ORGANIZATIONAL KNOWLEDGE DYNAMICS

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Abstract. *The paper addresses the main issues concerning knowledge conceptualization and knowledge dynamics, in the context of Romanian organizations. The links between organizational knowledge, organizational learning and organizational culture are being investigated, with the aim of conceptual clarification and paradigm unification, in a domain of increasing research interest, where increasing complexity implies the risk of increasing confusion.*

Key words: knowledge dynamics, organizational learning, organizational intelligence, organizational culture.

1. Conceptualizing knowledge

When, back in 1597, he had asserted that *knowledge is power*, Sir Francis Bacon couldn't possibly have foreseen the everlasting echo of his saying. Indeed, nothing haunts the post-bureaucratic organization (Heckscher and Donnellson, 1994) like the problem of knowledge. What it is and how it should be employed.

In 1988, Drucker identified knowledge as the source of competitive advantage and economic growth. From then on, the resource-based view of the firm (Barney, 1991) and the capability-based view of the firm (Prahalad and Hamel, 1997) take into account intangibles as key assets, evolving into a knowledge-based view of the firm (Grant, 1996; Spender, 1996). The age when knowledge existed inside the organization, but the organization, not its knowledge, was managed, is gradually replaced by the managerial focus on knowledge as such (Diekers et al., 2003; Easterby-Smith and Lyles, 2003).

Still, what do we manage? Knowledge was considered to be the fourth factor of production (Jameson, 2001), a dynamic and relational one, whose complexity, according to Schneider (2007), makes it an expression of the *conditio humana*, as difficult to define as life, or culture. The same researcher states that intensive publishing, in the last decade, on the topic, does nothing but to increase the confusion.

Brown and Duguid (2001) speak of an abundance of definitions and classifications of organizational knowledge. The starting point, if any, may be considered Ackoff's (1989) DIKW model. This pyramid advances from data to information, then to knowledge, and, finally, to wisdom, a fourth layer which is usually left apart in further quotations of the model (Davenport and Prusak, 2000). A main critique of the model, which is to found, for instance, in Spender (2008), is that the categories in the model are nested, rather than neatly separated (information is constructed starting from data; knowledge is built on information, etc.), which makes it difficult to define each of them other than tautologically. Spender's own definition of knowledge places it between organizational learning, which generates it (Duncan and Weiss, 1979), and

knowledge management, which makes it usable. A separation of domains, rather than a mere definition.

Alavi and Leitner (2001) notice the same lack of precision in defining knowledge. The concept is approached laterally, as Schubert et al. (1998) speak of a state of knowing (knowing, as defined by Gherardi and Nicolini, 2000, Cook and Brown, 1999, implies a certain form of participation, by being a dynamic, provisional process, rather than a possession of knowledge). Zack (1998) describes, following the same idea, knowledge processes, while Carlsson et al. (1996), continuing Habermas's (1971) and Everhart's (1983) theory of the „reified knowledge", speak of knowledge objects. McQueen (1998) links knowledge to the conditions of access to information, while Watson (1999) defines it as a capability to influence action.

Maturana (1997) defines two modes of knowing: *objectividad sin parentesis* (objectivity without parentheses), and *objectividad entre parentesis* (objectivity in parenthesis). The *objectividad sin parentesis* refers to the fact that the world is always there, and we can certainly say that this objective knowledge, given by the world, exists. But, as Maturana and Varela (1980, 1992) have argued, the world looks different for each of us, and this happens because social systems change every time they are analysed. In other words, as we are parts of the world, our knowledge of it, knowledge of ourselves, in fact, is never objective and never complete. This is the *objectividad entre parentesis*. Knowledge, then, can be defined as Ortony (1993, p. 11) defined language: "a phenomenon of thought and of mental representation."

Knowledge, which implies experience, being created, as Kolb (1984) states, by the transformation of experience, in the process of learning, involves the idea of action. Action, which, in the form of experience, is, according to Dewey (1910), a transaction between the individual and the environment, calls for reflection (or inquiry, in Dewey's terms). Schön (1983) speaks of the reflective practitioner, whose importance for the knowledge processes in the organization can be linked to the definition provided by Fisher and White (2000, p. 246):

> „organizational learning is a reflective process, played out by members at all levels of the organization, that involves the collection of information from both the external and the internal environments."

Knowledge, organizational learning, the learning organization and knowledge management are concepts which go all together, although, as Spender (2008) remarks, their supporters praise different gods: Polanyi, on the one hand, March and Argyris, on the other. The lack of a common language, in fields belonging to the same realm, increases confusion. While organizational learning and the learning organization are two concepts too often confounded (Dimovski, Škelavaj, Kimman, and Hernaus, 2008; Tsang, 1997), Chiva and Alegre (2005) account for confusions between organizational learning and knowledge management. The two are related (Roth, 2003; Rowley, 2000; Davenport, De Long, and Beers, 1998; Nonaka and Takeuchi, 1995), but, as Chiva and Alegre (2005) point out, while knowledge management is studied by

strategic management specialists, organizational learning belongs to the human resources area of study, and the two pillars rarely meet, and, consequently, lack a common conceptual language. The confusion may also arise from the fact that knowledge management relies as much as on organizational learning, on organizational unlearning, as Hedberg (1981, p. 3) reveals:

> „knowledge grows, and simultaneously it becomes obsolete as reality changes. Understanding involves both learning new knowledge and discarding obsolete and misleading knowledge. The discarding activity – unlearning – is as important a part of understanding as adding new knowledge."

This can be considered an adequate response to a definition of the kind Levitt and March (1988) proposed for organizational learning: „The process of encoding interfaces from history into routines that guide behaviour". For sure, new routines have to replace old ones, and the harmonious advancement of this process is an issue of knowledge management (Tsang, 2008).
Still, one point of synthesis between knowledge management and organizational learning resides in the fact that knowledge is no longer perceived as a substance fragmented and deposited in the minds of the individuals in the organization, but as a socially constructed concept (Easterby-Smith et al., 2000). Knowledge creation, rather than knowledge transfer, as „knowledge is always created anew rather than merely transferred by human beings" (Van Krogh and Roos, 1995, p. 390), implies the existence of the communities of practice (Wenger et al., 2002). Inside these communities, knowledge sharing, „the provision or receipt of task information, know-how and feedback regarding a product or procedure" (Cummings, 2004, p. 352), takes place.
The process of knowledge-sharing is underlined by Polanyi's (1962) distinction between tacit and explicit knowledge. The distinction was further developed by Nonaka and Takeuchi (1995) in the knowledge spiral model, accounting for the transformations taking place between tacit and explicit knowledge. Although the model has its critics – Tsoukas (1996, 2003) states that individual knowledge exists because of the social practices in which individuals engage, while the tacit-explicit distinction suggests an opposition between the two; Giroux and Taylor (2002) argue that actually there is no tacit to explicit transformation, but the explicit knowledge creation reflects the tacit modes in which a specific community produces knowledge – we take this model as representative for what knowledge dynamics means.

2. Knowledge dynamics

If we systematize the quoted definitions of knowledge, there are two streams in defining it: according to the first, knowledge is a basic economic resource (Drucker, 1993; Spender, 1996; Zack, 1999), one which appreciates rather than depreciates with use (Adler, 2002). In fact, the knowledge-based view of the firm (Spender and Grant,

1996) is enrooted, as a new paradigm telescoped from an older one, in the resource-based view of the firm (Day, 1994; Hunt and Morgan, 1996). According to the second, knowledge is a product (Skyrme, 1998), for which life cycle models have been developed (Birkinshaw and Sheehan, 2002).
The resource perspective on knowledge is in line with the cognitivist approach (Varela, 1992), stating that knowledge is a mobile resource, which does not diminish with use, and is equally available to all the members of a given group, *i.e.*, to those who share a common background. Following this model, knowledge is „that which is known" (Machlup, 1980), a resource which you may have in a greater or lesser amount at a given moment. Various classifications of this resource have been attempted. For instance, some of the knowledge resources are tangible (infrastructure, people – but they are understood different, as human capital (Roos and Roos, 1997), not as labour force –, training manuals, procedures manuals), some other (individual and organizational abilities, know-how, insights, processes and relationships, etc.) are intangible (James, 2005).
The intangible resources are further classified (Alavi and Leitner, 2001) in:

- Tacit (following Nonaka and Takeuchi, 1995):
  - cognitive tacit – mental models
  - technical tacit – know-how applied to specific situations
- Explicit – *prêt-à-porter* knowledge, preformatted to be communicated
- Individual – knowledge created and used by the individual
- Social – knowledge created and used by the group
- Declarative – know-about (know where to take the knowledge from)
- Procedural – know-how (master the knowledge usage)
- Causal – know why (master the mechanisms of knowledge usage)
- Conditional – know-when
- Relational – know-with
- Pragmatic – useful knowledge for an organization

This classification may be correlated with the one proposed by Nonaka, Toyama and Konno (2001):

- Experiential knowledge – a tacit and social knowledge, as they are defined above
- Conceptual – explicit knowledge
- Systematic – a pragmatic and explicit knowledge
- Routine – technical tacit and procedural knowledge

According to Gamble and Blackwell (2001), the knowledge resource can exist in three forms:

- Embodied knowledge, very similar to the tacit individual form of knowledge, belonging genuinely to each of us, with little or no possibility to be expressed in a transferable form.

- Represented knowledge, which is explicit, and may be accessed in the form of procedures, documents, manuals, etc.
- Embedded knowledge, which is organizationally tacit, residing in processes, relationships, rules, etc.

The partial conclusion which we may draw from the resource view on knowledge, taking into account also the contrastive, though complementary, concepts of knowledge flows (Polanyi, 1966; Nonaka, 1994) and knowledge stickiness (von Hippel, 1994), is that knowledge exists in a semi-solid state, which may result in deposits (knowledge stocks) and movements (knowledge flows). Szulanski (1996) also speaks of the „internal stickiness" of knowledge, which may prevent it from easily flowing across an organization or from one organization to another. There are several conditions which may accelerate knowledge flows, or may, on the contrary, hinder them. Sterman (2000) has modelled dynamic capabilities as a chain of related knowledge stocks which increase or decrease over time as a result of knowledge in-flows or out-flows. According to Mooradian et al. (2006), there are four categories of factors involved in the process:

- Knowledge factors, like degree of knowledge articulation and aggregation. Knowledge articulation (Zollo and Winter, 2001) is a learning process, an effort to turn tacit experience into articulated sequences of knowledge. Knowledge aggregation (Zeng and Fikes, 2004) refers to integrating data from heterogeneous sources into a semantically coherent architecture.
- Individual factors, related, mainly, to the level of trust employees grant to each other. One of the trust models, that McKnight et al. (2002) developed, decomposes trust in three elements contributing to it: the *general predisposition to trust*, which is given by a mindset which implies that people are usually well meaning, the *institutional trust*, given by the conviction that rules and laws are in good order, and that the environment is well settled, and *trusting beliefs*, referring to the person's willingness to disclose information, and thus to depend on the discreteness of others.
- Managerial factors, referring to the way management, by incentives and rewards, stimulates knowledge sharing in the organization, and creates a culture of openness (Boal and Schultz, 2004), leading to the cognitive consensuality of Gioia and Sims (1986).
- Environmental factors, which belong to the organizational culture, technological advancement, social networks (Brown and Duguid, 2002).

All these factors, taken together, may explain the efficiency of knowledge transfers in some organizations, as compared to their failure, in others.
The product approach to knowledge, as developed by Birkinshaw and Sheehan (2002), traces the path of knowledge from invention to commodity. The first stage will, then,

be creation, when knowledge is exported from the individual, for the probable benefit of the community. If the community accepts it, by some pre-buying contract, knowledge enters the mobilization stage, when it is validated by the group. Then, the diffusion stage, which means a wider utilization, follows and, finally, the commoditization stage, when knowledge is preformatted and made available for mass usage. This model explains, from a different perspective, the same passage from tacit to explicit, in the form of the idea's way into the product. The link between knowledge as a product and innovation is shown in the model proposed by Paukert et al. (2003), including six overlapping stages: problem identification, ideation, approach development, operationalization, evaluation, exploitation. The problem identification, by analogy with the product development, is the stage in which the need is spotted. In ideation, a solution to the problem is found, and the approach to problem solving is detailed in the approach development step. Then, the prototype of the "product" offering the solution is designed, in the operationalization phase. The proposed solution is evaluated and, finally, exploitation parallels product selling in a given market.

The conclusion of the knowledge as product approach is that knowledge is externalized at the pressure of the need to innovate. Thus, knowledge as created as individuals and companies advance around the innovation circle.

This second perspective, of knowledge as product, is in line with Johnson-Laird and Bryne's (1991) theory of the mental model, seen as the table of all the conclusions which may be extracted from a given set of premises. After building this mental model, individuals are able to produce knowledge not explicit in the premises. But, as van der Henst (1999) shows, the conclusions people might produce from the same set of premises are different. Knowledge extraction processes are, then, at stake when it comes to explaining how we know what we know.

The four knowledge-transforming processes that Nonaka and Takeuchi (1995) have included in their SECI spiral, namely:

- Socialization – from tacit to tacit knowledge
- Externalization – from tacit to explicit knowledge
- Combination – from explicit to explicit knowledge
- Internalization – from explicit to tacit knowledge

show that knowledge does not only transform in order to change its type, from tacit to explicit and vice-versa, but also in order to enrich and to restructure, within the boundaries of the same category.

According to the same model, knowledge transformation includes five phases:

- Sharing tacit knowledge
- Creating concepts

- Justifying concepts
- Building an archetype
- Cross-levelling of knowledge.

All these processes have as an end the production of actionable knowledge, that is, intelligence. Ein-Dor's (2006) taxonomy includes types of knowledge which may be internalized by the organization, in its learning processes, or may be left apart. What an organization prefers, in terms of knowledge transfer, may be labelled as intelligence.

Organizational intelligence, regarded as a non-linear system (Bratianu si Murakawa, 2004), in the same way in which individual intelligence is non-linear (Cruse, 2006), doesn't benefit, up to this moment, of a coherent research approach (Glynn, 1996; Akgun, Bryne and Keskin, 2007). The main approaches of individual intelligence, the behaviorist approach (Zuriff, 1985; Melser, 2004), the cognitivist approach (Sternberg, 1984; Walsh and Betz, 1990; Harth, 1993; Jensen, 1998) and the adaptive approach (Laughton, 1990; Plotkin, 1994) are imported in the studies dedicated to organizational intelligence. The behaviorist approach (Zara, 2004) refers to setting a range of behaviors adapted to the organization's interests, to which the organization arrives starting from a given set of inputs. The organization learns which are the behavioral algorithms yielding the expected results and, as the hybrid system, human and IT, that it is (Abraham, Koppen, Franke, 2003), it selects the corresponding algorithm, each time it comes across a situation which resembles a similar experience in the past. The cognitivist approach (Schlinger, 1992; Schwaniger, 2003) consists in the cybernetic modeling of the organizations, equaling intelligence with the information-processing structures. The critique of the cognitivist approach (Rizzello and Turvani, 2000; Perkins, 2003) is based on its ignoring of the intra- and extra-organizational environment in which information is processed. While intelligence, from the behaviorist perspective, is a reflex, which depends, linearly, on the external stimuli, the cognitivist intelligence is an autistic one, which ignores its context. The adaptive approach to organizational intelligence (Manville, 1999; Desouza, 2006) describes the organizational intelligence's evolution under the impulse of the environmental stimuli, by adopting a non-linear model. The AGIL model (Parson, in Nilsson, 2007) – *adaptation*, *goal attainment*, *integration*, *latency* (*pattern maintenance*) – is a simplification of the way in which organizations use their intelligence, in a manner which targets their adaptation to the environmental conditions, and obtaining success in two stages, both involving sustainability: survival and performance.

Organizational intelligence development, as an adaptive mechanism, through which the organization succeeds in taking the best decisions, under variable environmental conditions (van Riel, Lemmink, Ourweerslot, 2004), depends on two essential co-factors (Bratianu, Vasilache, 2007): organizational learning and organizational culture. Organizational learning, defined as a meta-learning (Swiering and Wiersma, 1992; Thomas and Allen, 2006), is the organizations' capacity to create, integrate and use

knowledge (Dixon, 1999). This definition includes continuous adaptation (Kotter and Cohen, 2002) demanded by the rapid changes in the competitive environment. The survival of the fittest is, thus, not a slow, evolutionary process, but a momentary acquisition, tied to the instantaneous capacity to react. Organizations, pressed by the environment, can intuitively adapt, by mobilizing their unconscious reaction mechanisms, or can apply standardized learning protocols which combine reproducibility with flexibility. The identification of these protocols is involved in the studies proposing methodologies to measure organizational learning (Templeton et al., 2002; Tippins and Sohi, 2003; Perez et al., 2004). Going through the learning curve implies a better capacity to face a situation the organization has found itself in, previously, in such a way that an *informed* organization will take a qualitatively better decision. Organizational learning influences, in the decision-making process, the forming of preferences and the feed-back, the possibility to anticipate the consequences of a certain decision and the interpretation the organization gives to these consequences (Ernst and Paulus, 2005).

Organizational culture is involved in the learning process by its facilitating or inhibiting role. The organizational intelligence models have to be particularized based on the culture of the studied organization. Existing models (Hackel and Nolan, 1993; Glynn, 1996; Albrecht, 2003, 2005; Lin and Ishida, 2006) are addressed to businesses, approaching decision as the way to drive the company to profits. Adapting this models to the organizations in which the profit is intangible, incorporated in the social role these organizations fulfill (Readings, 1996; Prejmerean si Vasilache, 2007) is made difficult by the particularities of these organizations, included in their organizational culture. A first particularity, in the case of university clinics, is given by the number and diversity of stakeholders (Neave, 2002). Also, these organizations have problematic hierarchies, based on loose power relationships (Patterson, 2001), with management being placed in a weak position, because the professional and the administrative layers are not delimited, and because of the symbolic capital (Bourdieu, 1993) which affects the power distance, inside the profession. The passage from professional bureaucracies (Mintzberg, 1997) to post-bureaucratic organizations (Heckscher and Donnellon, 1994) can be made by developing organizational intelligence.

Organizational intelligence development is essentially a matter of successful knowledge transfers. Nissen and Levitt (2002) adapted, starting from Nonaka (1994), Nonaka and Takeuchi (1995), a diagram of the way in which knowledge is being transformed, considering a quasi-static perspective, presented in Figure 1.

Their diagram includes also the four levels from Vera and Crossan's (1999, 2004) model of the 4Is: the individual, the group, the organization and the inter-organizational levels. Also, a broader perspective, considering epistemology (the study of the nature of knowing), and ontology (the study of existence).

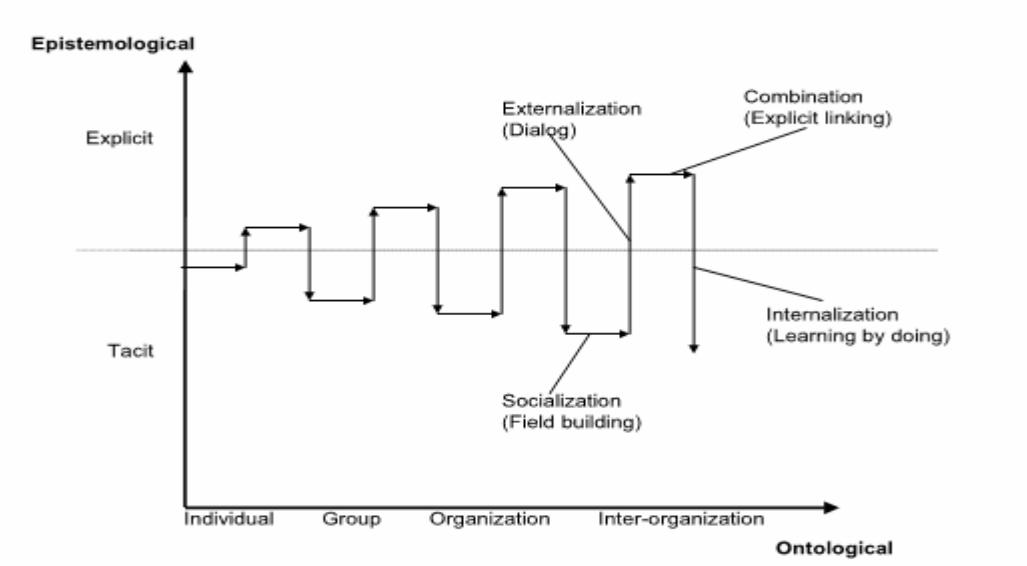


Figure 1. The tacit-explicit transformation processes

Thus, we come back to knowledge as *conditio humana*, a multi-level and multi-depths process, with fluid borders and fractalic architecture. In order to render it in a more dynamic perspective, which is closer to the transfer processes which actually take place in the organization, Nissen (2002) advances a composite model, which includes the SECI model and the Knowledge Management Lifecycle Model (KMLC), together with other organizational conditions, in the framework presented in Figure 2:

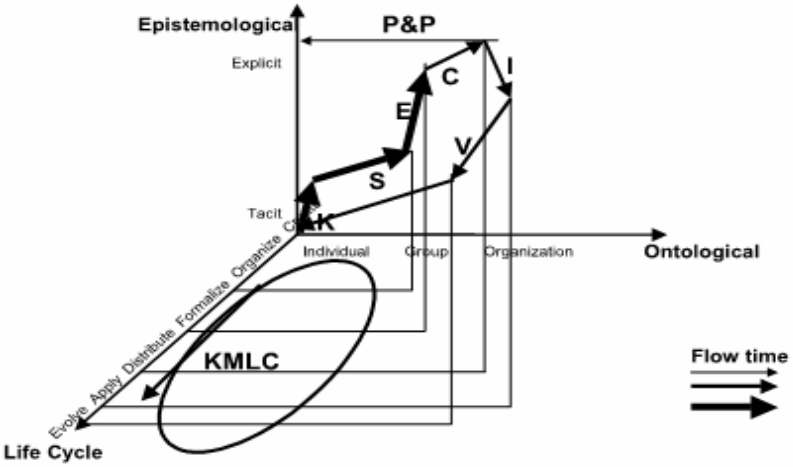


Figure 2. Dynamic knowledge transformations

Time, as an essential component of dynamic modelling is taken into account, and it can be seen that some flows are more consistent over time, while others tend to diminish. In other words, knowledge transfer processes have to be hierarchized, in such a way that the organization can focus on the core processes, and leave apart the ones which do not contribute to a significant increase in its actionable knowledge.

Conclusions

Knowledge, and knowledge management, can't be conceived separately from organizational learning processes, leading to organizational intelligence. This web of interrelations makes them mutually difficult to define, but has the advantage of being an adequate representation of the complex processes taking place at the organizational level. The interaction between the stocks and flows of knowledge can be hardly represented as such, because the system moves synchronously with its observer, but can be traced back by its effects. The sustainable competitive advantage, which Drucker has put in relation to knowledge and effective knowledge management twenty years ago, is expressed presently by organizational intelligence, as an effect of organizational learning. Having knowledge, which was asserted in the times when organizations were managed, not their knowledge, is not as important as being able to transform that knowledge, to make it circulate. The organizational knowledge dynamics is, then, the mechanism explaining organizational learning and development, and, more than that, organizational appearance and survival in its competitive environment

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