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Reframing the Systemic Approach to Complex Organizations as Intangible Portfolios

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Abstract

The aim of this paper is to pave the way towards the inclusion of mainstream sociological approaches (based on Luhmann's approach) for the studies of firms-organizations. In social sciences we can observe that the theoretic consequences of a paradigm shift is significantly represented by the evolution of systemic thinking from Parsons to Luhmann. This shift implies the change from the vision of systemic organizations as "structures" to that of systemic organizations as "communication flows". The milestone of systemic approach in management maybe found in the research and applied works of Anthony Stafford Beer with his Viable System Model (VSM) that today faced a relevant reconfiguration by Golinelli and the Italian school on Viable Systemic Approach (VSA). The paradigm shift in this field has been smoother than in sociology, and didn't imply the discard of the concept of organization as a structure. This because, in management sciences, the perspective and, consequently, the subject of study is the organization and its structure. We think this paradigm shift is possible also in management sciences, if we consider the whole organization as a structured information flow creating a dematerialized structure. Our research question is: "Is it possible to apply in business sciences the fundamental concepts that caused the paradigm shift in sociology?" To answer to this question we discuss about ontology of the firm and of the concept of value in order to understand to what extent intangible communication flows are called upon to be involved in a new definition of structure. Keywords: Systemic approach in Sociology, VSA, value constellation.

1. The Paradigm Changes

Organizations in the XXI century must increase their ability to manage their viability; the complexity of the social and business environment call for continuous advances in the field of knowledge and management of complexity in order to keep viability of the firms and of the whole social system. To govern complex organizations the systemic approach has been pivotal to open new lenses and understandings of the inner dynamics of living systems. In recent times we have witnessed to the growth of the strategic role of communication for the governance of complex organizations of any kind. Starting since the 1980's we saw a paradigm shift in the managerial approach from the whole/part model to the systemic-environmental approach. This shift generated the epistemological frame of the systemic approach to social sciences in the fields of sociology, management and economics.

The social and economic turmoil of our time calls for new paradigms to manage complexity. The systemic approach is open to interdisciplinary contributions that may also provide chances for kuhnian revolutions that can undertake the current evolutionary challenges of complexity. The present global scene offers a wealth of momentous thresholds and bifurcations; when faced with such momentous opportunities the most tragic and dangerous decision would be to not make any decision.

As outlined by Luhmann (1990, p. 26): *"The term complexity is meant to indicate that there are always more possi-*

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bilities of further experience and action than can be actualized "

Systems theory (ST) can provide a consensual domain for, among others, the following reasons:

- It is currently the only field of knowledge which can offer an analytic, deductive system that is unified syntactically and semantically over all the sciences from biology to economics and from mathematics to sociology.
- It is able to create an interface between science and humanities within the neo-renaissance perspective of a Third Culture (as theorized by the Edge Foundation, www.edge.org).
- It is able to decline this analytical, deductive and multidisciplinary system as an evolutionary theory of global society, and is able to grasp the flow of communication.
- ST of global society therefore becomes the systems theory of communication flows in global society itself. Global society could be represented as the relationship between an operating system (Globus) and its related software (Mundus).
- It has an interdisciplinary methodological and technical toolkit that can model and simulate alternative and otherwise possible scenarios (Terna, 2006), to invent viable futures.
- It is able to develop an *embodied* mathematics (Lakof & Nunez, 2005), that enhances the application range of science-based and knowledge-intensive policymaking.

Broadly speaking, the systemic approach embodies plenty of different conceptions of "system" deriving from different disciplines and scenarios since the end of the XIX century or before. In the field of systemic sociology, starting since the 1980's we saw a paradigm shift from the whole/part[1] to the systemic/environmental paradigm.

This shift generated the epistemological frame of the systemic approach to social sciences in the fields of sociology, management and economics.

1 Conceptualized by Talcott Parsons (1965) and even better by Ervin Laszlo (1998) and the Hungarian school that introduced a higher level of complexity when compared to the rigid variant of Parsons.

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From a sociological perspective the paradigm shift is significantly represented by the evolution of systemic thinking from Parsons to Luhmann; this implies the change from the vision of systemic organizations as "structures" to that of systemic organizations as communication flows, therefore a change of focus from tangible to intangible assets.

We define the whole/parts paradigm as "Paradigm 1" (P1), the system/environment paradigm as "Paradigm 2" (P2) and the systemic perspective of "Globus/Mundus" as Paradigm3 (P3).

This paper is at the crossroads between sociology and economics; it is developed at a very theoretical level focusing on reframing the systemic approach for the analysis of complex organizations as intangible portfolios. The shift reframes the concept of system itself by describing two pivotal Turning Points (TP):

1. P1 was based on the idea that a system is basically a structure provided with some key/vital functions[2]. Despite their differences, Parsons' and Stafford Beer's systems in some way consider functions (F) as functional (f) to the system intended as - more or less rigid and homeostatic- structure (S); so that F= (f) S. The kuhnian revolution of P2 focused on a key upside down of this perspective so that S=(f) F. A system has, someway, a structure but it becomes softer and softer, more and more dematerialized and the power of functional equivalents easily and dramatically reshapes these soft and very flexible structures. An artificial heart works because it is a functional equivalent of the human heart and not because it is shaped and made of the same material of a human heart.
2. P1 idea of system is not complex. Even if the term complexity is sometimes used by the P1 thinkers, their conception of system was not complex at all given that they think complexity maybe "controlled", in spite of the fact that by definition complexity cannot be controlled. P1 theories attempt to cope with the chaotic, fuzzy and complex "order from noise" logic of complexity.

Parsons'(1960) attempts to undoubtedly shape the

2 Parsons' LIGA pattern and Stafford Beer's Viable Systems are typical examples of this perspective.

borders of social order, rules and values though a normal/deviant pattern where normality was the only way to exist for the system. Stafford Beer's "control system" asserted that a system might organize and structure its relationships with the environment keeping everything under control by controlling the parts and their relations.

Paradigm 3 is the "Globus/Mundus", that will be discussed in the following paragraph. P3 represents a step forward from P2, and is based on a platform/catalog logic.

Moving from the Viable System Model (VSM) of Stafford Beer to the Viable Systemic Approach (VSA) of Golinelli and to value constellations of Norman the paradigm shift in systemic science in business has been smoother that in sociology, being the systemic approach in business sciences more rooted in the concept of structure (given the definition of firm as structure). To answer to our research question we discuss about the ontology of value and of firm in order to understand how the firm can be conceived of in the complex, dematerialized and networked context of XXI century.

Today the immaterial assets have overcome the material ones. When we buy a product we chose it according to its perceived differentiation; perceived differentiation is based, in the large majority of cases, on the judgments of the consumer about the intangible, immaterial characteristics (i.e. brand, image, etc.) of the good. Firms' networks plan and produce products in more than one plant; it is the network of communication and exchange of knowledge to produce them, being the physical plant a secondary and contingent aspect.

We will focus on how and why complex organizations need to be considered as value constellations of intangible assets. This implies that XXI century enterprises depend much more than in the past on their portfolio of intangible assets; the value of intangible assets is strongly dependent on communication, that consequently become crucial for the existence and viability of the organization.

We illustrate the taking over of intangibles in complex organizations considering a structural-cultural conception of organization reconfigured as a constellation created by a continuous flow of memetic recombinations.

Through a theoretical comparison, we combine Viable System's and Luhmann's paradigms to supply a framework to better understand complex organizations.

We sketch the shift from P1 to P2 and P3 in social sciences, reframing the evolutionary, chaotic system of the XXI century organizations, in order to propose a new idea of firm's structure that can be consistent with the theories of system/environment and platform/catalog paradigms.

2. Luhmann theory and the paradigm shift in sociology

The increase of connectivity and abstraction became more and more powerful through the paradigm shift from the whole/parts logic (Parsons, 1965; Laszlo, 1998; Mintzberg, 1992) to the system/environment one (Luhmann, 1995; Normann, 2001). In spite of the Kuhnian revolution this paradigm shift represented, it took its time ad gradually removed obsolete knowledge along a smooth continuum which can be represented as follows: Parsons – Alexander – Laszlo – Stafford Beer – Mintzberg – Golinelli – Normann - Luhmann.

In P1, Ervin Laszlo's conceptual model of whole/parts is based on substantive integration and synthetic holism, inspired by a logic of interdependence and interconnectivity through which the evolutionary system adapts to the external environment by recombining ideas and thought patterns in a very informative manner even if sometimes it verges on "less scientific "*new age*" statements.

A great evolutionary leap was achieved with P2, thanks to the monumental work of Niklas Luhmann. In recent years the economy has understood and applied the lessons of the constructivist systemic approach albeit sometimes in an indirect way as in the case of Schelling, 2005 Nobel for Economics, who underscores that a social context created collectively by individuals will be much more satisfying than the adaptation of the individual to a given social context (Schelling, 2006). Even the micro-economics theory therefore arrives at the conclusion that reality is a symbolic evanescence and that it is modeled and constructed and it is not an entity in itself that can be known, defined and "objective."

In the system/environment logic of P2, integration is purely methodological-modal in terms of functional equivalents. In this sense, P2 is not strictly "holistic" but rather it aims at a viable and functional *unitas multiplex* between differences that make a real difference. The evolutionary power of P2 is based more on auto-poiesis rather than interdependence, more on recursive and self-referential adaptation, rather than adaptation to a presumed external environment. Its organizational logic is software/hardware, therefore devoid of syncretism with a strong contingency of selective encoding and decoding. In P2 the software program is "blind", therefore the future is "elusive": it is a horizon that moves away the closer you try to get to it. The paradigm P2 shares with P1 the conceptual, organizational and heterarchical model even if this heterarchy is so nuanced and fragmented as to create mere space-time contingencies where social change almost always proves an illusion of perspective. The knowledge capability is considered at the technical level of communication and information for self-organization.

The Paradigm 3 is a step forward from P2; it is based on a platform/catalog logic which is an evolution of the system/environment paradigm. Nevertheless, it shares with P2 the modal integration for functional equivalents and the idea of *unitas multiplex* as well as the hardware/software organization. However, it hypothesizes selective self-referential codes (as in P2) that are able to understand the differences that make a difference (as in P2) but it does this by tracing the trajectories of great evolutionary bifurcations (as in P1). In terms of policymaking, P3 presents a reconfiguring evolutionary strategy that reveals how the future is to be neither predicted (as in P1), nor considered elusive (as in P2), but is to be seen as an invention for creating models. P3 shares with P1 and P2 the heterarchical organizational model, while the space/time proves to be a platform/catalog paradigm that is active in *"zero time of desire"*, where if $V = R / W^3$, then V is the maximum viability because W is reduced to a minimum. Social change is, therefore, understood primarily as the maximization of V and the epistemological model is the *third culture*.

3 V= evolutionary Velocity of the process; R= distribution of innovation according to the model of Roger (1956) as adapted by the author; W= Williamsons Costs.

P3 shares with P2 the concept of the horizon of "otherwise possible", but unlike P2, P3 treats it as a catalog from which different strategic problem-solving solutions can be selected.

It is also important to underline the main frame of the theoretical evolution of the shift up to the *"Globus/Mundus variant"* that characterizes the platform/catalog paradigm, which is evolving from P2 through functional differentiation, in the light of the theory of global society conceptualized by Luhmann (1997).

This conception of systemic science applied to social issues reveals its full-heuristic epistemic power in scenarios where it is clear that *"the more radical the renewals are from a scientific-technological viewpoint, the higher the proportion of social knowledge must be if society is o be put in a position to appropriate them culturally and thus transform them in a way that gives them sense and meaning"*. (Nowotny, 2008, p.134).

In this sense, systemic sociology is the constellation (Normann, 2002) in which social knowledge is generated and evolves. It is also the constellation that prompts Rogers' complex cycles, and accelerates the V in the formula S = R / W. It recombines and reconfigures the boundaries of sense of the social system by activating codes, procedures and programs that select sense (Luhmann, 1990,1993), considered as a memetic recombinant (Jouxtel, 2010), and enable the system to distinguish between systemic communication (the memetic reconfiguration cycles of V = R/W) and ambient noise.

In essence, a third culture is revealed as the institution qualified to issue *"Scientific Citizenship"* (Nowotny, 2008) of the Knowledge Based Economy Society, where science and technology surpass the border between present and future by bringing them closer and the present no longer dominates over a future that has become repetitive, monotonous, dictatorial and eternally present, but rather it is the future that has brought immobility crashing down and thus expanded the horizons of otherwise possible, so that *"reality will eventually imitate theory"*.

After so many futile debates about the limits to growth (associated with a naive idea of the predictability of the future), systemic sociology argues that there is no limit to systemic evolution (biological, psychological, social, etc.) as *"in finding and producing the new, the process between the not-yet and the no longer (which cannot*

be given precise temporal limits) always points beyond itself" (Nowotny, 2008, p. 68) and opens to the idea that the future is uncertain and not without risks, yet at the same time full of amazing opportunities that could facilitate ever more complex logics of evolution. This idea of the future is the very best game played (Atlan, 1986) from an indefinite recombination of all the memes circulating on the Globus as informed by the Mundus catalog, which demonstrate how memetics functions well as an algorithm of deconditioning (Jouxtel, 2010). In this sense, sociology as a systemic science proves to be a memetic recombinant and reconfigurator of algorithms that have evolved through differentiation of the auto-poietic cycles V = R / W and, therefore, a chaotic "laboratory" for the invention of an ever growing and open range of futures in which memes interact.

3. Conceptual changes in business science from Beer to Golinelli

In 1972, the British cybernetic scientist Anthony Stafford Beer in his book *"The Brain of the Firm"* introduced the idea of Viable System Model (VSM). Since then the VSM paradigm has been a useful conceptual tool to understand the organizations' behavior and support managerial decision making. The VSM and its evolution due to the studies of Gaetano Golinelli and his school (Viable Systems Approach, VSA) are the todays' state of the art of systemic approach in business sciences.

The VSM is a model of organization structure based on the metaphor of human nervous system. Stafford Beer's choice of the human nervous system as an organization model is based on the need to manage the complex network of firm's relations through a diversified system of specialized and observable functions able to handle variety. It is , therefore, a model belonging to Paradigm 1.

Human nervous system holds feed forward and feedback systems that deal to harmonize the whole organism with the social and physical surrounding world. Stafford Beer recognized a parallelism between capabilities and basic structural patterns of the human brain of a viable human organism and those of management systems of a viable organization.

Starting by considering that the human organism is

composed by three main interacting parts: muscles and organs, nervous system and external environment; the VSM brings back these features in the firm as follows (Stafford Beer, 1972, 1973):

— *Operations* (muscles, organs): made up of several operational units which do all the basic work (production, distribution, etc.);
— *Meta-system* (nervous system): has the task to ensure that all the operations units work together in an integrated way (scheduling, planning, etc.);
— *Environment* (external): includes all the environment elements, which are in contact and interact with operations and the meta-system.

These three parts must be in balance; when the environment changes, the enterprise must respond accordingly.

An autonomous organization needs to have five key interactive systems to maintain its identity and operate effectively in its environment (Stafford Beer, 1989).

In order to be viable, a system must incorporate the following five inter-connected sub-systems:

1. *Operations*: is placed at the lowest level of the system, inside it we find the "primary units" which are composed by basic units that achieve operations like production or services that are supervised by their own management, which locally controls them.

2. *Co-ordination*: is the "internal eye" that coordinates different operations carried out in primary units and ensures that they interact through information and communication to avoid conflicts in the whole organization.

3. *Control*: is the command function which interprets the system's policy according to its internal data. In this subsystem the operations and the processes of the other subsystems are optimized, harmonized and enhanced through an internal guidance that allocates resources, creates synergies and competes to reach the overall performance optimization of primary units. Complementary to the sub-system 3 we find the subsystem 3* Auditing/Monitoring. It is an internal monitoring sub-system as the sub-system 3; it aims to investigate and validate the information flowing through channels 1-3 and 1-2-3, by means of auditing and monitoring activities which imply a direct access to the basic units. In other words, it is an alternative channel that gi-

ves sub-system 3 the opportunity to get immediate information rather than counting on the intermediation of localized management of primary units. The management functions of sub-systems 1, 2, 3 and 3* deal with the inside and the present of the viable system ("Inside and Now"). It's important to point out that the only direct connection to the environment comes from primary units of sub-system 1.

4. *Intelligence*: is the strategic subsystem that gathers external data and information (about technologies, markets, etc.) and, after evaluating their relevance for the organization, translates them into strategies and plans. The focus here is on the anticipation of the future with a long term orientation.

5. *Policy*: defines the policy of the organization according to the objectives planned based on the basic principles of the enterprise-system formulated by the owners, the shareholders and/or the stakeholders. The action plans developed by subsystem 4 are translated into operations for subsystem 3. This subsystem keeps the identity and coherence of the whole enterprise-system.

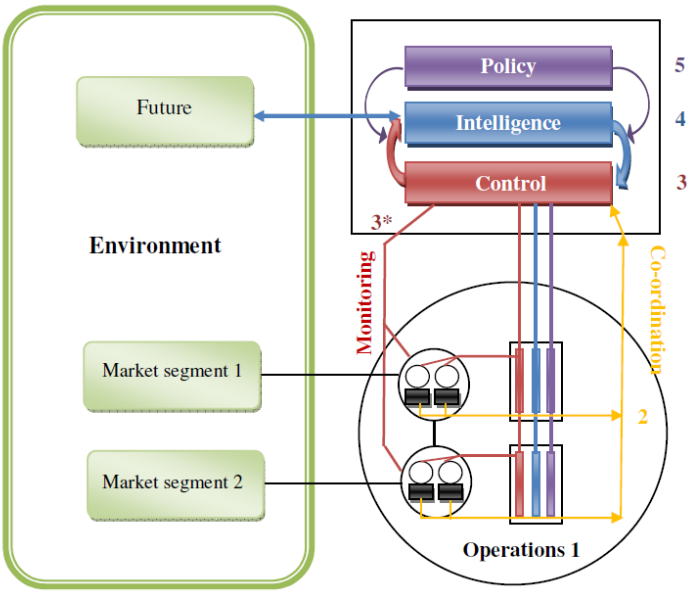

Fig. 1 The VSM

The Viable System Model has been the starting point for further elaborations, in Italy, by Gaetano Golinelli and his school.

While Stafford Beer focused on understanding or-

ganizations' inner functioning in order to support the external adaptation (Stafford Beer, 1972; Espejo & Harnden, 1989; Espejo, 1999; Christopher, 2007), Golinelli's VSA is more externally oriented and analyzes the influence coming from other overlying systemic entities in the environment (supra-systems).

In VSA the focus shifts from the static structure of VSM to the dynamic system, with the system being a dynamic concept in continuous change for adaptation. According to the VSA, the system's structure is not static but changes continuously to follow the dynamics of the relations with the environment. In this sense as we will see the VSA is closer to the P2 and the P3 than the VSM.

VSA is based on the following four assumptions:

1. *"A system is viable if it can survive in a particular sort of environment"* (Golinelli, 2010, p.55). The firm is not independent from the environment but as an open system it can survive only contextualizing its activity and creating exchange processes with it.
2. *"Viable systems have the isotropic property"* (Ib.). Each viable system has the attribute of identity or invariance of its shape (in the meaning of the ancient Greek εἶδος[4]) independently from the perspective (τρόπος) through which we look at it. This identity of shape is made of two areas: the area of decision making (Firm Government, Organo di Governo, OdG) and the area of action (Operative Structure), which may have continuous interactions.
3. *"The viable system is projected toward pursuing purposes and attaining objectives and can be connected to suprasystems and subsystems from which and to which expectations, guidelines and rules can be received and allocated"* (Golinelli, 2010, p.56). This implies that the OdG must try to interpret and satisfy the expectations of suprasystems also by mediating the interests of its subsystems.
4. *"A viable system, as an autonomous entity, may be dissolved within the suprasystem it refers to in a specific time-frame due to resonance processes which may follow conditions of consonance"* (Golinelli, 2010, p.58).

4 (εἶδος) means "idea", "image", "shape" and is used by the Greek philosopher Plato to refer to the ideal Forms or Ideas in his Theory of Forms.

> This postulate refers to the possibility that a viable system could annihilate its borders and its identity to melt down itself in a supra-system with which it shares values and aims. To do so the condition of consonance must be achieved.

According to the VSA, the firm's ability to survive and to generate value is not determined only by the firm's structure and resources but also by the relations and interactions that the firm is able to keep with the environment. In other words, the homeostasis of a system is determined both by the external normative environment which every system has to comply with and by the self-regulating internal environment (Barile, Polese, 2010).

As we will see in the following paragraphs, the main problem of communication between the paradigms of current sociology (P2, P3) and the Viable System Approach is the role of the structure. For Luhmann the focus is on communication and networking rather than on physical structures. Even if the VSA keeps a hierarchical and functional classification of sub-systems, it also considers the relevance of the relations system/environment and in special cases (like in assumption 4) the dissipation of firm's borders.

As we will discuss later the structure can be conceived as a cognitive conceptualization (Piaget, 1971) or like an item of the cathalog that we chose to achieve the "simplexity" (Berthoz, 2011). In other words the structure is regarded as a solidification of the constructive energy of knowledge within a value constellation.

The VSA underscores the role of collaborative connections with the supra-systems that are considered competitive forces which can affect viability. The VSA is a step forward in this sense, compared to the more static VSM. Viability is, in fact, given by the ability to be part of what Normann calls "value constellation" researching consonance with the supra system and the environment through communication. VSA is an important link in the chain of the paradigm shift that can bring to the application of complexity theories originating from sociology to the enterprise reality, thus helping to shed

light on the complex relations among socio-economic entities looking for viable interacting conditions.

4. The evolution of Firm through the systemic paradigm shift

As we outlined in the previous paragraphs, the paradigm shift from the Paradigm 1[5] to the system/environment paradigm is pivotal to understand the redesign of the concept of the firm. The most prominent theorist of the system/environment paradigm is Niklas Luhmann, while Richard Normann can be consider the one who used Luhmann-like paradigm for the analysis of the organization. Normann's idea of firm fits perfectly with Luhmann's approach in spite of the fact that Normann never quoted Luhmann in his works and probably didn't know his theories. The theories of Paradigm 1 view the systems as (rigid/flexible) structures with a hierarchical configuration (macrosystems, microsystems, subsystems, etc.) and they state that a system interacts with its external environment. The paradigm shift towards the system/environment vision denies both these two pillars of the P1.

Theories belonging to Paradigm 2 affirm that there is no hierarchy among systems. Each system (educational, economic, juridical, political, scientific, religious, etc.), has its own binary code and its own program to evolve within its semantic-conceptual-logical boundaries (with no physical ones). Thus according to these theories it would be very naïve, to consider the state a macrosystem and a firm a subsystem. Multinationals are a piece of evidence of the new paradigm and nevertheless, are we sure that, for example Belgium is a more powerful system than Nestlè? As each system has its own code and program to communicate, and the environment has not, the environment is not a system, thus cannot communicate. According to this view, the environment is simply a meaningless and noisy out world from which each system can select noise to be turned into communication. The competence of a system to: observe the variety of noise; select the noise which can be self referentially turned into meaningful communi-

5 We consider that Ervin Laszlo, Talcott Parsons, Anthony Stafford Beer, Henry Mintzberg, in different ways, all belong to Paradigm 1.

cation according to the system's self referential coding and programming; stabilize long lasting operative-organizational situations framed within the conceptual status of "contingency"; represent the system's effective power to evolve self referentially and by self reproduction. The system always evolves either by expanding or by imploding. The "boundaries" of this expansion/implosion are not physical.

If for instance we consider the brand value of a firm we can observe how the increasing value of intangibles leads to its dematerialization. In the same way we can observe the liquefaction of the concept of organized system and structure which turns into a dematerialized intangible. Normann pointed out how high density, conceptual and abstract idea need to be communicated beyond any kind of border.

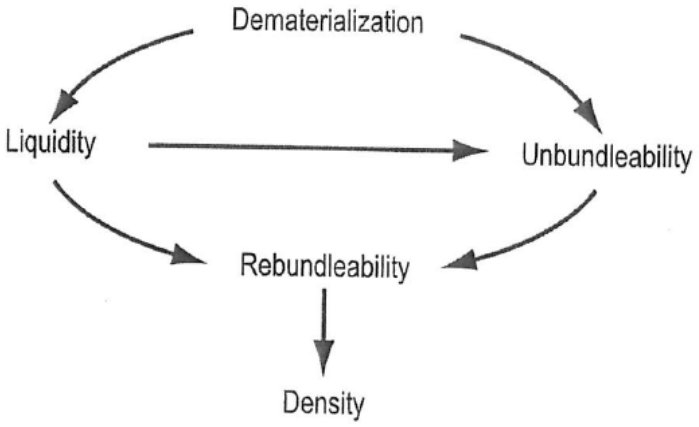

Fig. 2. Drivers promoting density – overview (Normann, 2001: 30)

A firm is essentially the intangible, networked system which goes through the cycle reproducing its self reference through communication which is the shape of meaning and its value constellation is metaphorically better described by the "stock exchange" organizational logic than by the "industrial" and boundary based of the whole/part paradigm .

5. From value CHAIN to value constellation and the predominance of intangible assets in the firm

As stated above the firm has to manage the com-

plexity emerging from the continuous relations between parts of its parts among them and with the environment. Today these relations consist mainly in the exchange of information and knowledge. Also the physical goods and the work in process materials can be regard as "crystallizations" of knowledge. In fact, in all the goods transformed (completely or partially) by the production process, the value of the "immaterial" parts represents, in the majority of cases, the greatest part of their value.

Physical goods have value because of the product idea, the engineering, the knowledge, the differentiation perceived by customers more than because of the material they are made of. Knowledge makes the differentiation, knowledge makes the value.

Nonaka and Takeuchi (1995) pointed out that knowledge must be considered inside firm's system. Knowledge has strategic value so the organization must consider the ways to better create and share knowledge to create value and be competitive.

This represents an important shift in the logic of value creation. Traditional doctrines of value creation are grounded on the hypothesis of the "old economy" where the firm can add value according to its positioning; a better positioning allow the firm to have the better supply chain, the better inputs and the better resources thus being able to add more value.

As stated by Normann and Ramirèz (1993), in a volatile and competitive environment it is nonsense to think that the goal of strategy is just to obtain the right positioning of a fixed set of activities along what Porter (1985) defined as "value chain"; we have to shift from value chain to value constellation.

Ramirez and Wallin (2000) outlined how the ideas of coproduction and interactivity are the foundations of actual strategies and how the value constellation designs are based on the deployment of the appropriate capability to create and communicate the knowledge within the organization, with supply chain partners and with customers. These capabilities are arranged so that they can result in a customer-specific and value-creating offer which allows customers to create value. As forecasted in 1980 by the futurologist Alvin Toffler in his book the "The Third Wave" consumers have a proactive role becoming "prosumer" (a portmanteau formed by contracting either the word professional or producer with

References

Ashby W. R., (1956). *"An Introduction to Cybernetics"*, London: Capman Hall.

Atlan H. (1986). *"Tra il cristallo e il fumo: saggio sull'organizzazione del vivente"*. Firenze: Hopefulmonster.

Barile, S., Polese, F. (2010). "Smart Service Systems and Viable Service Systems: Applying Systems Theory to Service Science", *Journal of Service Science*, 2(1/2): 20-39.

Barile S. (2006). *"L'impresa come sistema. Contributi sull'Approccio Sistemico Vitale"*. Torino: Giappichelli.

Barile S. (2009). *"Management Sistemico Vitale"*, Torino: Giappichelli.

Berthoz A. (2011), *"Simplexity: Simplifying Principles for a Complex World"*. Yale University Press.

Brandenburger A., Nalebuff B. (1997). *"Co-Opetition : A Revolution Mindset That Combines Competition and Cooperation : The Game Theory Strategy That's Changing the Game of Business"*, Currency Doubleday.

Christofer, W.F. (2007). *"Holistic Management: Managing What Matters for Company Success"*, Wiley-Interscience, Hoboke.

Dagnino G. B., Rocco E. (eds.). (2009), *"Coopetition Strategy"*, Routledge.

Delattre P. (1984). *"Teoria dei sistemi ed epistemologia"*, Turin: Enaudi.

Espejo R., Harnden R. (1989). *"The Viable system Model. Interpretations and Applications of Stafford Beer's VSM"*, Wiley.

the word consumer) because of the blurring of the characteristics of producer and consumer due to the request of more differentiation towards the personalization of products.

The concept of "value chain" of Porter (1985) was based on a sequential chain creating value along the supply chain.

The new concept of value creation is not sequential like in Porter. In value constellations the creation of value is obtained with a bidirectional process involving all the stakeholders in a process of co-production. The process of co-production of the offer in terms of products, services, information and relationships can be obtained through the implementation of knowledge-sharing relationships where all the parts find a symbiosis to gain synergies that create value.

Indeed, in a value constellation, value is not created through sequential chains but in "complex constellations" that involve all the supply chain including the customers (Norman & Ramirèz, 1993). Also the relation with competitors has changed; firms need to consider new ways to create their own markets also through co-operation with competitors[6], instead of fighting head-on with competitors.

To manage the value constellation it is necessary to implement processes that allow the firm to realize strategies of value creation with suppliers, customers and other possible actors through the creation of high value offers. It is necessary to consider in a wider view time, environment, customers, suppliers, competitors and other stakeholders, as well as other resources (Ramirèz and Wallin, 2000).

To achieve these goals it is necessary to "reframe" the business (Normann, 2001) to obtain new enterprise models through an "ecogenesis" process. Ecogenesis consists in the co-creation of a new ecology of the business environment where "all" the actors create value through a value constellation.

The concept of value constellation implies that the management has to think in a wider view, going beyond the legal boundaries of the firm. This is not a new concept, also in the old sequential value creation process, the firm had to think in terms of supply chain manage-

6 Defined by Brandenburger and Nalebuff, 1997, as "co-opetition", See also Dagnino and Rocco, 2009

ment with strategies involving more firms beyond their legal borders; what changes with the value constellation is the non-linearity of the process, like in a constellation of stars where is not possible to find a straight line to draw the direction of information and knowledge flows.

In a value constellation the firm is able to create value connecting with other firms and supra-systems in the environment. To create value through the ecogenesis the firm must be able to be innovative by finding new links among assets and resources that are underutilized, thus involving these assets and resources in the value creation process. To find underutilized resources in the environment it is necessary to be able to acquire knowledge that generates ideas in order to build a better fit between relationship and knowledge and put it into the product. The value becomes more "dense", being density a measure of the amount of knowledge packed inside a good. (Normann and Ramirèz, 2003).

Ideas and knowledge are the main assets of the firm and are both intangible assets.

The main difference between the "porterian" concept of value and that of value constellation relies of the importance of intangibles. This has a strong impact on the enterprise system and its organization, the shift is from "material" to "immaterial" or using the terminology of computer science "hard" to "soft". Unlike material goods the output of the intangible asset of knowledge is not scarce and its utilization "fertilizes" the ground for the creation of new knowledge. The value is not created by scarce assets as machines like in the old economy, but by the potentially infinite resource of knowledge. The firm becomes a "learning organization", a "system of knowledge" and its success is based on the ability of the management to use knowledge to produce new knowledge and new value (Gravin, 1993). The firm must be able to open to the environment to gain knowledge by networking and using underutilized resources dynamically and proactively reconfiguring its relations with the environment as indicated by Luhmann.

6. Conclusions. How can we reconcile structure and intangibility?

After analyzing the differences in the evolution of sy-

Espejo R., Harnden, R.J. (1989). *"The Viable System Model"*, John Wiley, London

Espejo R. (1999). *"Seeing systems: overcoming organizational fragmentation"*, in Castell, A.M., Gregory, A.J. Hindle.

Ford D. H., Lerner R. M. (1992). *"Developmental Systems Theory: An Integrative Approach"*. Sage Publications.

Jouxtel P., Memetica. *Il codice genetico della cultura*, Brossura 2010.

Golinelli G. (2010). *"Viable Systems Approach (VSA). Governing business dynamics"*. CEDAM.

Golinelli, G.M. (2000). *"L'Approccio Sistemico al Governo dell'Impresa", Vol. I "L'impresa sistema vitale"*, CEDAM,

Golinelli G.M. (1991). "La complessità ambientale: l'impatto sul sistema industriale meridionale", *Sinergie* n°6.

Gravin D.A. (1993). "Building a Learning Organization", *Harvard Business Review* 71(4): 78-91.

Kauffman S.A., Levin S. (1987) "Towards a general theory of adaptive walks on rugged landscapes", *Journal of Theoretical Biology*, 128: 11–45.

Kovacheva T. (2006). "Viable Model of Enterprise. A Cybernetic Approach for Implementing the Information Technologies in Management", *International Journal of Information Theories & Applications*, 13: 337-340.

Lakoff G., Nunez R. E. (2008), *"Where Mathematics Comes From: How the Embodied Mind Brings Mathematics into*

Being", NY: Basic Books.

Laszlo E. (1996). *"The Systems View of the World: A Holistic Vision for Our Time"*, Hampton Press.

Luhmann N. (1990). *"Essays on Self-Reference"*, Columbia University Press.

Luhmann N. (1995). *"Social Systems"*, Stanford University Press.

Luhmann N. (1990). *"Stato di diritto e sistema sociale"*. Naples: Guida,

Luhmann N. (1997). *"Die Gesellschaft der Gesellschaft"*, Germany: Suhrkamp Verlag.

Maturana, R.H., Varela, F.J. (1975). *"Autopoietic systems"*, BLC Report 9, University of Illinois.

Maturana R.H. and Varela F.J. (1998). *"The tree of knowledge, revised edition"*, Shambala, Boston.

Mintzber H. (1992). *"Structure in Fives: Designing Effective Organizations"*. Prentice Hall.

Nonaka I. Takeuchi H., (1995), *"The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation"*, Oxford University Press, USA

Normann R., Wikstrom S., Mitroff I. (1994). *"Knowledge and Value: A New Perspective on Corporate Transformation"*, Routledge.

Normann R., Ramirez R. (2008). *"Designing Interactive Strategy: From Value Chain to Value Constellation"*. Wiley.

Normann R., Ramirèz R., (1993), "From Value Chain to Value Constellation: Designing Interactive Strategy", *Harvard Business Review*, July-August 71(4):

stemic paradigms in sociology and in business science we can try to answer to our research question: *"Is it possible to apply in business sciences the fundamental concepts that caused the paradigm shift in sociology?"*

We can say that *"Yes, it is possible to apply the paradigm of systemic sociology in business science"* in spite of the absence in Luhmann's theory of the concept of structure. The issue of "structure" is of primary relevance, being the fundamental object and perspective of study in business science. The firm is, in fact, a structure, business science considers the perspective of the firm, consequently if there is no structure there is no firm and there is no business science. The answer to this problem is that the firm's structure doesn't need to be material; we can consider a new concept of dematerialized structure.

Probably the key challenge for business science and systemic sociology is to create a consensual epistemological domain in the Globus/Mundus paradigm (Paradigm 3) and the VSA; this coauthored paper is a step towards this for different reasons.

The first reason is that by saying that the physical borders are obsolete doesn't mean that firms are obsolete. Today the firm can be built using knowledge similarly to how in the old economy it was created using machines, bricks and mortar. Saying that the firm is made of "intangible" assets doesn't mean that it doesn't exist. Making a parallel with hard sciences, and physics in particular, we can see the origin of this paradigm shift: quantum physics found that the atom is empty, there is no matter inside the matter but just energy, vibrations, etc, depending on the different theories. So if even the material world is made of "intangibles" there is no reason why a firm cannot be made of intangibles.

The VSA is a perfect ground to develop the paradigm shift towards system/environment and catalog/platform (P2 and P3) paradigms of systemic sociology. According to VSA, the structure is dynamic and the firm is an open system that is in homeostatic and bidirectional (thus not necessarily hierarchical) relation with its environment; in this there is a first opening to the concept of the dematerialization of firm's borders. Moreover, the firm can be viable if able to find the consonance and create value inside a value constellation. The forth assumption of the VSA entails the possibility that a system in state of consonance can be dissolved in-

65-77.

Normann R., (2001), *"Reframing Business: When the Map Changes the Landscape"*, Wiley.

Nowotny H. (2008). *"Insatiable Curiosity"*, MIT Press.

Parsons T. (1960), *"Structure and Process in Modern Societies"*. Free Press.

Petitot-Cocorda J. (1990). *"Morfogenesi del senso"*. Bompiani

Piaget J., (1971). *"Structuralism"*, Routledge & Kegan Paul PLC.

Piaget J., (1972). *"Psychology and Epistemology: Towards a Theory of Knowledge"*. Penguin.

Piaget J., Brown T., Kishore J. T., (1985). *"Equilibration of Cognitive Structures: The Central Problem of Intellectual Development"*. University of Chicago Press.

Porter, M. (1985), *"Competitive Advantage: creating and sustaining superior Performance"*, Free Press, NY, USA.

Ramirez R, Wallin J., (2000). *"Prime movers: Define your business or have someone define it against you"*. Wiley, Chichester, UK.

Rogers E. (1956). *"Diffusion of Innovation"*. The Free Press.

Saraceno, P. (1972). *"Il governo delle aziende"* Venezia: Libreria Universitaria Editrice,

Schelling T. C. (2006). *"La strategia del conflitto"*, Milan: Bruno Mondadori.

Schwaninger M. (2006). "Theories of Viability: a Comparison", *System Research and Behavioral Science*, 23: 337-347.

to the supra-systems as a consequence of the resonance process. In other words the borders of the viable enterprise system can melt down becoming part of a supra-system with which it shares values and objectives.

The second reason is that there is no ontological contrast between Luhmann's approach, that sees everything as communication and the existence of a structure based on knowledge. Similarly to quantum physics, according to which the material reality is a kind of "solidification" of energy created by our perception the firm can be viewed as an entity created by our perception as a solidification of knowledge though the creation of a *hub* (that can be spontaneous according to the 80/20 empirical rule or constructed by other entities for a purpose) inside a network or constellation. As for the firms the same phenomenon happens for all "levels" of entities in the environment (sub-systems, macrosystems, etc.).

The third reason is that of the limits of our cognitive capability. As affirmed by the structuralist psychologist Piaget (1971, 1972, and 1985) in the field of cognitive science, the structure should not be considered as an object or something that can be positively found in reality, but as the way we look, observe and study the reality. The structure has to be considered as a map, a conceptual category or an item, in a "catalog" of the paradigm Globus/Mundus, with ontological and explicative attributes (Petitot-Cocorda, 1990).

The function of the OdG in VSA can be considered according to the catalog/platform paradigm.by not pretending it to be able to control the future but just to express a choice in the catalog of future probable scenarios.

Recently (2011), the neurophysiologist Alan Barthoz in his recent book *"Simplexity: Simplifying Principles for a Complex World"* introducing the concept of *simplexity* describes how living organisms (and consequently viable organizations) need to find conceptual maps that allow them to deal with information and conditions, while taking into account past experiences and anticipating future ones. These conceptual maps of course cannot include all the potentially infinite complexity of reality, but they need to elaborate solutions and find strategies to act and react in different situations. The viability of living history is hence given by its ability to find conceptual maps that make them capable of finding a direction inside the world's complexity and by imposing

Stafford Beer A. (1969). *"Cibernetica e direzione aziendale"*. Milano: Bompiani.

Stafford Beer A. (1973). *"L'azienda come sistema cibernetico"*, Milano: ISEDI.

Stafford Beer A. (1966). *"Decision and Control"*, Wiley.

Stafford Beer A. (1979). *"The Heart of the Enterprise"*, Wiley

Stafford Beer A. (1972). *"Brain of the Firm"*. The Penguin Press.

Stafford Beer A. (1967) *"Cybernetics and Management"*. English University Press.

Stafford Beer A. (1985). *"Diagnosing the System for Organizations"*, Wiley.

Terna P. (ed.). (2006. *"Modelli per la complessità"*. Bologna: Il Mulino,

Toffler A. (1980), *"The Third Wave"*, Bantam.

Williamson O. (1991). *"L'organizzazione economica"*. Il Mulino

their own rules onto the environment. Only with a map the viable system can act in the midst of the uncertainty of the complex world. These maps call for a conceptual simplification that can be managed by our cognitive capabilities in order to act in the best possible manner.

The concept of firm is one of these conceptual maps, sometimes we need to change the map to find the solution and to survive complexity.

Figures

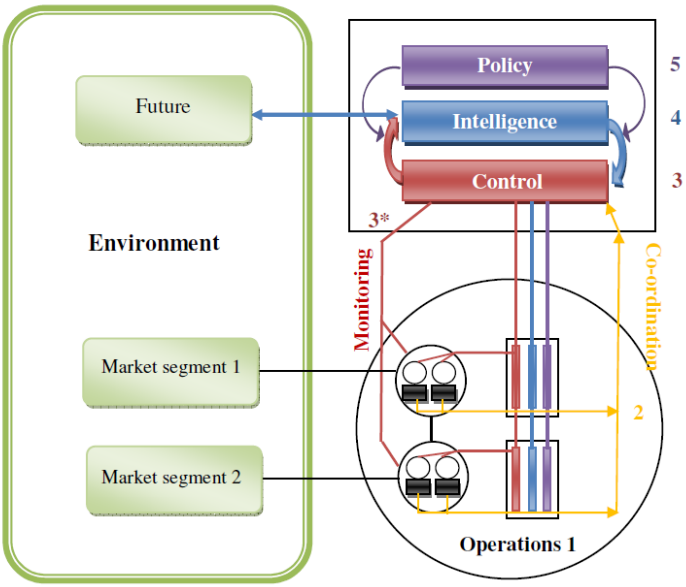

Figure 1. The VSM

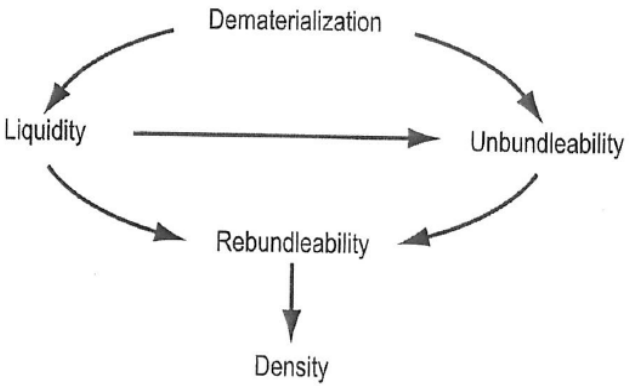

Fig. 2. Drivers promoting density – overview (Normann, 2001: 30)