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Knowledge Dynamics Impact on Intellectual Capital in Organizations

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***Abstract**. The purpose of this paper is to show the influence of knowledge dynamics processes upon the intellectual capital in organizations. In the literature, the authors focus on knowledge dynamics and knowledge management or intellectual capital but very few papers discuss the influence of knowledge dynamics upon the structure and functionality of intellectual capital in organizations. We use a conceptual approach based on the theory of multifield organizational knowledge and the theory of organizational integrators to demonstrate that intellectual capital structure results from the organizational knowledge dynamics. The well-known model of intellectual capital based on human capital, structural capital and relational capital appears as a meta-model that can be decomposed into rational capital, emotional capital and spiritual capital in organizations.*

***Keywords:** human capital, intellectual capital, knowledge dynamics, organizational integrators, relational capital, structural capital.*

Organizational knowledge dynamics

Following several decades of complex exploration and confrontations, there is a generally accepted view that organizational knowledge represents a semantic construct, which reflects a dynamic phenomenon (Becerra-Fernandez & Sabherwal, 2010; Dalkir, 2005; Davenport & Prusak, 2000; Jashapara, 2011; Nonaka, 1994; Nonaka & Takeuchi, 1995). Organizational knowledge results from the integration of employees' personal knowledge. That means that upon the individual's knowledge dynamics it is built up an organizational knowledge dynamics containing new forms of manifestation. Understanding the nature and the form of manifestation of knowledge and its dynamics depends on the metaphor used for knowledge representation.

Metaphorical thinking has been proved by Lakoff and Johnson (1999, p.7) to be fundamental to our reasoning and understanding: "The fact that abstract thought is mostly metaphorical means that answers to the philosophical question have always been, and always will be, mostly metaphorical. In itself, that is neither good nor bad. It is simply a fact about the capacities of human mind". A metaphor is a conceptual process based on a source semantic domain, a target semantic domain, and a mapping mechanism. In

the *source semantic domain,* we define a known concept with its main attributes. In the *target semantic domain,* we define a less known concept we want to understand better and to enrich it with new attributes. The enrichment is done by the *mapping mechanism* that transfers some attributes of the well-known concept to the less-known concept. Thus, we can understand better the new concept placed in the target semantic domain. The mapping process defines also the limitations of the new concept due to its new attributes. That is why Andriessen and Boom (2007, p.3) consider that knowledge should be understood in terms of the metaphor used to define it: "Knowledge is not a concept that has a clearly delineated structure. Whatever structure it has it gets through metaphor. Different people from different cultures use different metaphors to conceptualize knowledge. They may be using the same word: however, this word can refer to totally different understandings of the concept of knowledge".

Metaphors developed in the first generation contain in their source semantic domain objects or stocks, which means tangible and static entities (Andriessen, 2008; Bolisani, Borgo, & Oltramari, 2012; Bratianu, 2011a; Davenport & Prusak, 2000; Nonaka & Takeuchi, 1995). The main attributes mapped from the source domain onto the target domain are verbs like store, accumulate, locate, move, measure, and package. For instance, Sullivan (1998, p.143) says: "Just as food and manufactured goods can be packaged and sold, there are ways to package knowledge for commercial benefit, using the intellectual property laws". Metaphors developed in the second generation have extended their source domain to include *flows* and *stock-and-flow* as referential concepts. As knowledge becomes dynamic, we may say that it can move in the same shape however between various receptors. Additionally, knowledge can be changed taking another form. The same information can exist in various structures to various individuals. Nissen (2006, p.XX) describes the way we should understand knowledge as flows: "To the extent that organizational knowledge does not exist in the form needed for application or at the place and time required to enable work performance, then it must flow from how it exists and where it is located to how and where it is needed. This is the concept of *knowledge flow*". Thus, the first generation of theories concerning knowledge dynamics used this kind of metaphors where knowledge is imagined like a flow through the whole organization, in different forms.

In-depth studies emphasize that the "most extended, yet debated" taxonomy of organizational knowledge distinguished two dimensions of knowledge: degree of articulation and degree of aggregation. There are various ways of categorizing the degree of articulation. The earliest categorizations of organizational knowledge were made by Polanyi (1983)

who differentiates between *tacit* and *explicit* knowledge, which refers to the ease with which knowledge can be articulated and communicated to others. Later works argue the difference between *codified* and *tacit* knowledge (Nonaka, 1994) which refers to the extent to which knowledge has been articulated and captured in documents and databases. The degree of *aggregation* distinguishes between individual and collective forms of knowledge or the extent to which knowledge is held by one person or embedded in the interactions amongst a group of people (Nonaka, 1994; Polanyi, 1962). Several scholars have examined the interaction between these two dimensions of knowledge to create four types of knowledge: individual-tacit, individual-explicit, collective-explicit, and collective-tacit. The basic aspects we have to consider always when working with knowledge is the individual (the employee) and the organization. Based on the previously described two dimensions of knowledge (explicit and tacit), have been identified two dimensions of knowledge sharing mechanisms: codification versus personalization, and individualization versus institutionalization (figure 1). The interaction between these two dimensions results in a framework that generates four classes of knowledge-sharing mechanisms, which relate to the sharing of different types of knowledge identified above. Codification versus personalization distinguishes between mechanisms that enable the sharing of codified knowledge versus tacit knowledge. Individualization versus institutionalization distinguishes between mechanisms that enable the sharing of knowledge at the individual level, or at a collective level. I discuss each dimension of the knowledge-sharing mechanisms framework below (Boh, 2007; Lam, 2000; Spender, 1996).

These two type of knowledge sharing and retention processes offer some options for managing knowledge inside the organization. This idea of knowledge management does not necessarily mean having to codify all individual employees' knowledge so that the knowledge will be retained and shared with others in the organization. Instead, another key approach to retain and share knowledge is by ensuring that the knowledge is shared with and diffused amongst other employees in the organization. By institutionalizing various personalization knowledge-sharing mechanisms to help individuals share knowledge with a group of individuals, organizations can ensure that person-to-person knowledge sharing is not simply serendipitous but is more systematic (Boh, 2007).

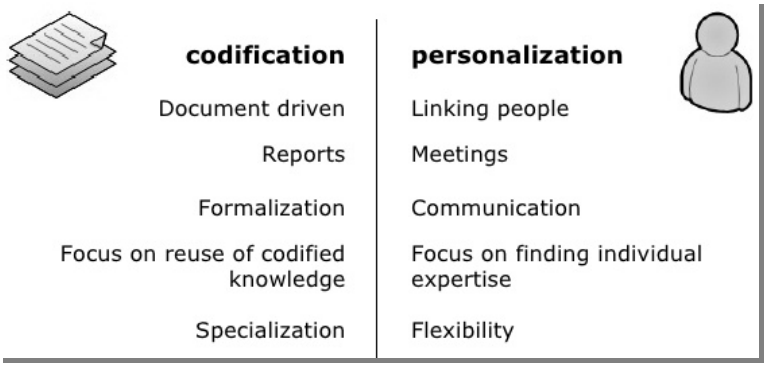

Figure 1. Knowledge codification vs. knowledge personalization
Source: Adaptation after Hansen (1999)

The changes may occur both at the level of tacit knowledge and explicit knowledge, which can be continuously transformed from one form of knowledge to another, and from individual to organizational levels: "Opposite of individual knowledge is organizational knowledge that is very dynamic: upon they work a variety of forces" (Davenport & Prusak, 2000, p.25).

The SECI model of knowledge dynamics

Considering all perspectives, the knowledge dynamics represents multiple transfers through different processes of which the best known are: socialization, externalization, internalization, combination. Transforming information into knowledge occurs when individuals: compare and integrate new information with existing one, imagine the consequences of their decisions and actions; share and analyze their ideas with others. Ikujiro Nonaka elaborated one of the most known models of knowledge dynamics called SECI, which has been developed in several stages afterward by him and his colleagues (Nonaka, 1991, 1994; Nonaka & Takeuchi, 1995; Nonaka et al., 2008). The following is a brief description of the SECI model and its fundamental processes.

The SECI model relies on the theory of organizational resources according to which the tangible resources were replaced by the intangible resources and the tangible processes were replaced by the intangible processes. Any organization owns both types of resources and *knowledge* represents the complementary component of the tangible resources dynamics. Thus, knowledge management has the role of a link between operational management and strategic management. The SECI model contains four fundamental conversion processes: socialization, externalization,

combination, and internalization. Figure 2 presents an illustration of the SECI model. The first process is *socialization*. Socialization means gathering practical knowledge from the tacit knowledge of another person. Learning occurs not by speech or training, but through observation and imitation. Socialization process is considered as the most important type of knowledge transfer in the Nonaka cycle because it involves the transmission and transformation of key knowledge generated at the individual level. Tacit knowledge is generated by the direct experience of people and is located within the non-rational thinking of individuals. Successful leaders use the features of tacit knowledge and are able to inspire and motivate those they lead. Socialization is an opportunity to participate in and shares experiences as well as a way of learning through sharing of tacit knowledge. Through learning by observation and imitation, inexperienced youth can acquire real lessons from experts in various fields. However, knowledge sharing is a process with many individual and organizational barriers (Bratianu & Orzea, 2010; Chen et al., 2013; Dalkir, 2005; Ford & Staples, 2010). Szulanski (1995, 1996, 2000) introduced the concept of stickiness in order to explain the hidden barriers experienced in knowledge sharing: "Knowledge transfer is seen as a process in which an organization recreates and maintains a complex, causally ambiguous set of routines in a new setting. Stickiness connotes difficulty experienced in that process" (Szulanski, 2000, p.10). Although stickiness refers to all kind of knowledge transfer, the most important aspects are involved in the process of tacit knowledge sharing. When referring to tacit knowledge, we must understand that knowledge is not or cannot be codified and the transmission of knowledge can only take place by means of direct communication. In a few cases, the holder (intellectual owner) of tacit knowledge may not even be able to utter aloud his knowledge. This represents a major barrier and reduces the knowledge transmission process to learning-by-watching, i.e., face-to-face situations with non-verbal communication (Franz, 2010).

Next is the process of *externalization*, in which tacit knowledge is articulated. Tacit knowledge is transformed into explicit knowledge using metaphors and analogies or through gestures and body language. As soon as knowledge becomes explicit, it can be shared, disseminated and transferred to others through different means of communication. Of the four knowledge conversion processes, externalization is considered key to knowledge creation, as it leads to new concepts, the explicit expression of tacit knowledge (Nonaka & Takeuchi, 1995). Externalization is a process of reasoning and efficient conversion success depends on the ability to use metaphors, analogies, and cognitive models. The efficiency of outsourcing depends largely on the level of education and motivation of individuals.

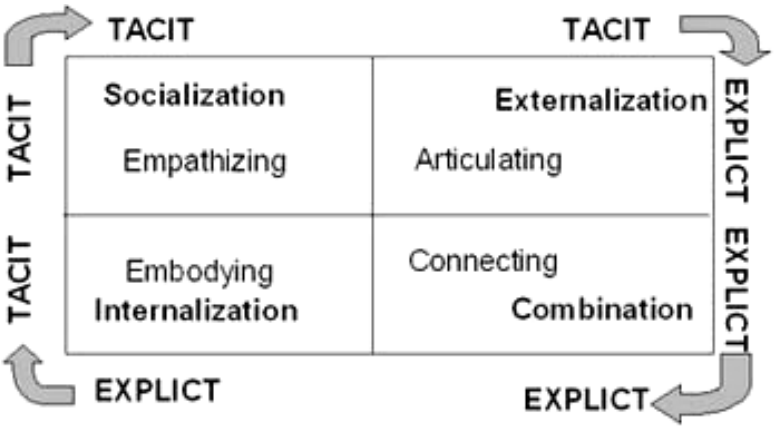

Figure 2. Knowledge dynamics processes
Source: Adaptation after Nonaka (1994)

The combination is the third process and is seen as a stage in which knowledge is mixed and new explicit knowledge is classified in order to integrate the already existing body of explicit knowledge. According to Nonaka & Takeuchi (1995) "In fact, it involves combining three processes. First, explicit knowledge is collected from inside to outside the organization and then mixed. Secondly, new explicit knowledge is disseminated to members of the organization. Third, explicit knowledge is edited or processed within the organization so that it becomes easier to use." Unlike externalization, which is a process that takes place in the individual plan, the combination is a social process that is based on the transmission of explicit knowledge. Combination occurs in a specific organizational context that has been designed and implemented for this purpose. The last process is the *internalization*, the newly perceived explicit knowledge will be transformed back into tacit knowledge. If certain experiences are internalized through socialization, externalization, and combination as a tacit knowledge base of individuals in the form of shared thought patterns or technical expertise, they become valuable assets (Nonaka & Takeuchi, 1995). From this perspective, internalization is a process of converting explicit knowledge into tacit knowledge. It has a very close connection with practical learning. Internalization of knowledge is useful for expanding, extending and rearranging the tacit knowledge belonging to members of the organization.

It is important to underline the fact that the four processes described above develop a three-dimensional spiral that reflects the knowledge creation process because of the individual actions and the organization context. The SECI model of knowledge dynamics is very simple and intuitive, attributes

which contributed to the high acceptance from knowledge management researchers. However, some limitations of this model determine limitations in explaining the complexity of the organizational knowledge dynamics. First, Nonaka created an idealized sequence of processes that generate a spiral of transforming individual knowledge into the organizational knowledge. If the model can explain very well what happens in the Japanese companies, it is not able to explain many aspects common to the American and European companies due to different cultural values and different organizational behavior of people (Bratianu, 2010; Essers & Schreinemakers, 1997; Glisby & Holden, 2003).

The multifield theory of organizational knowledge dynamics

The multifield theory of knowledge dynamics has been developed by Bratianu (2013a, 2015) based on the *energy metaphor* as a new perspective of knowledge interpretation (Bratianu & Andriessen, 2008; Bratianu, 2011a). In the new perspective, knowledge is considered as a *field*, which means that it is intangible and nonlinear. That is a great depart from the previous metaphors using tangible entities in the source semantic domain. Since energy manifests in different forms, knowledge can be conceived of being present at individual and organizational levels in different forms. Bratianu (2013a) defines three fundamental forms of knowledge: rational knowledge, emotional knowledge and spiritual knowledge. *Rational knowledge* is the most known form and sometimes the only form of knowledge due to its importance and communication potential. It is a direct result of the thinking process fact that made many philosophers equate the concept of *knowledge* with that of *rational knowledge*. For instance, the famous idea of Descartes expressed in Latin *Cogito, ergo sum!* made Bertrand Russell to underline the importance of thinking in our existence: "I am a thing that thinks, a substance of which the whole nature or essence consists in thinking, and which needs no place or material thing for its existence" (Russell, 1972, p.565). Rational knowledge is used primarily in managerial decision-making and in information management and information technology. Rational knowledge is equated by many authors with cognitive knowledge, which means to consider both its forms of manifestation as explicit and tacit knowledge. However, tacit embraces not only rational knowledge but emotional knowledge as well. Thus, when we consider rational knowledge we should be careful in discussing the tacit component to extract from that only the rational part of the experience, which is not so easy.

Emotional knowledge field emerged especially with the research of Nonaka and his colleagues, based on the Japanese oneness philosophy about knowledge (Nonaka & Takeuchi, 1995, p.9): "Highly subjective insights, intuitions, and hunches are an integral part of knowledge. Knowledge also embraces ideals, values, and emotions as well as images and symbols". Damasio (2012) considers emotions as a key element to decision-making and learning process and a central element of judgment. For example, when we make a wrong investment – we end regretting it. Subsequently, in a similar situation, we will become more cautious, we will gather more information about possible investment and we will carefully consider the action possibilities. This attitude should lead to a better decision, which means a better result. Thus, we may say that we are beings led by emotions. Among the challenges we are facing some have a connection with material things and induce our emotions such as pleasure or displeasure, disgust or fear and in this case, our feedback forms in a direct manner and in a single direction. Other experiences are caused by people and in this case, our assessments will be more complicated and will lead to intrigue and personal strategies. Furthermore, the latest research on brain activity shows that the emotional side of the human brain is more developed than the rational one and the processes that occur in the human brain are based more on emotions than on the work of cognitive activity (Hill, 2008). In recent works, the tacit knowledge - explicit knowledge dyad tends to be increasingly replaced by a new dyad, the cognitive knowledge - emotional knowledge dyad, considered more comprehensive (Bratianu & Orzea, 2009, 2013; Bratianu & Iordache, 2011). Here, cognitive knowledge is considered similar to rational knowledge. Based on the metaphorical analysis between energy and knowledge, the new dyad induces the idea of possible transformations of rational knowledge into emotional knowledge, and vice versa (Bratianu, 2016). This transformation parallels the transformation of mechanical energy into thermal energy and the reverse in some specific natural and technological contexts.

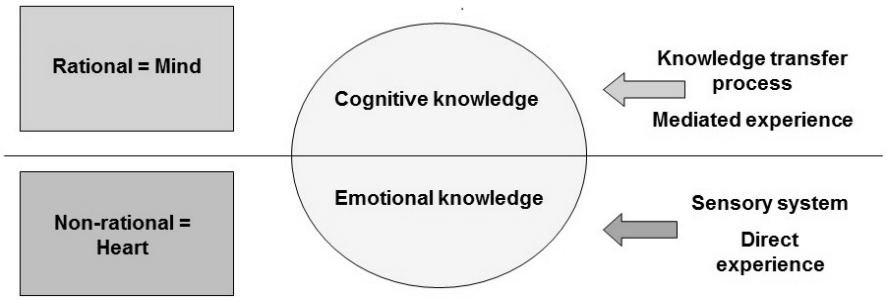

Figure 3. Cognitive – emotional knowledge dyad
Source: Adaptation after Bratianu and Orzea (2009)

Spiritual knowledge is the third fundamental field of knowledge spectrum. Spiritual knowledge integrates values and beliefs about life and about our own existence (Zohar & Marshal, 2000, 2004). Many researchers include spiritual knowledge in tacit knowledge together with emotional knowledge but without any possibility of their clear identification. It is considered just a part of our personal hidden knowledge we call generically tacit knowledge. Due to its increasing importance in spiritual leadership and managerial decision-making, spiritual knowledge should be considered separately as in the multifield theory developed by Bratianu (2013a, 2015). Spiritual knowledge is the source of the spiritual intellectual capital of any organization. According to Zohar and Marshal (2004, p.27), "Our spiritual capital is our shared meaning, our shared purpose, our shared vision of what most deeply matters in life – and how these are implemented in our lives and in our behavioral strategies. It is the capital that is increased by drawing on the resources of the human spirit". Spiritual knowledge reflects the set of organizational values and the framework of organizational behavior being the backbone of the corporate social responsibility. Both emotional and spiritual knowledge fields are essential in designing the motivational system of any managerial structure and in rewarding people's performance.

Spiritual knowledge can be considered a component of a new dyad together with rational knowledge or with emotional knowledge with a simplified structure like that presented in figure 3. In the multifield theory of knowledge, "The cognitive knowledge field, the emotional knowledge field, and the spiritual knowledge field constitute together the generic triple helix of any organization. That means that these forms of knowledge can transform one into another according to some laws we do not know at this moment, but research will discover them" (Bratianu, 2013a, p.217). These transformations are irreversible in concordance with the entropy law and give the full meaning of organizational knowledge dynamics (Bratianu, 2016).

Intellectual capital in organizations

In the current knowledge-based economy, Intellectual Capital (IC) has been seen as the key element for a competitive business. IC is a company's asset such as professional experience, skills, knowledge, organizational structure and routine, and internal and external relationships. The most common IC framework classified these characteristics into human capital, organizational or structural capital and relational or customer capital (Edvisson & Malone, 1997; Mazzota & Bronzetti, 2013; Schiuma & Lerro,

2010; Stewart, 1997). In this approach, *human capital* represents the overall knowledge of all persons working within an organization. This knowledge does not remain in the organization when the individuals go out. Human capital consists of knowledge, skills, and experience of employees and managers. Human capital is the only form of intellectual capital that is able to generate innovation and business strategies. The fact that human capital is not fully controlled by management leads to the necessity of developing stimulating motivational systems for employees to come with new ideas for products and services.

Structural capital is represented by institutionalized knowledge and codified experience stored in the database, routines, patents, and all manuals and regulations. Whereas human capital is possessed by the employees, structural capital is controlled, possessed and managed by the firm. In this sense, structural capital can be seen as the skeleton and the glue of an organization because it provides the tools and architecture for retaining, packaging, reinforcing, and transferring knowledge along the business activities. Finally, structural capital, consist of the stock of knowledge that stays in the organizations in form of tacit and explicit knowledge, that is contained in documents, routines, and organizational culture. In another word, structural capital is a firm's supportive structures for knowledge creation and deployment as well as the set of knowledge, skills, and abilities embedded in the organizational structure. (Bontis, 1999; Mazzota & Bronzetti, 2013; Stewart, 1997). Furthermore, human capital is a fundamental component due to its endless generation of innovation as well as its impressive adaptation to the organization's needs. Human capital may be rebuilt on a greater speed than structural and customer capital which needs more time to reach a convenient estate. However, in order for the human capital to instantaneously bounce from one stage to another, pushing forward its evolution there has to be an appointed knowledge dynamics (Bejinaru & Iordache, 2010, 2011).

Relational capital is understood as all knowledge arising from the interaction between the firm and its stakeholders. Relational capital reflects the organizational value that emerges not only from a firm's relations and connections with customers, but also with current and potential suppliers, shareholders, other agents, and the society in general (Ordoñez de Pablos, 2005). Relational capital is the source of the reputation, credibility, consent, and image of the organization. Relational capital consists of knowledge resources derived from networks of relationships between peer, customers, suppliers, and business associates. These three new forms of capital capture a company in movement as it transforms its skills and knowledge into competitiveness. Therefore, the company needs to keep up and develop the existing capital structure and also acquire know-how, skills, and

professionalism, train and develop employees by emphasizing their business skills and capital to focus on trading and customer (Tennyson et al., 2013). An illustration of the intellectual capital structure presented above is given in figure 4.

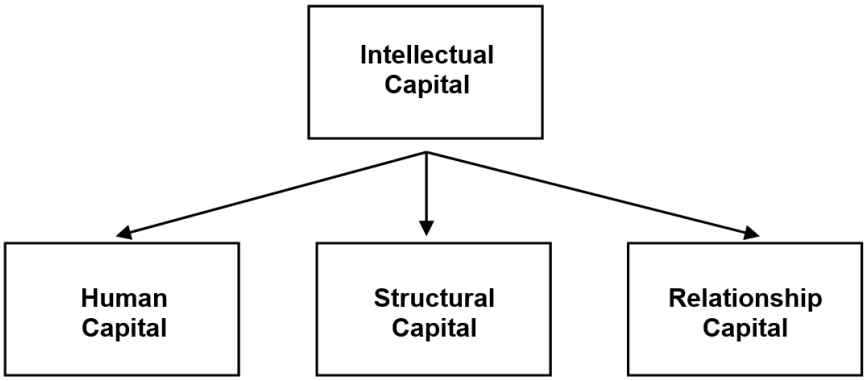

Figure 4. Intellectual capital illustration

Intellectual capital is based on knowledge and knowledge actively generates value throughout its use. The greater the knowledge dynamics is the greater impact of knowledge on IC value is. Knowledge creates value by incorporating it into the company's products and services (Davenport & Prusak, 2000; Ricceri, 2008). Knowledge dynamics significantly influences the company's capacity of producing and delivering valuable economic products to clients. Incorporating knowledge into the organization, it will lead to valuable outputs which not only enclose knowledge but also were the result of previously well-processed knowledge. Research was undertaken in domains like knowledge management, IC and learning organization obviously emphasizes the actual estate of disciplines in the context of organizational change. Each of these disciplines represents the need to shape the employee's knowledge as a must for the survival in the present business environment. Out of the whole picture, the researcher will construct the cause-effect relationship between the organization and its knowledge dynamics and then he will use it in order to increase the firm's performance (Bejinaru & Iordache, 2011).

Discussing the IC dynamics means to have an integrative view of the following aspects. Competencies include knowledge and practical abilities. The attitude refers to the employee volition of using his/her knowledge and abilities to serve the organization's interest and he/she may be influenced by motivation and behavior. Intelligence refers to the employee's capacity to use knowledge and abilities in various contexts and in order to increase

knowledge and competencies throughout learning. Relating capacity represents the individual ability to establish relations with others -clients, suppliers, business partners and other stakeholders. The innovation and development rate comprises the intangible aspects that may improve the intellectual capital, all the 'elements' that were built or conceived and that will have an impact on the future value of the organization's IC. The nature of the organization is to manage valuable knowledge only for itself and the individuals inside. The individuals' nature is to adapt their work – of creating knowledge – to the organization's requirements and also resources. The IC existing inside the organization generates that organization's values, knowledge, and intelligence. The output of values, of knowledge and intelligence depends greatly on the inputs and the capacity of the organization to integrate all these components in order to generate synergy and performance.

The impact of knowledge fields on the intellectual capital

In a knowledge-based perspective, we see the organization as a repository of knowledge resources and capabilities. To the extent that the knowledge and capabilities are unique and difficult to imitate, they confer a sustainable competitive advantage for the organization. Knowledge is cumulative, so the more the organization knows the more it can apply what it knows to new areas of opportunity and increase its returns. The primary rationale of organizations is thus the creation and deployment of knowledge. Performance differences between organizations are a result of their different wealth of knowledge and their differing capabilities in developing and deploying knowledge. Knowledge and competence have become the primary drivers of competitive advantage in advanced nations (Choo et al., 2001; Dalkir, 2005; Davenport & Prusak, 2000; Nonaka & Takeuchi, 1995).

Several authors (Bontis, 1999; Pöyhönen & Smedlund, 2004; Roos et al., 1998) have noted that most studies tend to view IC merely from a static point of view, whereas in order to understand how organizations use IC for value creation, a more dynamic approach is required. However, dynamics should not be considered in the Newtonian view like a motion in space, as many authors did base on the first and second generations of metaphors. These metaphors created the image of knowledge flow so many authors translated this image on the intellectual capital and developed their dynamic theory based on the concept of flow. The limitations of all these theories came out when researchers developed metrics to measure the intellectual capital and when they realized that the canonical structure of the organizational intellectual capital no longer satisfies the needs of accuracy.

Bratianu (2008) demonstrates that the components of intellectual capital, i.e. human capital, structural capital, and relationship capital are not independent entities which mean that regardless the metric used in their evaluation there will be always overlapping zones leading to errors. According to any ontology logic defining the components of a given conceptual model, the resulting components should be independent entities. However, the intellectual capital structure does not respect that principle. Thus, it is necessary to look from a different perspective and to find a new composition rule. Analyzing human capital, Bratianu (2008) found that it can be decomposed into knowledge, intelligence and values. These entities are independent and can serve as basic bricks for the construction of human capital. Intelligence represents our capacities to process knowledge of different nature (Gardner, 1983, 2006). Values represent confirmed beliefs and condensed wisdom we use in making decisions. This basic composition can be applied to structural capital, and to spiritual capital as well. However, that structure can be improved by considering the multifield theory of knowledge and the organizational knowledge dynamics based on it. Thus, if we start with the three fundamental fields of knowledge (i.e. rational, emotional, and spiritual) it is logical to consider a multifield intellectual capital composed of rational capital, emotional capital, and spiritual capital.

These three basic components are fully independent and they can be evaluated by using specific metrics in concordance with their nature. The rational intellectual capital contains all rational knowledge and other possible intangibles from the firm, as well as rational intelligence. The emotional intellectual capital comprises emotional knowledge and emotional intelligence capable of processing emotional intangibles. Spiritual intellectual capital comprises spiritual knowledge and spiritual intelligence able to process it. Since any knowledge form can transform itself into another form of knowledge, it is logical to assume that any form of intellectual capital has the same capacity of transformation. This way, the structure and the dynamics of the organizational knowledge maps onto the structure and dynamics of the organizational intellectual capital (Bratianu, 2013b). The result is that organizational intellectual capital can be decomposed at the basic level into rational IC, emotional IC, and spiritual IC. The former components (i.e. human capital, structural capital, and relational capital) do not disappear. They become an intermediate level of the intellectual capital structure as shown in figure 5.

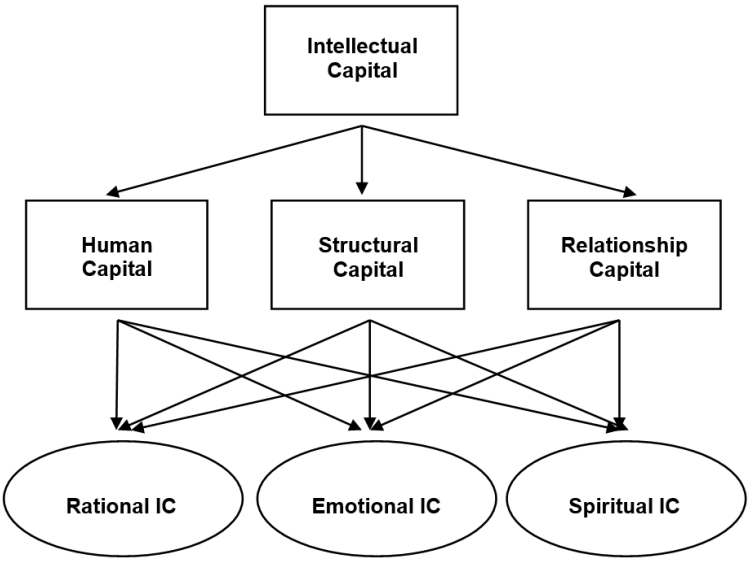

Figure 5. The new structure of the organizational intellectual capital
Source: Adaptation after Bratianu (2011b)

Figure 5 shows a new and more complex architecture of the organizational intellectual capital that reflects the multifield structure of the organizational knowledge. Rational knowledge is transformed into rational intellectual capital by the action of rational intelligence. Similarly, emotional and spiritual capital entities result from emotional and spiritual knowledge fields being processed by emotional and spiritual intelligence, respectively. These three basic forms of intellectual capital represent independent entities and they can be evaluated by using specific metrics without the risk of counting twice the same intangibles. Each form of intellectual capital can transform itself into another form generating this way a continuous dynamics. These dynamics based on irreversible processes is totally different than the Newtonian dynamics (Kianto, 2007) based on the stock-and-flow metaphor.

Using the metaphorical thinking based on mechanical energy, the transformation of potential energy into kinetic energy can be map onto the transformation of *potential* intellectual capital into *operational* intellectual capital (Bratianu, 2008; Bratianu et al., 2011). All the papers in the field of intellectual capital are concerned with the potential intellectual capital, although business performance depends on operational intellectual capital. The transformation of potential intellectual capital into operational intellectual capital can be done by organizational *integrators*. By definition, "an integrator is a powerful field of forces capable of combining two or more elements into a new entity, based on interdependence and synergy"

(Bratianu et al., 2011, p.32). According to Bratianu, the *interdependence* property is necessary for combining all elements into a system. The *synergy* property makes it possible to generate an extra energy or power when there are nonlinear phenomena. The most important organizational integrators are the following: technology and associated processes, organizational culture, management, and leadership. The *integration* process realized by integrators is much more powerful than the alignment process described by Kaplan and Norton (2006). An illustration of the role of integrators in transforming the potential intellectual capital into operational intellectual capital is given in figure 6. Figure 6 presents an integrated model of the organizational intellectual capital dynamics which reflects the structure of the multifield structure of organizational knowledge. In this way, there is a better correlation between the research of knowledge management and that of intellectual capital.

Conclusions

The purpose of this paper is to show the knowledge dynamics impact on intellectual capital in organizations. It is a conceptual paper based on the SECI model developed by Ikujiro Nonaka and the multifield and integrators theories developed by Constantin Bratianu for the organizational knowledge and intellectual capital. The paper shows that the SECI theory deals only with the explicit and tacit forms of knowledge, a fact which lead researchers to a static model for the intellectual capital composed of human capital, structural capital, and relationship capital. However, human capital, structural capital, and relationship capital are not independent entities fact for which any metric used so far for evaluating organizational intellectual capital resulted in overlapping zones and indicators.

The new multifield theory of organizational knowledge introduces three distinct characteristics for knowledge which changes completely its dynamics and understanding. These are the following: 1) knowledge is a field, which is intangible; 2) there are three basic fields of knowledge – rational, emotional, and spiritual; 3) each form of knowledge can transform into another form of knowledge, generating a new type of knowledge dynamics. Thus, the entropic dynamics of knowledge influences the organizational intellectual capital and induces the idea of having three basic components: rational IC, emotional IC, and spiritual IC. This new composition has the advantage of dealing with independent entities, avoiding this way overlapping measurements. Human capital, structural capital and relational capital remain but as meta-components in a more complex framework. In addition, the new structure and dynamics of the

intellectual capital are characterized by two distinct levels: a potential intellectual capital and an operational intellectual capital. The transformation of the potential intellectual capital into operational intellectual capital is done by the organizational integrators.

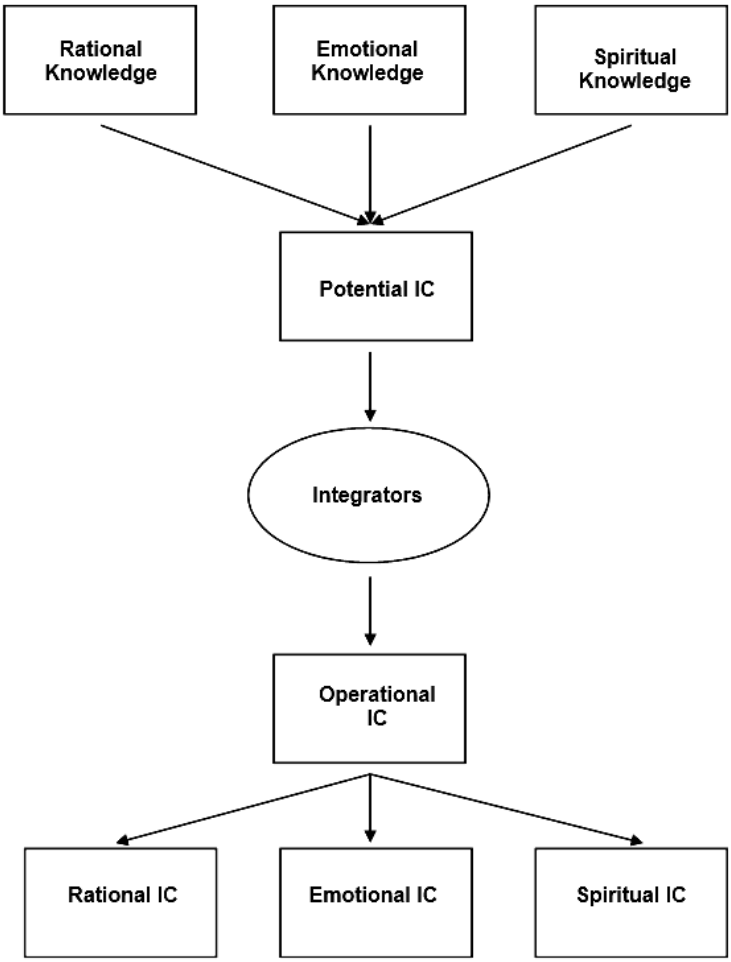

Figure 6. Dynamic structure of the organizational intellectual capital and the role of integrators
Source: Adaptation after Bratianu (2011b)

References

Andriessen, D. (2008). Stuff or love? How metaphors direct our efforts to manage knowledge in organizations. *Knowledge Management Research & Practice*, 6(1), 5-12.

Andriessen, D., and Boom, M.D. (2007, May). Asian and western intellectual capital in the encounter. Paper presented at IC-Congress 2007, Inholland University of Applied Sciences, Haarlem, The Netherlands.

Becerra-Fernandez, I., and Sabherwal, R. (2010). *Knowledge management: Systems and processes*. New York: M.E. Sharpe.

Bejinaru, R., and Iordache Ș. (2011). Intellectual capital dynamics within the learning organization. In *Proceedings of the European Conference on Intellectual Capital* (pp.70-77). Reading: Academic Conferences Limited.

Bejinaru, R., and Iordache, S. (2010). Knowledge channeling in the learning organization. In *Proceedings of the 5th International Conference on Business Excellence* (pp. 59-62). Brasov: Infomarket Publishing House.

Boh, W.F. (2007). Mechanisms for sharing knowledge in project-based organizations. *Information and Organization*, 17(1), 27–58.

Bolisani, E., Borgo, S., and Oltramari, A. (2012). Using knowledge as an object: Challenges and implications. *Knowledge Management Research & Practice*, 10(3), 202-205.

Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field. *International Journal of Technology Management*, 18(5/8), 433–462.

Bratianu, C. (2008). A dynamic structure of the organizational intellectual capital. In: M. Naaranoja (Ed.), *Knowledge management in organizations* (pp.233-243). Vaasa: Vaasan Yliopisto.

Bratianu, C. (2010). A critical analysis of Nonaka's model of knowledge dynamics. *Electronic Journal of Knowledge Management*, 8(2), 193-200.

Bratianu, C. (2011a). Changing paradigm for knowledge metaphors from dynamics to thermodynamics. *Systems Research and Behavioral Science*, 28(2), 160-169.

Bratianu, C. (2011b). A new perspective of the intellectual capital dynamics in organizations. In B. Vallejo-Alonso, A. Rodriguez-Castellanos, and G. Arregui-Ayastuy (Eds.), *Identifying, measuring, and valuing knowledge-based intangible assets: New perspectives* (pp.1-21). Hershey: IGI Global.

Bratianu, C. (2013a). The triple helix of organizational knowledge. *Management Dynamics in the Knowledge Economy*, 1(2), 207-220.

Bratianu, C. (2013b). Nonlinear integrators of the organizational intellectual capital. In M. Fathi (Ed.), *Integration of practice-oriented knowledge technology: trends and perspectives* (pp.3-16). Heidelberg: Springer.

Bratianu, C. (2015). *Organizational knowledge dynamics: Managing knowledge creation, acquisition, sharing, and transformation*. Hershey: IGI Global.

Bratianu, C. (2016). Knowledge dynamics. *Management Dynamics in the Knowledge Economy*, 4(3), 323-337.

Bratianu, C., and Andriessen, D. (2008). Knowledge as energy: A metaphorical analysis. In D. Harorimana, and D. Watkins (Eds.), *Proceedings of the 9th*

European Conference on Knowledge Management (pp.75-82). Reading: Academic Publishing Limited.

Bratianu, C., Dima, A.M., Vasilache, S., and Orzea, I. (2011). *Nonlinear integrators and intellectual capital dynamics*. Bucharest: Curtea Veche.

Bratianu, C., and Iordache, S. (2011). Knowledge Dynamics Analysis in Negotiations. *The Electronic Journal of Knowledge Management*, 11(1), 18-29.

Bratianu, C., and Orzea, I. (2009). Emergence of the cognitive-emotional knowledge dyad. *Review of International Comparative Management*, 10(5), 893-901.

Bratianu, C., and Orzea, I. (2010). Knowledge sharing dynamics in post-socialist organizations in Romania. In L. Uden, L. Szabo, and N. Obermayer-Kovacs (Eds.), *Knowledge management in organizations: Roles and challenges of knowledge management in innovation for services and products* (pp.85-94). Veszprem: University of Pannonia.

Bratianu, C., and Orzea, I. (2013). The multifield structure of organizational knowledge. In A.R. Thomas, Al.N. Pop, and C. Bratianu (Eds.), *The changing business landscape of Romania: Lessons for and from transition economies* (pp.3-19). New York: Springer.

Chen, X., Li, X., Clark, J.G., and Dietrich, G.B. (2013). Knowledge sharing in open source software project teams: A transactive memory system perspective. *International Journal of Information Management*, 33(3), 553-563.

Choo, C.W., and Bontis, N. (2001) Strategic Management of Intellectual Capital. University of Toronto & McMaster University, Ontario, Canada. Retrieved from http://choo.fis.utoronto.ca.

Dalkir, K. (2005). *Knowledge management in theory and practice*. Amsterdam: Elsevier.

Damasio, A. (2012). *Self-comes to mind. Constructing the conscious brain*. New York: A Harvest Book.

Davenport, T., and Prusak, L. (2000). *Working Knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Edvinsson, L., and Malone, M.S. (1997). *Intellectual capital: Realizing your company's true value by finding its hidden brainpower*. New York: Harper Business.

Essers, J., and Schreinemakers, J. (1997). Nonaka's subjectivist conception of knowledge in corporate knowledge management. *Knowledge Organization*, 24(1), 24-32.

Ford, D.P., and Staples, S. (2010). Are full and partial knowledge sharing the same?. *Journal of Knowledge Management*, 14(3), 394-409.

Franz, P. (2010). Knowledge spill-overs for knowledge-based development: progression in theory and obstacles for empirical research. *International Journal of Knowledge-Based Development*, 1(1/2), 25–38.

Gardner, H. (1983). *Frames of the mind: The theory of multiple intelligences.* New York: Basic books.

Gardner, H. (2006). *Changing minds: The art and science of multiple intelligences*. New York: Basic Books.

Glisby, M., and Holden, N. (2003). Contextual constraints in knowledge management theory: The cultural embeddedness of Nonaka's knowledge-creating company. *Knowledge and Process Management*, 10(1), 29-36.

Hansen, M.T. (1999) The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44(1), 82-111.

Hill, D. (2008). *Emotionomics. Leveraging emotions for business success*. Revised Edition. London: Kogan Page.

Hunter, L. (2002) Intellectual Capital Accumulation and Appropriation. Working Paper. Melbourne, Australia.

Jashapara, A. (2011). *Knowledge management: An integrated approach*. London: Prentice Hall.

Kaplan, R.S., and Norton, D.P. (2006). *Alignment: Using the Balanced Scorecard to create corporate synergies*. Boston: Harvard Business School Press.

Kianto, A. (2007). What do we really mean by the dynamic dimension of intellectual capital? *International Journal of Learning and Intellectual Capital*, 4(4), 342–356.

Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies*, 21(3), 487-513.

Lakoff, G., and Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic Books.

Mazzota, R., and Bronzetti, G. (2013). Intellectual capital in a services-oriented firm: The case of Italian public utilities. Retrieved from http://www.irma-international.org/viewtitle/75250/.

Nissen, M.E. (2006). *Harnessing knowledge dynamics: Principled organizational knowing & learning*. London: IRM Press.

Nonaka, I. (1991). The `knowledge-creating` company. *Harvard Business Review*, 69(2), 96-104.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14-37.

Nonaka, I., and Takeuchi, H. (1995) *The knowledge-creating company. How Japanese companies create the dynamics of innovation.* Oxford: Oxford University Press.

Nonaka, I., Toyama, R., and Hirata, T. (2008). *Managing flow: A process theory of the knowledge-based firm*. Houndmills: Palgrave Macmillan.

Ordonez de Pablos, P. (2003). Intellectual capital reporting in Spain: A comparative view. *Journal of Intellectual Capital*, 4(1), 61–81.

Polanyi, M. (1962). *Personal knowledge: Towards a post-critical philosophy*. Chicago: The University of Chicago Press.

Polanyi, M. (1983). *The tacit dimension*. Gloucester: Peter Smith.

Pöyhönen, A., and Smedlund, A. (2004). Assessing intellectual capital creation in regional clusters. *Journal of Intellectual Capital*, 5(3), 351–365.

Ricceri, F. (2008). *Intellectual capital and knowledge management: Strategic management of knowledge resources*. New York: Routledge.

Roos, J., Roos, G., and Dragonetti, N.C. (1998). *Intellectual capital: Navigating in the new business landscape*. New York: New York University Press.

Russell, B. (1972). *A history of western philosophy*. New York: Simon and Schuster.

Schiuma, G., and Lerro, A. (2010). Knowledge-based dynamics of regional development: the intellectual capital innovation capacity model. *International Journal of Knowledge-Based Development*, 1(1/2), 39–52.

Spender, J.C. (1996) Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17(4), 45–62.

Stewart, T.A. (1997). *Intellectual capital: The new wealth of organizations*. New York: Doubleday.

Sullivan, P.H. (1998). *Profiting from intellectual capital: Extracting value from innovation*. New York: John Wiley & Sons.

Szulanski, G. (1995). Unpacking stickiness: An empirical investigation of the barriers to transfer best practice inside the firm. *Academy of Management Proceedings*, 38(1), 437-441.

Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17(1), 27-43.

Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes*, 82(1), 9-27.

Tennyson, R., Zhao, J., and Ordóñez de Pablos, P. (2013). *Intellectual capital strategy management for knowledge-based organizations*. Hershey: IGI Global.

Zohar, D., and Marshal, I. (2000). *SQ: Spiritual intelligence. The ultimate intelligence*. London: Bloomsbury.

Zohar, D., and Marshal, I. (2004). *Spiritual capital. Wealth we can live by*. San Francisco: Berrett-Koehler.

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