INSTITUTIONAL INNOVATIONS AND ORGANIZATIONAL SUSTAINABILIZING

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Abstract: *The innovation capacity (potential) is a necessary feature of any dissipative systems. In the case of organizations that must maintain their structure and the correlative functions, i.e., must verify the state of sustainability, this feature is much more important. The paper examines the role of the innovation regarding especially the institutional innovation in generating and preserving the sustainable state and kinematics of organizations considered in the most abstract way: dissipative systems „endowed" with human beings. Some conceptual clarifications are delivered in order to prepare the considerations on the main mechanisms aimed to react to the external or internal perturbations on the sustainability of the organizations in case. The paper goes beyond the simple resilience or robustness, by convoking some new and still polemical concepts: auto-poiesis, anti-fragility, Oedipus effect and so on. Finally, a logical map of emerging auto-poiesis in organizations are sketched.*

Key words*: sustainability, auto-poiesis, organization, innovation, institutions*
JEL Classifications*: D50, M10, Q01.*

1. Introduction

It is generally accepted that the structure of a system generates and preserve the functions of that system [Hayek, 1960][1]. As the set of functions give the role, we obtain the role of a system is a result of its structure. More than that, the structure is the warrant of the system identity. By identity we understand that situation in which the state vectors of the system between two moments of time have their parameters within a gap pre-accepted. So, being the parameters which fundamentally describe a system: s_i^j, where $i = \overline{1,n}$, and j is the moment of time, the state vectors for moments of time j and k are: $S^j = \left(s_1^j, s_2^j, \dots, s_n^j\right)'$, and $S^k = \left(s_1^k, s_2^k, \dots, s_n^k\right)'$, respectively. Now, be the acceptable gaps for variations of parameters: $G^{jk} = \left(g_1^{jk}, g_2^{jk}, \dots, g_n^{jk}\right)'$. We say the structure of the involved system s invariant between the moments of time j and k if: $\left|s_i^k - s_i^j\right| \leq g_i^{jk}$. In other words, a certain variation of the parameters are acceptable, but only inside the gaps pre-accepted. The invariance of the structure in the mentioned understanding assures us about the identity of the given system. We'll see below the invariance of the system is the crucial benchmark to discuss the question of its sustainability.

But, the invariance of a system seems to be inconsistent with its development or, in the case of social systems, with its progress. In fact, by development it must be understood a variation of a structure as result of growth. As a variation of a structure could means a modification of the system's identity, how might be interpreted that? Generally, the pressure on the structure changes is exerted by innovations (either generated inside of the system, or imported from outside). So, it is important to elucidate these relationships between the sustainability delivered by maintaining the system's identity and the innovations, especially the institutional innovations[2].

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[1] Remember this assertion is the ground of the Darwinism in the natural evolution of life (NB: it seems, however, **Darwin** is inspired rather from the social evolution which he has „transplanted" on the nature.

[2] To be mentioned that the institutional innovations are a species of the social innovations.

2. What the institutional innovation is it?

An innovation (*I*) is, conceptually, something (idea, procedure, mechanism, object etc.) that changes a statu quo in a given system. Of course, overtaking of a threshold is still necessary here to qualify a change as an innovation[1]. As observed, almost all considerations on the economic/social concepts and mechanisms need thresholds. According to the above allegations, the thresholds are needed in order to establish that the identity is conserved or not. So, an innovation is that change within a system that signify such a change in its structure that overtakes a certain threshold but, in the same time, doesn't overtake the threshold that could compromise the identity of the given system. Figure 1 tries to visually suggest this idea.

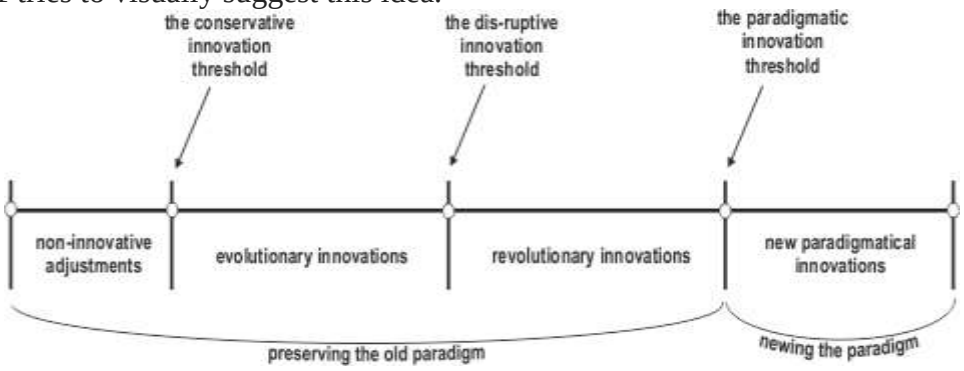

Figure no. 1. Innovation general typology

So, it seems there are, based on the role in the system dynamics, four type of innovations: pseudo-innovations – until the conservative innovation threshold, evolutionary innovations – which maintain the system identity, revolutionary innovations – which change the system identity, and new paradigmatical innovations, which in contrast with the former three types of innovations, do not preserve the current paradigm within which the system evolves, but determines passing towards a new paradigm[2].

If that is the innovation, we are further interested by the institutional innovation. Before that, we want to specify an innovation doesn't derive from an inferential mechanism, because this case it isn't properly said an innovation, but only a result which, sooner or later, would have appeared anyway. More precise, an innovation must be a novelty, that implies be unpredictable. Or, an inferential mechanism is totally predictable, based on valid inferences within it. Now, what could be the supplementary predicate or predicates which could lead to this species of innovation, that is, institutional innovation? We consider that being given an innovation (*I*), of any type, it becomes institutional innovation (I^2) if:

(a) the system within which the innovation occurs is an institution[3]; verifying of this predicate generates potential institutional innovations (PII);

(b) the innovation in case enters (i.e., affects) the structure of the system; verifying of this predicate generates actual institutional innovations (AII);

The first supplementary predicate (i.e., the host of the innovation must be an institution, as defined by the footnote no.5) is not problematic, but the second seems need some comments. As was said before, the structure ensures on the keeping of the system identity. By requiring that the innovation must enter the structure of the system, in fact we

[1] Otherwise, small changes that do not pass beyond the established threshold cannot be considered as innovations, but changes in the same „innovational paradigm".
[2] Of course, the new paradigm will repeat all the four types of innovations, and so on.
[3] Here, the term institution addresses the largest signification of the concept, in fact, so large that its intensiveness is reduced to artefactual systems (i.e., any organization or group with a minimum degree of formalism).

require the innovation have at least two functions in the system evolution: a) maintaining the identity of the system (of course, according to the figure 1, as evolutionary innovation only; b) ensuring on the irreversibility of the change brought by the given innovation. Regarding the second function, it is accepted in the system theory that the structure has a great reluctance to reversibility. So, imposing the structural immersion of the institutional innovation, we locks the possibility the innovation disappear. Figure no. 2 tries to visualize these considerations.

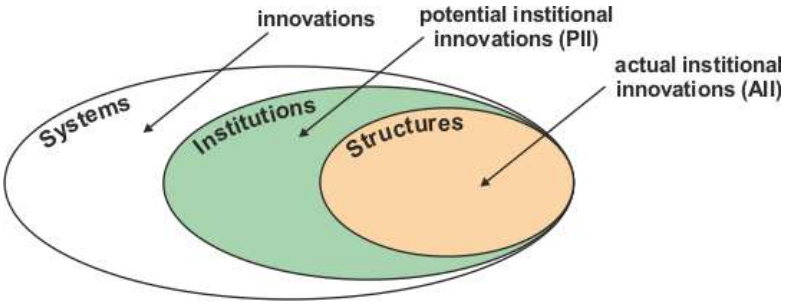

Figure no. 2. Way of generating institutional innovations

3. Relationship between institutional innovation and sustainability

So, supposing the given threshold was overtaken, an innovation must be, supplementary, persistent, i.e., irreversible. This feature is assured, as mentioned above, by the type on innovation called actual institutional innovation (AII). It is of importance to discussed now two issues: 1) how the actual institutional innovation can guaranty the sustainability of the institution involved; 2) how the actual institutional innovation can re-sustainabilize an institution di-sustainabilized.

(1) Generally, an innovation disturbs the system within which it occurs. There are at least two reasons to claim that: a) by definition, an innovation is no predictable. This means: a.1) it is not part of an occurrence model, i.e., an algorithmical device that make us to expect (at limit, to predict with a reasonable accuracy) its appearance. As a result, any innovation has the potential to destabilize the host system[1]; b) it is focused on the system structure. As a result, its impact is not at all superficial and passable, but, by the contrary is deep and irreversible. So, an innovation comes with a strong „intention" to destabilize (or di-sustainabilize) the host system. But how can we be ensured against the non di-sustainabilizing of that system? We think there are a single but strong principle in the matter: empowering the given system with a sufficient capacity of robustness (capacity to grossly resist against perturbations), redundancy (capacity to replace internal devices to resist against perturbations, i.e., capacity to rebuild the robustness), and resilience (capacity to re-bring the system in its initial state after the perturbations impacted t). So, this kind of the phenomenon addresses the case in which the targeted system tries to

[1] Of course, only if the given innovation exceeds the threshold under the system in case maintain its identity. In principle, there two sides of such a threshold: 1) the size, which means the innovation must have an amplitude of change under the dimensional side of the threshold; 2) the speed, which means the innovation must enter the system with a speed under the limit within that system can absorb the perturbation brought by the innovation. Unfortunately, because the unpredictability of any innovation, the overcome of the two mentioned limits of the threshold are established/observed always after the innovation have produced its impact. To be mentioned an innovation anyway disturbs the host system, but by fitting the two limits, the perturbations can be maintained inside the system identity, so, in a way, the innovation impact is managed.

preserve itself, that is, to maintain the perturbations generated by innovation within the limits which ensure on the system identity.

(2) The second case is that when the limits of preserving the system identity are overcame. Now a new issue arises: how can the system involved in such a process return to its initial state. We think this case require to introduce the concept of auto-poiesis, so we think the system in case must be „endowed" with the auto-poetic capacity. If it is well-known, the biological living systems have such an auto-poietic capacity, which means a capacity to self-repairing, self-organizing (or self-reorganizing)[1]. Consequently, the system in case must be built up and conceptually understood as being a logically (not just biologically) living system. In such a way, sufficient degree of auto-poiesis could be „injected" into the system structure, functioning and behaviour so its identity be re-gained after the innovation applies its impact by putting it off its identity. To get that, the system in case must hold at least: a) an (internal or external[2]) accessible and indestructible memory regarding its former (i.e., before the innovation impact); b) an (internal or external) mechanism of repairing the damages caused by the innovation; c) an (internal or external) device to verify the achievement of repairing. To be noted, the re-sustainabilize is not the same with the re-stabilize: the first does allow some degree of variation from the initial state (structure, functioning, and behaviour) of the system, under the condition of preserving its identity, while the second does not allow such a gap, requiring a punctual remaking of the initial state.

The Figure no. 3 indicates the phenomenology of the innovation impact in a host system.

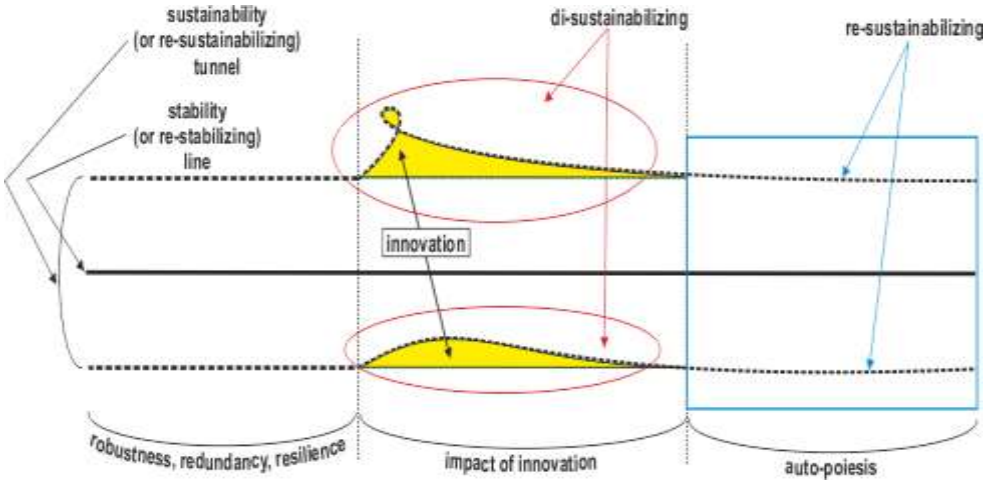

Figure no. 3. The phenomenology of innovation impact regarding the sustainability state of a system

4. Innovation and anti-fragility

The issue of the benefits from innovation is an old one. It must be said that there are many other types of small adjustments inside systems aimed to improve its functioning in the framework of the same basic structure, but these are not innovations in the sense here stipulated, but fine tuning changes that punctually bring small enhances of functioning. As mentioned above, an innovation hold risks, primarily regarding the sustainability of the host system, because the two reasons already examined (unpredictability and structurality).

[1] Of course, again, within the limits which preserve the system identity.
[2] And accessible.

Beyond the interest to counteract the de-sustainabilizing impact of the innovation, another question can be (and, actually, is) putted: if is it possible and how could be objectified the way to gain from perturbation, more specifically from the innovation occurrence. Some considerations are to be done here.

(1) Generally, an innovation brings advantages (gains of certain kinds), but many times not the advantages are the system targets, but its sustainability. In this context, the most innovations are expected to bring advantages, but their impact on the system sustainability still remains problematic[1]. So, another question arises now: even in the case an innovation, although brings some advantages for the host system, but these advantages means some risks (or costs, what is equivalent) for the host system sustainability, what can be said about gaining just from these risks. In other words, how is it possible to benefit from perturbing the system's sustainability. The concept of anti-fragility [Taleb, 2012] answer this question. We do not detailed examine the concept of anti-fragility, but only want to mention that such a concept has as basic consequence the uselessness of taking into consideration the risk[2]. More than that, neither uncertainty[3] is needed to be taken into consideration. Of course, these „savings" (of taking into account the risks or/and the uncertainty) require a cost: ensuring the anti-fragility as a parameter of the system structure. Such a parameter will have just the function (or role, if it embedded more convergent functions) to deliver gains from perturbations. For example, any removing of the system in case from its sustainability tunnel (see figure 3) should acquire some gains (of no matter kind) for that system. How is it possible is the subject of another paper;

(2) It is important to specify that the concept of anti-fragility is not inconsistent with the other concepts already evoked: robustness, redundancy, resilience. The crucial difference between it and the mentioned concepts consists in the capacity of an anti-fragile system to gain from perturbations. An interesting question that arises here is: an anti-fragile system gains from perturbation even in the case in which such a perturbation di-sustainabilizes the given system? In other words, the anti-fragility do not deliver principles and mechanisms to preserve the system identity under the perturbation? The issue is not yet approached in the dedicated literature, so, for the moment, we'll offer only some general considerations: a) an innovation is a special case of perturbation – in the most cases, it occurs in order to improve the system structure and functioning; however, for the host system, the innovation remains a perturbation, but the risk to have a net negative impact from it is small; b) in the (a) case, the anti-fragility should acquire supplementary gains compared to those brought by the innovation itself; c) is not necessary, for the anti-fragility do its impact, that the system be removed from its sustainable trajectory through the innovation, so, the anti-fragility and the resilience capacity of the given system could form an integrative defensive mechanism.

Selected bibliography

1. Hayek, F., 1960. *The Constitution of Liberty*. Chicago: University of Chicago Press. (the book was been translated into Romanian, under the title *Constituția libertății*, by Institutul European Publishing House, Iași, 1997).

[1] The main reason here is, of course, the unpredictability of an innovation in its sense held in this paper.
[2] Any kind of risk needs distributions of probabilities (either objective, or subjective), but the new (unknown) risks have not such distributions of probabilities.
[3] To be remembered that uncertainty cannot be not at all credited with distribution of probabilities, unlike the risks.

2. Taleb, N.N., 2012. *Antifragile. How to Live in a World We Don't Understand*. Allen Lane Publishing House (the book was been translated into Romanian as *Antifragil. Ce avem de câștigat de pe urma dezordinii*, Curtea Veche Publishing House, 2014).