http://www.bsu.edu/classes/flint/systems.html). These better solutions are obtained because of the functional relationships among these five people while in action. The construction workers of our country lift heavy weights together singing songs in unison; it would not have been otherwise possible for them to lift proportional weight individually. This is because of the functional relationships among these people while lifting weights. These are two mundane examples of non-summativity. To make it more clear let us put it mathematically. Suppose, a system is composed of five components. The total outputs of these five components stands (7+6+8+5+7) 33 but the system output would be 40, i.e., the system output is greater than the outputs of all components added together. This occurs because of the functional relationships among the components. This principle of system is called non-summativity.

In the VAT system if such relations among components or levels can be properly established, the total revenue generated by the VAT system can be much higher than the revenue given by all units in totality. Applying this conceptual framework, the VAT system can be analyzed.

All VAT paying units pay certain amount of VAT. All these amount added together may be smaller than the total collection of the VAT system, if we can understand the relations among these units other than understanding those units in isolation. This can become a very prosperous area of research and action. In any work, it can be examined whether there exists this law of non-summativity in the VAT system of Bangladesh. If non-summativity is there, it can be further examined to see whether there exists any problem with non-summativity. Avenues can be explored to suggest ways for bringing about relations among units of the VAT system. Measures can be suggested to make non-summativity stronger in the VAT system of Bangladesh to generate more VAT with no reaction from the VAT payers. These relations can as well be searched in line from import stage to whole-sale stage to retail stage or from production stage to whole-sale stage to retail stage. Suppose, on an item in import, whole-sale and retail stage Tk. 12+4+3=19 is collected but government receives Tk. 25 in total, if proper systemic relations among these levels can be established. This excess (25-19) = 6 is generated with no impact upon the tax-payers in these three levels. When proper systemic relations are established, such excess amount can be collected somewhere else. Thus with proper functioning of system, the principle of non-summativity can produce more revenue than the total revenue paid by all tax-payers. This aspect of system can be a promising area of analysis with regard to VAT system of Bangladesh.

5. Conclusion

Since mentioned earlier, considerable amount of research has not yet been undertaken in the area of VAT in Bangladesh. To speak the truth, research in truest sense of the term has not been carried out in the area. The research and statistics wing of the National Board of Revenue (NBR), the private and public sector think tanks, the business community and the donor agencies so far have undertaken several case studies to meet their contingent needs. Most of those governmental ventures focus on how-to-do techniques and the private sector studies emphasize upon how-to-get strategies. Basic research to find out problems, laws, to lay down principles or to shed lights upon the gray/darker areas of VAT system have not been undertaken so far. This article is a guideline for research in the area for them who like to use the tools of GST in the area of VAT system of Bangladesh. Indications have been made in the fourth part of this article, which can open new horizon for the intending VAT researchers. There are some points pursuing which, limitations with the VAT system of Bangladesh can be unearthed. The research outcomes taken care of by the policy makers, there can be significant growth in the revenue generation of Bangladesh.

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DIMENSIONS OF INNOVATION IN TRANSITION COUNTRIES

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Abstract

The emergence of the knowledge economy, intense global competition and considerable technological advance has seen innovation become increasingly central to competitiveness. It is well known that firms in the transition countries have not yet succeeded in developing innovation capability needed in achieving sustained competitive advantage with innovative products and services.

In most researches, innovation capability in innovative societies has been investigated. Much less attention has been devoted to innovation capability in the transition countries. Therefore, the main goal of this paper is to analyse the dimensions of innovation capability in transition firms. Through an extensive literature review, five dimensions of an organisation's overall innovativeness were identified. These five dimensions form the component factors of the organisational innovativeness construct.

Taking into account available data in a sample of 214 Slovenian firms only four dimensions were included in the further analysis. A final 10-item measurement construct was validated by using confirmatory factor analysis. The results obtained by this study enabled us the conclusion that innovation capability of the firms in transition countries is not supported by all four dimensions important for innovative societies. Theoretical and methodological issues regarding innovation capability construct are discussed in the light of this finding.

Keywords: *Organizational innovativeness, dimensions, confirmatory factor analysis*

1. Introduction

Throughout the 1980s and 1990s, competitive advantage rested variously on mainstream variables like efficiency, quality, customer responsiveness and speed. In the new millennium, control over the above variables represents the minimum threshold to "play the game". Each factor remains important, but is unlikely of itself or as part of a group to provide a sustainable competitive advantage. Today's organisations face an additional challenge – the requirement to innovate, not just occasionally but often, quickly and with a solid success rate (Lawson and Samson, 2001).

Therefore, the ability to develop new ideas and innovations is one of the top priorities of organisations. The emergence of the knowledge economy, intense global competition and considerable technological advance has seen innovation become increasingly central to competitiveness. Innovation can help firms play a dominant role in shaping the future of their industries. High-performing innovators are able to maintain a giant juggling act of capabilities, and consistently bring new high quality products to the market faster, more frequently and at a lower cost than competitors. Moreover, these firms use process and systems innovation as a way of further improving their products and adding value to customers. This combination creates dynamic and sustainable strategic position making the organisation a constantly moving target to competitors (Kiernan, 1996).

2. Innovation Capability

One of the theories evolved in the strategic management field over recent years is the resource-based theory. It assumes that performance differences across firms are due to differences arising from valuable, rent-generating, firm specific resources and capabilities that cannot be easily imitated or substituted (Hamel and Prahalad, 1994). Resources include all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve efficiency and effectiveness. Organisational capabilities are also viewed as a resource.

The other theory, i.e. the capability-based theory of competitive advantage suggests that a firm can achieve sustainable competitive advantage through distinctive capabilities possessed by the firm (Grant, 1991, Prahalad and Hamel, 1990) and the firm must constantly re-invest to maintain and expand existing capabilities in order to inhibit imitability. Although capabilities are resource dependent (Grant, 1991) resources do not exclusively determine what the firm can do and how well it can do it. Penrose (1955) also argue that a firm achieves rents not because it has more or better resources, but because the firm's distinctive capabilities allow it to make better use of available resources. Accordingly, firms do not compete on new products, but rather on a deeper factor – the capacity to innovate.

Capabilities can be distinguished regarding the knowledge they contain. Functional capabilities allow a firm to develop its technical knowledge (Prahalad and Hamel, 1990) while integrative capabilities allow a firm to absorb knowledge from external sources and blend the different technical competences developed in various company departments (Cohen and Levinthal, 1990). Innovation capability is defined as a higher-order integration capability, that is, the ability to mould and manage multiple capabilities. Organisations possessing this innovation capability have the ability to integrate their key capabilities and resources to successfully stimulate innovation (Lawson and Samson, 2001).

3. Conceptual framework

The review of literature showed that different dimensions of innovation and their importance were emphasised by authors (Schumpeter, 1934; Miller and Friesen, 1983; Capon et al., 1992). Taking into account their findings five dimensions of an organisation's overall innovativeness were found. They were product innovativeness, marketing innovativeness, process innovativeness, behavioural innovativeness, and managerial innovativeness. In line with these perspectives, Wang and Ahmed (2004) defined the organisational innovativeness as an organisation's overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behaviour and processes. Innovation is also defined as the application of ideas that are new to the firm, to create added value either directly for the enterprise or indirectly for its customers, regardless of whether the newness and added value are embodied in products, processes, managerial and marketing systems.

Product innovativeness

Product innovativeness is often referred to as perceived newness, novelty, originality, or uniqueness of products. The perceived newness encompasses two perspectives: from the consumers' perspective and the firm's perspective. From the consumers' perspective, characteristics such as innovation attributes, adoption risks, and levels of change in established patterns are considered as forms of product newness. From the firm's perspective, environmental familiarity, project-firm fit, and technological and marketing aspects are viewed

as dimensions of product innovativeness (Wang and Ahmed, 2004). Product innovativeness is critical success factor, which is highly associated with sustainable business success.

Marketing innovativeness

Marketing innovativeness emphasises the novelty of market-oriented approaches. It refers to innovations related to market research, advertising and promotion as well as identification of new market opportunities and entry into new markets (Wang and Ahmed, 2004). For some companies, this means that they can enter a market or identify a new market niche and launch products with cutting-edge technological content. For other companies, it means the adoption of new marketing programmes to promote the sale of existing products and service. In both cases, companies apply marketing innovativeness in order to successfully take up against new competitors either in a new, or an existing market.

Process innovativeness

Process innovativeness captures the introduction of new production methods and new technology as well as new management approaches that can be applied to improve production and management processes. This kind of innovativeness can be taken as an imperative in overall innovative capability, in that an organisation's ability to exploit its resources and capabilities, and most importantly to recombine and reconfigure its resources and capabilities to meet the requirement of creative production is critical to organisational success (Wang and Ahmed, 2004).

Behavioural innovativeness

Behavioural innovativeness is a fundamental factor that underlies innovative outcomes. It can be presented at different levels. Individual innovativeness is interpreted as the individual's willingness to change. Team innovativeness is the team's adaptability to change. It is not simply a sum of innovative individuals, but synergy based on the group dynamics. Managerial innovativeness demonstrates management's willingness to change, and commitment to encourage new ways of doing things, as well as the willingness to foster new ideas.

Behavioural innovativeness demonstrated through individuals, teams and management enables the formation of an innovative culture, the overall internal receptivity to new ideas and innovation. Innovative culture refers to the deeply rooted set of values and beliefs that provide norms for behaviour in the organization. Most definitions suggest that culture is the pattern of behaviour adopted by a group (society, corporation, or team) as the accepted way of solving problems. Innovative culture serves as catalyst of innovations, while lack of it acts as blocker of innovations (Wang and Ahmed, 2004).

Managerial innovativeness

The primary focus of this kind of innovativeness is to measure an organisation's ability to manage ambitious organisational objectives and identify a mismatch of those ambitions and existing resources in order to stretch or leverage limited resources creativity. For example, it can be measured by introducing computer-based administrative applications, developing new rewarding/training schemes, introducing new departments or projects, etc. (Weerawardena, 2003).

All five views together highlight an organisation's overall innovativeness. Product and marketing innovativeness are inter-twined. They are externally focused and market based,

while behaviour and process innovativeness are both internally-focused. Taking into account these aspects we propose the following hypotheses:

H1. The covariance among 13 items can be accounted for by one general factor, i.e. organisational innovativeness.

H2. The covariance among 13 items can be accounted for by restricted four-factor model where each factor presents one of the conceptual components describing the organisational innovativeness. Each item loads only on one factor.

H3. Responses to each item are reflective of two factors: a general organisational innovativeness factor and a specific component factor. Thus, the five-factor model is applied to account for the covariance among 13 items.

4. Research methodology

A questionnaire was used to collect empirical data on 49 items generated from literature. 13 items out of 49 were included in the study presented in this paper. The responses were subjective estimates, therefore knowledgeable and confident informants were needed. Our survey was strictly limited to CEOs. They possess the most comprehensive knowledge of the characteristics of the organisation, its strategy and performance. Items were assessed using a seven-point scale. The items, their descriptive statistics and the meaning of verbal anchors of scale are given in Table 1.

A sample of 1000 Slovenian manufacturing firms was randomly selected from the database IPIS where information on Slovenian firms are given. In the first half of the year 2004, the questionnaire with a cover letter was sent to the managers of randomly selected firms by mail. A total of 254 completed questionnaires were received, representing a 25.4 per cent response rate. The rate of usable responses was 21.4 per cent.

The scale development process must include an assessment of whether the multiple measures that define a scale can be acceptably regarded as alternative indicators of the same construct (Gerbing and Anderson, 1988). To test a hypothesised factor structure a two-step approach developed by Gerbing and Anderson (1988) was used. They recommended that the measurement model is first developed and evaluated separately from the full structural equation model that simultaneously models measurement and structural relations. In the approach described, confirmatory factor analysis was applied using AMOS and the Maximum Likelihood estimation method.

Table 1. The organisational innovativeness construct

Variable	Description	Mean	Standard Deviation
BEH	Behavioural innovativeness	5.027	1.438
BEH1	How well do formal procedures and control support creativity and innovation in your firm? [1=very bad, 7= very well]	4.568	1.301
BEH2	The staff is encouraged to be creative and innovative. [1=never, 7=always]	5.682	1.415
BEH3	Innovative suggestions of the staff are evaluated. [1=never, 7=always]	4.817	1.681
BEH4	Mistakes regarding creative and innovative efforts of individuals are tolerated and used as the opportunity. for learning [1=never, 7=always]	5.042	1.323
BEH5	Employees are recognized for their creative work also with non-financial rewards and recognitions. [1=never, 7=always]	3.860	1.850
MAR	Marketing innovativeness	3.545	1.435
MARI	How many marketing innovations were introduced in the firm during the last five years? [1=none, 7= far more than competitors]	3.672	1.454
MARC	Marketing innovations were mainly [1=incremental, 7= radical].	3.417	1.416
MAN	Managerial innovativeness	4.049	1.579
MANI	How many innovations did the firm introduce in the managerial system? [1=none, 7=far more than the competitors]	4.175	1.592
MANC	The improvements in the organisational system were mainly [1=incremental, 7=radical].	3.941	1.586
PROC	Process innovativeness	4.106	1.512
PROCI	How many innovations did the firm introduce in production processes? [1=none, 7=far more than the competitors]	4.302	1.445
PROCC	Innovations in production processes were mainly [1=incremental, 7= radical].	3.911	1.576
PROD	Product innovativeness	3.925	1.638
PRODI	How many new products did the firm launch on the market during the last five years? [1=none, 7=far more than the competitors]	4.000	1.583
PRODC	Product improvements were mainly [1=incremental, 7= radical].	3.850	1.691

In the first step, all 13 items were included in the first-order measurement model for organisational innovativeness. The model fitness indices were assessed and subjected to respecification. In the second step, a second-order confirmatory factor analysis was applied based on respecified model. The multidimensional model was then compared with the competing one-factor model.

Data analysis

The initial model fit indices for all 13 variables were χ^2=173.765, df=61 $p<0.05$, goodness of fit index (GFI) 0.882, adjusted goodness of fit index (AGFI) 0.825, root mean square error of approximation (RMSEA) 0.093, normed fit index (NFI) 0.849, comparative fit index (CFI) 0.895. Their values showed that the original model had to be respecified to obtain better fit with sample data[1]. The pattern of normalized residuals analysis confirmed the need for a respecification. Item BEH5 had small squared multiple correlation (0.323) and large error variance (2.29). Therefore, it was removed. Items MANI and MANC had large error covariance (38.754). Therefore, these two items were deleted because each estimated construct is defined by at least two indicators.

Having eliminated 3 items, the modified first-order confirmatory factor analysis model fit indices were: χ^2=33.062, df=28, p>0.1, GFI=0.972, AGFI=0.944, RMSEA=0.029, PGFI=0.495, NFI=0.959, CFI=0.993. All fit indices show that model fits data very well. The standardized regression weights of all variables loadings onto their respective factors were between 0.538 and 0.955, with all critical ratios above 1.96 (which means that all the regressions are statistically significant at the 0.95 per cent confidence level). Their values are given in Table 2.

The validation procedure involved computing reliability for each set of measures. Even a perfectly unidimensional scale will not be useful in practice if the resultant scale score has unacceptably low reliability. The reliability of the scales using Cronbach's alpha as a measure of internal consistency was encouraging with all the scales adequately meeting standards for such research (Nunnaly, 1978). The behavioural innovativeness scale achieved an alpha of 0.722, product innovativeness 0.716, process innovativeness 0.716 and marketing innovativeness 0.886.

Table 2. Loadings of the first-order confirmatory factor analysis

		Standardized first-order loading[a]			
Variable	R^2	Behavioural	Market	Process	Product
Behavioural[b]		-	0.269	0.378	0.284
BEH1	0.350	0.592[c]			
BEH2	0.590	0.768 (6.943)			
BEH3	0.407	0.638 (6.559)			
BEH4	0.289	0.538 (5.868)			
Marketing			-	0.949	1.152
MARI	0.912		0.955		
MARC	0.693		0.833 (12.502)		
Process				-	1.206
PPROCI	0.613			0.783	
PPROCC	0.515			0.718 (9.072)	
Product					-
NPRODI	0.580				0.761
NPRODC	0.543				0.737 (9.221)

Note: [a] Standardised first-order loading is the standardised regression weights of the individual variables' loading on to one of the component factor. Numbers in parentheses are critical ratios from the unstandardised solutions; [b] Standardised first-order loading for component factors is the covariance between any two of these component factors; [c] Critical ratio is not available, because the regression weight of the first variable of each component factor is fixed at one.

Taking into account the results of the first-order confirmatory factor analysis the hypotheses were revised to discern 10 instead of 13 items.

To assess the multidimensional structure of the organisational innovativeness construct the second-order confirmatory factor analysis was used. The fit indices obtained for this model showed similar results as the first-order confirmatory factor analysis and were: χ^2=37.275, df=30, p>0,1, GFI=0.968, AGFI=0.941, PGFI=0.528, RMSEA=0.034, NFI=0.953, CFI=0.99. The slight difference in the first-order and second-order estimates occurred due to different degrees of freedom.

The standardised regression weights of all component factors loadings onto the general factor organisational innovativeness are given in Table 3. They ranged from 0.385 to 0.972. The smallest regression weight belonged to behavioural innovativeness while the largest one to the product innovativeness.

Table 3. Loadings of the second-order confirmatory factor analysis

Factors	R^2	Standardized Regression Weight	Critical Ratio
Behavioural innovativeness	0.148	0.385	3.977
Product innovativeness	0.945	0.972	8.169
Process innovativeness	0.840	0.916	7.769
Marketing innovativeness	0.478	0.692[a]	

Note: [a] This critical ratio is not available, because the regression weight for the component factor marketing innovativeness is fixed at one.

To assess hypotheses H1 and H2 the hypothesized multidimensional model was compared with a competing unidimensional model. As shown in Table 4, the one-factor model which loaded all 10 indicators to one factor, yielded statistically not significant chi-square of 228.617 while the four-factor model resulted in the statistically significant chi-square of 33.062, suggesting a significant improvement. Furthermore, the improvements in GFI, RMSEA, CFI and NFI were substantial, indicating that the former model presents a better fit to the data. Thus the convergent validity of the constructs is also supported.

Table 4. Results for nested models

Model	Description	χ^2	df	p	GFI	RMSEA	CFI	NFI
1	One general factor	288.617	35	0.000	0.758	0.184	0.664	0.640
2	One general factor + two components	155.442	34	0.000	0.858	0.129	0.839	0.806
3	One general factor + three components	40.577	31	0.117	0.964	0.038	0.987	0.949
4	One general factor + four components	33.062	28	0.233	0.972	0.029	0.993	0.959

5. Discussion and conclusion

The organisational innovativeness construct developed in this paper shows that also in the transition firms the innovativeness is multidimensional category measured by behavioural, product, process and marketing innovativeness. Unfortunately, the managerial innovativeness had to be excluded from further analysis.

The researches carried out in more innovative firms (Wang and Ahmed, 2004) showed that all five principal components had similar impact on the organisational innovation capability. In their study, the standardised regression weight ranged from 0.59 to 0.80. They also found out that two components, i.e. strategic and marketing innovativeness had a slightly larger impact on the innovation capability than product and process innovativeness. Results of our study showed that the highest impact on the innovation capability of Slovenian firms had also two components, i.e. product and process innovativeness. Behavioural innovativeness found as the component with the smallest impact on the innovation capability.

The results obtained by our study allow us the conclusion that Slovenian firms mainly concentrated their efforts in the product and process innovativeness and much less attention has been paid to develop behavioural and marketing innovativeness. Having coupled our results with the well-known fact that Slovenian firms are not innovative enough, we can conclude that poor support of behavioural and marketing innovativeness is probably one of the important reasons why Slovenian firms are not capable to compete with innovations. The results obtained show Slovenian firms and also other firms in the transition countries how to improve their innovation capability.

Methodological issues

In this study, three components were measured by only two items. The main reason for the scale used was that innovation capability was only one of the four constructs in the research in which the relationships among organisational culture, entrepreneurship, market knowledge competence and organisational innovation capability were analysed. For this reason, more items may be added to the constructs and retested for validation the model in further researches. This is especially important for the component managerial innovativeness which had to be removed from our further analysis due to large error covariance between items chosen to measure this component.

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Endnotes

[1] GFI is always between zero and one, where unity indicates a perfect fit. AGFI is bounded by one, which indicates perfect fit. Practical experience showed that a value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom. Its value of about 0.08 or less would indicate a reasonable error of approximation and would not to employ a model wit a RMSEA greater than 0.1. Models with NFI of less than 0.9 can usually be improved substantially. CFI values close to one indicates a very good fit.

NEW PRODUCT DEVELOPMENT BASED ON INTER-REGIONAL NETWORK

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Abstract
New product development is essential for a business existence. Inter-regional networks are initiating a stimulative environment for business communication and therefore raise the chance for successful promotion of innovative processes and matching of service or product supply and demand side. The characteristics of interregional networks are its wide coverage and a high possibility of alienation of the participators. The New Product Development (NPD) roadmap facilitates an open access virtual knowledge exchange network, where a company would find the most appropriate NPD support, a chance to participate to knowledge sharing and also find a personal attendance in the NPD Centre. With the self-assessment tool in the NPD roadmap a company could check the status of their existing NPD project or asses a new one.

Keywords
"new product", innovation, development, network, entrepreneurship

1 Introduction

A core of any new business is a new product, and behind each successful new business is a successful new product. Small and medium sized companies are the backbone of the European economy, but in this age they can find it hard to evolve at the rate of increasing market demands and competition. What makes a product successful is a basic question that needs to be answered. A substantial effort has been devoted mainly from governmental institutions in Europe to establish stimulative environments for business communication (just within two FP6 programmes structuring and strengthening European Research Area the budget allocated was € 319 million and € 347 million respectfully). One of such possibilities is inter-regional European network for new product development or: NPD-net.

2 Paradigm

The new product ideas or innovations present a crucial impulse for a company start-up or an existing company spin-off and most often, in every day life of accompany, they present an adequate source of added value to keep a business worthwhile. Despite such imperative role the actual time and funds consumed on the subjects of "new idea generation" and "innovation management" tend to be understated. The general impression is that the bulk of attention is given to the product making and getting revenue, while the innovation and NPD remains the sideline activity (Page, 1991; Cooper, 1988; Schwartz, 2004).

3 The New Product Development – Net

New product development (NPD) is fraught with risk. Large companies compensate it with extensive R&D teams, supported by certified quality management systems, while smaller

companies suffer from lack of structure in NPD and poor information feedback loops. The research on companies and their approaches to new product development has shown that the critical element on the path to the market success is discipline of systematic consideration of each step in the process of NPD (Cooper, 2001; Griffin, 1997, 1998). For this reason the project that has been started under the Interreg IIIC programme (DG Regional Policy) focuses on a practical method; a tool predominantly aimed to support small and medium companies, who do not posses the adequate capacity in R&D. The method introduced as NPD-net method uses a roadmap, which has segmented a NPD process in to seven steps (Figure 1). A preliminary view is possible at the web page: http://www.vrc.gr:8080/npd-net/en/npd/index.html.

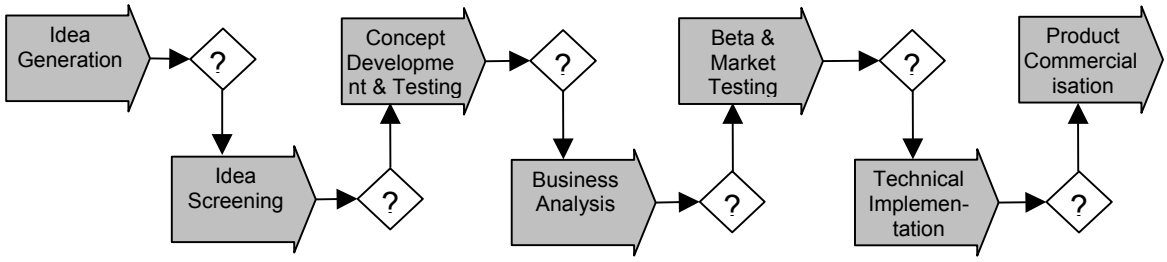

Figure 1: Seven steps in the self- assessment NPD process developed for the NPD-net project (? – Self-assessment Tool).*

Each step in the NPD roadmap is outfitted with:

- basic explanation of objectives of particular step,
- tools to assist the realization of a particular task in the development process,
- best practices and case studies of the tools in use,
- references to the or public accessible knowledge (literature, internet sites,)
- self assessment tool to support a decision of product idea adequacy to proceed in the development path.

4 Just Another Network?

The trend observed in the last couple of years was intensive incorporation and connection of existing service suppliers into groups of common interests. The number of associations, clusters, centres and networks has made an ambiguous web where it is hard to find a perspective business environment. The unappreciated effect is the raising opinion shared among entrepreneurs that such institutes are self-sufficient. Improvement in the efficacy of such in associations is crucial to prevent a long-term distrust for the cooperative incentives.

5 The Advantages of the New Product Development Net Method

5.1 Equal Significance of the NPD Stages

A positive effect is expected from application of the NPD-net method for its equally distributed attention throughout the NPD steps. The present concepts are often concentrated on measurable parts of R&D activities and they tend to miss the new idea or innovation generation, collection and management. As Schwartz (2004) has expressed, they are missing "I" out from R&D. The NPD-net method gives the relevant stress to the soft or fuzzy parts of R&D; Idea Generation and Idea Screening and suggests the use of different descriptive evaluation tools.

5.2 Virtual and Personal Contact

Nowadays the high-end technology development rarely takes place under one roof. The knowledge and the experts come from different companies and institutes and work on a common task. Virtual spaces offer endless growth opportunities; still the cooperation between the people involved in NPD process rarely gets 100% virtual (Leenders, 2004). In the NPD-net method each of the project partners provides a personal attendance through the "New Product Development Centres". The mission of the NPD centres is to facilitate the intra- and inter-regional cooperation. An expert approach is being assured with the certified NPD consultants who will personally attend to a particular request.

5.3 Specialisation

The NPD-net roadmap offers the possibility to accommodate a sector specific NPD support. This increases the quality of the information in the roadmap material, the professional authority, the networking potential and applicability of the roadmap. Each sector has some characteristic approach and the requirements for NPD. Our study of NPD status in four economic sectors (40 companies) revealed that food (DA15), furniture (DN36), optoelectronics (DL33) and automobile (DM34.3) have common NPD impediments and incentives but significant differences in openness to cooperation and the NPD process. The furniture industry heavily depends on the product design, while the industry of car spare parts depends on the final product set by the client.

The NPD-net method uses the inter-regional network to address the possible regional gaps in the NPD service chain. In the process of regional adaptation, each project partner will add NPD tools, best practice cases and the regional NPD service supply. With presumption that the NPD-net roadmap will be positively accepted the contents would be able to attain high quality sector specific features.

5.4 Sustainability

The roadmap concept is designed as an opened and constantly growing virtual place. It enables a simple access and submission of a material either as support service information or a reference case (best practice). A contribution or a remark/idea can be posted also to personal attention in one of the appointed NPD Centres. This way the management of the common roadmap is transparent and gives the NPD-net users equal access to supplement the contents. Through the best practices, case studies or NPD tools supplemented by the companies the roadmap will become a place of intensive information exchange and knowledge accumulation

6 Conclusion

The roadmap is designed with opened possibilities for modifications and continuous up-grading. The fear of alienation between the NPD service supply side and the demand side brought by virtual space is minimised with the NPD Centres and appointed NPD consultants. The contents maturity and user friendliness is support with user-to-user knowledge transfer facility. To achieve the desired enhancement effect of the existing segregated knowledge in the regions of Europe it appears that the NPD-net method proposed has respected what honourable inventor Thomas Edison said "All parts of the system must be constructed with the reference to all other parts,…"

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The new knowledge based innovative systems: the case of Croatia

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Abstract
One of the main sources of economic growth lies in the successful development and application of new knowledge and innovation in regard to products, processes and support systems within organizations. The ability to achieve successful knowledge transfer is now recognized as an important organizational performance. System thinking is an important way of promoting conceptual learning organizations and learning at different levels in dynamic environment. Complicating this process is the difference between an organization's ability to learn, and its ability to apply knowledge efficiently and effectively. On the regional level functional differences between different sectors are getting new shape. We have used the systems thinking framework because systems thinking is about dynamics, interrelationships and feedback loops, it is often awkward to try describing how people actually use it. This paper focuses on Croatian transition economy and its continued thrust towards the encouragement of knowledge generation and innovation. Transitional economies and specifically Croatia have difficulty in developing innovative practices due to their history of socialism entrenched with their institutions. In the socialist system, there is little reward for improved efficiency in the enterprise. The whole cost of transformation of production processes, of relocation of the work force or new training has to be fully supported. Croatian organization builders work within a different set of institutionally shaped barriers, constraints, obstacles and opportunities. Therefore, there is no surprise if scientific achievement in the socialist system could go along with technical backwardness, low quality goods and inefficient processes. Changing of these institutional pressures will continue to be a time sensitive evolution in Croatia. Therefore we expect few firms to be currently innovative, but more firms over time developing innovations.

Key words: *knowledge, tacit knowledge, innovation***,** *Systems thinking, HRM, Croatia*

1 Introduction

It is often assumed that a new economy is characterized by new technologies, globalization, systems thinking and an ever-increasing emphasis on intangible knowledge access (Jackson, 2000; Cohen, W.M., Levinthal 1989, D'Aveni, 1994, Hamel,1998; Thurow, 1997). The old "scientific management" models of management are no longer considered to be efficient (Harel and Tzafrir, 1999). What matters to new paradigm managers is attracting innovative, flexible and imaginative staff needed to deal with the wide range of challenges facing countries, firms' organization, skills and training. As Drucker pointed out (1985) capital, natural resources and labour are not the most valuable resources in today's economy; instead

knowledge and knowledge workers play the central. Knowledge has emerged as the most strategically significant resource of the organizations performance (Stannack, 1996; Grant, 1996; Quinn, et al 1996). Also, innovation is considered a fundamental component of entrepreneurship and a key element of business success (Nonaka and Takeuchi, 1995; Nonaka et al., 1996). Following Abramovitz, (1986), Radošević, (1999), the catching up hypothesis for transition countries assumes that countries must possess a so-called social capability- that includes human capital, infrastructure capacities and institutional setting – to adopt and use the new technologies efficiently and successfully. The wide and deep evolution within the system community at the same time that signals its vitality also increases difficulties in communication between different approaches and paradigms. How will societies in transition countries combine social and technological networks to foster economic growth and social development? Considered from the point of view of theory of systems every organization is an open system that exchanges matter, energy and information with its environment. Badaracco (1991) claims that a human being cannot take advantage of information unless he/she has earlier "social software" connected to that information. We try to investigate how people are designing and implementing the new social and technological tools for building knowledge-based societies.

2. Innovation

Kimberly (1981) categorizes definitions of innovation into two groups, each with two possible focuses. The first definition defines innovation as a process, which brings some new method into an organization. This view may either focus on just the implementation of an innovation, or may require that the implementation of an innovation result in "a `fundamental' change in a `significant' number of tasks" (Wilson, 1966, p.196) in an organization. The second definition sees innovation as a "discrete product or program" (Kimberly, 1981, p. 85) that an organization adopts. "To explain innovation, we need a new theory of organizational knowledge creation.... the key to knowledge creation lies in the mobilization and conversion of tacit knowledge." (Nonaka and Takeuch, 1995, p. 56) Leonard and Barton (1995) stressed the importance of knowledge with successful innovations in view of activities in the firms

H_1 *If an organization decides to become a fast innovator, managers should co-ordinate the ability to formulate a competitive strategy and to build advantages against competitors.*

While this ability may depend on the capacity of speeding up creative operations to generate innovations the knowledge and skills needed for innovation cannot without problems be transferred through networks linking these multiple groups there also needs to be what Kogut &Zander (1993) termed a "common stock of knowledge", to facilitate such processes. That is, the communication of knowledge is only possible between people who, to some extent at least, share a system of meaning (Trompenaars, 1995). Knowledge then is not transferred but must be continuously created and recreated through networking as individuals come to share a common understanding or a common frame of reference (Harvey et al 2002).

3. Knowledge

In the "new economic growth theory" various scholars shifted their focus from traditional, tangible capital assets in the neo-classical model to intangible knowledge assets accumulated through science and technology investments. We used Libenskind's (1996. p. 94.) definition of knowledge as "information whose validity has been established through tests of proof. The "specific purpose "in present context is toward creating competitive advantage. The relevance of new knowledge can be discovered by exposing it to prior knowledge. In organizations, the

implications of new knowledge are discovered through explicit documentation or embedding in prototypes. Frequently organizations establish formal knowledge exchange requirements in order to exploit local innovations wide. Placing an R&D unit of a multinational near a university is an example The uncertain relevance of new knowledge generates "push" as well as "pull" forces that stimulate outflows of knowledge (Schulz, 1991). Codifying the knowledge in a domain into explicit forms renders it more fluid, communication, transformation, implementation and codification is likely to enhance knowledge flows between subunits pointed out Kogut and Zander, (1993). The first hypothesis captures the level of codification. The implications of this knowledge are probably more relevant to other subunits, constantly stimulating knowledge horizontal and vertical outflows. This context creates following hypothesis.

H_2 *The higher the level of codification of domain knowledge, the stronger is the outflow of knowledge*

According to Antonelli (1997) the technological knowledge used by firms draws upon four different forms of knowledge. There we can have four components of technological knowledge: internal and external tacit knowledge and internal and external codified knowledge. An important contribution to the subject comes from knowledge management. Explicit knowledge is a formalized tacit knowledge. As described in Schmid and Stanoevska (2000) knowledge consists of two parts: language component and information whereby the language is the medium for expressing implicit knowledge by means of recognisable categories while the information is the result of explicit knowledge. In explicit knowledge one has to pay special attention to the carrier. The carrier takes over a formalized implicit knowledge and is charged with its transfer, preservation and storage. We follow contingency theorist (Lawrance and Lorsch, 1969) who argue that specific cub section of an organization may exhibit different behaviours.

3.1. Tacit knowledge

Tacit knowledge appears to be particularly abundant in young and complex technologies where the rate of technical change is rapid, as is the case for science based sectors like biotechnologies, electronics and telecommunications. (Polany,1966). The recipient organizations from transition/emerging markets may be unable to exploit this property knowledge because of their lack of technical and organizational preparedness. This would lead to the following hypothesis:

H_3 *Organizations must proactively develop effective and efficient means to transfer and codify tacit knowledge to enable them to incorporate this valuable knowledge that is needed to compete in the high technology hypercompetitive global market place.*

Researchers have found that highly tacit forms of knowledge, such as local social knowledge about emerging markets, tend to be more immobile or "sticky" and therefore difficult to learn and transfer without intensive socialization among managers across organizational units (Kogut & Zander, 1993, 1995). The objective of each firm is to maintain the balance between tacit and explicit knowledge and direct them towards creating more innovations and higher profitability of the institution. The interaction between these two forms of knowledge creates a dynamic relation which becomes the basis of operation of every modern institution. Therefore, managers who possess this tacit contextual knowledge prior to the assignment (i.e. inpatriates) have increased likelihood of success in adjustment and high performance in the organization (Harvey, Speier& Novicevic 1999). The tacit social knowledge of inpatriate

managers goes beyond "knowing how to do business" and therefore, a residual outcome of inpatriate social knowledge is the evolution of a higher level of trust with host country managers/employees and other stakeholder.

4.1. Croatia

The history and culture of Croatia differ significantly from other countries in the region but in the same time is very similar with Slovenia. Historically Croatia and Slovenia have always been more Western oriented than other parts of Yugoslavia. After the liberation war in 1991 Croatia enjoyed a great measure of political freedom. Despite the end of the communist regime, the residual corruption and emergent organized crime are having a significantly negative impact on many aspects of the developing patterns of organizational behaviour and activity. In course of one decade from 1990 up to 2000, Croatia has virtually altered three political systems and therefore three economies and markets orientations. Country has turned in this period from the socialist system (ruled by communists), through the nationalistic plural democracy up to a kind of representative democracy that is in power at the moment. Economy changes managed to follow political changes, transforming the economy from centralist-commanded to enterprise market economy. In the past decide, Croatia was lagging behind in using knowledge as a production factor and losing markets for export of high demanding products. Companies were more focused on surviving and restructuring. In the same time many companies broke the ties with the world –leading companies. The business sector has not so far adequately used educated potential by investment in own research and development. Even nowadays, the majority of current workforce performed within all three mentioned political systems, and that fact particularly influenced and shaped today's people business culture, by embossing in it a segment of each single period. The field of systems thinking in Croatia has undergone significant change during the last decade. This process progresses slowly and with a number of obstacles and barriers that the country has to overcome. Things are therefore not favourable for the country at this moment. This research focuses on the Croatian transition economy and its continued thrust towards the encouragement of knowledge generation and innovation. This transition from a socialist economy to one that is free-market focused is fraught with historical barriers and institutional pressures. Trends that appeared together with the development and the increasing application of information technology, whose influence on the organization structure is the greatest, are business globalization, change in the structure of employees, elimination of boundaries among the parts within the organizations, but also among individual organizations (Merry in Baric et al 2002) We investigate whether the change in the governmental policies have affected individual firm's potential for knowledge generation and innovation. We examine this assumption in the context of Croatia and knowledge development and application through innovation focused on both developing efficiency as well as higher quality of products. Former socialist manufacturing firms were institutionalized to maintain jobs and to produce an adequate product. As competition with foreign products was nearly non-existent due to monopoly power, these firms were not required to mount an effective strategy to acquire and maintain customers. Currently, Croatian firms are "catching up" in both quality of product, and the production process. As to the patent registration, Croatia has 61 patent registration of resident per mil. resident in 1999 . This is similar to transitional countries, which are behind the EU countries, except Slovenia (147). This activity in Croatia is 6 times lower than in Austria and compared with Germany 15 times lower (Eurostat, 2003). Dabić et al (2002) survey of innovative practices was administered to 45 Croatian firms that export products. Firms from 11 industry types were interviewed. The largest number of firms comes from manufacture of electrical and optical equipment and manufacture of leather and leather products. Confirming the "catch up" mentality of firms in Croatia due to their past socialist

institutional constraints as they understand the importance of innovation to compete, our research suggests that innovation in the production process was to achieve efficiency (see table 1). In the past socialist market, manufacturing firms' purpose was not efficiency, but to provide jobs, and to produce an adequate product. The data illustrate that not only the introduction of new technology was an incentive for innovation, but also to cut the costs associated with production, or in effect to become more efficient.

Incentive for innovative activities	Percentage of firms that consider the incentive as very important
Introduction of new technology / equipment	51.1%
Reduction of labor costs	33.3%
Reduction of material costs	40.0%
Reduction of energy costs	33.3%
Reduction of production time	28.9%
Reduction of project and design costs	22.2%
Increase production flexibility	11.1%

Table 1. Incentives for innovative activities – production process

As many researches have noted, the internal growth of firms in transition economies is limited by institutional constraints (Peng and Heath, 1996) but institutions can also facilitate firm's adaptive ability if they are allowed to move beyond their institutional constraints (Oliver, 1991). As long as Arrow- Nobel Prize winner in 1962 pointed out that individual participants in a fully competitive market cannot capture sufficient returns to justify bearing the risk. Arrow concluded "The bulk of basic research has been carried on outside the industrial system, in universities, in the government and by private individuals…" The reason for this to some extent is their embedded obsolescence of these capabilities, but in many instances it comes from the inefficient use of the available resources. The expenditure for R&D in Croatia are relatively modest, but the situation is similar with new accessed EU countries. The estimate R&D intensity in Croatia (share of expenditure for R&D in GDP) in 2001 (1,25%) is considerably lower than the EU average (2,21% in 1999) but bigger than in Ireland and Italy. There is a relatively large number of researches; Croatia has 37 researches per 10 000 persons of workforce. Unfortunately, low is the share of researches workers in business sector with 16% of the total researches' employment in Croatia. In the same time indicators for EU countries are 4) and for OECD are 63% (Eurostat, 2003).

In sum, till now there was little reward for improved efficiency in the enterprise. Institutional pressures will continue to be a long-term, difficult evolution in Croatia. The leverage concept is the most enticing in system thinking theory. As P. Senge in the Fifth Discipline said: » leverage follows the principles of economy of means: where the best results come not from large scale efforts but from small focused actions. « Therefore we expect few firms to be currently innovative, but over time more firms will become more innovative. More than 50 years one has discussed the connection between innovative activity (patent number, level of investment in R&D) and the size of a firm. Traditional economic approach to understanding innovation suggests that large firms have an advantage in innovation. Some other results show that small firms may have an advantage. Small firms may be faster at recognizing opportunities. They might be more flexible with respect to adjusting research plans or in the implementation phase of innovations. Traditional economic approach to understanding innovation suggests that large firms have advantage in innovation (Rogers, 2000). SPRU research suggests that small firms may have higher innovations per employee.(Radošević,

1999) However Tether (1998) show that the number of innovations is not the same as measuring the value of innovation. Using SPRU data, Tether (1998) finds that the firm size – innovation relationship will vary according to the specific technological and market conditions. We can conclude that there is a rough long-linear connection between inside industry and the size of a firm's allocation for R&D. In the sector of «specialized suppliers» in mechanical engineering a large amount of innovations belong to small firms (but small in comparison with this industry not with the whole national industry. The research investigated the relationship between firm size (measured in both number of employees and investments in innovative activity and number of innovations (Dabić, et al,2002) (Table 2). Pearson's correlation coefficient is calculated for the combinations of the above-mentioned variables. The results suggest that larger Croatian firms had higher innovative activity.

Variable	Pearson Correlation	Sig. (2-tailed)
Investments	.690**	.854
Number of registered innovations (1996-2000)	.490**	.090
Number of applied innovations (1996-2000)	.527**	.662

** Correlation is significant at the 0.10 level (2-tailed).

Table 2. Correlations between number of employees and innovative activity

Conclusion

The contribution of the paper comes in two parts. Firstly, we built the hypothesis of knowledge importance for a small open economy to accelerate transition and introduce system thinking. Secondly, we analyzed small transition country - Croatia in her vision to capture the key factor progress through cumulative and continuous progress during which the society learns how to use the technical progress driven by investment in human capital. To sum up, we interpret knowledge in line with capacity to absorb new ideas and creativity upon the productivity improving knowledge and generating new ones. We hope that governmental policies will encourage efficiency in the production process and the generation of new knowledge processes within the nation's individual firms.. Concurrently, the firms were less able to build experience-based strategies and more able to access high quality personnel in the MNCs. Even the strongest firms such as Pliva, Tesla- Ericsson, risked loss of key personnel in the event of a dip in the firm's fortunes. We have to accept that change is contemporary business context appear to become increasingly complex and turbulent. The new country managers in Croatia and other transition countries are expected to develop effective local knowledge strategies that encourage: 1) dynamic exchange of ideas between R&D and firms from transition/emerging market; 2) Employing competent quality people and building effective means of developing these individuals by the employer, 3) Extensive collaboration with universities and not-for-profit organizations; 4) dynamic exchange of knowledge between researches, MNC and managers from transition/emerging markets.

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IMPLICATIONS OF FRACTAL ANALYSIS FOR ECONOMIC GROWTH AND DEVELOPMENT

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Abstract This paper first considers three essential characteristics of socioeconomic development activity from a fractal perspective, utilizing the basic principles of Integral Science (Goerner, 1994, 1999) and methods of fractal analysis developed by Salingaros (2003) for urban planning. The paper then shows how fractal analysis can be used to measure the issues of system inter-connectedness, system dynamism, scale responsiveness, collaboration, and social learning, as well as the role of economics in overall social welfare and system health, drawing from the work of Ulanowicz (1986, 1997), Zorach and Ulanowicz (2003), and Matutinovic (2003).

Keywords. *Fractals, Intricacy, Integral Science, Socioeconomic Development, System Performance Measurement***.**

Introduction. The interrelated concepts of Fractals and Intricacy provide new ways of conceptualizing the complexity of socioeconomic development, and can help us measure it more sensitively. Healthy development must follow the natural laws of developmental growth that apply to all ecosystems, with sufficient fractal intricacy to support the size and mass of the system, as well as sufficient fractal connectivity (a balance between fine-grained, streamlined, and properly nested subsystems) to keep energy flowing through the system.

Benoit B. Mandelbrot's *Fractals and Scaling in Finance: Discontinuity, Concentration, and Risk* (1997) and, with Richard L. Hudson, *The (mis)Behavior of Markets* (2004), are, together with Edgar E. Peters books, *Chaos and Order in the Capital Markets* (1991, 1996), and *Fractal Market Analysis: Applying Chaos Theory to Investment and Economics* (& Sons, (1994), among the notably few finance/economics texts that employ fractal analysis. As indicated by their titles, however, they are oriented to better understanding of how the market works, as such, rather than to strategies for economic growth and development.

1. Fractal Intricacy and Economic Growth. Continuing annual growth of economic product is widely accepted as fundamental to economic success, even though there is evidence it is no longer necessarily equivalent to growth in social welfare (Daly, 1996). For this reason, economic growth alone is not a *sufficient* basis for the science and practice of economics. A number of economists, including Daly (*op.cit*), have said that what we need *is quality of development* rather than economic growth, but an Integral systems perspective (Goerner, 1994, 1999), employing interactive collaboration, social learning, and structural intricacy, can go a step further.

Neoclassical economists use the terms *endogenous* and *exogenous* to refer to variables internal and external to a given economy, respectively, so they can be treated separately. The tendency to separate inside and outside systems doubtless evolved from the need for analytical focus, one system at a time, and because the institutional context for a national or global economy was perceived as different from that of the local economy or the economy of the firm. Integral Science and Gaia theory, however, tell us that everything is integrated within the biosphere, and that all things are integrated *fractally*.[i]

Fractal relationships (self-similarity) are the basis of scale relationships in nature, facilitating energy transfers from one level of scale to another. Fractal structure is the natural result of energy flow. Though mathematicians rarely mention it, the two concepts are inseparable. Fractals represent a type of mathematical power law. As noted by Schroeder (1991, 103), power laws are endless sources of self-similarity. Fractals exist in the real world because they make energy/information flow efficient and because they are the natural result of energy's tendency to both make and break structure. For example, the bifurcation of a fractal tree structure occurs because restricted energy flow leads to energy buildup that creates growing stress on the conduit. After bifurcation, the two new channels increase the efficiency of flow. The process is iterative.

This simple energy principle operating in concert with nature's natural "inhomogeneity" (i.e., little differences in strength, evenness, etc.) produces semi-homogeneous fractal breakouts. As ant trails demonstrate, the element of innate semi-randomness actually helps optimize energy flow, information distribution, and discovery of new paths. The combination is self-optimizing. Nature's tendency to follow "magic numbers" such as the Fibonacci series 0,1,1,2,3,5… (which are seen throughout the human body), results from simple, regular energy rules.

Continuing annual growth of economic product is accepted as a good in the Integral view of economics, provided that internal intricacy and sustainability of external relationships can be maintained. As Jane Jacobs (2000) puts it, 'it's not how *big* you grow, but *how* you grow big." Economic growth must be based on the growth of internal intricacy both at the level of the human community and also in the systemic context outside the human community.

The internal intricacy of a community's infrastructure must be respected. This means, among other things, that we must take care of education, roads, hospitals and all other minimum conditions for happy, healthy human community life, including its economic basis. It also means we must respect local enterprise, which is likely to be more densely connected with and supportive of the rest of community life. Quality of life, social equity and justice, and supportive environmental quality all are key additional components of the social ecology.

Multiscale connectivity is required, as in nature. At the level of the firm, as shown by Watts (2003, 284), the distinction between knowledge manager and production worker becomes blurred, because everyone must do some of both. It is no longer possible to cleanly separate manager from worker, consumer from supplier, or micro from macro considerations. This view is widespread in the management literature (see Mogensen, 1989, 1990), stemming in part from reaction to the rigid hierarchical control and separation of thinking and doing that characterized the "scientific management" movement of 100 years ago. In the Mondragon industrial cooperatives (located in the Basque region of northern Spain), sharing of the thinking function by the workers resulted essentially in elimination of middle management, with substantial gains in productivity. Collaboration, transparency, and trust are essential for all organizations of any size, but the Mondragon experience also tells us that 600 persons in a given production unit is *maximal* for good interpersonal communications (Lutz, 1998).

Because we are inextricably tied to the biosphere chemically, we have to pay close attention to what we cycle out to the broader ecosystem. Thus, while modernist economics sees relatively little harm in pollution, its focus on short-term profit maximization may decrease our ability to reproduce and increase our susceptibility to disease (see Colburn, Dubanovsky, and Myers, 1996).

Fractal analysis has just begun to be used in analysis of cities. The geographers Batty and Longley showed in *Fractal Cities* (1994) that the complexity and diversity of cities can be simulated with computer graphics based on fractals. Their book deals with city morphology,

urban boundaries and edges, urban land use, form based on population density, and systems of cities based on fractal geometry (xii-xiv).

Salingaros, an applied mathematician, highlights the importance of urban fractals for *planning* purposes (see his keynote paper for the Fifth Biennial of Towns and Town Planners in Europe, 2003). Salingaros shows that *historical* cities are fractally organized, because they were designed incrementally, following the intuitive fractal design principles used by ordinary people, whereas *modernist* twentieth century cities typically are not. A city is fractal only if its diverse nodal structure is hierarchically coherent and intricately linked at all scales from large to small.

Sleek, large modernist geometric city shapes interconnected by highways exist only at the level of large scale, and destroy the intricate interconnectivity of the old pedestrian city. In fractal cities, the smaller the urban components, the more numerous they have to be, following an inverse power distribution (Salingaros 2003, 23-24). Consistent with earlier findings by Christopher Alexander (1977), this means that a hypothetical city of five regions would need to have 27 subregions and 140 distinct neighborhoods (op.cit). **Fractal theory *…reveals the distribution of built structures to be naturally skewed towards the small scale, thus undoing the large-scale bias of twentieth-century planning.*** Interestingly enough, the small-scale spatial connections are also the most compatible with evolving patterns of the electronic interface, where we want the largest number of connections at the smallest scales, so that the shortest paths predominate (op.cit.4, 25).

Based on these ideas, we can begin to rethink and reorganize our approach to economic development, paying better attention to subsidiarity (never do for others what they can do for themselves) and the fractal relationships needed for more mutually fruitful and beneficial connections within and among the various levels of geographic scale. Salingaros (2003, 4-25) provides a useful starting point, oriented to reestablishing or reconnecting the spatial infrastructure of cities that has been destroyed by twentieth century modernization and the car culture. His two fundamental fractal design principles, which we now apply here to economic development as well as urban spatial planning, are as follows:

Hierarchical (Fractal) Coherence. There must be sufficient density and variety of nodes at all scales in the hierarchy so that they can catalyze interactions among themselves by exchange of information and energy. If there are huge corporations, they must be balanced by larger numbers of smaller firms, in inverse proportion, at all levels of scale. Coherent structures at the large scale should be linked with self-similar components at the smaller scales, in accordance with a scaling factor.[ii] As in the vibrant nineteenth century city, there must be a mix of land and use functions including residential, commercial, light industrial, governmental, green space, and religious nodes in proximity to and connected with one another, *rather than concentrations of like nodes in homogenous areas*. The slum, an area of socio-economic disconnection from information exchange that has driven out the healthy mixture of urban functions needed for vitality, can be revitalized by rebuilding parallel networks of economic nodes and connections, using both top-down and bottom up processes (e.g. mixed use zoning, relaxation of codes, and provision of financing and subsidies to allow owner-built projects to rebuild the missing smallest scale functions of cities, including self-organized organic squatter settlements in third world cities).

Fractal Connectivity. Every node of economic activity (e.g. a firm) must have multiple alternative paths of connection with other nodes (e.g. other firms, financial institutions, and customers). Both long and short links are needed to provide "small world" connectivity between nodes, some of which are distant from one another (Watts, 2003). The connections must provide for exchange of information, money, energy, materiel, and goods, and must occur among all scale levels. In

addition, they must provide for exchange among both persons and firms, including both economic (barter, local currency, and banking services) and other means of connection (including pedestrian, bicycle, automobile, public transportation, utility and electronic linkages, together with goods deliveries at several levels of scale—by rail, truck, ship, and air). Local as well as national currency and smaller, narrower streets and sidewalks (providing "capillary" structure) are needed both for intimate personal exchange and exchange of small-scale goods and services. The weaker and smaller pedestrian connections must be protected and rebuilt as needed to assure spatial intimacy at the smallest scales. As a city grows, it must also have larger and larger roads and utility trunk lines as well as financial and other services, typically provided from the top down by private sector and public governance structures, but it must always adjust its overall communications infrastructure in accordance with an inverse power hierarchy[iii] so that complementary small links are also developed from the bottom up. Economic linkages at every level of the economy must include equitable access to capital financing and business advisory services at reasonable cost, to assure interactive entrepreneurship and innovation throughout the system.

In summary, there are three basic characteristics of economic activity that must be considered from both an Integral and a fractal perspective. Two of these characteristics are mainly structural, while the third is mainly concerned with process, but all three are interrelated, as follows:

Economic actors are connected in a fractally organized energy/information system. The purpose of the system is to optimize flows of energy and information for the mutual benefit of all the actors and the system as a whole. Actors all participate in buying and selling economic goods and services. Their organizations range in size from those of single individuals to large conglomerates, and all are interconnected ***as in an ecology***. The goods, services, and capital can be conceptualized as embodying energy and information. Flow optimization is accomplished through the development of intricacy in the structural relationships between actors and their use of economic resources, including material resources, information, and capital.

The distribution of economic activity in space is described by power laws operating within established levels of governance and scale. The purpose of the distribution is to optimize the relationships of the human population and its natural environment in adaptability, stability, and efficiency terms. While not all economic activity must be tied to place, those kinds of economic activity that are most directly linked to the basic needs of people for food, shelter, human services, and a pleasant environment in which to live and work, are of necessity tied to place.

Economic activity is organized spatially on the basis of power laws, expressing fractal relationships, resulting in distribution of geographic *hubs* (centers with high levels of interconnectivity to other centers within all relevant levels of scale), extending from the local to the global. Each set of hub relationships is nested fractally in the other ones, both up and down the scale levels that describe the network. Each is interdependent with the others. For optimal operation of the network, the hubs and their constituent parts at each level of scale should operate on the basis of the same *subsidiarity* principles that characterize natural systems, including living organisms, with energy flow and information processing occurring at all levels--especially at the lowest levels--in the interest of the speed, efficiency, and appropriate response of the overall system. This means that the traditional distinction made between micro and macro-economics is not as important as the mutual interdependency of the smaller and larger units of economic activity. Leadership, ownership, and management of both human and natural resources must occur at all levels of the system to optimize economic benefit.

These structural relationships must be supported by collaborative social learning for the innovation and entrepreneurship required, at each level, to facilitate the development of increasing system intricacy. This means that all hubs must be completely open to the

exchange of energy and information and capital, without destructive domination of any hub by another, so that an ecology of mutual support is possible. In a cultural context that recognizes the importance of collaboration and sharing, this may not be a problem, but in dominator cultures this is a serious issue.

The Mondragon industrial cooperatives and the Grameen Bank provide prototypes for the elements of collaborative processes, social learning, and culture that are necessary for success (see Dyck, Mulej, and coauthors, 1998). Everyone who contributes also benefits. But the organizing principles and processes must go beyond the individual organizations represented by those two examples. In order to establish systems that facilitate the operation of similar organizations at all levels of scale from the local to the global, and in order to prevent dominance by monopolistic and oligopolistic global systems, the same cultural principles must extend from bottom to top.

Success ultimately must be guaranteed either by mutuality of moral commitment or governance structures with enforcement capabilities, or both. Economic structures have always existed within the framework of governance structures, though most neo-liberal economists and politicians prefer to ignore that salient fact.

2. Integral Measures of Economic Health and System Vitality. In modernist economics, *efficiency* is the only real criterion of success, while *adaptability* and *stability* are ignored for the most part (see Ulanowicz, 1997 and Anthony, 1978). Robert Rosen (1991), writing on complexity and dynamical systems theory in biology, points out that all of *mechanistic* (emphasis added) science is reduced to efficiency and efficient causality. Incidentally, efficiency is also the salient criterion, borrowed from neoclassical economics, used in the fields of public and business administration as the basis for program administration. But adaptability and stability must be incorporated as well, in the interest of guidance for flow systems that are to be sustained over the long term.

This leads us to a consideration of the measures of fractal connectedness that could be used in Integral Economics to bridge the main issues of system interconnectedness, system dynamism, scale responsiveness, collaboration and social learning, and the role of economics in overall social welfare and system health. We must deal with at least five levels of geographic scale, extending from the household and firm in the community, to the city and region, state (province), nation, and the international level. We suggest the use of the *ascendency* and *connectivity* measures pioneered by Ulanowicz (1997, 71-82), to judge economic as well as ecosystem health. We should also use fractal (power law) analysis, as proposed by Salingaros (2003), to plan the structure of economic webs to support the physical and communications infrastructures of our cities.

Let us first take a look at the measure of fractal connectedness that has been developed by Zorach and Ulanowicz (2003) in connection with their work on networks in complex ecosystems. Graphing the "trophic depth" or "efficiency" or "number of basic *roles*"[iv] of a given system (equivalent to ascendency) against its complement, "system overhead" or "system breadth" or "degree of parallelism in the network" (i.e., measures of *connectivity*[v]), they define a rectangle called a "window of vitality" for ecosystems, inhabiting a constrained area of parameter space, with *roles* measured in the range between between 2 and 5 (vertical dimension) and *connectivity* between 1 and 3.25 (horizontal dimension). They have found that this window of vitality comprises only a very small portion of all distributions generated by random networks. The fact that all natural networks should fall within such a narrowly constrained window is somewhat surprising to Ulanowicz, leading him to suggest that "artificial nets" (such as power grids or economies) may in fact plot outside the window--to their disadvantage, as compared with *stable self-organizing* systems.[vi]

Igor Matutinovic, in applying the approach developed by Ulanowicz to economic systems, suggests by inspection (so far without empirical analysis) that economic systems likely also exhibit a trophic depth of about 4 or 5 transformation levels or *roles,* as follows:

1. Extractive industry and agriculture
2. Material processing
3. Tool building
4. Consumer products (marketing) and (as a separate or similar category)
5. Services.[vii]

Matutinovic uses Ulanowicz's ascendancy and connectivity ideas to analyze global economic exchange and stability in his paper entitled, "Organizational Patterns of Economies: An Ecological Perspective" (2002). He shows that most of world trade is conducted among a very small fraction of the technologically developed countries and that the strength of trade exhibits a power law with exponential decay, resulting from autocatalysis that evolves over time between trading partners (425-428). While this pattern fosters efficiency (ascendency), with quick and high returns on investments for the principal trading partners, it also implies a trade-off in socioeconomic diversity (system overhead) that may well be antithetical to the stability of our global economic and ecological systems in the long term (433-435). But Matutinovic concludes that national economies and trade interactions *per se* have evolved to a kind of "window of viability," (derived from Ulanowicz's "window of vitality" (1997, 116)), so far able to withstand a range of socioeconomic perturbations (437).

We have suggested to Matutinovic, however, that when we encounter high levels of vertical integration of the four or five dimensions of an economy, which typically occurs in transnational globalization (providing economic efficiency and high profits for the organizing and controlling elites, but diminution in economic opportunity and resource control for the majority smaller players), we have in effect a sixth level that should be designated "vertical integration via globalization."[viii] We further suggested that this sixth level of activity likely lies outside the window of viability/vitality because it is not as place and resource attentive as it would be in local or national economies, and that it tends to diminish the regeneration of energy flow through the entire system because it ignores the importance of systems overhead (a. k. a. parallelism, connectivity, and organizational intricacy). Matutinovic subsequently agreed in principle, concerning the sixth level or role, citing supporting arguments by Konrad Lorenz (1973, 60) that knowledge acquisition leads to more efficient appropriation of energy, and by Ulanowicz (1997, 47), who puts the same idea in more precise terms, explaining that autocatalytic loops exercise centripital pull on available resources, reducing opportunity for their use by less efficient agents.[ix]

Clearly the window of vitality idea deserves further empirical exploration in both large and small economic and ecological systems. Economic analogues of biological processes that allow for adaptability and stability, including entrepreneurship, innovation, succession, collaborative learning, and fractal connectedness should be identified and examined. Perhaps eventually we will be able, with window of vitality analysis, to better predict and mitigate the consequences of boom and bust cycles, the growing disparities of wealth and resource utilization within and among cities and nations, the growing imbalance of urban versus rural economic development, the impact of urban sprawl on the resource base, etc., as well as the disadvantages of globalized markets characterized by over-centralized ownership and management.

For comparative purposes, we should develop and apply the sort of analysis Matutinovic has pioneered for international trade also to other levels of economic scale, including communities, the cities and metropolitan regions of which cities are a part, the states or provinces incorporating the urban conglomerations, and the nations that incorporate states and provinces.

The analyses should be cross-cultural as well as cross-national, and should include interrelated ecological and social learning systems. Our working premise would be that economic and social learning systems that do not work on the autocatalytic self-sustaining basis of adaptive, stable ecosystems are less than optimally productive in maintaining human welfare.

Summary Comment. While the Integral methods for analysis of the relative health and vitality of social, economic, and environmental systems presented herein are not yet completely worked out in terms of standardized procedures, and have yet to be generally accepted as more helpful than the prevalent but rather simplistic modernist measures of economic growth such as GNP, they appear to have significant potential. We hope that our discussion of methods pioneered by Zorach and Ulanowicz (2003) and Mututinovic (2002), for natural and economic ecosystems, respectively, will attract a larger audience in all the relevant areas of inquiry that we have discussed. This in turn should foster additional experimentation with the methods and lead ultimately to measures of welfare that are more sensitive, reliable, and easier to use than current methods, as well as more inclusive of all the levels of scale that we need to know about, ranging from the local to the global.

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Endnotes

[i] Mandelbrot coined the term *fractal* in 1975 to denote a new geometry of nature, which unlike smooth Euclidean geometry, "makes it possible to quantify many forms of *roughness*" (Mandelbrot, 1997, 8). Batty and Longley (1994, 3) elaborate Mandelbrot's verbal definition by adding that the irregularity of fractal spatial forms repeats itself geometrically across many scales, so that a fractal object may be said to possess the property of *self-similarity* or scale *invariance*.

[ii] The key property of a fractal is that it possesses structure on a symmetrical hierarchy of scales. Thus, a structure defined at an overall size x implies something similar at size rx, where r is a *scaling factor* like 1/3. For a structure to be fractal, self-similar substructures must exists at r^2x, r^3x, r^4x, etc. (Salingaros, 2003, 23).

[iii] The exact rule is called an *inverse power distribution*, and may be shown as $p = C/x^m$ where p = number of units of size x (and is inversely proportional to x), and C and m are constants. C is related to the largest size under consideration, in this case, the overall dimension of the city; the exponent m is the fractal dimension. A fractal (i.e. *scale-free*) city has structural components of all sizes, ranging from the overall size of the city to the microstructure of its building materials (Salingaros, 2003, 24). Similarly, the size of the largest economic unit in a fractally organized economy would provide the basis for a distribution of smaller economic units, with the numbers of units at each level inversely proportional to the size of the unit at each level, respectively, so that the largest number of units would be of the smallest size.

[iv] Here "role" is a specialized function: a group of nodes that takes its inputs form one source and passes them on to a single destination that can also be a group of nodes. The number of roles is also defined by the number of nodes divided by their connectivity (Zorach and Ulanowicz, 2003, 69).

[v] Connectivity can be further defined as equal to the network flows divided by the number of nodes (ibid.).

[vi] Personal correspondence dated May 3, 2004.

[vii] Personal correspondence dated May 10, 2004.

[viii] Personal correspondence dated June 8, 2004.

[ix] Personal correspondence dated June 16, 2004.

PUBLIC AND PRIVATE MARKETING – LINK BETWEEN BUSINESS ENVIRONMENT AND PUBLIC ADMINISTRATION

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Abstract
The Romanian society is crossing one of the most important stages of its transition toward the near future integration in the European Union. This event, expected to take place at the beginning of 2007, will define the final processes bound for the socio-economic reconstruction.
Based on the previous experiences, an assumption rose up that, at this moment in the Romanian society there are two systems – business and public administration, placed on opposite, antagonistic, unfriendly sides. At the same time, there is the opinion that a proper public and private marketing could be the link between them. The link between these systems should make the relation useful to create and handle the cooperation and cooperation climate in these two environments.
The paper aims to present the systems, their characteristics, the opinion about the other, the identified link components, and to propose a solution for the link improvement. A small survey of the members' opinions, in both systems, will be the base of the analysis.
The first stage is to analyze each environment as an independent system: business system (BSy) and public administration system (PASy). We will present the structure, characteristics, interactions with other socio-economic components, etc.
The second stage will focus on the role of public and private marketing as tools of feedback reaction of the systems to the general environment dynamics. The marketing behavior is typical for the BSy and its level of marketing knowledge is higher than the poor level of marketing knowledge in PASy lacking the marketing attitude about public services.
At the third stage shall be presented the conjunction between the two systems in a new structure „public and private partnership" and link between them through the marketing.
This approach creates the possibility to use the marketing concepts, typical for BSy, in PASy as a natural component of the public-private partnership system.

Keywords: *business, public, environment, link, marketing*

General overview

The necessity to change state structures has been pressing Romania all the time from 1989 until present. Its cause was the replacement of the socialist state system with the democratic state system and simultaneously the market economy replaced the centralized economy. The social and economic restructuring ere included a set of processes regarding legislation and regulation and also the changing of people conception.

There was a long transition time that was mainly focused on the legislation transposition. Starting from the objective of European integration and general compatibility of Romanian legislation with democratic states, it took place a large process of laws elaboration, approval and implementation in all the socio-economic fields.

So, the business environment starts with law 31/1990 regarding the organization of commercial companies and they have now a complex system about company registration, accounting, taxation, customer protection and so on.

We could appreciate that the public sector was one of the last fields to benefit from its special regulation. It is relevant that the first law for public administration was issued in 1996 and only later other regulations were added.

The Romanian society is passing through one of the most important stages of the transition toward the near-future integration in the European Union. This event, expected to take place at the beginning of 2007, will define the final processes bound with the socio-economic reconstruction. The democratic values include that the citizen has rights and obligations on one hand and on the other hand, the public administration has the role of serving citizen and to force them to fulfill the obligation or to punish them.

Based on the previous experiences, an assumption rose up that, at this moment in the Romanian society there are two systems – business and public administration, placed on an opposite, antagonistic, unfriendly sides. At the same time, there is the opinion that a proper public and private marketing could be the link between them. The link between these systems should make the relation useful to create and handle the cooperation and cooperation climate in these two environments. This is the reason that we should focus on the link between business and public administration by the marketing activity.

Starting point

In order to have a better understanding of the images of business and public marketing activity, we made a small survey of the citizen opinions. The survey was made on a group of 100 subjects – 75 from business environment and 25 from public administration structures. The ratio does not respect the ratio between the number of employees in public and business sectors: we are much more interested in getting additional and relevant information from the public sector.

Briefly we present the questions and the answers process to some items relevant for this paper.

Q14 – Do you think that the public sector and the public services should have marketing activities?

Yes No

Q16 – Public services promotion and public awareness about founds administration will:

a. Increase the taxpayers expectations;
b. Facilitate a better communication between the two sectors;
c. No effect;
d. Clarify the tax pay obligation;
e. Make the acquaintance of society benefits by taxes.

Q17 – Marketing theory knowledge and practice on public administration and public services will:

a. Decrease bureaucracy;
b. Improve the services;
c. Improve the communication between public servant and taxpayer;
d. Increase the public servants responsibility;
e. Change attitude in both sectors.

Q18 – Are the public servants qualified for „market economy" and „european public sector"?
Yes No

Q19 – Do you consider that marketing specialists in public sector are desired?
Yes No

Question	Yes	No	a.	b.	c.	d.	e.
Q14	**93 %**	7 %					
Q16			7 %	65 %	19 %	27 %	12 %
Q17			57 %	44 %	29 %	17 %	35 %
Q18	2 %	**98 %**					
Q19	**92 %**	8 %					

The total answers to Q16 and 17 could exceed 100 % because they were allowed to tick more then one answer.
As a result:
- 93 % of subjects think that the public sector and the public services should have marketing activities;
- 98 % of subjects consider that public servants are NOT qualified for „market economy" and „european public sector";
- 92 % of subjects consider that marketing specialists in public sector are desired;
- 65 % assess that public services promotion and public awareness about founds administration will facilitate a better communication between the two sectors;
- 57 % assess marketing theory knowledge and practice in public administration and public services will decrease bureaucracy; 44 % assess they will improve the services and 35 % expect they will change attitude in both sectors.

The survey confirms the empiric supposition that public sector lacks using marketing techniques and that they could be a link element between private and public environments.

Systems presentation

Business environment experiences a rapid development by the individual private initiative and later by the privatization program. The conception of the private entrepreneurs was adapted easier to the market economy expectations. This is because of certain factors as we mention:

- Certain entrepreneurships know, at least theoretically, the market economy requests;
- Foreign investors, experts of the occidental business environment appear;
- Private entrepreneurs have courage to start business and to adapt them and themselves to the international practices;
- Managers are acquainted with practical and then theoretical knowledge.

The public central and local administration environment has a naturally much slower changing process. The process of drawing up the legislation system, in conformity with the expectations of market economy states, was a complex, difficult and long term one.

From the human resources point of view, the two sectors offers different opportunities, so they were attractive for two segments of people with different characteristics.

The business environment was very attractive because of the company management's various methods of personnel motivation; the most important in our opinion are:

- High level of salaries (compared with public sector);
- Professional satisfaction;
- Training and continuous learning for employees.

These factors attracted from the labor market to businesses the personnel with the highest level of skills and field education.

The central administration provided the business sector benefit by a special attention to the legislation requested to stabilize the environment. We could assess that in the last 15 years the business environment had more laws than anyone expected. Every 4 years, and some time sooner, the Romanian Government decided to „change the rule". The well know examples are the foreign investment law that was changed at least every two years and ones twice in a year, and the privatization law that has the record of being changed three time in the same year.

Even if the environment has a lot of dis-functions it should be know that it benefits from several facilities as well. There were, for example, a lot of programs that support small and medium enterprises (SME's) such as: marketing activities; training of personnel on business marketing and management; start up consultancy and start up investment.

The business system (BSy) can be presented, in our opinion as in Figure 1.

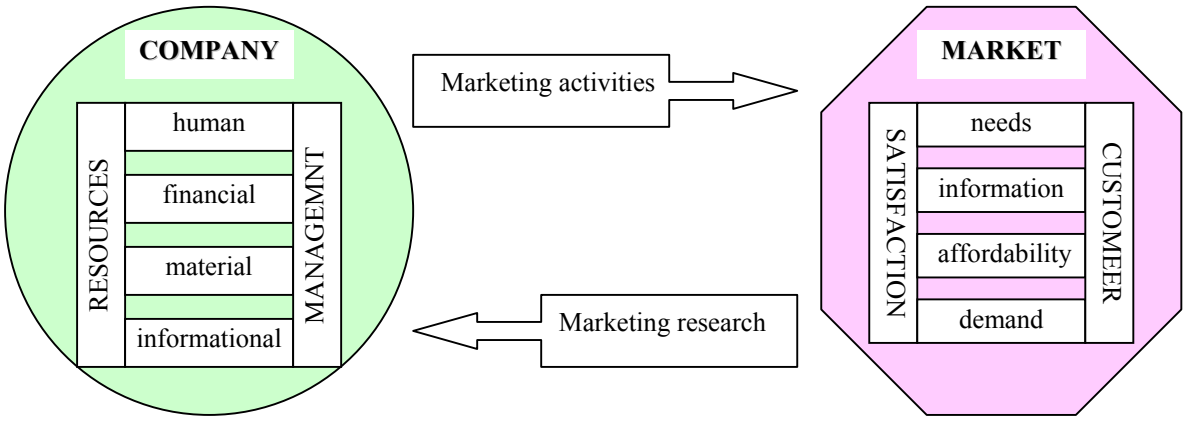

Figure 1: Business system (BSy)

The public administration system (PASy) has not enjoyed too much attention during last 15 years. It is mainly based on the human resources. As a result, the administration is working with people for people and the important impact is through the public services. As we well know, the specificity of marketing approach to services is the personnel component.

The absence or weak usage of the personnel motivation components in the public sector has caused the personnel with old and obsolete practice to remain, and to attract young people with a low level of education or with no other options.

This relative polarization of personnel between the two sectors of activity generates the appearance of the theory of incompetence and bureaucracy related with the public sector and the arrogant and exaggerated aspirations in the private sector.

The representation of the public administration system (PASy) could be as in Figure 2:

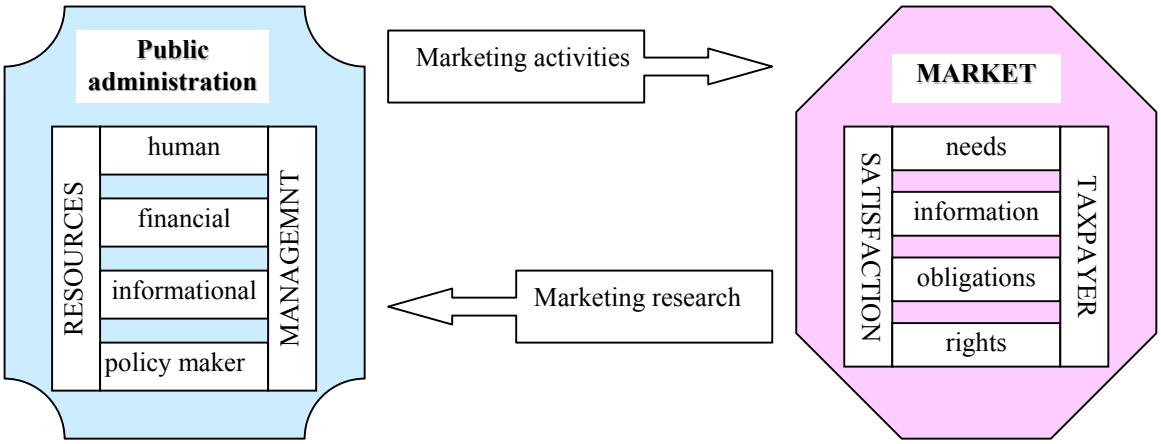

Figure 2: Public administration system (PASy)

Because of the personnel polarization, lack of resources, and lack of qualification in certain area such as marketing, at this moment, Romanian society has to deal with a weak cooperation between the public administration and business environment, with different forms of disagreement, some time even acute.

The difference in salary levels, in work conditions, in organizational and social culture, the lack of a civic self-awareness, and a weak communication make the disagreement stronger and form antagonistic groups, as well as the expression like „US-THEY".

Business and public marketing

There is a unanimous vision, at the conception level, that the public-private partnership is necessary. There are efforts in this direction starting with the experience of other states from the European Union or other developed countries, already experienced and available to assist and support the local demarches in Romania.

So, the application of the marketing concepts for the public sector promotion could be a way for their beneficiaries, majority parts of the private sector, to know better the relationship aspect between the two sectors and the mutual dependence of them.

If we redesign the structure with both actors at the same time, as they have to work in real life we can easily highlight the role of marketing (figure 3).

The stronger marketing component with applicability in this process is "public awareness" referring to various projects in which the role of each citizen is very important. The absence of the funds needed for the implementation of different policies and the social objectives is determined by the fact that the population majority neither knew how to obtain public funds and nor how they are spent. What they are aware of is the direct contact allocation without bids, corruption at all levels, lack of professionalism, bureaucracy: all of these generate a certain degree of mistrust to local and central authorities.

It is true that, at the same time the private sector has its share of contribution in this un-proper climate. For sure the corruption is increased by the continuous attempts to obtain facilities: penalties exoneration, shortening or prolonging of deadlines, unreal declarations, and so on, could be reasons of perpetuations of this situation and its development to large scale in public-private relationships.

It creates a spiral between the public and private environment supported by both sectors

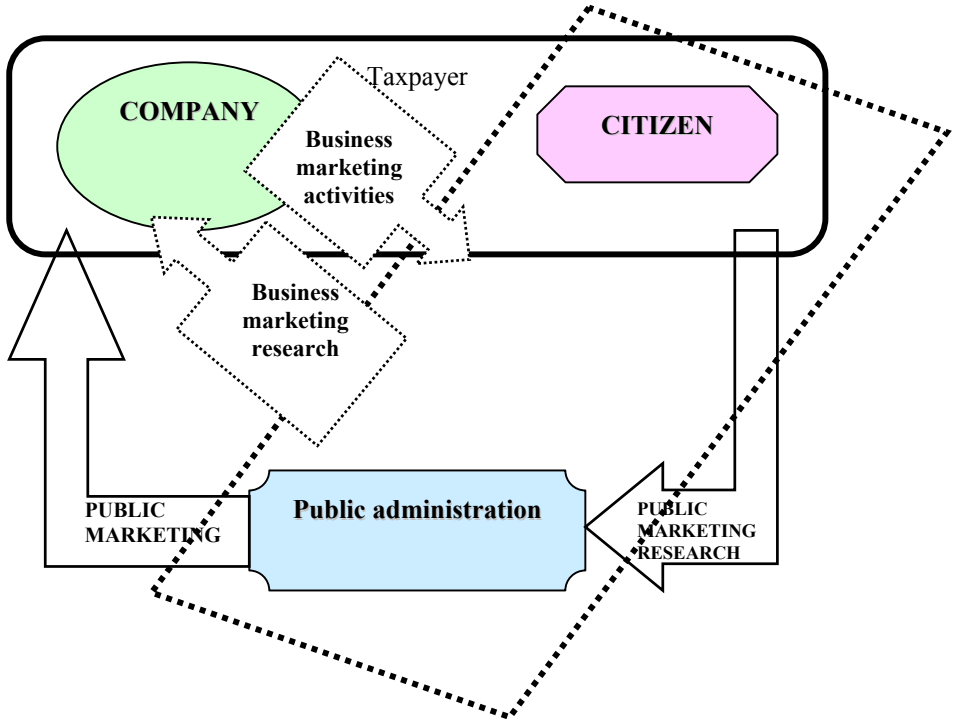

Figure 3: Business and public administration systems

through the individual or group interests and it continues to generate an un-proper climate, which is reported to the whole society.

We consider that these structures could be consolidated by the marketing theory and the marketing activities aimed to highlight the role of these two components of general development of Romanian society, regional development, and economic development on the whole, or each company development, so together to better serve the population's economic and social needs.

Another form of the cohabitation between the two systems and their „socio-economic system" is a form of „eco-system" as designed in Figure 4. This diagram showes that each component plays two roles depending on needs. The company offers/supplies the market for individual customer, for other companies and for public administration. In this case the company is interested in marketing research to be any time in line with the market trends, the customer desire, demand and satisfaction. The marketing activities includes the promotion of the company offers and maketing mix it designs for its target segments.

The public administration works as policy maker and public service supplier. It has to know the citizen expectation from the officials as national social policies in order to offer the motivation to pay taxes. The economic policies have effect on the companies as economic

actors and influence the tax paid by them. On the other hand the public services has to be promoted to the citizens if they are free as a return for the already paid taxes and if they are charges to motivate a potential discrepance between offer and customer satisfaction.

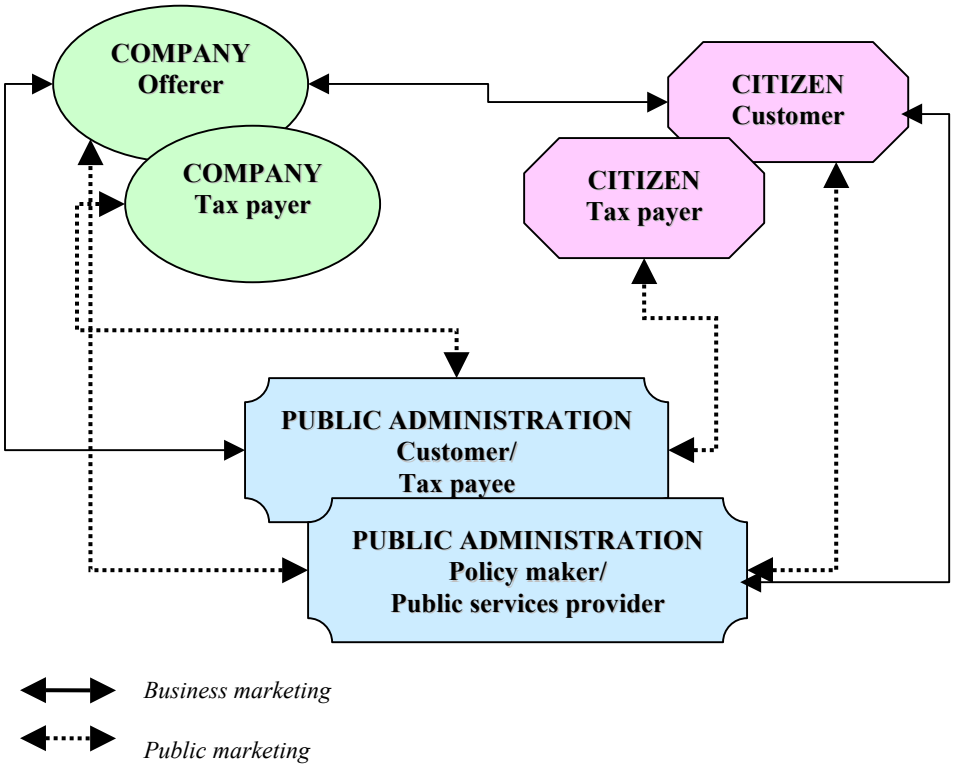

Figure 4: Business and public marketing

A start for redesigning the public-private relationships could be represented by the investment projects in infrastructure. They are, recently under regulation by the Government Ordinance no. 16/2002, Government Ordinance Emergency15/2003 and Law 293/2003 that allowed the public-private partnership on the investment field.

These regulations have the reason to clarify the ways of designing, finance, construct, exploitation, service and transfer of any public assets according to the public-private partnership.

Marketing of public-private partnership

Public-private partnership is a method to introduce the private management in public services by the contractual links on long term bases between a private operator and a public authority. Public-private partnership assures the public service totally or partially, as a function of the private fund involved and asks for the private sector knowledge related to the efficient administration; thus, it offers of better quality public services. Using the marketing tools in promoting these services and supporting the way of offering them to high level of quality consolidates the link between public and private environment.

The public-private partnership, if defining start from the key words, includes:

- **Partnership** for action is formed by two or more partners joining to realize together an activity, an objective, a subject, a fact, an institution, a business. In the public-private

partnership the main elements belong to the two sectors and have as aim the public interest objectives.

- **Public** presumes that it belongs to the collectivity or to the local, regional or national society. This determines the obligation for it all to be conducted based on specific laws and regulation and handled by central or local authorities.
- **Private** defines that it belong to the individual property, free initiative, market economy and it is controlled by demand and supply rule.

The public-private partnership represents the association between the two components aimed to achieve public interest objectives by joining characteristics and principles of business approach, able to increase efficiency and effectiveness.

The partnership is the opposite of opposing, fight, aggressiveness, and it is based on understanding, cooperation between partners to achieve common objectives.

The steps of building a public-private partnership are:

- Initiating project by the public authority's or by the private sector's initiative based on the society needs;
- Elaboration of „pre-feasibility" to offer information about the possibility and the effects of the objectives achievement;
- Publishing the advertisement related with the initiation of a public-private partnership for the project implementation and/or public debate;
- Issuing the „Letter of intent" regarding the involving in project implementation;
- Negotiations of the project implementation conditions with the selected investors;
- Concluding the "The project agreement" with the selected partners by the public authority in charge to handle the project;
- Elaboration by the public authority together with the partners from the private sector of „Project feasibility study";
- Hierarchy of the investors' offers by the efficiency in technical-economic and financial index;
- Negotiation of „Public-private partnership contract" with the investor placed first in the classification of the offers hierarchy, until the best results is obtained;
- Exploitation of the project results according with the „Public-private partnership contract" by the private partner;
- Transfer to the public authority of the public assets obtained by the project at the end of „Public-private partnership contract".

The main types of investment project, that could by made by public-private partnership, are: Design-Build-Operate (DBO); Build-Operate-Renewal of Concession (BOR); Build-Operate-Transfer (BOT); Lease-Develop-Operate (LDO); Rehabilitate-Operate-Transfer (ROT); Build – Own – Operate – Transfer (BOOT).

Public-private partnership is based on the next cooperation principles:

- Free competition in investor selection;
- Fixed set of criteria, easy to measure, transparent in investor evaluation;
- Confidentiality;

- Neutral and preventive about conflicts of interest;
- Following the schedule of the selection procedure and the project implementation;
- Clarity in communication;
- Honesty in project implementation and transfer;
- Fulfilling the accepted obligations.

The public-private partnership is also based on the relevance and viability criteria:

- Fulfilling the public interest needs, but under the administration of the private sector tools;
- Common objectives, evident and identifiable by both parts;
- Existence of the politic support for the project,
- Public fund availability and resources mobilization;
- Previsions/perspectives related to the added value and project efficiency;
- Existing interest from the private sector;
- Possibility of risks transfer to the private sector;
- Necessity of both sectors implication;
- Procedures/regulation of project implementation.

Project implementation by a public-private partnership assumes that, in the first step, the results exploitation will take place in the business administration system.

As it could be seen from the steps of a public-private partnership building and then the business principles applied on the implementation and results exploitation, the business marketing should be present and its techniques successfully applied. Simultaneously should programs of public awareness be developed about the role of public administration in the partnership and the benefits of the local and national communities.

Project marketing a tool of business and public marketing

According to the marketing principles, projects marketing takes specific forms of the general functions (as defined by C. Florescu in *Marketing*, Editura Marketer, Bucharest, 1992), as:

a) **Market investigation, project needs.** This function implementation has the role of obtaining information about the potential and existing markets, system of beneficiaries demands, local and international finance suppliers (grants), their motivation, customers behaviour, competition, environment components related with the company and market relevance, national and international strategic objectives.
b) **Company dynamic connection to the social-economic environment.** This function reflects the new vision of marketing about the company-environment relation: based on the company activity it must be all time correlated with the environment demands. Execution of it includes the renewing and resources mobilization able to value the opportunities and also to influence the environment. The project management promotion makes possible the development in the complementary areas and focus on the objectives-results link.
c) **Satisfying at high level of the environment demands.** These could have different forms of expression: consumption needs, structural and institutional change, information and socio-cultural needs. This function requests that the project implementation should lead to the expected result, that will get its material form in solution (projects) – projects documentation – in order to produce the expected change.
d) **Maximising the economic efficiency.** This function has its role in resources mobilization, optimizing the structures according with the organization objectives for process to carry on by a motivational climate inside project constraints.

Complexity and projects market evolution, on the one hand, and projects ideas on the other hand, as well as the implied factors of attitude influence the environment. These include all actors and forces that influence the project marketing activity. Marketing environment has a fluid, dynamic character, reflecting opportunities and threats, restrictions with strong effects, as an open system.

According to the extreme complexity and the different ways of behaviour a clarification of environment elements is compulsory, and so is the nature and the influence of them on the organization's marketing activity.

Some conclusions

Public sector services promotion and the optimizing of its relation with its contributors could explain the rational ensemble that exists between the components and the system of mutual support.

Public-services marketing rise up as a necessity and could use the business marketing tools, and evaluate simultaneously the politic marketing that has a faster and stronger development in Romania.

Using the marketing principles in public-private partnership and in exploitation of projects results in efficiency, effectiveness, and free competition principles, will lead to increased mutual reliance between the two sectors and to improved communication. At the same time it will lead to a proper transfer of knowledge from business to public environment and help realize the level of assumed risks that determine the difference between the levels of benefits.

Public sector marketing shows up as a necessity and it can use the tools of business marketing, offering add value to the politic marketing which knows a faster and stronger development.

Efficient communication establishment between the two environments will lead, for sure, to the development of a segment of satisfied citizens, employees, owner and vice-versa.

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4. *** Government Ordinance no. 16/2002;
5. *** Government Ordinance Emergency15/2003;
6. *** Law 293/2003 "Public-private partnership on the investment field".

IS THERE REALLY NOTHING NEW ABOUT THE NEW ECONOMY?

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Abstract
U.S. Northwestern University economist Robert Gordon stated in his paper in Journal of Economic Perspective (2000) that computers didn't contribute much to productivity. To Gordon, the Internet and computers have had and will have little impact on productivity. He argues that Internet and computer technologies pale in comparison with the great innovations of the early 20th century, including electricity, internal combustion engines, chemistry, telephone and telegraph communications and indoor plumbing. He argues that all the gains of the second industrial innovations contributed directly to higher productivity. He stated that even when they didn't contribute directly, they certainly had some impact on quality of life. He argues there is nothing truly world changing, if those achievements are compared with the achievements of digital age. In our paper, we challenge his opinion and show that computers and the Internet are the fuel on which modern businesses are run, governments rule, and societies become better connected. Computers and the Internet help us create, access and visualize information in previously inconceivable ways and forms. This created many new combinations in the form of new goods and services and increased variety but almost none of this is captured in the productivity statistics. In spite of the importance that computers and the Internet have in our world it is not easy to measure it. Firstly, because the effects of technological change are not prompt but rather delayed in the future. Secondly, because information and communication technology is high capital and skilled labor-intensive.

Keywords: *Technology, New Economy, Internet, Efficiency, Digitization*

1. Introduction

The Information Technology, the Internet, or the Computing & Communications technology revolution has been central to the economic discussion for several decades. Before the mid-1990s the catchword was the "productivity paradox" coined by Robert Solow, who stated in 1987 "Computers are everywhere visible, except in the productivity statistics" (Eliasson et al., 2004).

Then the New Economy and fast productivity growth fueled by computing and communications technology suddenly became the catchword of the very late 1990s. In the last two decades, concepts have appeared that have influenced and even defined entire science and technology policies in Western countries: high technology, national system of innovation, information economy, knowledge-based economy, and the new economy (Carlsson, 2004). New economy is in fact the culmination of decades of work on technology and productivity (Godin, 2004). The computer has certainly acted as a catalyst given its pervasiveness and its capacity to merge with other technologies. The computer contributed to prolonged life expectancy through the development of new medical tools improving the diagnosis and treatment of diseases. The computer provides for the production of cheaper commodities and it can reduce the human input needed for routine and boring jobs. Businesses are becoming more efficient because they have more and better information, on a much more timely basis, which means savings in areas such as inventory, thus improving productivity (Hill et al., 2004; Močnik, 2004a, 2004b).

The paper is organized as follows. The defining characteristic of the modern economy is presented in the next section. In the third section we present the growth potential of the technology. The effects of the computer, digitization and the Internet are discussed in the fourth section. The fifth section discusses why there is a difference between possible and actual efficiency of using information and communication technology. The conclusions are presented in the final section.

2. The Defining Characteristic of the Modern Economy

Information and communication technology (ICT) is the result of a bundle of both product and process innovations which apply to a wide variety of activities and reflect the characteristics of the innovating firms and countries. ICT has been diffused internationally because of its strong effects in terms of profitability of adoption and rates of increase of total factor productivity. Even though its adoption is far from homogenous across firms and countries (Antonelli, 2003), which is discussed in the fifth section of the paper.

By surveying recent research, it is suggested that both the production and use of information and communication technology have been the factors behind the improved economic performance (Antonelli, 2003). Some sceptics questioned whether computers and the Internet have even affected the productivity and the quality of life when evaluated in comparison with the great inventions of the past (Gordon, 2000). This question has been posed even for the U.S. where it is suggested that the effects of the New Economy have been the greatest in comparison with other parts of the world (Carlsson, 2004).[1]

There are also some people who believe that computers and the Internet have contributed to the more flexible economic system and the more rapid spread of the New Economy everywhere, no matter that the extent to which new technologies are superior and their consequences in terms of productivity growth different across firms and regions.

Our question in the paper is whether the research data about economic performance can be regarded as convincing evidence of a New Economy or simply as indicators of some interesting and possibly new patterns in the late 1990s that can not be compared to previous radical technologies, such as the railway, the dynamo, the fordist mass production system, the plastics and the petrochemical industry at large as it was suggested by Gordon (2000).

In our analysis, we would like to start with Schumpeter who argued that economic growth is a result of innovations, i.e., new combinations of products, processes, markets, sources of supply, and organizations (1911, in Carlsson, 2004). According to this view, it should be acknowledged that computers and the Internet enable greater connectivity among actors and ideas, which creates even more possible combinations through identification of existing opportunities and discovery of new ones. In essence, the defining characteristic of the modern economy is extremely rapid technological, organizational and institutional change, all embedded within broader patterns of social change (Potts, 2001).

The Internet makes it easier than ever before to connect people, ideas, and bodies of knowledge (Močnik, 2003a, 2003b). This makes it more likely that new capabilities, as the key source of competitive advantage, will emerge and that previously separate activities will be connected, integrated, and restructured (Hill et al., 2004). The search for information and knowledge, that build new capabilities, is facilitated by the Internet (Carlsson, 2004; Močnik, 2004b).

According to Carlsson (2004), the observed changes are at least consistent with the view that digitization of information, combined with the Internet, represents a form of general-purpose technology that is giving rise to a vast new array of possible combinations that we may refer to as the New Economy. The level of connectivity between actors and ideas is increasing dramatically. In fact, we have only begun to see the impact, and only part of it is measurable.

The New or Digital Economy is about dynamics, not static efficiency. It is more about new activities and products than about higher productivity. What is really new in the New Economy is the proliferation of the use of the Internet, a new level and form of connectivity among multiple heterogeneous ideas and actors, giving rise to a vast new range of combinations. There are some measurable effects on productivity and efficiency, but the more important long-run effects are beyond measurement (Carlsson, 2004).

3. The Growth Potential of the Technology

As it was proven historically, the more generally applicable are the technologies, the greater is the economic growth potential (David, 2001; Jorgenson, 2001; Brynolfsson et al., 2001). The cost saving potential of a general-purpose technology is only a part, not necessarily the most important one. According to Rosenberg and Trajtenberg (2002) the growth can be achieved primarily through pervasive innovational complementarities instead of cost savings calculations. On the other hand, the very fact that general-purpose technology does generate new combinations, sometimes with considerable delays, makes it difficult to identify and measure their contributions to economic growth, as it is partly the case of ICT. Carlsson (2004) shows that it was the same in the case of transportation and communication technologies in the 19th century, steam engine, the dynamo (electric motor) and the like. Carlsson argues that general-purpose technologies led to higher efficiency and productivity in the economy as conventionally measured but also that the measured effects are only a part of the contribution to economic well-being and long-run economic growth. Conventional measurement tools are even more deficient when the analysis extends to total improvement in human well-being and economic well-fare caused by, for example electrification or ICT more generally.

The introduction of electric lighting and electric domestic appliances (e.g. refrigeration) permitted changes in lifestyle, improved the environment, and influenced how human beings spend their time and build their homes and cities (Carlsson, 2004). This created many new combinations in the form of new goods and services and increased variety but almost none of this is captured in the productivity statistics. It took several decades for the productivity improvements (as conventionally measured) to show up in the statistics (Carlsson, 2004). It is the same with ICT. There is no reason to expect any huge differences when ICT is considered. ICT aligns among generally applicable technologies, which means that the greater are the systemic effects, and the greater is the number of possible new combinations it generates, the greater is the connectivity and the greater are the dynamic effects (Carlsson, 2004). In the next section it will be argued that the effects of digitization in combination with the Internet are even broader, though not any easier to measure.

4. The Effects of the Computer, Digitization and the Internet

In discussing the New (Digital) Economy, it is necessary to distinguish between information and knowledge. Information may be defined as a collection of data, whereas knowledge can be defined as a structure that makes it possible to organize and interpret information (Tapscott, 1995). Information is not new, only the form in which it is gathered, manipulated, stored, and transferred. In the long run, one would expect knowledge-intensive industries such

as financial services, entertainment, health care, education, and government to be those most transformed and benefiting the most from digitization and the Internet (Gordon, 2000).

With the proliferation of the Internet, the old technologies had co-evolved technologically to the point where they could be called new (Carlsson, 2004). What was really new was the way in which they developed simultaneously, energizing and reinforcing one another. The knowledge is becoming the critical resource. Digitization of information that had occurred over decades made it possible to take advantage of the Internet.

Digitization and the Internet, in combination with new software, enable companies to collaborate with suppliers and customers in new ways and thereby to raise productivity (Tuttle, 2002). Accessing information and responding quickly to customers' needs are what drive the demand for Internet collaboration in the distribution industry (Močnik, 2003b). Using collaborative Internet technology, distributors can become involved in designing and developing products more easily than in the past. Also, a distributor with direct supplier connections with a number of vendors can enable customers to check availability of needed items at these vendors and fill their orders immediately rather than having to wait while a salesperson calls each factory and then places an order. This can reduce the order cycle from days to minutes, and the software makes it possible to store information about the transactions that can be used later (Tuttle, 2002; Hill et al., 2004). Similarly, Internet technology makes it possible to bring together design engineers in collaborative systems to develop new products (Močnik, 2005; Hill et al., 2004; Keenan et al., 2002). Thus, digitization of information in conjunction with the Internet can reduce costs, increase productivity, and help producers respond more quickly to changing consumer demand.

The market efficiency impact is the most heavily studied aspect of the Internet. Several studies of the efficiency effects of the Internet (for example, Smith et al., 2000) show that the main effects in the markets are to make it easier for buyers and sellers to compare prices, to cut out the middlemen between firms and customers, and to reduce transaction costs and barriers to entry. Thus, the Internet increases competition and improves the functioning of the price mechanism. In this sense, the most important immediate (and measurable) effect of the "new" economy may be to make the "old" economy more efficient. The sources of potential cost savings are reduced transaction costs, increased management efficiency, and increased competition leading to more transparent prices and broader markets (Močnik, 2005; Močnik, 2004b). Litan and Rivlin (2001) conclude that the greatest impact may not be felt in e-commerce, but rather in a wide range of "old" economy' arenas, including health care and government, because of changes to the way information flows. Further, as a result of the Internet, there is considerable scope for management efficiencies in product development, supply-chain management, and a variety of other aspects of business performance, encouraged by enhanced competition (Hill et al., 2004). Finally, much of the benefit from the Internet is likely to show up in improved consumer convenience and expanded choices, rather than in higher productivity and lower prices.

Increased production and market efficiency and restructuring of economic activity are only at the beginning; in the long term, the most important effects of digitization and the Internet are likely to come through entirely new products (goods and services). Digitization and the Internet have already transformed existing products and activities in a number of areas. E-mail is changing the ways in which people communicate with each other, replacing regular mail, and to some extent also voice communication. The availability of on-line financial services is transforming the way we manage out accounts, pay bills, etc. On-line applications

to universities and various other institutions and e-filing of tax returns are other examples. Electronic games, electronic cards, and downloadable music are examples of consumer products that are both complements to and substitutes for existing products. On-line searchable databases and electronic journals are changing the ways in which research is done (Carlsson, 2004). All the mentioned examples above have changed our lives considerably, but many of their effects on productivity and efficiency cannot be measured in traditional way. In the next section, the reasons why the efficiency of ICT can hardly be evaluated or even impossible to do are discussed.

5. The Efficiency of Using the Computer, Digitization and the Internet

ICT is a non-neutral, capital and skilled labor-intensive technology. Much current analysis of the effects of the new wave of technological change seems to miss the necessary systemic understanding of the structural characteristics of the economic system into which the new technologies are being introduced. The introduction of ICT is not just the installation of needed infrastructure but overall implementation of new innovations and the adoption of new capital goods and intermediary production factors, which include a radical reorganization of the vertical division of labor within firms and across industries. The efficient use of ICT requires the full fabric of the economic system by which a specific and well-advanced design of the organization of the business process is needed. More generally, too much attention has been paid to assessing the effects of the rates of technological change. Too little analysis instead, has been devoted to understanding the effects of the direction of technological change. Even more obscured has remained the issue of the interactions between the rate and the direction of technological change in a dynamic and complex context, one where factors costs are allowed to change in time and in space (Antonelli, 1995, 1999).

The differing and confusing opinion about the productive use of ICT is happening because it has been suggested that the introduction of ICT at the firm level has direct effects on the productivity levels (Greenan and Mairesse, 2000). But in reality there are delays as well as differences among firms in their ability to take advantage of the ICT, which is capital-intensive technology and requires highly skilled labor with very specific and formal academic training in well-defined disciplinary fields. Capable human resources are one of the firm-specific and difficult to imitate resource that create a distinctive competency of the firm (Hill et al., 2004). However, it is not enough just to have skilled labor and sophisticated ICT. What creates the productive use of firm's resources (human and ICT) is its ability at coordinating them efficiently (Hill et al., 2004). This is the relevant reason why the effects of ICT might not showed up early and are hardly measured in traditional way, as it was the case in traditional engineering technologies (Antonelli, 1988, 1991, 1992).

The less efficient use of ICT than expected can be attributed to the general usage of specific devices and the imitation of the new organization of the business process and the purchase of an array of intermediary products and especially services which have been already tested and experimented successfully elsewhere, but cannot simple bi transferred to some other system. For the efficient use of ICT on the micro (firm) level the development of firm-specific capabilities is required. For the efficient use of ICT at the macro level the structural transformation of the industrial economy into a "new", ICT-based economy is needed, which is beyond the scope of this paper (Carlsson, 2004; Jalava et al., 2002).

6. Conclusion

For many years skeptics questioned the impact that computer-based information systems were having on productivity, even though that recent data suggest that the gains are starting to appear (Lichtenberg, 1995; Brynjolfsson and Hitt, 1995). In the paper, we discuss the meaning, measurement and spread of the New Economy, how this resulted in changes that are the consequences of digitization of information, which combined with the Internet, represent a vast new array of possible combinations that we may refer as the New Economy. The level of connectivity between actors and ideas is increasing dramatically and we have only begun to see the overall impact of these changes, of which only part is measurable.

Computers and the Internet are an indispensable part of our modern world. The worldwide economies are becoming increasingly dependent on computing and Internet technologies. Information and communication technologies create and contribute to knowledge, which is considered as one of the most important asset in the 21st century economy, the most important source of economic growth of the countries and of the success of individual corporations. In spite of being the key economic resource and perhaps even the only source of comparative advantage (Drucker, 1999), the contribution of the knowledge to business performance is hard to assess, which, from our point of view, could be the reason for a misleading judgment of some people who believe that "New Economy doesn't contribute to productivity, which according to their opinion means that it doesn't deserve to be treated as the major achievement of modern society.

So, our answer to the Gordon's question "Does the "New Economy" really merit treatment as a basic industrial revolution of a magnitude and importance equivalent to the great inventions of the late nineteenth and early twentieth century?" is – yes. One simply cannot compare productivity of the twentieth-century manual worker in manufacturing and the productivity of knowledge work and knowledge workers (Drucker, 1999).

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Endnotes

[1] During the second half of the past decade, growth in the United States accelerated and far exceeded the growth in the other leading industrial (G-7) countries (Salvatore, 2003).

ECONOMIC THOUGHTS ABOUT MANAGEMENT INNOVATION

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Abstract
The nature of management process is maintenance and innovation，and economic performance is enterprise management innovation's logical starting and ending point. But it's nonlinear complex relation between management and economic performance. Management innovation does mean neither efficiency nor nonefficiency at all time. This paper analyses each state, then gives dialectical ideas and analysis.

Keywords: *Economic, management innovation, Enterprise, efficiency, performance*

Since Economist Joseph Schumpeter put forward "innovation" for the first time, there have been a lot of researches about innovation, system innovation, technique innovation and management innovation in theory field and many enterprises. At the same time, there have been some influential theories or practice achievements in economy and management field. However, in my opinion, what are the management innovation's economic meaning and logical starting point as it's a kind of inner variable. It's a very important theory problem needed to be made clear. However, it's a pity that few people discussed about it. In fact, system innovation and management innovation own different fixed logics. If they are inadequately grafted, it's hard to bring efficiency. The external variable of fixed institution, market and cost structure decides enterprise's activities borderline and productivity. But enterprise's inner variable, such as management, organization design and incentive mechanism determines enterprise's survival ability and economic performance. Then what kind of nonlinear logic relationship is there between management innovation and economic performance? Does management innovation equal to efficiency inevitably? How to promote management innovation's efficiency? We try to answer these questions in this essay.

1. Economic Performance is Enterprise Management Innovation's Logical Starting Point and Ending Point

The nature of management process is maintenance and innovation. What's management innovation? It's a series of activities which from three dimensions of people, money and material, coordinate and reorganize systematically all of resources inside of organization, innovate systematically and partially enterprise' management ideas, operation manners, mechanism and institution etc. to realize profit maximum continuously. Professor Mingjie Rui, from Fudan University, pointed out that *management innovation means to produce a new and more effective resources' reorganizing mode. This mode can be a kind of management during the whole process, and it also can be a management in details*[1]. This viewpoint is representative. Management innovation derived from enterprises, and its core concept is reengineering which put forward by Michael Hammer and James Champy. They defined reengineering as overall and sharp redesign on business' organization structure and culture, then to realize a great performance. Generally speaking, connecting management innovation with efficiency has been widely acknowledged.

Business development could be divided into three stages: demand-driven, investment-driven and innovation-driven stages. That is to say, innovation is the most top ambit for business development. Knowledge becomes the dominant factor for business grow-up, and unconventional diffusion and flowage of knowledge also enhance the difficulty and height of management innovation. To enterprises, the efficiency of management innovation can be embodied in these aspects: it can reduce exchanging expenses, production cost, information cost and supervision cost; it also can weaken conflict between organizations and strengthen production and competition advantage. Through this way, it will produce connection, aggregation and system enlargement effect. Enterprise management innovation owns a lot of characteristics, such as, multilevel, all-orientation, thorough-process, all-of-employee, novelty, non-rule, high risk and so on. From these characters which mentioned above, we can conclude that the enterprise's management innovation has a huge room and various forms. However, there are so many different enterprises, no matter they are in the same trade or not, located under different conditions, and this makes the modes and ways of innovation are hard to be imitated by each other. In this way, the efficiency of the management innovation can not be showed thoroughly.

In 1937, Ronald Coase pointed out in "The Nature of Enterprise" that the reason of enterprise's existing was that it could save the exchanging cost of market. And the saving of cost is just achieved by management innovation. Joseph Schumpeter believed that the substance of market competition was not the price competition but the innovation competition. Enterprise's profit came from innovation, so the temporary monopoly profit which got from innovation is the necessary financial condition to keep the enterprise's innovation ability. Hence, there is a non-linear function relation between management innovation and economic performance. In fact, as a kind of economical profit organization, enterprise's operation behavior actually is a process of pursing of the expected profit maximum. Although the ways which used by enterprises to increase profit and reduce cost are various, the important reason for enterprise's management innovation is to increase profit or reduce cost. And these two goals are the effective ways to heighten enterprise's economic performance, or the activities of management innovation will end naturally because there is no value and need for it to exist.

There are some cases which can be used to prove this: For example. How can Haier Group grow up to a first-class and one of the most excellent companies in China? It's a success depends on not only the technical innovation ability of product, but also the formation and expansion of management innovation ability. Recognition and Cohesion of Haier's enterprise culture, which formed by Ruiming Zhang leaded, inspires Haier Company to become a learning-type organization. Guided by this spirit, staff in Haier keep on innovation and create a series of management measures which is suitable for China's situation. At last, they create the Haier wonder. Similarly, Galanz Company in Guangdong province is one of the largest companies that produce and sell microwave ovens in the world. Its annual production scale reaches to 6 million, and occupies more than 60% shares of the domestic market. Its products sell to more than 60 countries and areas. Its successful development trail is called "Galanz phenomenon" and "Galanz mode" by economists. The key of its success is that the company builds the all-around management innovation depending on its own condition, including setting up a special management mode, carrying out CIS and culture marketing, creating the cost management called "Five Regulations and Five Responsibilities", and so on...

All these mentioned above makes the management innovation becomes the source of enterprise's profit and enterprise can develop super-conventionally and continuously. Under

market economy condition, all of increment-flow of fund, technology, labor forces, persons with ability and knowledge factors is of pursing economic benefit. If business's economic performance is higher, these factors will be easier to flow in. The higher the marginal profit rate is, the easier the outer resources can flow into and form a good circulation. However, management innovation focuses on the reorganization of enterprise's inner existing factors but not the flowing of the outer factors. The management innovation will be more realistic, operational and urgent in the circumstance of rare resources. To the enterprise itself, as a close system relatively, when it develops to a certain level, its marginal efficiency will become lower and lower. This can be embodied by some phenomena such as rigid organization structure, low efficiency, negative rising of profit, obsolete ideas, the increasing of the super, corruption, buckpassing and disputing over trifles, low competition competency, products singleness and stale, and so on. At last, enterprises will be the soil of formalism, bureaucracy, red-tapism, gastronomy，egoism and individualism. The whole system will be disorderly, irregular, low efficient and even come to decline; sometimes it will show the sign of downfall. This is called *"Entropy Effect"* or *"Management Entropy Law"* in management[2]. Business development is not only the outcomes of size expand and continuous studying, but also the necessity of management innovation.

Then, maybe we can say, no matter from the inside and outside of the enterprise environment or from the enterprise system itself, management innovation is the inevitable result when the enterprise develops into a certain stage. The reason why enterprise needs to exist is that it can fulfill the maximum of expected profit. Under fixed factors and conditions, management innovation is the best way for enterprise to turn the expected maximum profit into reality. From this point of view, the main goal of management innovation is to fulfill the maximum profit, keep on increasing the economic performance and at last bring about the continuously development of the enterprise. Economic performance is the logical starting and end-result points of management innovation.

2. Management Innovation Does Not Mean Efficiency at All Time

The aim of management innovation is to gain the expected profit maximum. That is to say, this profit is not certain to be fulfilled. However, to enterprise, even if it has carried through management innovation, it couldn't ensure that the economic performance could attain a continuously expected increase. Because there are so many uncertain factors existing in the inside and outside environment or in the management innovation processes, the aim direction and way of management innovation can be gradually corrected and perfected only by continuous fumbling and feedback when the information is incomplete. Due to the ubiquity of uncertain factors, only the successful management innovation can bring realistic profit and economic performance to enterprise. Thereby, management innovation has its own prerequisite, it is not the blind command which follows one's inclinations, it's not the whimsicality, which does not fit to the practice. Furthermore, it does not want to pursue the unprecedented performance. Management innovation is an innovative process with high risk, but risk is not in direct proportion to economic performance. On the contrary, the relationship between management and efficiency is not symmetrical and non-linear. Wanting to get profit and speed from management innovation unconditionally can only be treated as a myth which used by enterprise to get rid of the fetters of resources, gain the high increase and excellent performance. Management innovation does not equal to efficiency necessarily at all time. The reason is that there are a lot of uncertain factors existing in each stages as well as the whole process of management innovation. The more the factors, the more the choices can be chosen by management innovation. As a result, the uncertainty of innovation has grown. We have the detailed analysis below:

2.1. The Uncertainty of the Outer Environment and the Incompleteness of Information

The outside environment is the outer restrictive and nonexpectant condition for enterprise to carry out its management innovation, and forming ultimate effects to management innovation. Actual management innovation is a kind of innovative working which would be carried out under the circumstance of uncertain conditions and incomplete information. Only those businesses which reflect agilely to outside changes of circumstances could exist and develop. There are some disadvantages which does not benefit the management innovation. For example: the incomplete surrounding which existing in the outside of the enterprise, the over-attention to political performance and over-intervention of government, the lack or unsuitable of selecting mechanism, the deviation and discontinuous of policy orientation, the imperfect or short of law, and so on. These above factors also influence the manager's innovative impetus. Thus the aim of enterprise' management innovation lies in the acclimatization, furthermore in the making use of and even inducting environments.

2.2. The Dynamic and Complicated Characteristics of Management Innovation

In the final analysis, persons are fundamental in the process of management. It implements its function through organization' dynamic activities such as: organizing, planning, coordinating, controlling, commanding and so on. Management innovation can't be conducted repeatedly as technique innovation does. Similarly, it can't conduct tests at selected points and then be spread as system innovation does. It possesses the character of blur, non-repeating and non-popularizing process; indirect and retardative effect; diversity and multi-layer content; and irregular method. All this characteristics makes the management innovation obscure, complicated and uncertain, just like "the moon floating on the surface of the lake" and "the flower blooming in the fog". If we could build a good each-other restrictive and supervise mechanism for innovation main-body's might, we would change the close innovation process to open-up and equity.

2.3. The Limit Rationality of Innovation Main Body and the Limited Innovation Ability

From the viewpoint of the limit rationality of innovation main body, when there is short of reference frame in innovation main body's activity target, judgment standard and expectation forecast, etc., the enterprise can only choose limited, low level and unclear or even wrong target. This will directly lead to low level of innovation, unsatisfied performance or even the failure of innovation. The management innovation power of some state-owned enterprise's leaders is only stay at low stage such as keep up state property or increased, change deficient state to increase surpluses. They don't have initiative and consciousness. There is only a few of enterprisers who can carry out the management innovation from a strategic point. For example, Xinxian Zhao of Sanjiu Group, Ruimin zhang of Haier Group, Runfeng Ni of Changhong Group, Chuanzhi Liu of Lenovo Group and Xuan Wang of Beida Fangzheng Group. Low ability of innovation, receive and cooperate passively with higher authorities in innovation, copy word for word without consider about reality, study without purpose, blandish higher-up, think much of form, carry out unpractical management for several decades without reformation, etc.

2.4. The Indispensability of Sustainable Resources

The management innovation activity itself can not assure the efficiency and profit maximum. It needs the sustainable resources such as ethics, enterpriser's prestige, system innovation and technology innovation to achieve the above targets. An efficient and profitable management

innovation further need “rational economic persons” obey the social common ethics which based on “Honesty and Credit”. Marx had said that ethics was a special way which used to control the world. When the criterion of ethics based on commutative trust and faithfulness does not really establish in the market economic activities, the validity of the contract signed by enterprises in economic activities will be discounted. And some of them maybe suffer economic loss because each side of them is making use of the management innovation only from the point of their own benefit. The prestige and personal charm of enterprisers are the important reason why the detail of innovation can be implemented. Management innovation also needs outside impetus----institutional innovation. It can make outside institutional changes actively into interior one and reduce enterprise’s social costs. D. C. North had pointed out that *institutions played a more fundamental role; they were the basic factors that determined the long-term economic performance*[3]. Institution innovation itself could break intrinsic equilibrium state of system, transfer intrinsic innovative path of system, then realize the turnaround from old character to new one. Institution innovation is the inexhaustible headspring both of macroeconomic increment and individual manufacturers to realize profit maximum. So it is maybe to say, management innovation which departed from institution innovation, would be difficult to image. Management innovation must depend on technology innovation, and these two factors together form the investment combination. Technology innovation offers new tasks to management innovation directly or indirectly and pushes the latter one into deeper stage.

2.5. The Inaccurate Forecasting of Management Innovation Performance

Although researches in existence indicate that the contributions for management innovation to economy increasing may be measured by quantity methods, it can’t change the essential stamp of uncertainty in the process of management innovation. The products, working and policy performance of management innovation will not be forecasted accurately. This includes two situations: optimistic lean and pessimistic lean. The former means the actual result is better than the forecasted result, and the latter means the actual result is worse than the forecasted result. In practice, most of these inaccurate forecasts turn to be pessimistic tendency, such as innovation’s input is more than anticipation, the innovation’s cycle is longer than plan, the innovation performance is lower than forecast and so on. All of these lead to the debasement of management innovation’s efficiency and the increasing of invalidity. We can see that the ideas of absolutizing the management innovation’ efficiency has influenced the area of policy decision-making behavior and value judgment. Some phenomena such as losing control of scale-expanding, over-speed change of organization structure, improper management method and fictitious management idea make management innovation walks with difficulty.

3. Management Innovation Does Not Mean Non-efficiency at All Time

The management innovation can realize enterprise’s inner efficiency by dividing the work properly, reducing the cost, increasing the management effectiveness. This is also the reason why management innovation can exist. Therefore, if restrained conditions were properly, the amount of innovation profit will be more than the amount of innovation cost by effective management innovation. The key rests with the following points:

3.1. Choose Effective Management Innovation at the Beginning

Management innovation can be divided into effective form and ineffective form. At the first stage, nobody can promise any management innovation’s effectiveness. The enterprise itself also can’t know what kind of innovation is profitable, and sometimes it will lead to the waste

of resources, the overlap of organization structure or running disorderly, staff idling and low economic efficiency. Management innovation needs people to pay a high price, and allows people to make mistakes and take a failing risk. Generally speaking, although there is similar phenomenon like Gresham' law of "Bad Money Expels Good Money" under certain situation, ineffective management innovation is always the precondition of effective management innovation. This is inevitable in most of the situations and always become the impetus of new management innovation. Pursuing effective management innovation should undoubtedly become the long-term policy orientation and aim-choosing of enterprise.

3.2. Depend on Right Innovation Path in Order to Carry Out Effective Management

Innovation often means that it has chosen a right initial path. D. C. North, the winner of Nobel economy prize, pointed out in "Institutions, Institutional Change and Economic Performance" that institutional change possessed the characteristic of path-dependence. *Institutional changes possess mechanism of recompense increasing by degrees and self-strength. This mechanism can make that institutional change once marches into one path, its fixed direction will be self-strengthened in the further development* [4] Institution economy believes that, different system arrangement will produce different rational economic response, and produce different economic performance further. In fact, different institutional innovation possesses character of path-dependence; there are also existing self-strengthened and path-dependence in the process of management innovation. Generally speaking, to any management innovation, there will be four possible outcomes because of the variety of path-dependence: there are multi-equilibrium which contains many solving methods instead of singular method; originally partial path excellent and then losing efficiency; choosing a kind of innovation path which will operates easily but fixes people's thought; firstly choosing the correct path, then under the effect of self-strengthened mechanism, appearing the phenomenon of marginal profit increasing by degrees, and at last entering into a benign circulation which is mutually conditional, mutually accelerating and continuously optimizing. On the contrary, because of a wrong choice, there will appear inefficient management innovation and lead the management innovation fall into a long-term lock-in state. From the above, we would find that the path of management innovation is just like a one way street or the road without backpedaling. But it is really the winning method f successful enterprise. Better and Andrew pointed out that *although all of the most successful companies of the last century had their own special point of success, they all obeyed a common mode—correct path—when they chose working method, production ability, market and value creation*[5]. The character of path-dependence for management innovation decides the evolution orientation of management innovation. Then, how to choose a correct path? Butter and Andrew brought forward three principles: simplicity, discipline and commercial drive.

3.3. Entrepreneurs' Spirit

Enterprisers are the heterogeneous human capital[6] which possess the productivity form of marginal recompenses increasing by degrees. They devoted to economic performance for enterprise and economy increasing for society through technique progress. They own the high degree of watchfulness towards the outside surroundings, and they can timely catch up the opportunity which existed in enterprise to improve economic performance. Besides these, they can find out rules from accidental success and make the management innovation could be carried out continuously, stably, orderly and high-efficiently. Just by their creative social necessary working, special personal charm and enterpriser's spirit, they build up a new productive function which makes the whole management process full of vigor, creativity and performance. The vigor and state of enterprise has reached to the most high point and

represented exteriorly as the economic performance of enterprise's continuously development. This enterprisers' spirit make the life basis of the entire enterprises so firm that they possess super flexible ability to face the market changing continuously. Of course, other person in enterprise also takes part in management innovation, but the management core layer leading the activity of management innovation. Undoubtedly, in order to realize the efficiency of enterprise's management innovation, we further need to focus on some important and pivotal key points such as the push of outside institution and technique, the redesign of manager's salary inspiring mechanism, the relocation and redesign of the enterprise's achievement, etc. In a word, we still shoulder heavy responsibilities and need to keep the spirit of exploration in the future.

4. Dialectic Thinks on the Management Innovation

The nature of business means innovation, and satisfactory performance is only temporary outcome. When business captured approving performance, top managers would often ignore some signals which represented management innovation, so as to drop out best opportunity of making management innovation. Business then will be on a sticky wicket in the continuous development process. Top managers of monopoly enterprises have more innate inertia of innovation than competitive enterprises, so as to difficult to brought forward ideas for management innovation. Some of succeeded enterprises' competency will decline distinctly because of lack of challenge spirits to innovation, though profits were vast at one time. So management innovation of enterprises will act not only on the economic performance, but also on the effectiveness and efficiency of entire system. Businesses' management innovation will play conformity, harmonizing and directing roles in the system of business. From the point of view, business' management innovation has more significance than technique and product innovation.

Management innovation will be restricted and obliged with dominant values of innovation main-body. Decision-making of management innovation must embody and accord with rational requests from persons，and meet nonrational demands of persons just as sentiment, mentality and so on. Otherwise decision-making of management innovation wouldn't sustain business although it's reasonable.

Management innovation is a two-edged sword. It has characteristics of protecting and destroying, of ascertaining and randomicity, of obverse and negative functions, to the economic performance of businesses. And its function, ways has various kind of form. Our acquaintanceship to business' management innovation is still a corner of iceberg.

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ECONOMIC CONVERGENCE OF THE EUROPEAN MEMBER STATES FROM POINT OF VIEW OF ECONOMIC-CULTURAL ORIENTATIONS

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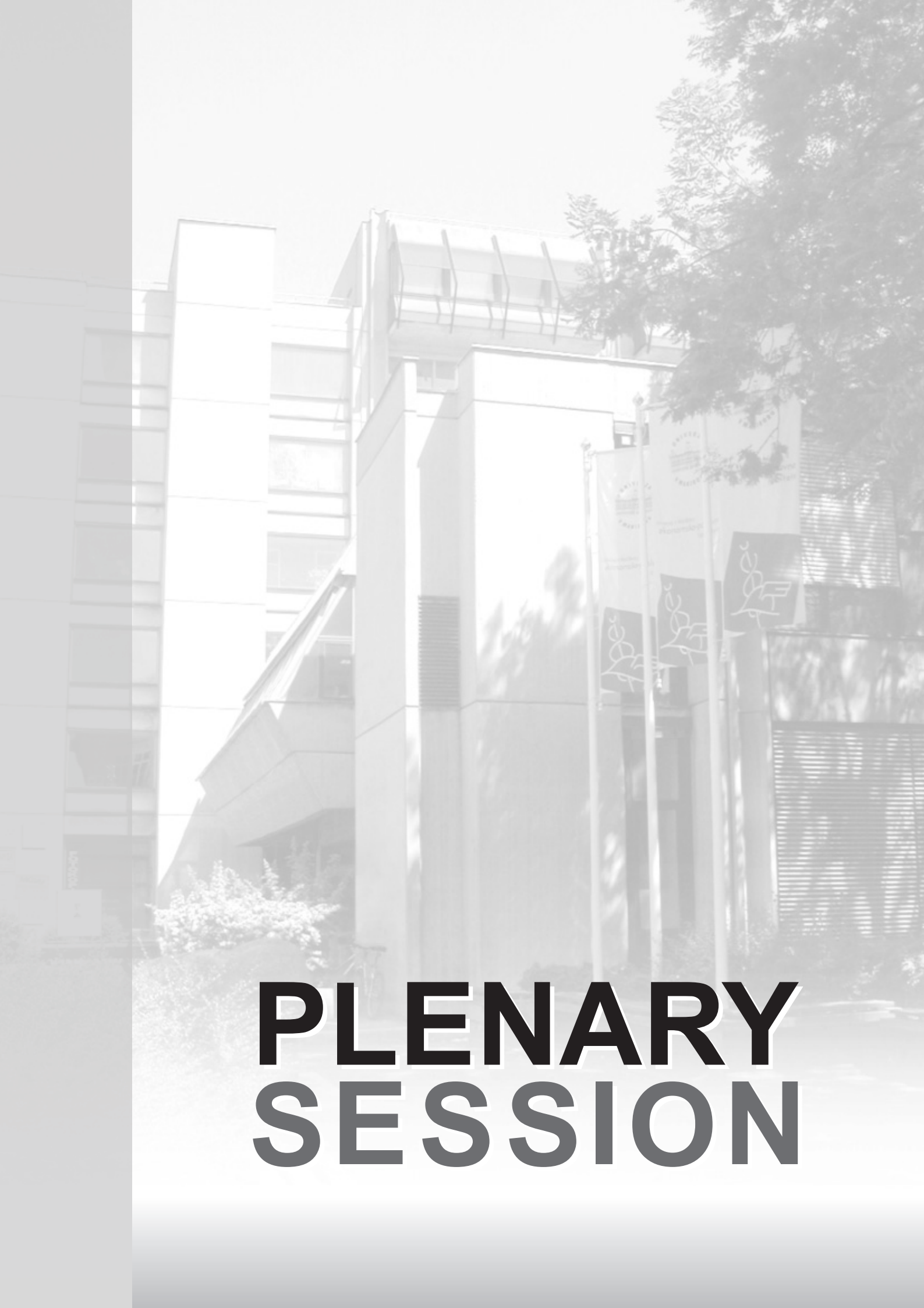
Abstract

EU member states are in the process of convergence, especially in the economic sense, which is being supervised by the Maastricht convergence criteria before entering the European monetary and economic union. Many speculations have been made, that the European cultures are converging as well. But is this really the case? Are EU member states becoming "one big happy European family" in cultural perspective? We tried to solve the puzzle by using empirical evidence in economic-cultural and economic context. In our research we combined soft variables and hard economic indicators.

By analyzing the database European values study 1999/2000 and World values survey 1990/1992 we selected 5 economic-cultural variables (identical in both, thus suitable for comparison). They were compared on a national level[1] for 22 European countries (12 old EU member states, 8 new EU member states and 2 candidate countries). First we have simply compared European countries according to the each economic-cultural value orientation. Basically we can distinguish 2 groups of countries – the developed countries and the transitional ones. Than we compared value orientation with CPI (corruption perception index): results also showed that the desired state is far from the real picture.

The development through time (in one decade, years from 1990 till 1999): comparison of the average value of 5 economic-cultural variables and HDI (human development index) was used. Results showed that there is an overall positive trend in the economic culture, that the European countries have made progress on the national value orientation level and real economic level (economic development, well-being). Results were discouraging for Slovenia, which made progress in the national well-being (prosperity, quality of living), but has fallen and is lagging behind the developed European countries from economic-cultural perspective.

[1] According to operational model of culture (Hofstede 2001) on the national level value orientations are prevailing, as oppose to the individual level, where behavior is emphasized. Thus on the national level value orientations are cultural indicators.



PLENARY SESSION

THE CONTEMPORARY REORDERING OF SOCIAL KNOWLEDGE: THE ROLE OF SYSTEMS APPROACHES AND COMPLEXITY STUDIES

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The emergence of the social sciences in the late nineteenth century reproduced in the disciplines of the "sciences of man" the long-term, ongoing tensions between the sciences and the humanities. On the one hand, the case was made that the social sciences would be "value-neutral" and free of the commitment to one or another set of value orientations that had characterized analytical frameworks in the humanities, but which were explicitly denied in the natural sciences. Thus, their findings could be deemed authoritative and employed in what could be argued were unbiased policy decisions.

The trade-off, on the other hand, was the internalization to the social sciences of a set of antinomies: for instance, agency-structure, qualitative-quantitative, free will-determinism, interpretation-explanation. Systems approaches (e.g., General System Theory, Cybernetics, Sociocybernetics) and complexity studies (order-in-chaos, order-out-of-chaos, fractal geometry) directly challenge the bases of these binaries and suggest the very different shape that social knowledge will take in the future.

It will be argued that these developments represent a new concern for spatial-temporal wholes comprised of relational structures representing the persisting regularities normally associated with a "scientific" approach, but that simultaneously, these same relational structures evidence the phenomenological time of their reproduction and change (the ineluctable reality of the arrow-of-time), so capturing the play of incommensurable differences associated with a "humanistic" approach. Difference, of course, implies values, suggesting that the search for universal, timeless, deracinated truth in the human world must give way to analyses of possible futures and modes for their attainment.

REQUISITE HOLISM BY CO-OPERATION OF SYSTEMS THEORIES: AN INVENTION OR INNOVATION IN INQUIRY OF INNOVATION[1]

Matjaž MULEJ[2], Štefan KAJZER[3], Vojko POTOČAN[4], Bojan ROSI[5]

Abstract: Systems theory was created in interdisciplinary co-operation. So was cybernetics. Thus, their authors made an innovation by attacking exaggerated specialization. The latter is preferred in scientific inquiry, especially the traditional one, taking place per specialised disciplines, and in practice. Even systems theory and cybernetics conferences see few authors' inter-disciplinary co-operation. Their contributions may therefore be questionable, or limited in scope. Due to lack of holism innovation results sometimes only, and innovation in inquiry is needed. A new and different attack on exaggerated specialization is suggested here.

Key words: Bertalanffy**,** Critical Systems Thinking, Cybernetics of Conceptual Systems, Dialectical Systems Theory, Dialectical Network Thinking, Einstein, Soft Systems Methodology, Systemic Co-operation, Viable System Model

0. THE SELECTED PROBLEM AND VIEWPOINT OF DEALING WITH IT

A lack of systemic, i.e. holistic thinking, has been an old illness of humankind, and it culminated in the 20th century in two World Wars, world-wide economic crisis (in 1914-45) etc. It limits human capacity of invention and innovation. System theory and cybernetics surfaced and evolved right after 1945, as a response. They both need and support trans-disciplinary and inter-disciplinary co-operation. Most specialists have found these capacities less important than their own limitation of holism inside their own specialisation. A variety of both systems theories and cybernetics resulted. Their orientations are rather different from each other. Complexity is big enough inside many specialized disciplines and practices for this move to make sense. But it still means a simplification, which departs from the original reasons for systems theory and cybernetics to surface and from the humanity's need to solve problems in a less one-sided and therefore less poorly efficient and effective way. A middle way between too much simplification and too much complexity of thinking is needed, but only sometimes achieved. To help humankind meet this need, Mulej/Kajzer suggested the *law of requisite holism*. (Mulej, Kajzer, 1998; Rebernik, Mulej, 2000). It complements Mulej's concept of the *dialectical system*, which is an entity of insight networking all crucial viewpoints and thus all crucial systems as mental pictures of the existing real, tangible or spiritual, objects under investigation. (Mulej, in Mulej, Ženko, 2004, and earlier, since 1974). Several systems theories, formulated by other authors, seem to jointly / in synergy support the

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law of requisite holism (See: Christakis, Bausch, co-chairs, 2003). Synergy emerges from their co-operation/interaction.
Co-operation of specialists from different disciplines is urgently needed for the requisite holism of their work to be attainable. Systems theory is young, but supposed to support system thinking, which is a millennia old good informal practice of requisite holism of the successful ones (Delgado, Banathy, 1993; Mulej et al, 1998). But the one-sided and therefore failing ones tend to prevail: 80% of new companies fail in a few years (Gerber, 2004). They and all the society would be better off, if the less one-sided views were practiced (Ackoff, 2001; Ackoff, Rovin, 2003; Capra, 2002; Christensen, Anthony (2004); Christensen, Raynor, 2003; Collins, 2001; Collins, Porras, 1997; etc.). Humans can no longer, if ever, be interdisciplinary professionals as individuals due to the modern huge amounts of knowledge and information. Thus, systems theory should support specialists' co-operation much more than so far. But it does not seem clear to all authors who claim systems thinking, how is it defined (Mulej, Potočan, 2004). A new model of systemic co-operation might help. We can start from Leonardo da Vinci and then move to modern times with Einstein.

1. LEONARNO DA VINCI'S AND ALBERT EINSTEIN'S THOUGHTS LOOKING LIKE SYSTEMIC THINKING AND LEADING TO INNOVATION

Many know that there has been, centuries ago, a certain Leonardo da Vinci. He is known as artist of the supreme quality, but he was also a great researcher. One can find in him a pioneer in the fields of creative thinking, accelerated learning, and innovative leadership (Gelb, 2004). Gelb's finding is summarised as follows (Figure 1, from p. 10; thanks to New Moment):

7 DA VINCIAN PRINCIPLES	*What is it?*	Look at your own mind map from the perspective of the 7 Da Vinci principles
1 Curiosita	An insatiably curious approach to life and an unrelenting quest for continuous learning.	Am I asking right questions?
2 Dimonstrazione	A commitment to test knowledge through experience, persistence, and willingness to learn from mistakes.	How can I improve my ability to learn from my mistakes and experiences? How can I develop my independence of my thought?
3 Sensazione	The continual refinement of the senses, especially sight, as the means to enliven experience.	What is my plan for sharpening my senses as I age?
4 Sfumato (Literaly "Going up in Smoke")	A willingness to embrace ambiguity, paradox, and uncertainty.	How can I strengthen my ability to hold creative tension to embrace the major paradoxes of life?
5 Arte/Scienza	The development of the balance between science and art, logic and imagination. "Whole brain" thinking.	Am I balancing Arte and Scienza at home and at work?
6 Corporalita	The cultivation of grace, ambidexterity, fitness, and poise	How can I nurture the balance of body and mind?
7 Connessione	A recognition of and appreciation for the inter-connectedness of all things and phenomena. Systems thinking.	How do all the above elements fit together? How does everything connect to everything else?

Figure 1: How to Think like Leonardo da Vinci

For details see Gelb (2003) or its original in English. Thus, after the ancient Chinese yin-yang and ancient Greek dialectics, we can see another step in the evolution of informal systems thinking as a specific attribute of successful individuals, communities, and societies. Let us consider one more!

Many know that there has been once upon a time a certain Albert Einstein, author of a certain special and a certain general theory of relativity, Nobel Prize Laureate, etc, a genius. Recently a book was published (Thorpe, 2003) offering suggestions what should one do in order to be able to think creatively like Einstein. We will not reproduce recipes, but some quotations of Einstein that look like systemic thinking about inquiry (in our translation from Slovenian). Their common denominator reads: *break the laws, free your imagination, do no let your education put limits on your inquiry, and be persistent, do not let tradition control you, think with both hands, i.e. with networking of several viewpoints* – for holism and discovery, possibly innovation. Here are some quotations of Einstein's ideas:

- Common sense is a set of prejudices, which we have collected before our age of 18. (p. 9)
- To approach a topic always in the same way and, at the same time, to always expect different results, is the most reliable sign of madness. (p. 21)
- Difficult problems we work on cannot be solved, if we stay on the same level of thinking than in the time of making them. (p. 31)
- The main characteristics of our time seem to be perfection of methods and confusion of intentions. (p. 35)
- Things should be as simple as possible, but not simpler. (p. 41)
- If we knew what are we doing, we could not speak of inquiry. (p. 53)
- The most incomprehensible fact of our world is that the world is comprehensible. (p. 56)
- Imagination matters more than knowledge. (p. 63)
- We must develop child's curiosity, and than direct this child to areas that are important for society. (p. 65)
- When mathematical laws speak of reality, they are unreliable. And when they are reliable, they do not speak of reality. (p. 117)
- I have no special talent. I am just passionately curious. (p. 121)
- Realism is only an illusion, but a very persistent illusion. (p. 123)
- The point is not that I am clever. I just persist longer with problems. (p. 141)
- The secret of creativity is the question how to hide one's sources. (p. 148)
- If you want to become a model member of a sheep herd, you must first become a sheep. (p. 167)
- Two thinks are endless: universe and human stupidity; and I am not totally sure about the universe. (p. 167)
- It is important that we never stop asking questions. (p. 195)
- Actually, very few people watch with their own eyes and feel with their own hearts. (p. 198)
- Curiosity has its own special reasons to exist. (p. 200)
- Who reads too much and uses brain too little, will some day become lazy and start to think. (p. 201)
- All things that count cannot be counted. Not every thing counts that can be counted. (p. 213)
- Objectively, there are absolutely no limits to what humans with devotion can grab from Truth. (p. 231)
- Very few individuals are capable of expressing their views, which differ from prejudices of their social environment, and remain unconcerned. Most individuals cannot even formulate such views. (p. 10)

Einstein's style of thinking is a systemic process of four steps (Thorpe, 2003, p. 25, see Fig. 2):

Step	Einstein's idea	Thorpe's comment
1	*Find the right problem*.	You need an open problem allowing for innovative solutions that differ from your initial expectations. Limiting problems tend to have so many prohibitions, that they cannot be solved. An open problem allows for any solution that works. A good problem broadens possibilities. Seeking the real problem requires a lot of thinking, and especially so, when the solution seems obvious.
2	*Stop using routines*.	Einstein made biggest successes, when he was ready to consider any idea, especially the ones making no sense. You will leave routine aside, once you start to create new ideas about which you have not been ready to think seriously earlier.
3	*Break the rules*.	Breaking the rules is a goal-oriented and planned way for seeking the solutions. If you cannot find solutions between all the possible ones, you must start thinking about the impossible ones – you must break some rules.
4	*Develop the solution*.	Einstein was developing relativity into a usable theory for long years. When we come to think of good solutions, they rarely seem good. When we compare them with the established views, then even the most radical ideas seem faulty. If we want to develop an idea into a good solution, our judgement must wait, and we must seek help and make several mistakes, too.

Figure 2: Einstein's process of creative work on an informal systemic basis

His process can obviously lead to new inventions and discoveries, although not necessarily to innovation, defined as: invention + successful application (OECD, 1971; EU, 1995; EU, 2000; EU, 2002; Afuah, 1998 and 2003; etc.). Thus, systems theory is an innovation.

2. LUDWIG VON BERTALANFFY – INVENTOR AND INNOVATOR OF THINKING

L. v. Bertalanffy's (LvB's) General Systems Theory was called uncommon sense (Davidson, 1983; compare to first Einstein's sentence above!). It was so with full right, we see today: it deviated from the established routines. LvB invented something that became innovation: he said explicitly that he had created the General Systems Theory in order to attack the exaggerated specialization and attain a new, broader world view, a reorientation of thinking (Bertalanffy, 1979, p. VII). – LvB was breaking the rule of his and our time:

- *LvB found a real problem* – the one of exaggerated specialization endangering survival of humankind and the planet Earth, if we people go on behaving in the way that has caused World Wars (and other wars, for that matter) and ecological destruction. This wrong human behaviour is based on too one-sided/biased thinking resulting from exaggerated specialisation; it causes critical oversights, because many specialists do no feel and act in interdependence.
- *LvB stopped using the established routine* – he did not invent another specialized science working on another complicated issue like the traditional sciences do (with full right and resulting in both critical limitations and precious results). He switched from complicatedness to complexity resulting from relations and from overseen synergies resulting in new attributes of the wholes/entities that their individual parts do not possess alone.
- *LvB broke the rule* – the prevailing rule has kept saying, over several recent centuries, that one must specialise and specialisation is enough: the whole's attributes were said equal to the

sum of attributes of its parts. Systemic thinking goes beyond this limit, and systems theory tries to follow and support it (but no longer in all of its versions / streams of today).
- *LvB developed a solution* – he worked with an interdisciplinary co-operating team. His result is seminal: the General Systems Theory offers bridge among many sciences and backs an array of systems theories created later on, partly to be used inside the traditional disciplines, partly to build bridges between them and to enable their co-operation.

The open issue for us reads: many humans of today are not able to really accept LvB's solution. Many cannot give up their exaggerated specialisation in order to replace, or complement, it with LvB's concept of total holism – behave like citizens of the entire world and care for the entire biosphere (See: Elohim, 1999). There is too much knowledge around for us humans not to be narrow specialists, which is both an unavoidable, useful, and dangerous fact. Many can even not accept LvB's solution as complementary to their own specialization and interdependent with it. (See most professional/scientific journals and conferences, including those on systems science and cybernetics, and curricula around the world. They are too many to quote. See a case in Mulej, 2005)

And this is why we have suggested the *dialectical system* (Mulej, 1974, and later, such as 1976, 1977, 1979, 1992, 1998, 2000, 2002, 2004) and fortified it with the *law of requisite holism* (Mulej, Kajzer, 1998; Rebernik, Mulej, 2000). We have found it, and find it today as well, attainable by creative co-operation of mutually different specialists using *ethics of interdependence*. This applies equally to the daily routine-work problems of a more complex character and to the scientific inquiry, including the one about innovation, or leading to it.

3. FOUR PHASES OF INQUIRY REQUIRING CREATIVE CO-OPERATION – A DISCOVERY AND INNOVATION IN DIALECTICAL SYSTEMS THEORY

Our three decades of official dealing with the Dialectical Systems Theory have shown that we were right when breaking the rule and asking questions such as:

- Do you hear more about defining the objectives or about carrying them out?
- Do you hear more about desired objectives or about holistically grounded ones?
- Do you hear more about independence and dependence, or about interdependence?

The usual response has been: routine stresses *carrying out* the *desired* objectives and forgets about *interdependence*. It detects: (1) the bosses' right to set objectives (rather than their duty to do so, and to be requisitely holistic with the biggest breadth of all); (2) their right to set objectives as they please, which includes ir right of one-sidedness, even a total one, if they please so; (3) the subordinates' right to feel dependent and hence entitled to irresponsibility. As a response to the resulting bad experience, the strategic and other planning has emerged in politics, army, business, etc. (Duh, Kajzer, 2002; Belak, 1998; Kralj, 2000, and earlier; etc.) Still, this has meant no end to mistakes resulting in e.g. loosing elections, letting Hitler and similar individuals and groups seize power, loosing wars, going bankrupt, dying in traffic, abusing drugs, etc. (Daily newspapers report as a curiosity, that after the WWII there have been about 2.500 wars with about 50 million victims, and that in the last ninety (90) years ninety (90) times more people have died in wars than in previous five centuries. – See: 7 dni, 16 Feb. 2005)

Such terrible events mean that the decision makers have not paid enough intention to the phases of the work process before the definition of objectives and to their impact on the later phases. We express this need with the law of hierarchy of succession/process and

interdependence. This law requires us to see any work process, creative or routine, as a process of four main phases:

1. Preparation of the objectives definition.
2. Defining the objectives and elaborating tasks and processes for their realisation.
3. Realisation of objectives.
4. Monitoring of results and intervening by feedback for objectives and results to not be too different.

Leonardo's seven principles apply to all phases and all sub-phases in them. Einstein's four phases apply to creative work: his *Find the right problem* – fits in our phase 1; his *Stop using routines, Break the rules, Develop the solution* (unless solution is the objective to be realised in our phase 3) – fit in our phase 2. Our phases 3 and 4 must be added in daily work for both innovation and routine to result.

In a routine work of production, school teaching, judging in court of law, or any other process, these four phases are not easy to control on a holistic basis. But this control is a far more complex problem in inquiry and even more so in an invention/innovation process. In it, breaking the rule, at least in terms of content, is a rule to be standardised. At the same time, content of an inquiry result depends on methods applied in this inquiry. Thus, it is not good enough to have a strict technological norm (which fits best in routine jobs), but a framework one that is experience-based and a very adaptive description of processes and methods; this is actually the rule to be standardized. We call them *programoteque* (Mulej et al., 1982, and later, including Mulej, Ženko, 2004).

In everyone of the four phases co-operation tends to be a must, because it tends to provide for the necessary requisite holism best. In a business case, about which we know most, this may look briefly as follows:
(1) *Preparation of objectives* requires consideration of the expectable market evolution, expectable technology evolution, related human resources and equipment needs in the production as well as in the accompanying business functions, etc. This can best be done requisitely holistically with creative co-operation of differently specialised professionals.
(2) *Defining of objectives* is less than phase (1) a matter of professional views and their synergies alone: it includes the owners' and investors' and managers' feelings, emotions, values and knowledge as well, not only the ones of professionals. It still can best be done requisitely holistically with creative co-operation. It includes elaborating the tasks and processes of their realisation.
(3) *Realisation of objectives* (by execution of the tasks related to or resulting from the defined objectives) requires less of the long-term view of professionals involved. The term professionals includes all, assembly-line workers and cleaning personal as well as operation managers and researchers; all specialists are equally important in their parts of the shared process, although they may be less equally influential. But nobody is there, if not needed for one's specific professional knowledge and skill. This job can best be done requisitely holistically with creative co-operation too.
(4) *Monitoring and intervening* requires links between the previous three phases, and thus another concrete type of co-operation of specialists. It also brings us back to earlier phases.

What all four main phases have in common is the *need for co-operation* based rather on differences in knowledge, skills, and values, than on shared attributes of humans at stake. This is why we have stressed their *interdependence* and their need for *ethics of interdependence*. (Kajzer, Mulej, 1997; Mulej, Kajzer, 1998; Rebernik, Mulej, 2000) Many specialists seem to

have not been educated in this ethics, which causes them to oversee many complexities (See: Hindle, 2004; Richardson, 2005; Rosi, 2004; Scott, ed., 2004).

The lack of ethics of interdependence is equally problematic in the inquiry processes. They also consist of the same four phases, on a general model level, but there may be less routine and more of a narrow specialisation involved. (Germ Galič, 2003; Jelink, 2004; Kokol, 2002; Markič, 2004; Rosi, 2004; Udovičič, 2004; etc.) A new way seems necessary to support interdependence and interaction on its basis.

Such new general model of systemic co-operation might perhaps result from a new synergetic combination of many well-known contributions called the Soft Systems Methodology, Viable System Model, Critical Systems Thinking, Cybernetics of Conceptual Systems, Dialectical Systems Theory, and Dialectical Network Thinking, as follows.

4. A GENERAL MODEL OF SYSTEMIC CO-OPERATION RESULTING FROM CO-OPERATION OF SEVERAL SYSTEMS THEORIES - NEW INVENTION

Let us brief the attributes of the systems theories mentioned, which we find complementary and interdependent, in order to sketch such a general model of systemic co-operation[6]:
(1) *The Soft Systems Methodology* (SSM) sees in the human activity less reliability of the output resulting from an input than in machines or nature. Its four basic principles include (1.1) learning, (1.2) cultural diversity, (1.3) wish for co-operation, and (1.4) the two ways of thinking – in the real world and in the abstract/laboratory environment (See: Mingers and Uršič, in: Mulej et al., 2000, p. 434 ff.). It supports the work process by its very adaptive model of seven phases; it supports the requisite holism by guidelines of thinking in these phases.
(2) *The Viable System Model* (VSM) requires the organisational hierarchy to not become a commanding one, but to be enriched by information exchange and provision of all the necessary sources and information for every part of an organisation and the entire organisation to be able to meet the law of requisite variety. The one-sided commanding hierarchy is replaced. (See: Espejo, in: Mulej et al., 2000, p. 368 ff.) Communication serves the requisite holism.
(3) *The Critical Systems Thinking* (CST) requires managers (which may mean all persons controlling any situation or process) to combine (3.1) critical attitude replacing acceptance of routine; (3.2) social awareness replacing the too narrow thinking about consequences of a decision; (3.3) complementarism in theory, meaning the know-what and why, and complementarism in methods, meaning the know-how and why, enabling co-operation replacing exaggerated specialisation and horizon; (3.4) social and individual emancipation, meaning equality in chances for creativity. (See: Jackson, in: Mulej et al., 2000, p. 446 ff) CST includes Total Systems Intervention (TSI) as its applied methodology. It serves the requisite holism, too.
(4) *Cybernetics of Conceptual Systems* (CCS) requires the influence of humans over humans to be seen as a social process, rather than a biological and machine one only. It is not only a description of reality to which humans are subordinate. It rather considers humans both as biological and thinking, constructive and influential individuals and groups, and societies, including their tolerance for each other and mutual differences. (See: Umpleby, in: Mulej et al., 2000, p. 344 ff). It serves the requisite holism as well.

[6] Our suggested model differs from »System of Systems Methodologies«, because we do not want a toolbox to select from, but synergies of systems theories. (See: Jackson, in: Mulej et al., 2000, p. 446 ff, for comparison/reference)

(5) *The Dialectical Systems Theory* (DST) sees the humans' need to meet the law of entropy by using the law of requisite holism and the law of hierarchy of succession/process and interdependence. Whether or not this capacity can be reached, depends on personal attributes of the involved humans, rather than on their circumstances and conditions, even preconditions of life and work alone; it depends even less on their available tools alone, including theories and methods or methodologies. Therefore, it is essential to impact humans' subjective starting points (made of knowledge and values in inter-dependence, i.e. dialectics) and consider the subjective starting points' interdependence with the objective ones. Humans should be aware of their need for creativity, even innovation, and for requisite holism of thinking, decision-making, and action, as well as for knowledge about why, what, and how to do for innovation and holism to flourish. (See: Mulej, in Mulej et al., 2000, p. 81-284; Mulej, Ženko, 2004) DST includes USOMID as its applied methodology. It serves the requisite holism, but differs from others by impacting human attributes quite directly.
(6) *The Dialectical Network Thinking* (DNT) provides for a new synergy of the Network Thinking methodology that has been created three decades ago in St. Gallen, and of the Dialectical Systems Theory (see 5 just above), as well as Project Management, as a framework methodology for understanding and managing complex organisational situations and processes (Rosi, 2004). It serves the requisite holism as well.

We can see all the briefed six *methodological systems theories* as interdependent and complementary in provision of the human capacity of co-operation, including the one in inquiry and invention and innovation processes:

- Humans act on the basis of their *subjective starting points*.
- The latter can support either routine or one-sidedness or innovation and holism. Thus, in modern conditions, they should receive an *impact toward holism and innovation.*
- This can be attained by the *DST* and supported by the *CCS* and *DNT*, if the influential persons / society support holism and innovation rather than one-sidedness and routine.
- Once such an impact is attained, the process of creative co-operation (aimed at innovation) can receive support from principles and models of *SSM, TSI, USOMID, and DNT*.
- It can, further on, receive an organisational support from *VSM* and its stress on information and communication rather than commanding subordination.
- It can receive support in terms of a requisitely holistically organised process from e.g. DNT.
- This process might be run well by managers using *CST*.
- Such a general model of systemic co-operation can be standardized as a framework process of decision-making. (See: Potočan, in Mulej et al., 2000, p. 481 ff)

5. A SKETCHED APPLICATION OF THE SKETCHED NEW META-MODEL TO THE INQUIRY PROCESS AND CO-OPERATION IN IT – TO SUPPORT INVENTION AND INNOVATION

We quoted earlier: If we knew what are we doing, we could not speak of an inquiry. (Einstein, in: Thorpe, 2003, p. 53) But we still can apply the above general model to inquiry. Even more, in inquiry this might be even more crucial than in the daily routine processes, because *inquiry* creates new bases for a later routine work, but it does not run as a routine work. It has therefore, in terms of the law of hierarchy of succession/process and interdependence far *more influence* than the routine processes have, or the uncritical, poorly co-operative, and narrow-minded managers can attain.

The latter difference makes a big part of the bottom line of the *worldwide difference* between the 20 % of humankind that are rich because they are innovative and therefore productive to a much higher degree than the other 80 % are. (See e.g.: Dyck, Mulej et al, 1998; Ećimović, Mulej, Mayur et al, 2002). General newspapers report that the 20 % of humankind possess 97 % of patents… (See: Mulej, 2004, for details). A dangerous global trend results, and thus the need for a *general model of systemic co-operation* is much more than an academic issue: it is a matter of survival, as LvB rightly has said.

Realisation of such a general model of systemic co-operation that replaces, to a large extent, the established models of routine work is a very tough job. It requires innovation of attitudes and knowledge and preconditions of life (called starting points in DST), including education and motivation. In the creative work the *extrinsic motivation* works much less efficiently, one depends much more on the co-workers' *intrinsic motivation* and the managers' capacity to activate the intrinsic motivation extrinsically (Udovičič, 2004). A lot more trouble may be expected especially in societies in which people must rather quickly adapt to the *culture of innovation*, while they are coming from a social environment in which the culture of routine has still been prevailing (Wagnes, 2005). The *human resources management* must pay a lot of attention to these conditions (Treven, Mulej, 2005). The current international efforts for total business quality, such as *ISO 9000/2000* standard, may be going to need quite a lot of time to really prevail (Pivka, Mulej, 2004). The modern concepts of *corporate social responsibility* may help speed this process up (Knez-Riedl, Mulej, Dyck, 2005). All of these findings matter because holism supports *creativity in teamwork* (Mayer, 2001). Perhaps, the suggested general model can show a new way out of trouble. See its summary in Figure 3.

<table>
<tr><td colspan="3">Life in the contemporary knowledge and innovation driven society, or suffering from neo-colonisation resulting from globalisation and huge differences in innovation level</td></tr>
<tr><td>CCS interfacing society and its individual members, hopefully supporting holism and innovation, including ethics of interdependence in their routine work and inquiry →</td><td>Humans' objective conditions (needs/possibilities) in interde-pendence with humans' subject-tive starting points (values and knowledge in interdependence), hopefully aimed at holism and innovation, incl. ethics of interdependence in their routine work and inquiry</td><td>DST providing for education and guidelines for managers and their co-workers to aim at holism and innovation, incl. ethics of interdependence in their routine work and inquiry ←</td></tr>
<tr><td colspan="2">Management based on CST & Organisation based on VSM</td><td>Mastering work processes by SSM, DNT, and by routine and framework standardisation</td></tr>
<tr><td colspan="3">Corporate social responsibility, adaptation to innovative society, and intrinsic motivation for holism and innovation, including methods of creative co-operation and excellent quality etc.</td></tr>
</table>

Figure 3: Interdependence, complementarism, and synergy of several soft-systems theories in a general model of co-operation in inquiry, invention and innovation (as well as routine parts of the work and life processes)

A clear transition from the traditional to the contemporary systems thinking may result and – in a feedback process may support creative co-operation in inquiry and daily routine work. See Figure 4. (Mulej et al., 2003; Mulej et al., 2004; Treven, Mulej, 2005)

Systems / Systemic / Holistic Thinking	Unsystemic / Traditional Thinking
Interdependence/s, Relation/s, Openess, Interconnectedness, Dialectical System	Independence, One-way dependence, Closeness, A single viewpoint / system
Complexity (plus complicatedness)	Simplicity or Complicatedness alone
Attractor/s	No influential force/s, but isolation
Emergence	No process of making new attributes
Synergy, System, Synthesis	No new attributes resulting from relations between elements and with environment
Whole, holism, big picture	Parts and partial attributes only
Networking, Interaction, Interplay	No mutual influences

Figure 4: The Basic Seven Groups of Terms of Systems / Systemic / Holistic versus Non-systemic Thinking

In the innovation processes there is a lot of complexity and the risk level is very high. Let us apply the concepts from Figures 1-4 to inquiry about invention and innovation from the viewpoint of preconditions for these processes and their outcomes to florish.

6. A BRIEF APPLICATION OF THE SKETCHED NEW MODEL TO INVENTION AND INNOVATION PROCESSES AND THEIR OUTCOMES

They found data that only one single percent of patented inventions become innovations, and that some seven percent of incremental inventions become innovations (See e.g. Afuah, 2003; Likar et al., 2001; Likar et al., 2002; Mulej, Ženko, 2004; Mulej et al., 2005; Mulej, Likar, Potočan, 2005; etc.). But, in the modern market in which supply exceeds demand a lot, innovation is an unavoidable precondition of survival, and hence a requisite holism is so, too. Sticking to the old routine for too long is even more risky than taking the risk of innovation (See e.g.: Krošlin, 2004a; Krošlin, 2004, b; and several authors quoted here so far).

Contemporary business condition are very different from the ones from the times in which Adam Smith, the first generally accepted economist (originally professor of moral and ethics), spoke of interdependence (Petzinger, 2000). His concept of the invisible hand speaks of relations between suppliers, buyers, and competitors: pleasing a supplier's customer better than his or her competitor does makes this supplier earn more benefit, too. The same applies to relations between bosses and their employees. In 1870s the big innovation of management took place, ending the supremacy of guilds and church over Western Societies by government decisions to introduce free market (of production/business factors) and democracy (as a free market of ideas). (Rosenberg, Birdzell, 1986) Thus, for 20 % of humankind the modern economy and society started then. So far, the process resulted in tremendous and rapidly growing differences in richness and innovation (See: Figure 5).

Year	*1790*	*1870*	*1970*	*2000*
National per capital income span between the richest and poorest country of the World (World Bank Data)	---	3:1	150:1	500:1

Figure 5: Differences in the World richness based on differences in innovativeness

Beyond 95 % of knowledge is said to be under control of the 20 % of humankind making its most innovative part (North America, Western Europe, Japan, Australia, New Zealand, four small Pacific Rim Tigers). Globalisation works for them much better than for the other 80 % of humankind, to whom globalisation works as a source of neocolonial subordination, not only as a source of global markets and modernisation (Beck, 2003; Bošković, 2004a, b; Brain-gain, 2004; Brudenius et al., 1999; Bučar, 2001; Bučar, Stare, 2003; CJE, 2003; Dakhli and de Clercq, 2004; Dyck, Mulej, and coauthors, 1998; EU, 2002; Krbec, ed., 2003; Lal, 2002; Marn, Ženko, 2003; Mulej, 1994a, b; Mulej et al, 2002; Rebernik, 2004; Stare et al., 2004; Ženko, 1999; Ženko, Mulej, Marn, 2004; etc.). Holism and co-operation do not win over exaggerated specialization and one-sidedness, yet.

History has caused market to change from a random and suppliers' market, which do not demand innovation, to the modern buyer's market and state supported buyers' market, which demand more and more innovation. Suppliers must become more and more innovative to provide »systemic quality«, which is a dialectical system of low cost, excellent quality, broad range, uniqueness, and care for environmental quality. (For details see: Mulej, 2004, part 2) It has become very difficult for any supplier to hide in a local market, due to globalization. The innovative society includes the information society, science and technology society, learning organizations and society, creating society, entrepreneurial society, and similar attributes. It demands the process in Figure 6 (ibidem):

◙← Survival, existence, evolution, growth and development ←
← competitiveness ←
← investment capacity ←
← offering the »systemic quality« ←
← innovating (= creation of new benefit from new ideas/inventions/suggestions) ←
← *social and organisational culture supportive of inquiry, inventing and innovating x (fresh knowledge and creativity and co-operativity of humans at stake)* ←
← innovated and innovative management, using systems thinking ← ◙

Figure 6: Systems thinking as a basis of survival in modern times

If globalization is also neocolonialization, and market is not really free, but a means of power of the most innovative ones, then innovation must also be seen as a systemic problem. We brief its dialectical system of preconditions in Figure 7 (ibidem):

innovation = (invention x entrepreneurial spirit/entrepreneurship x management x requisite holism x co-workers x culture of innovating, co-operation and interdependence x co-opetitors x customers x suppliers x socio-economic conditions x natural environment x incidental events/good luck)

Figure 7: Dialectical system of preconditions for innovation

In all activities based on the equation in Figure 7 we may be better off, if applying Leonardo's and Einstein's and LvB's principles of thinking. If Eduardo de Bono has said that thinking is the most important human behavior (Jeran, 2003), than we say that it is actually the requisitely holistic thinking which really matters. Systems thinking supports it once we define holism as in Figure 8 (Mulej, 2005):

Real features's attributes		*Necessary attributes of holistic thinking about real features (incl. spiritual etc. ones)*
Systemicity	Complexity	Consideration of whole's attributes, which its parts do not possess alone
Systematicity	Complicatedness	Consideration of single parts' attributes that the whole does not have alone
Dialecticity	Basis for complexity	Consideration of parts' interdependence making the emerging synergy – the whole
Realism/Materialism	Basis for requisite holism	Consideration the need for materialism, i.e. realism, i.e. consideration of reality in line with the law of requisite holism

Figure 8: Holism – dialectical system (of all and only essential attributes of the entity at stake)

7. SOME CONCLUSIONS

Systemic co-operation depends on three basic attributes of the potential team members:
1) Clearly defined and specific specialisation of every-one of them in a different viewpoint / science / profession.
2) Their clear and visible ethics and practice of interdependence due to their mutual differences, along with some uniting attributes, e.g. their shared project of inquiry.
3) Their capacity to use a methodology supportive of their co-operation, such as Project Management, USOMID, Critical Systems Thinking and Total Systems Intervention, Viable Systems Model, Network Thinking, Dialectical Network Thinking, Viable System Model, Cybernetics of Conceptual Systems, etc.

There are many methods and methodologies, but less many individuals possessing the ethics of interdependence and capable of the contemporary systems thinking. Therefore, the central problem of co-operation in inquiry and of the requisite holism, rather than the fictitious holism (limited to a single viewpoint alone) or the unattainable holism (total, Bertalanffian), lies with humans, their values / cultures / ethics / norms, and the related influence over humans, e.g. in the form of education and/or experience. The Dialectical Systems Theory has proved, in 30 years of development and application, the capacity to provide a suitable education/experience. In the above new suggested synergy all the briefed systems methodologies can become even more useful than so far. They might be well combines with application of Leonardo's, Einstein's, and LvB's style of systemic thinking, even without a formalised systems theory, sometimes at least.

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