

Organizational Knowledge Conversion and Creation Processes in a Chaotic Environment

Ștefan Andrei NESTIAN

Alexandru Ioan Cuza University,
11 Carol I Blvd., 700506, Iași, Romania
nestian@uaic.ro

Abstract. *This is an explorative and conceptual paper, based on the analysis and comparison of relevant literature. The purpose of the article is to clarify the differences between knowledge creating processes and knowledge conversion processes, by analysing them when confronted with a chaotic environment. The way the knowledge conversion and creation processes are presented by Ikujiro Nonaka and his co-workers suggests the necessary existence of a Ba in order to generate the spiral of knowledge creation. This implies the acceptance of a relationship between the environment and the knowledge conversion process, in which the environment influences the knowledge creation. The article is based on the hypothesis that a chaotic environment, characterized by unpredictability, non-linearity and crisis, will lead to specific ways of functioning of the knowledge creation and conversion process that highlight the relations between the two different types of processes. Starting from the general concept of resilience, herein one proposes and explains the concept of resilience of the knowledge conversion system. The role of the attractors from the chaotic environment in the creation of new knowledge is identified and explained*

Keywords: knowledge creation, knowledge conversion, chaos, environment, resilience

The influence of the environment upon the knowledge conversion and creation

The SECI cycle represents a model that includes two types of knowledge actions: conversion actions (e.g., the transformation of tacit knowledge into explicit knowledge) and creation actions (e.g., welding explicit knowledge into new knowledge in the combination stage of the cycle). The completion of the cycle implies definitely four conversion stages, but does not necessarily imply four creation stages. The creation of new knowledge is possible in all of the four conversion stages, but is subject to a different set of causalities.

The way the knowledge conversion and creation processes are presented by Ikujiro Nonaka and his co-workers suggests that the evolving spiral is possible mainly because of the inputs of knowledge generation from within. Still, the compulsory existence of a Ba in order to generate the spiral demonstrates that

the spiral is influenced by inputs from the Ba. This implies the acceptance of a relationship between the environment and the knowledge conversion process, in which the environment influences the knowledge creation.

It is also true that the knowledge conversion processes can be responsible for the creation of new knowledge, without any intervention from outside the organization. Welding new knowledge from previously acquired knowledge assets is an example. This is why separating the causes of the knowledge creation in internal and external is important as argument for the exploration of the impact of a chaotic environment on the processes of knowledge conversion and knowledge creation.

In the following pages, the system composed of the SECI cycle conversion processes, the Ba and the knowledge assets will be called knowledge conversion system. Further arguments for the necessity to separate the knowledge creation processes from the knowledge conversion processes will be provided in order to analyse the impact of a chaotic environment.

So as to justify the previous ideas, we start from the definition given by Nonaka: Ba is a shared space for emergent relations. It can be physical (desks, workspaces), virtual (e-mail, teleconferences), mental (ideas, ideals, shared experiences), or a combination of all these. This definition certifies that Ba has a physical component, of space in which the knowledge conversion process takes place, as well as a mental component, which supports the transfer of ideas, ideals and shared experiences, within the limits of the physical component of Ba.

Nonaka and Konno describe very clearly the physical aspect of the relation between Ba and the entities participating to the process of knowledge conversion. Therefore, they consider that Ba is the world in which the individual is self-conscious as part of an environment upon which his life depends. The individual is surrounded by the social group that he belongs to, being a part of the Ba of that group. Just as the group is the Ba of the individual, so the organization is the Ba of the group. Finally, the market is the Ba of the organization. It is upon it that the life of the organization depends (Nonaka & Konno, 1998).

The favourite perspective from which the Ba is more often regarded in articles and research studies is that of “organization as the Ba of groups”. The undeclared logic of this perspective is the “consultancy view” of focusing the discourse on the practical aspects of managerial intervention at the level of

organization (Chen, 2002). The main perspective used in the present article argumentation is somewhat different: the market is the Ba of organization.

Starting from the idea that the market is the Ba of organizations, the interactions that need to be analysed will be based on other rules than in the case of the relation between groups and the main organization. This time we speak about other elements that suffer interactions, and in the Ba there will be included the external components as well as the internal components of the organization.

Focusing more precisely on the present article's main interest, the problem of this analysis is the connection between environment and organization, from the perspective of the impact on the knowledge conversion and creation processes. In order to reveal these connections we will analyse the case of relations between a chaotic environment and the organization.

Thus, this article is based on the hypothesis that a chaotic environment, characterized by unpredictability, non-linearity and crisis will have a specific impact on the knowledge conversion and creation processes.

The chaotic environment

The chaos theory is a field of study in various spheres of activity – Mathematics, Physics, Philosophy and Economy – studying the behaviour of the dynamic systems, highly sensitive to initial conditions. The chaos theory was built around mathematical equation describing complex, dynamical, non-linear systems. Chaos is the science of complex, dynamical, non-linear, co-creative, far from equilibrium system (Fitzgerald & Eijnatten, 2002).

In order to classify it, thematically speaking, the ideas of the chaos theory start from the general theory of systems. A system is a set of parts that interact with each other as a whole.

A chaotic environment is defined as an environment characterized from a determinist perspective by non-linearity, bifurcations and strange attractors. Since modelling the reality in linear model is one of the most common approaches for the decision makers (Bratianu, 2009), dealing with a chaotic environment is for the thinking patterns of most individuals as difficult as experiencing an extreme environment. The same discomfort when experiencing an

extreme environment will be found in the thinking models of organisations dealing with chaotic events in a chaotic environment. The discomfort comes from the impossibility of using the recall mechanisms in order to choose suitable behaviours for dealing with the new context. Godden and Baddeley experimented in 1975 the relation between reproduction of previous knowledge and the environment in which such knowledge was acquired (cited in Miclea, 2003). The experiment was designed to measure the reproduction rate of the items acquired in two different environments (A and B). Results have shown that the reproduction rate for the items acquired in the A environment is significantly higher if the reproduction takes place in the A environment, compared with the situation when the reproduction takes place in the B environment. In chaotic environments the repetition of a context has a small probability, hence the possibility of using past knowledge is similarly small.

In the chaotic dynamic systems, the dynamic balance is kept through the simultaneous existence of the evolution and identity of the system. The history, identity and sense of existence for the system define its limits and guide its evolution and growth while the natural processes of growth guide it to chaos.

The chaos theory treats dynamic systems as auto-organized systems in terms of the way in which they organize and structure themselves, as well as in terms of how they grow and change. This view does not only involve the internal emergent order, but also the coevolution with the environment. The chaos theory states that the system creates its own order whilst its evolution, by integrating the changes induced by the interactions with the environment in the system's identity. Because a chaos system operates in an unstable combination of randomness and order, it continuously changes and evolves. As answer to the changes and turbulences in the environment the system transforms the rules, which it observes in order to cope better with the changing environment. Because the chaotic environment is non-linear, small changes in the initial statuses can take place, growing exponentially, creating major shocks on the growing and evolution of the systems. Bifurcation points can cause sudden changes in direction, character, or structure and permanently redefine a system in new and unexpected ways. The feedback modulates the system, either for maintaining its stability (negative feedback), or for amplifying the deviations and abnormalities, destabilizing the actual state, and introducing new types in the system (positive feedback). Starting from the essence of the feedback, the outcome is as follows: the new system is bettered, creates its own future and adapts itself continuously to the environment on the basis of the intelligence and information that it contains (Bechtold, 1997).

Chaos, knowledge conversion and creation processes

The spiral of knowledge creation is not autonomous and self-maintained. The evolving spiral is possible with inputs from the Ba platform for knowledge creation and not with knowledge generation from within. The evolving spiral of the knowledge creation passes sequentially through individual processes and organizational processes in a deterministic way, although knowledge dynamics is not a physical process (Brătianu, 2010).

Nonaka and Konno affirm that Ba is just an organic ground for creating knowledge. The concentration of knowledge in Ba doesn't involve consuming these resources, but a cyclic ecologic process of cultivation-valuing of the resources (Nonaka & Konno, 1998). In the theory of complexity, the feedback of the system is the generator of economic results for the company. This is possible due to the organizations knowledge, acquired on the market, which allows the obtaining of a sense from the signals in the environment. For example, the process of acquiring knowledge from the environment is strongly supported by the direct interactions with clients and suppliers. To be more specific, socializing involves knowledge capturing by physical proximity, the necessary approach being the development of shared activities, in the same environment.

Holons

The concept of Ba as it is defined by Nonaka and Konno includes a series of characteristics for the systems which are considered in the chaos theory. First of all, the perspective of the Ba's included one into another, respects the holons theory. Koestler defines Holons as entities that are wholes and parts of wholes in the same time (cited in van Eijnatten, 2004). Wilber (cited in van Eijnatten, 2004) states that they are structures simultaneously autonomous and dependent, being characterized as having their own identity, having their own status in a community characterized by self-transcendence, which allows the individual development, and self-dissolution, which allows them to split into sub holons.

Self-transcendence allows a holon to better understand the reality it faces, while evolving on the scale of knowledge. Thus the holonic capacity is the

ability of holons to operate more rationally, with a superior conscience and with “control and response-ability”. The control-ability is the degree in which a holon is capable of influencing the future events, and the response-ability is the capacity of coping with the conditions “Far From Equilibrium” (van Eijnatten, 2004). All these elements referring to the holons are true for the Ba too.

The growth of the holonic capacity of the organization is the function fulfilled by the knowledge conversion and creation processes. In order to discover how these processes can be done successfully it is necessary to place us in the enlarged Ba of the organization. Whilst positioning ourselves, we exit the logic of the central discourse of Nonaka and we give birth to a dilemma connected to the knowledge creation process. Can we use as model the SECI spiral, after a holonic logic, in which to place teams instead of individuals, and organization’s Ba instead of team’s Ba?

Analysing this situation from every stage of this cycle, we obtain the following arguments:

1. Instead of the individual socialization, we need to change the reference to the tacit knowledge transfer between groups. Shared activity of various groups is not a valid solution because the tacit knowledge is included in the individual, but there are at least 3 possible solutions: moving the individuals through various groups, including the individual into various teams, and organizing temporary interdepartmental teams such as project management teams.
2. For the externalization stage, the commitment of the individual to the group is necessary. This commitment allows the knowledge to transcend the individual barriers, thus becoming transferable between individuals. The perspective of surpassing the barriers of the group imposes the commitment and trust between groups, possible to accomplish by stimulating the collaboration between groups and between departments.
3. In the combination stage, the key aspects are the diffusion and systematization of knowledge. This involves capturing knowledge from the inside and outside of the organization. Secondly, this knowledge must be dissipated in the organization by meetings and discussions. Thirdly, knowledge can be transferred as documents. The manners in which we can do the combinations don’t differ according to the adopted perspective: at the level of individuals or at the level of teams.
4. During the internalization, the key point is identification by the individual of the explicit knowledge present in the organization, useful for his activity, which he will start applying, thus modifying some of his routines based on

the tacit knowledge obtained previously. This process leads to new tacit knowledge, which becomes the basis of a new SECI cycle, by means of the transfer provided by the socialization process. A change in perspective, from the individual to the group, does not lead to sense changing, so we can state that internalization is not affected by the proposed view.

Chaordic system

The characteristics of the knowledge conversion system respect the chaordic systems' definition. Chaordic comes from the amalgamation of chaos and order, and means:

1. something simultaneously organized and chaotic
2. structured in a manner which isn't dominated by chaos or by order
3. something existing at the boundary between chaos and order.

Chaordic systems are complex, capable of surviving in turbulent conditions, known as "Far From Equilibrium (FFE)". Fitzgerald (cited in van Eijnatten, 2004) states that a chaordic system is a dynamic and complex arrangement of connections between elements, which form a whole, whose behaviour is unpredictable and structured.

A chaordic system is under the influence of different attractors. An attractor is a force or a condition that leads a system to repeating certain behaviour, in a different manner every time, but within the limits of clear boundaries (Marchall & Zohar, 1997). Although they don't act as external force, the attractors serve as a magnet, creating an influence area.

Polley defines the basin of an attractor as the region in which an attractor is capable of accomplishing successfully its function as magnet. The bifurcation point shows up when a holon placed at the edge of an attractor's field goes under the influence of another attractor (Polley, 1997). According to the evolutionary direction generated by an attractor, they were classified as seen in the table 1 (van Eijnatten, 2004).

Table 1. Attractor's classification, based on the evolutionary direction generated by the attractor

Attractor	Abbreviation
Equilibrium attractor	E
Near to equilibrium attractor	NTE
Far from equilibrium attractor	FFE
Fatal chaos attractor	FC

Bearing in mind the concept of attractor, the chaotic evolution is defined as “a dynamical process passing from one attractor basin to the next in an incessant journey toward the ‘edge’ of chaos” (van Eijnatten, 2004).

There is a question that arises from applying the concepts above on the example of knowledge conversion system, question connected to the idea of attractor: can we state that Ba is a gravitational field with decreasing force towards its edges? The idea is coherent with the need of having a center of attraction, which offers identity and integrity to the system. If we accept this view, consequently we can say that, the less an organization is vulnerable to “strange attractors” which appear in the environment, the more the organization can maintain a greater attraction intensity of the Ba produced by it, on a broader distance surrounding it. In more concrete terms, this could be stated as the tendency of involving customers and suppliers in the dynamic process of knowledge creation, at a participation level similar to that of the employees. Only in this way the intensity of the Ba outside the organization can have closer levels to the one inside the organization.

Other problems that must be cleared up when applying concepts from the theory of chaos on the dynamic system of knowledge creation are non-linearity and the relation between this and the attractors’ existence. There are two questions arising from here. The knowledge conversion and creation processes in the SECI cycle, are they linear or non-linear? Can the ideas of attractors and bifurcation be included in SECI functioning?

Bearing in mind that the real value for the organization of knowledge created in this dynamic process isn’t revealed but contextually, the only conclusion is that the conversion and creation processes are non-linear. The knowledge is generated in the system, and only afterwards tested in order to determine their value. The result is a different value for each item of knowledge produced, independently from its manner of production.

In chaotic systems there are bifurcation points which can cause sudden changes of direction, character or structure, which permanently define the system in new and unexpected ways (van Eijnatten, 2004). This statement is valid for the knowledge creation processes. Learning processes lead to new behaviours of the system, which occur each time the system contacts a new reality that has impact on it. This is a proof that the system receives impulses for learning – as a change in its behaviour – each time it contacts a new attractor. Therefore, the appearance of sudden changes in the system’s state

is possible under the impact of a new attractor: newly discovered knowledge, whose transformation in products and services involves system changes.

The resilience of the knowledge conversion and creation system

Based on the study of mathematical properties of nonlinear evolutionary models it is found that the essential characteristic of nonlinear evolutionary models is getting away from continuity (OuYang & Lin, 1998). However, this is not the case of self-organized dynamic systems, as they can keep their existential continuity by means of built-in response mechanisms to the nonlinear evolutions of the environment.

Because the chaotic environment is non-linear, small changes in the initial statuses can take place, growing exponentially, creating major shocks on the growing and evolution of the systems. The key process that characterizes the chaotic environments is that of the appearance and disappearance of attractors with unpredictable magnitude. In order to survive in this kind of environment, the evolving dynamic systems must possess the capacity of realizing the turbulent passing through different influence areas of the attractors. The systems must have the capacity of adsorbing the impact of the influence areas in the environment. They have to be resilient. Resilience is the property of a material to absorb energy when it is deformed elastically and then, upon unloading to have this energy recovered. In a measurable perspective, it is the maximum energy per unit volume that can elastically be stored (Avallone, Baumeister & Sadegh, 2007).

Singularizing this concept at the context of the dynamic conversion of knowledge, we obtain the following: *The resilience of the knowledge conversion system is its capacity of absorbing adaptive tensions generated by the appearance of new attractors in the environment, preserving its integrity and identity, in order to generate new knowledge and behaviours after getting in contact with these attractors.*

This definition helps us to better understand the way in which the two processes interact. The conversion processes are the foundation based on which the deforming tensions created by the environment emerge new knowledge. Hence, the creation of new knowledge can be associated with the occurrence of adaptive tensions created by the contact with a new attractor in the environment. In this case, the knowledge creation is a consequence of the

deformation suffered by the knowledge conversion system as a result of the differences between the new attractor and the former one.

In the process view, passing through a new attractor's area becomes a trigger for the knowledge creation, by the adaptive tension perceived in the knowledge conversion system. As stated before, this does not mean that the contact with an attractor can be considered the only determinant of the knowledge creation.

The most powerful attractor from the system of the dynamic creation of knowledge is the Ba of groups, which defines the internal space of the organization. This is the gravitational center of the entire system, offering to it integrity and identity. When positioning the analysis at the level of the Ba of organizations, the external attractors created by the market must be taken into account. The appearance of a new attractor in a company's environment will lead to the appearance of a bifurcation that can be fatal or can have effects which are exponentially positive. The system is drawn to the edge of chaos by the major impact of the attractor on the environment, followed by a change in its form or a recovery of the initial form. If the system survives the impact with the environment, it will change its behaviour under the influence of the attractor. It will thus acquire something new, but this new element will be limited by the tendency of maintaining integrity and identity of the system. The resilience of the knowledge conversion system is connected to the tendency of maintaining integrity and identity of Ba. The tendency to return to the use of previous knowledge is provided by their validity, which acts as attractor. Maintaining in use the newly acquired knowledge can happen only if the validity of the new knowledge is contradictory to the validity of the previous knowledge or if the benefits produced by the new knowledge are perceived as superior.

Thus, we can state that the creation of new knowledge can occur on two separate stages of contact with a new attractor. Firstly, it can take place during the initial deformation phase, in which the influence of the attractor is perceived in the system, and the system bends because of the tension. Secondly, it can take place during the unloading of the tension, in order for the system to resume a shape as close as possible to the initial one.

For example, when a new product of a competitor is offered on the market, the company must suffer a "deformation" of its knowledge about the market, must analyse the features of the new product and start searching a solution to cope with the competitor's new products. This is the first stage of learning.

After the solution is found, putting it into practice is another process in which new knowledge is produced. This is the unloading of the tension phase, and at the end of it the company is seeking a recovery of its initial standing on the market.

The magnitude of the attractor

The new attractor appeared in the environment must have enough force to produce a change in behaviour. Because the observers of chaotic systems can most of the times see the change in the movement direction without determining the cause, the term that is mostly used is “strange attractor”. Knowledge that becomes attractor by causing the appearance of fields of attraction in the environment can be known or unknown in the organization.

According to the sense and magnitude of these attractors, the organization will feel different adaptive pressures. In case of E-attractors or NTE-attractors, the organization will feel a minimum adaptive pressure. In case of FFE-attractors or FC-attractors, the organization will focus on the margins of the chaos, and its resilience will be challenged.

For the case of this analysis, where the system confronted with a chaotic environment is the knowledge conversion system, these new attractors are in fact new knowledge held by an individual or an organization on the market. They can be either knowledge of competitors, of suppliers, or new insights or attitudes of customers, provoked by their newly accumulated knowledge. Incremental improvements performed by competitors to their products will represent most certainly E-of NTE-attractors, while the appearance on the market of a substitution product based on new technology will most probably represent a FFE-attractor or FC-attractor.

The game of double influence generated by the main attractor (Ba of groups) and an external attractor of the organization will have adaptive consequences in the knowledge creation processes, proportional to the divergence of forces and magnitude of influence of both of them. The bigger the tension between the two, the more difficult the adaptive processes will be. For example, the emergence of a new technology (typical FFE-attractor), able to substitute the technology in use (core inertial knowledge in the BA), will require a great level of unlearning: technology, product designs, production systems, and management procedures.

A learning process of the same magnitude, to build a business system around the new technology, should follow this unlearning. The shifts from typing machines to computers, from chemical photography to digital photography, from telephones to mobile phones are typical examples in which the companies had to deal with great adaptive tensions.

In order to better cope with the tensions, the organization has to develop its holonic capacity. Reduction of these tensions must be made by extending Ba as much as possible in the environment, in order to make the organization (as Ba of the groups) an important attractor in the environment of the organization. This is the strategy that the innovative companies adopt to impose to the followers the rhythm of evolution on the market. Hamel and Prahalad (cited in Bechtold, 1997) state that the focus of the strategic process must be that of transforming the industry, and not that of transforming the organization. The organization must therefore improve its “control-ability”, in order to be able to rather control the environment than the other way round. The main benefit is that by creating the knowledge from already existing knowledge assets in the knowledge conversion system, the company feels lesser adaptive tensions and evolves in a continuous transition.

Another solution, connected to the improvement of “response-ability” is the opening of organization in order to let the influences of the attractors in the environment manifest inside, allowing the development of the early warning systems (EWS). They are based on the maximisation of the information and environmental knowledge circulation speed. The best approach is being instantly informed and acting simultaneously with the environment.

Both solutions mean an orientation towards accepting in the SECI cycle of as much as possible contributors. Brigid L. Bechtold affirms that the chaos theory imposes a process of continuous strategic development, which involves all members of the organization, together with the customers and suppliers. In her opinion, the strategic planning should become a continuous process because the changes in the environment will need strategic repositioning most frequently. Involving all members of the organization will lead to growth in the knowledge of organizations, and to its better matching to the environment (Bechtold, 1997).

Early Warning Systems are similar with acoustic resonance boxes, created to maximize the impact of the external attractors in the knowledge conversion system. Only instant information creates the possibility of getting the

maximum from the learning opportunities provided by the environment and to create as much new knowledge as the environment facilitates.

The second part of the best approach, acting simultaneously with the environment, can be achieved only if the company adopts a chaotic management system (Kotler & Caslione, 2009). This system, as described by the authors, is based on the design of the strategic response system and of the marketing system for resilience. Most of the rigidities of the system must be eliminated in order to achieve an internal state that allows the company to welcome the turbulences and to use them in order to learn as fast as possible how to react to the changes in the environment. The strategy of the company is replaced by a EWS coupled with a scenario creation mechanism that tries to foresee the possible bifurcation points in the development of the events.

Crises

Passing from an area of an E-attractor or an NTE-attractor in an FFE-attractor or an FC-attractor area, will be the transition that produces the maximum possible pressure. This passing is characteristic for the appearance of crises. An organizational crisis is a low-probability, high-impact event that threatens the viability of the organization and is characterized by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly (Pearson & Clair, 1998). The description of the organization's crisis involves the need for resilience of the organization, and in particular the resilience of the knowledge conversion system, in chaotic contexts. Pearson and Clair claim that "Effective crisis planning aims at identifying the early warning signals for the crisis. The chronic crisis stage is sometimes called the "clean-up" stage of a crisis situation, when the organization tries to recover from the crisis, identify its vulnerabilities and learn from the failures and successes of its response. The crisis resolution stage is when the organization comes back to normality and resumes full functionality". Identifying early signals is essential when their evolution is non-linear, learning from crisis is essential for implementing future changes and the final point is returning to a new functional state.

The description of the response mechanism of the organization during a crisis is similar to the description that has been made above for the contact of the knowledge conversion system with an attractor, with a specific focus that points to a FFE-attractor. The two phases of knowledge creation are distinctly

presented also: one during the emergence of the crisis and one during the “clean-up” stage, ending up in the crisis resolution stage.

Conclusions

The SECI model proposed by Nonaka and his co-workers comprises two different processing: conversion of knowledge and creation of knowledge. While the knowledge conversion can be realized independently from the knowledge creation, given the existence of a knowledge base, the knowledge creation is dependent of the knowledge conversion process.

The system composed of the conversion processes of the SECI cycle, the Ba and the knowledge assets can be considered autonomous and named knowledge conversion system.

In this system, given the right conditions, the knowledge creation processes can occur. In chaotic environment, organizations act as holons, their evolution being influenced by the appearance of attractors in the environment. The knowledge conversion system is a holon. The key process that characterizes the chaotic environments is that of the appearance and disappearance of attractors with a magnitude that cannot be predicted. In order to survive in this medium, the evolutionary dynamic systems must possess the ability to successfully accomplish the passing through different areas of influence of the attractors. The easy passing through can be defined as maintaining the integrity and identity of the system, on the basis of its adaptation to the attractors' influence.

The function that the knowledge conversion system has is the development of the holonic capacity of the organization. The knowledge conversion process is responsible for the creation of a part of the new knowledge, from already existing knowledge assets and without any external intervention, but another part of the new knowledge is created due to the contact with the environment.

The resilience of the knowledge conversion system is its capacity of absorbing adaptive tensions generated by the appearance of new attractors in the environment, preserving its integrity and identity, in order to generate new knowledge and behaviours after getting in contact with these attractors. The knowledge creation is a consequence of the tensions perceived in the knowledge conversion system during the passing from an attractor's area to another attractor's area.

Because the changes in the way of thinking and behaving of the system are caused by the passing through the new attractors' areas, we can state that new knowledge creation is related to the contact with new attractors. They represent development factors, so the rhythm of knowledge creation will be influenced by the appearance of new attractors.

The creation of new knowledge can occur on two separate stages of the contact with a new attractor: during the initial deformation phase – when the system bends because of the tension – and during the unloading of the tension, when the system resumes a shape as close as possible to the initial one.

The game of double influence generated by the main attractor (Ba of groups) and an external attractor will have adaptive consequences in the knowledge creation processes, proportional to the divergence of forces and magnitude of influence of both of them.

Instant information creates the possibility of getting the maximum from the learning opportunities provided by the environment and to create as much new knowledge as the environment facilitates.

References

- Avallone, E., Baumeister, Th., & Sadegh, A. (2007). *Marks' Standard Handbook for Mechanical Engineers* (11th Edition). New York: Mc-Graw Hill.
- Bechtold, B. (1997). Chaos theory as a model for strategy development. *Empowerment in Organizations*, 5 (4), 193-201.
- Bennet, D., & Bennet, A. (2008). Engaging tacit knowledge in support of organizational learning". *VINE*, 38 (1), 72 – 94.
- Brătianu C. (2009). Management și Antimanagement. *Business Excellence*, 9 - 25.
- Brătianu, C. (2010). A Critical Analysis of Nonaka's Model of Knowledge Dynamics. *Electronic Journal of Knowledge Management*, 8 (2), 193 – 200.
- Chen, C. (2008). Linking the knowledge creation process to organizational theories. A macro view of organization-environment change. *Journal of Organizational Change Management*, 21 (3), 259-279.
- Eijnatten, F. van (2004). Chaordic systems thinking. Some suggestions for a complexity framework to inform a learning organization. *The Learning Organization*, 11 (6), 430-449.
- Fitzgerald, L., (2002). Chaos: the lens that transcends. *Journal of Organizational Change Management*, 15 (4), 339 – 358.

Fitzgerald, L., & van Eijnatten, F. (2002). Chaos speak: a glossary of chaordic terms and phrases. *Journal of Organizational Change Management*, 15 (4), 412 – 423.

Kotler, P., & Caslione, J. (2009). *Chaotics: The Business of Managing and Marketing in The Age of Turbulence*. New York: Amacom.

Nonaka, I., & Konno, N. (1998). The concept of “Ba”: building a foundation for knowledge creation. *California Management Review*, 40 (3), 40-54.

OuYang, S., & Lin, Y. (1998). Some problems on classical chaos. *Kybernetes*, 27 (6/7), 691 – 700.

Miclea, M. (2003) *Psihologie cognitivă: modele teoretico-experimentale [Cognitive psychology: theoretical and experimental models]*. Polirom: Iași.

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of Management Review*, 23(1), 59-76.

Polley, D. (1997). Turbulence in organizations: new metaphors for organizational research. *Organization Science*, 8(5), 445-457.