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ORGANISATIONAL SYSTEMS AND INNOVATION

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Categoria: Punti di Vista

INTRODUCTION

This is a paper about organisational innovation in a liquid society (Bauman 2000). Change is happening at breath taking speed. Innovations associated to brilliant minds, will continue happening but the focus of this paper is on innovations emerging from the collaborative efforts of people, contributing to the best of their abilities to visualise, create, and produce new ideas in uncertain and risky environments. Innovation is often related to new products but also, particularly today, in the digital society, to new forms of organisation; it is related to disruptions of organisational processes which enable products and services that were unthinkable before. This second form of innovation relates to changes in organisational relationships and structures. Organizations, supported by technologies, are increasingly finding ingenious ways to cope with the demands of their environments through virtuous circles of technological innovation and problem solving. Today with new technologies they are achieving structural centralisation and functional decentralisation, and indeed structural decentralisation and functional centralisation.

My interest in this paper is innovation to support organisational adaptation to turbulent environments. Supported by the metaphor of gliding (cf. Espejo and Zarama 2000) the key question I want to address is the relationships that are more likely to increase the chances for an organisation to glide successfully in its environment. Innovation here relates to the organisation's problematic environment and the reconfiguring of its structure for this purpose. Two aspects need consideration, the first is the organisation's choosing of its problematic environment to make its gliding more manageable and the second is the organisation's ability to change its structure and processes to make this gliding, in whatever environment it chooses to glide, more successful. Perhaps, for an organisational system, changing its environment might appear as more challenging than changing its structure, however, either way structure and environment are co-dependent and both can trigger and require innovation.

The main conceptual tool I want to use for these purposes is Beer's Viable System Model -VSM- (Beer 1979; Beer 1981; Beer 1985). The organisation in focus is any *organisational system* emerging from the integration of resources, whether these are institutional parts, full institutions, individuals, or collectives, that align their purposes through self-organisation in the creation of shared policies (Espejo and Reyes 2011).

A major concern will be, how is it that organisational systems work out their problematic situations. What drives their adaptation to turbulent surroundings? The dynamic balancing between an organisational system and its environment requires clarifying performance criteria; purposes, values, and outcome, that are necessary

for their mutual sustainability.

To start with I will say a few words about the Viable System Model. I will then explore in more depth the interactions of the organisation with its problematic environment. The *operational environment* is the full context supporting the organisation's co-evolution with its environment, but the *problematic environment* is the one where the future is latent. This is the main concern of the paper; how does the organisation deal with this known unknown? Then I use my earlier work on structural and identity archetypes (Espejo 2008). In the context of this paper I'll refer to the *stretching and liquid identity archetypes*. I'll explore around these two archetypes the challenges of dealing with an organisation's problematic environment and with its internal structure. Both archetypes suggest forms to increase an organisation's innovation capabilities.

THE VIABLE SYSTEM MODEL

For any complex policy, multiple institutional resources are focused on it. Often these resources are fragmented, however, one way or the other, through self-organization, over time, they interact, constituting, if the policy proves to be viable, an organizational system. For instance, we may expect that the different resources focused on nuclear waste management (NWM) in a country, (whether these are operating companies, regulatory bodies, or government institutions) will relate to each other and over time produce an autonomous system, with the capacity to create, regulate and produce nuclear waste management. Autonomy in this context means that the nuclear waste management system (NWMS) accepts responsibility for its own affairs and can norm itself within the framework of larger systems, such as the nuclear industry and society at large. As for the nuclear industry, we can also expect that it is an autonomous system, with capacity to create, regulate and produce its meanings (i.e. purposes and values). In the case of the nuclear industry it should not be difficult to visualise that the government (through its departments of state focused on energy) is creating nuclear policy, regulating the implementation of this policy and through private and/or public nuclear *operators*, it is implementing it. The nuclear operators are *primary activities* of the nuclear industry. Also, within each of the operators we may expect to find autonomous systems focused on creating, regulating, and producing their own policies. This devolving is largely a self- organising strategy to cope with environmental complexity, which for socially required performance triggers as many structural levels as are necessary to produce desirable services (social goods) to customers. This is the *unfolding of complexity* of autonomous units within autonomous units (Figure 1)

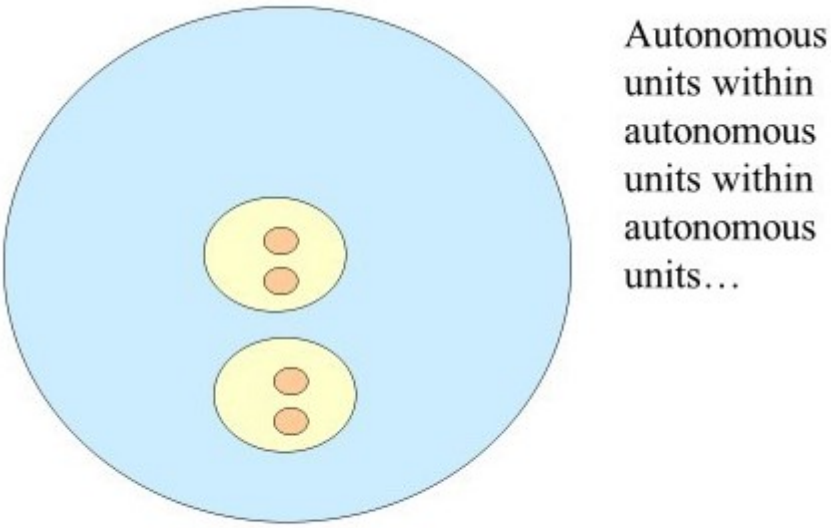


Figure 1 Unfolding of Complexity

This top-down description is useful to visualise the architecture of complex social systems, however in practice the situation is far less tidy. For instance, systems may develop connectivity and come together to produce a larger system of which they become autonomous systems. In fact, in social situations the political will to pursue a policy may trigger that so far unconnected autonomous institutions come together under the umbrella of this policy, thus producing a larger system of which they become autonomous parts. The variety of possible *organizational forms*, that is, of possible unfoldings vis-à-vis a wide range of catalysts (e.g. policies, innovations, serendipity, and so forth), can be very large.

Each primary activity (i.e. circle in figures 1 and 2) is to larger or lesser degree a viable system in the sense that it develops a discourse of its own, norms its own actions -for which it must be prepared to redeem its legitimacy claims- and maintain an autonomous existence in its relevant environment -for which it must be prepared to redeem its authenticity and the truth of the knowledge it uses and produces. All this requires functional capacity (Wene and Espejo 1999; Espejo 2007).

A viable system is produced by five systemic functions, *Policy, Intelligence, Cohesion, Coordination, and Implementation* (Espejo 2003), which together create, regulate, and produce its products and services (Figure 2).

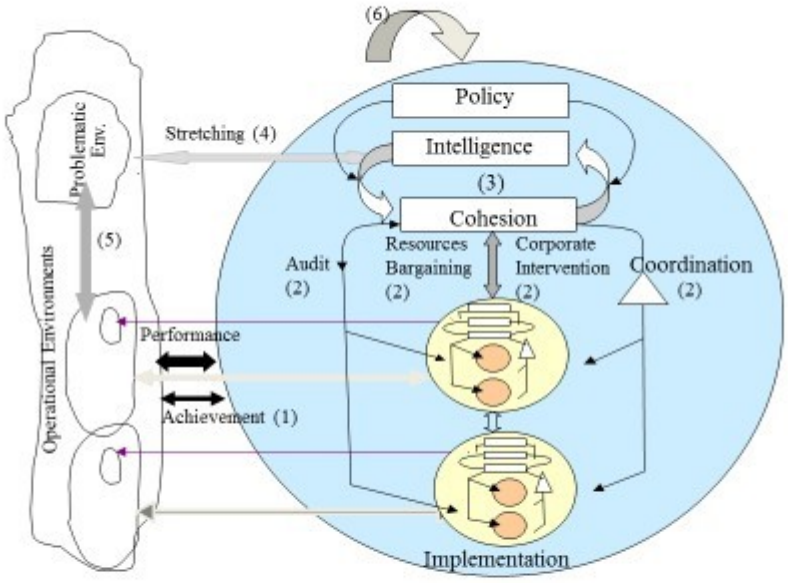


Figure 2 Viable System Model: Reference Model

The system's primary activities implement (i.e. produce) the policy. Policy, intelligence, and cohesion, together, constitute an *adaptation mechanism* that catalyses the emergence of these primary activities and are at the core of innovation. Policy gives *closure* to their communications, sets strategic orientation and manages interactions to use intelligence and cohesion resources to the best of their abilities in the collective benefit. The Intelligence function is concerned with the *outside-and then*, that is, with the organization's *problematic environment* in the future. This is the functional capacity that maintains conversations with those external agents1 that may influence the policy's long term consequences. The cohesion and co-ordination functions allocate resources and regulate the implementation function. Together these three functions constitute the *cohesion mechanism*. The cohesion function is concerned with the *inside-and-now*, that is, balancing the autonomy of embedded primary activities with the cohesion of an encompassing viable system. The same five systemic functions recur in all embedding and embedded primary activities (see this recurrence of functions and relations in the graphical patterns of figure 2), as requirements for their viability. This is Beer's concept of structural recursion, i.e. that the same structure for viability recurs in all primary activities, at different structural levels.

What is of methodological interest is that actors, or any institutional resource, recurrently contributing through their interactions to the creation of a meaning at a given level of recursion, whether they are *formally* distant or close to the systemic functions they are contributing to, become systemic roles of those functions in the

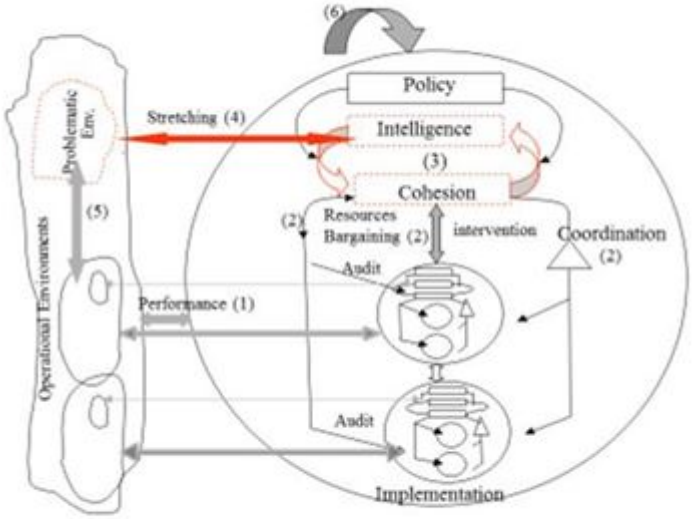
primary activities constituting that level of recursion. For instance, shop floor workers, if through their interactions are contributing to the company's creation of new products, despite being in the shop floor, are systemic roles of the *company´s (corporate) intelligence function*. In the end, all human and institutional resources in an organisation can be mapped onto the five systemic functions. This is the great methodological power of the VSM to study the requisite organization for a policy issue.

ENVIRONMENT-INTELLIGENCE INTERACTIONS: THE STRETCHING ARCHETYPE

A challenge for an organisational system is disclosing its *problematic environments* (see figures 3 and 4). This is an issue at the core of innovation. In a changing, highly dynamic environment, full of uncertainties, *organisational actors* need to engage in conversations with *environmental agents* to disclose new worlds for the organisation's future (Spinosa, Flores et al. 1997). They glide in the environment (Espejo and Zarama 2000)2; conversations are key to anticipating turbulences, historic changes, emerging values, and so forth to glide successfully to a destination. Often An organisation's future oriented conversations are weak implying what in figure 3 is presented as weak stretching. To support adaptation, intelligence actors should develop sensibility for their contexts, establish networks of responsible trust, become aware of critical trends and so forth (these are the environmental decoders in figure 4). Holding conversations with agents in the operational environment is not enough; conversations with agents beyond operations are necessary.

Which conversations are relevant for the organisation's future viability? These depend on the organisation's purposes and policies, which, in their turn, evolve from conversations between actors focused on the *inside and now* (cohesion function) and the *outside and then* (intelligence function). It is in these conversations that intelligence actors work out who could be relevant agents in their *problematic environment3*. Key agents, for no other reason that they have different contexts and histories, stretch the actors' views about the organisation's futures. *They stretch* the organisation's transformations4, either because they offer new products or services, or because they are developing and using new technologies, or because their centre of gravity is in different geographies, or because they operate in settings with institutional innovations, or by innovative organisational forms or whatever.

Figure 3: Weak Stretching



Performance Archetype: Weak Stretching

Serendipitous agents may stretch the creativity and competence of actors, possibly of actors operating throughout the organisation. For the less expected actors, such as actors focused on local issues, as they glimpse situations beyond their immediate concerns, they may find themselves contributing to the intelligence function of the total organisation. These are actors that *see* the advantage of aligning their operations and values with those of, possibly, distant and unexpected agents. These are actors that recognise creatively the value of their interactions with these agents' products and services. These are meaning creation interactions aimed at taking advantage of possibilities of consonance and resonance with environmental agents (Golinelli 2010, Sergio Barile, Saviano et al. 2012)5.

Actors glide in complex environments full of threats and opportunities. But, to capture these threats and opportunities they need developing collectively their bodyhood6. This body should be capable of maintaining direction and responding, if necessary, to unpredictable storms. Is the organisational system capable of maintaining its dynamic stability in these evolving environments? Gliding happens in the middle of the uncertainty of uncontrollable events. Organisations in pursuing their purposes need to be prepared to deal with the unthinkable, with 'black swans' (Taleb 2008), to keep their course and move ahead, creating their future. Bodyhood emerges from networks of actors as they achieve operational closure. Operational closure requires actors´ alignment of their common purposes and achieving coherence between their policy creation and policy implementation. Their informational and operational domains need to become congruent (Espejo and Reyes 2011).

Achieving congruence between *espoused purposes* and *purposes in use* (Argyris and Schon 1996) is a challenge for the adaptation of an organisational system to its complex environment. This is *achieved largely through self-organisation in turbulent environments, which requires creativity and innovation*. Actors, as anticipated before, need to look for agents that are relevant to their purposes and through their interactions

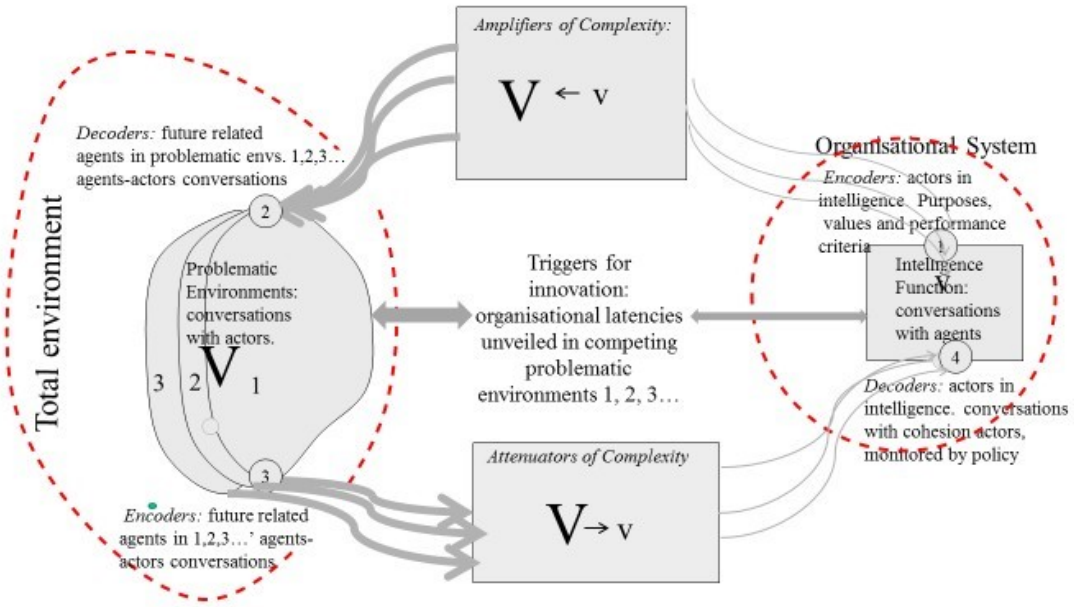
work out strategic direction and performance criteria for sustainability in their wider environment (i.e. beyond their operational environment- see figure 1). It is in these interactions that alternative problematic environments emerge (see figure 4). Who are the agents which have significant relevance and influence in their grasp of their long-term viability? There are several loops in operation. Actors' inventiveness may trigger competing environmental challenges, and as they work out alternative forms of consonance and resonance with myriad of agents they structure several problematic environments (see figure 4). It is through the competition of leading actors in structuring these problematic environments, driven by varied conversations, that alternative performance criteria are visualised; they are establishing alternative problematic environments, which may require for their viability structural modifications. The strength of alternative problematic environments is constructed by the attraction that these leading actors achieve with other actors within the organisation in response to exploring (encoding) and interpreting (decoding) environmental demands and performance requirements. This emphasis in alternative problematic environments is graphically represented in figure 4.

Figure 4 is a model of a homeostatic relationship between the intelligence function and its problematic environments. This diagram models communications from the perspective of variety engineering (Espejo and Reyes, 2011). It highlights that the intelligence function is not a single viewpoint, but we expect several actors structuring the problematic environment and trying to win the support of other actors to strengthen the overall influence of intelligence in policy processes.

This competition among actors focused on the outside and then increase their variety (V) and therefore opens the space to stretch the environmental influence in policy debates7.

Actors will recognise different problematic environments and unveil different latencies for the organisation, thus *changing its overall performance*8. This is an important issue at the core of innovation. As they visualise alternative problematic environments, they trigger creative conversations among them and possibly unveil alternative organisational latencies, which set different references for developing its dynamic capabilities.

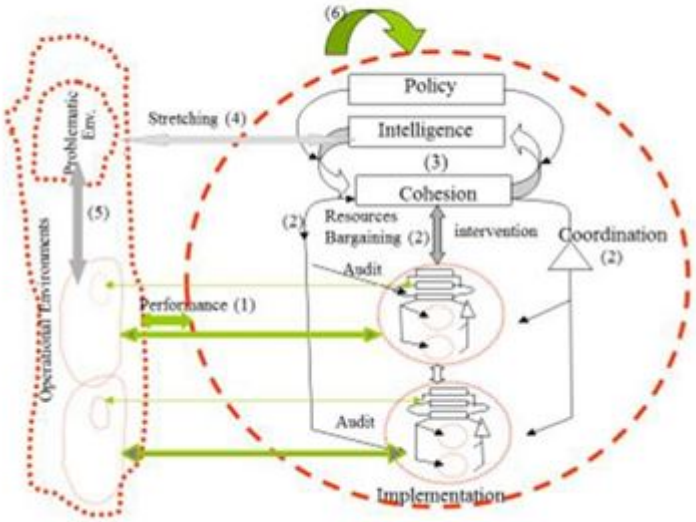
Figure 4: Competing Problematic Environments Stretching and Innovation



STRUCTURAL DISRUPTIONS: THE LIQUID IDENTITY ARCHETYPE

In VSM terms, actors as they contribute to policy, intelligence and cohesion converge into alternative purposes and policies for the organisation, which often imply reconsidering primary activities for policy implementation and reconsidering relational structures for viability. Innovation is necessary for effective organisation structures. *For an organisational system, a structural challenge is opening to all actors the space for conversations about the future; this is necessary for them to contribute to the best of their abilities to the organisation's viability*9. The required alignment of resources varies for different policies. New policies open the space for structural innovations within the organisation. The actors "winning" the conversations for adaptation, that is, making their proposals for problematic environments more relevant, trigger the need to consider related disruptive cohesion mechanisms. This is a trigger for internal innovation, that is, for disrupting processes towards a better performance. New technologies play a critical role in this form of innovation. In today's digital society, organisational systems should be increasingly fluid, flexible, and adaptable (Bauman 2000). This is a necessity to deal with the turbulence of societal and technological changes. However, actors often operate in a legacy of rigid structures, that limits their response capacity. Understanding the liquid identity archetype (figure 5) helps overcoming constrains for disruptive innovation (Espejo 2008).

Figure 5 Fluid Identity



The challenge for them is re-inventing the organisation's future through innovative primary activities and processes, as new disruptive technologies increase competitiveness and make necessary new *forms of organisation*; there is pressure for innovation from within. It is common to find organisations locked into one problematic environment, often a straightforward one, with limited capacity to recognise agents for innovation. As advanced above, when actors recognise spaces for consonance and resonance with environmental agents, they are opening opportunities not only to invent alternative problematic environments but also *to invent alternative implementation processes* that feed back into them. The feedback of these implementation processes may reinforce some of problematic environments and reject others; related actors are involved in processes to win the argument. Actors who structure alternative problematic environments and discover latent possibilities are opening spaces for fluid structures and therefore for more flexible policy implementation. As said before performance is the product of current achievements and of the latencies emerging from the organisation's problematic environments. An organisational system with good cybernetics allows bottom up processes of self-organisation to adapt structures to the environmental demands, thus developing their dynamic capabilities. Fluid boundaries require processes that are agile and responsive to environmental challenges. Aspect of policy, environmental stretching and structural fluidity have the potential to drive innovation.

The challenge is not predicting the future. For innovation, the challenge is capturing the future that is latent in their creative interactions with environmental agents. Selected conversations with agents, whether these agents are close or distant, help visualising latencies. These conversations help capturing dynamic capabilities at all levels of recursion producing a policy.

The issue of identity is particularly significant for organisations trying to achieve stability in environments constituted by agents stretching them beyond their response capacity. Liquid identity is at the core of many

identity problems. In today´s world organisations cannot expect that their products and services will remain valid for too long. Technology and people's expectations are changing too quickly; ecological, social, and economic considerations are changing their requirements and needs. The life of products and services can be short, perhaps months or few years, to the point that their value is reduced almost at the very moment that agents in the environment receive them; the speed of their co-evolution is huge. If organisations do not adapt quick enough to the demands of their surroundings they may not remain viable. If they do, past knowledge and experience may appear undervalued, as actors give preference to potential ability (i.e. talent) at the expense of experience. In terms of relationships liquid modernity may produce actors' low loyalty, reduce trust, and weaken organisational learning. From the perspective of identity, the problem for organisations is that actors find it difficult to recognise what are solid, long- term, learning platforms for them. If management re-enforce producing *old* products/services, they may lose agents' recognition; if they move too quickly into new products they may reduce internal loyalty and trust. Hitting the right balance, that is, finding a stable identity, requires competencies for adaptation and change and for the constant introduction of disruptive technologies. These organisations may need to see that their primary activities are *co-evolving* with agents in their environments (Espejo and Dominici 2016). All these are aspects for disruptive innovation.

Complex environmental changes require an organisation´s resources to integrate, reconfigure, gain and release resources, to match and create its dynamic capabilities (Teece, 2008); it relies much less on existing knowledge and already learned routines, and much more on rapidly creating situation- specific new knowledge. Existing knowledge can even be a disadvantage. In these circumstances, they say, environmental boundaries are blurred (see red dots in figure 5), operational models are unclear, and agents are ambiguous and shifting. The organisation needs to develop dynamic capabilities of a higher order, that is, it needs capacity to structure and compare problematic environments in tandem with evolving primary activities that are themselves liquid and questioning the organisation's identity.

Constant innovation is a whole mark of organisations experiencing liquid identity.

CODA

Conversations, organisation structure and innovation are presented as three foundational ideas in this paper. Gliding of actors in the organisation´s environment is a mechanism to work alternative problematic environments relevant to its future. Conversations with agents stretch intelligence actors and help them disclose new worlds in which the organisation is gliding now and possibly in the future. Anticipating the needs for adaptation requires this contextual sensitivity, which provides the strategic orientations for innovations. Beyond awareness of the environment, innovations need to be grounded in the organisation's vision and its possibilities. While the environment is the space to detect possible innovations, agreements about innovation require balanced conversations between intelligence and cohesion actors, monitored by policy actors responsible for the organisation's purposes and policies as well as for its operational closure. I have proposed to contextualise changes both in the organisation's actuality, as understood by cohesion actors, and in its latencies as visualised by intelligence actors. Competing problematic environments disclose alternative organisational latencies and those most appealing to actors – those offering higher performance- point the direction for organisational development. Latencies, visualised by the intelligence function, possibly with participation of actors from throughout the organisation, are the engines to develop the organisation's

dynamic capabilities. Indeed, visualising latencies, and their related innovations, should be open to the unrestricted participation of all actors through bottom up self-organisation processes. This is not dreaming but opening the space for the widest participation possible, accepting that all actors from their own perspective have knowledge that is potentially useful to the whole organisation. For an organisational system, the challenge for its structure is opening the space for conversations about the future to all actors making possible for them to contribute to the best of their abilities to the organisation's viability.

References

Argyris, C. and D. Schon (1996). Organizational Learning II. Reading, Addison-Wesley Publishing Co.

Sergio Barile, M. Saviano, Francesco Polese, Primiano Di Nauta (2012). "Reflections on service systems boundaries: A viable systems perspective. The case of the London Borough of Sutton." European Journal of Management 30(5).

Bauman, Z. (2000). Liquid Modernity. Cambridge, Polity Press. Beer, S. (1979). The Heart of Enterprise. Chichester, Wiley.

Beer, S. (1981). Brain of the Firm. Chichester, Wiley.

Beer, S. (1985). Diagnosing the System for Organizations. Chichester, Wiley.

CNICChile (2013). SURFEANDO HACIA EL FUTURO: CHILE EN EL HORIZONTE 2025. Santiago, Chile,

Consejo Nacional de Innovacion para la Competitividad

Espejo, R. (1992). Cyberfilter: a management support system. Executive Information Systems and Decision Support. C. Holtham. London, Chapman and Hall. 15: 145 - 169.

Espejo, R. (2003). "The viable system model, a briefing about organizational structure." Aston Science Park, Birmingham: SYNCHO Limited.

Espejo, R. (2007). "The RISCOM model: dialogues and requisite organisation." Kybernetes **36**(3/4): 291-306.

Espejo, R. (2008). "Observing organisations: the use of identity and structural archetypes." International Journal of Applied Systemic Studies **2**(1-2): 6-24.

Espejo, R. and R. Zarama (2000). The Cybernetics of Anticipation. 44th Annual Meeting of the International Society for Systems Sciences, Toronto.

Espejo, R. and A. Reyes (2011). Organizational systems: Managing complexity with the viable system model. Heidelberg Springer Verlag, .

Espejo, R. and G. Dominici (2016). "Cybernetics of Value Cocreation for Product Development." Systems Research and Behavioral Science Published in Wiley Online Library 10.1002/sres.239.

Richard Foss , (2015),"A self organising network model of information gathering by the honey bee swarm", Kybernetes, Vol. 44 Iss 3 pp. Permanent link to this document: http://dx.doi.org/10.1108/K- 11-2014-0264.

Golinelli, G. M. (2010). Viable Systems Approach (VSA). Milan, CEDAM.

Spinosa, C., F. Flores, H.I Dreyfus (1997). Disclosing New Worlds. Massachusetts & London, The MIT Press.

Taleb, N. N. (2008). The Black Swan: the impact of the highly improbable. London, England, Penguin Books.

Teece, J. D. (2008). Technological Know-How , Organizational Capabilities, and Strategic Management : Business Strategy and Enterprise Development in Competitive Environments. London, World Scientific Publishing Co.

Wene, C.-O. and R. Espejo (1999). A Meaning for Transparency in Decision Processes. VALDOR; Values in Decisions on Risk, Stockholm, Sweden, Swedish Nuclear Power Inspectorate.

1 *Actors* are the constitutive roles of the organisational system and *agents* are roles in its environment.

2 Fernando Flores uses the metaphor of surfing rough seas: CNICChile (2013)

3 These agents are not necessarily stakeholders; they are deemed relevant to the organisation's future and therefore to the organisation's problematic environment.

4 An organisation transforms inputs into outputs using technologies that can go from simply technologies such as an assembly line to highly sophisticated technologies such as medical and educational processes (Espejo and Reyes, 2011).

5 The purposes of these actors and agents may be different, and most likely will be different, but aspects of the transformations implied by these purposes may be discovered as alignments permitting consonance and resonance of their activities (Golinelli 2010).

6 I use the term bodyhood for the structure and organisation, including strengths and weaknesses. Bodyhood highlights the structure and relationships of an organisation producing its own identity and closure.

7 This is an insight that can be found in Richard Foss's work (e.g. Richard Foss , (2015).

8 Organisational performance is understood here as the ratio between potentiality and actuality or alternatively as the product of achievement and latency (Beer, 1981, Espejo, 1992).

9 For instance, shop floor actors may visualise innovations in product lines, far beyond their local activities and actors working at the corporate level may understand the need for specific innovative local changes. The proposal of this paper is that formal structure should not constrain actors contributing to systemic functions at different levels of recursion far beyond their own levels. In this examples the shop floor actors are functionally part of corporate intelligence while corporate actors are part of systemic functions of a local primary activity. Of course, it is important to avoid local intrusion, but contributing creatively to making it viable should be acceptable.