THE ROLE OF SOCIAL CAPITAL WITHIN BUSINESS NETWORKS: ANALYSIS OF STRUCTURAL AND RELATIONAL ARGUMENTS

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Abstract

This article proposes the vision of the knowledge-sharing issues through the perspective of the social capital explanations of the processes in organisational networks. The business effectiveness that results from knowledge sharing is examined via the model of social capital residing in a network. Social capital itself is analysed with respect to the closure and structural hole approaches, which are defined as no more opposite ones, but concerning two levels of network – whole network and sub-networks. Closure argument explains knowledge sharing in the sub-network through a cohesive network. Structural holes argument explains knowledge sharing via brokerage in the whole business network as a network of different organizations. Research methodology proposed is based on the network partitioning and examining network structure, content of relations, and trust.

Keywords: social capital, business network, knowledge sharing, structural holes, closure.

**The Role of Social Capital within Business Networks:
Analysis of Structural and Relational Arguments**

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Introduction

The knowledge sharing phenomenon has become one of the crucial issues in organisational studies thanks to the spreading analysis of organisational processes that significantly influence economic effectiveness. Examining the latter one demands to join the approaches that concerns micro, meso, and macro levels of organisational interactions. Methodologically, that kind of research in organizational studies becomes realisable through the network analysis as an approach corresponding to such economical macroprocesses as world and european globalization including the unifying of national markets into the huge transnational networks of producers, suppliers, and merchants. The units that constrcut a network are joined by the commojn purpose of economic advantage, which nisnin turn assisted by a multitude of factors forming the final product/service's cost. The latter-day research demonstrates that knowledge sharing is the most expensive factor. At the same time, this cost can be incredibly minimized compared to other expenses. Due to the appropriate organization of an effective business network, knowledge sharing expenses could be reduced by more than 50% [Bian 2000].

Organization is either an entier network that consists of departments-actors, or an actor of bigger business network that includes interdepending organizations. From this point of view, the vision of organizational processes through the network perspective is an adequate instrument to explain a number of organizational phenomenons: organizational identity, organizational knowledge cycle, organizational development, etc.

Business network is a particular case of social network, which represents a union of actors (varying from individuals to organizations) joined by the common purpose. Social network accomplishes certain activities to achieve certain goals and purposes planned. The specificity of business network consists in: 1) its orientation to economic advantages; 2) its initial structural and relational formality; though, relations could be informal, this informality is always developed on the basis of well-defined functions and sanctions; 3) business processes are mostly regulated by official law, while social network could refer to common sense notions.

The notion of business network brings up the question of its effectiveness and the sources of this effectiveness. The concept laying behind the idea of such sources is the social capital theory. An increasing number of studies examines this concept with respect to the problems of quality of social relations in business; trust; structuring the communication flow; contributing to the intellectual capital [Baker 2001; Davern, 1997; Hjollund & Svendsen 2000; Jarvenpaa, and Maki, 1998; Tsunjinaka 2003], etc. In spite of the skepticism concerning the notion of social capital, its measures and positive influence, this concept stays the most adequate theoretical model to interpret tacit phenomenon of business success. As E. Lessler and J. Cothrell [2001] tell, "The new currency won't be intellectual capital. It will be social capital – the collective value of whom we know and what we'll do for each other. When social connections are strong and numerous, there is more trust, reciprocity, information flow, collective action, happiness, and by the way, greater wealth."

The evidences of the social capital benefits are proven by the latest research in this field. For example, Hall [2001] outlines following perspectives on social capital.

Attracting and retaining talent. Despite the proliferation of Internet recruiting services, most employers still find the right people for jobs, and most jobseekers find the best jobs by tapping their informal networks of friends, family, neighbors, colleagues, associates, and acquaintances. Social capital embedded in those networks means that the information given about potential candidates is trusted. Once it was used, it works again. Entering a new social structure is somewhat like an initiation into the existing codes and relations within social network. Has been passed successfully, this stage finishes by means of inclusion and a feel of inclusiveness. The, talented people stay in their jobs because they find meaning in their work and because they develop a sense of community, feel that they belong, and identify with the company.

Creating value and rewarding value creators. People with rich social capital are paid better, promoted faster, and receive better appraisals. The reason is simple: these are rewards for superior value creation. People with rich social capital are better-informed, more efficient, more creative, and better problem-solvers; in short, they create value.

1. **Breaking silos and improving collaboration.** Informational silos are a fact of organizational life, which naturally tends to form around function (common activities, specialties, and disciplines) and geography (shared locations). Growth by acquisition worsens the problem of silos. Without

deliberate intervention, the company remains an agglomeration of different cultures and distinct networks. While, social capital intervention makes the company being an effective network connecting those distinct sub-networks and cultures by an entrepreneurial bridging and bonding that aim on knowledge exchange communication. Hence, by building social capital, it is possible to break silos, improve collaboration, and produce business results - more sales, more innovations, faster time to market, and so on.

2. **Improving knowledge management.** We live in the information age, and so developing the capacity to create, disseminate, and share knowledge is more important than ever before. Too often, however, knowledge management is viewed as a technical problem solved by the "right" hardware and software. However, **knowledge resides in social networks**, not computer systems. Most of organizational knowledge is tacit, surfacing only in the course of social interaction, storytelling, mentoring, demonstration and observation. To build effective knowledge sharing networks, leaders use formal and informal social gatherings, offsite retreats, collocation, open office designs, and incentive systems that reward participation and collaboration. Such techniques aim to develop an effective communication (with minimized knowledge-sharing barriers) between sub-networks based on emotive (trust and inclusion) and/or reactive (sanctions and awards) mechanisms.

According to the benefits mentioned above, the process of knowledge sharing is predetermined by management of information flow through the networks rich in social capital. Therefore, the questions to answer in order to find out the way to make knowledge sharing effective are:

Which types of business networks facilitate/ determine knowledge sharing?
Is there the correspondence between a network type and a knowledge type that permit to share knowledge in the most effective way?
What are the business network characteristics, which contribute to building social capital in the business network, and thus, network knowledge sharing?

1. The Phenomenon of Knowledge Sharing

1.1. Knowledge and Knowledge Sharing: Notion, Forms, and Mechanisms

Knowledge sharing assists economic development in general and certain organizational perfection in particular [Dyer, Nobeoka, 1998]. This process

means sharing, diffusing and transferring of knowledge between individuals, groups and organizations [Jarvenpaa, Maki, 1998]. The essence and the sole of this process is knowledge, which is defined and classified in plural theories in order to explain the nature and the specificity of the sharing of each knowledge type.

First of all, knowledge is treated as a multidimensional phenomenon. Its typologies concern different parameters of knowledge. The basic and fundamental distinction, being used in management sciences, is the dichotomy "explicit knowledge - implicit knowledge", or "knowledge proper – know-how", presented by Polyani [1975] and Grundsteim [2000]. Polyani proposes to divide knowledge into explicit and implicit one. He understands explicit knowledge as such one that can be transmitted by language, expressed, communicated, and documented. Implicit knowledge is known unconsciously, difficult to announce, formalize and communicate by language [1975]. The knowledge conception elaborated by Grundstein is similar to Polyani's model. Grundstein [2000] uses different terminology. He speaks about knowledge proper and know-how. The first one is defined as a formalized and specialized explicit knowledge, embedded in data, procedures, plans, models, algorithms, and documents. This type of knowledge is heterogeneous and marked by the context of its creation. Know how is a tacit knowledge, which can or cannot be explicable, embedded in talents, skills, professional secrets, routines, etc. This type of knowledge is acquired by practice and transmitted by collective implicit learning [2000].

Enlarging discussed classifications, Baumard [1996] introduces one more knowledge measure, based on the knowledge ownership. He proposes the following model of knowledge:
- Explicit and individual knowledge (personal dossier and written notes; status expertise; technical and declarative knowledge, methods)
- Tacit and individual knowledge (instinctive, intuitive knowledge; occasional insight; imagination; practical, procedural knowledge)
- Explicit and collective knowledge (creature of the collective organizational papers, documents, and standards; institutionalized organizational rules; keeping the organizational hierarchy)
- Tacit and collective knowledge (common sense; local collective knowledge; organizational collective thinking; organizational culture and traditions)

Thus, organizational knowledge in general consists of the tacit and explicit elements. Knowledge sharing process supposes a provision or receipt of task information, know-how, and feed-back regarding a product or procedure based

on the implicit coordination of expertise or information about who knows in the group. In addition, it includes both intellectual and social capital, competencies of the employees, and knowledge and information to run a business [Jarvenpaa, Maki, 1998]. The sources of knowledge can range from customers to organizational experts, to members themselves [Cummings, 2003].

As knowledge sharing is a multi-facet process, with respect to a network it develops at two levels: in the internal network [Burt, 2000] (or sub-network, intragroup according to Cummings [2003]) and in the external network [Burt, 2000] (whole network according to Cummings [2003]). At the internal network level, this process develops as an exchange of general overviews, specific requirements, analytical techniques, progress reports, and results of network actors. Peculiarity of knowledge sharing at the external network level appears as results with other internal, or sub-networks' members, hole network members or non-members [Cummings, 2003].

Knowledge sharing is realized by means of different media: face-to-face interaction, joint action, learning-through-doing, video-conferencing, phone calls, e-mails, letters, memos, etc. Some media serve to unmediated, direct communication, the others – to virtual networking, while certain media are more or less effective and compensatory. For example, video-conferencing facilitates trust enhancing within virtual network through creating the situation of real, reflected relations [Jarvenpaa, Maki, 1998].

The mechanisms enhancing knowledge sharing and its value are defined as: 1) closure [Coleman, 1990]; 2) weak, or indirect, ties [Granovetter, by Cummings, 2003]; 3) structural holes [Burt, 2000]; and 4) social resources embedded in a differentiated network providing desired feedback [Lin, by Bian, 2000]. The issue of the knowledge sharing mechanisms is closely connected with the issue of structural network characteristics, namely different kinds of structural organizational diversity: geographic (location), functional (member assignments), hierarchical, and communal (association with different business units) [Cummings, 2003].

As we have suggested above, knowledge sharing is realized at two levels, while each level serves as an effective mechanism to share knowledge of a certain type. According to Dyer and Noebeka [1998], to share explicit or implicit knowledge one need different network characteristics. In particular, explicit knowledge sharing can be accomplished through weak ties of a sparse network, while tacit knowledge sharing requires dense ties, or a cohesive network. Tacit knowledge is difficult to codify, difficult to transfer. Due to this fact, a sub-

network level is more favorable than a whole, or external, network level providing all necessary conditions: 1) absorptive capacity of the knowledge receiver; 2) long-term dense network; 3) needs in knowledge sharing and acquisition [idem].

However, organizational knowledge sharing process faces some difficulties. Resulting from the level of embodiment of knowledge sharing, all existing barriers could be classified into three groups [Michailova, Husted, 2003]. The first group consists of barriers related to the very nature of knowledge sharing. The second one includes the impediments associated with the economics of knowledge sharing. Finally, the last group is presented in the obstructions, which originates from individual behaviour. Examining the issue of knowledge sharing hostility in Russia, Michailova and Husted [2003] discuss the phenomenon of NIH syndrome – "Not-Invented-Here". According to the NIH syndrome, external to an organization knowledge is often rejected because of certain reasons. At first, it is more prestigious to create new knowledge than to reuse knowledge invented elsewhere. At second, the recipients do not trust the quality of shared knowledge and, thus, prefer elaborating the specific knowledge themselves instead of validating existing external knowledge. Finally, the authors conclude that the trust is an important condition to overcome NIH syndrome and to encourage bottom-up and voluntary knowledge sharing.

1.2. Knowledge Sharing Preconditions

Knowledge sharing needs preconditions. By a common sense, to make one person sharing knowledge with somebody else, first, these two persons should be able to communicate with each other. Then, the person who shares information should be sure in the right utilization of information. Finally, both should speak the same language, otherwise, the information will be non-transferable, non-sharable. Hence, knowledge sharing demands connection, trust, and shared language. The latter one is a question of cognitive skill, though the other two preconditions (trust and connection) pose the question of the business network structural and relational characteristics providing an effective knowledge sharing, bring up the necessity in the methodology that permits to answer these questions.

The issue of three preconditions of knowledge sharing leads to the model of social capital including them as its dimensions, which are interpreted by different authors as forms, levels, channels, and indicators of social capital [Allee; 1997; Hall 2001; Nahapiet & Goshal 1998; Grootaert & van Bastelaer

2002; Michailova & Husted 2003; etc.]. Nahapiet and Goshal [1998] declared three-dimensional model of social capital as certain challenges:

– Individuals must perceive themselves to be part of a network (structural dimension)
– A sense of trust and mutual obligation must be developed across this network (relational dimension)
– The members of the network must have a common interest or share common understanding of issues facing the organizations (cognitive dimension).

Table 1. Dimensions of Social Capital

Form – level	Structural	Relational	Cognitive
Macro	Institutions of the state, rule of law	Governance	Mentality
Meso	Social network: size, homogeneity, hierarchy (positions), density, constraint.	Modality of relations: emotional closeness, frequency, and strength. Values and norms: trust and reciprocity.	Norms of specific language.
Micro	Individual contacts	Personal relations	Accessible language

Grootaert and van Bastelaer [2002] proposed the model of a two-dimensional space of social capital that varies from micro to macro level, from structural to cognitive scope. The generalized concept of social capital constructed on the base of existing social capital models presents social capital as a phenomenon embedded at three levels and in three forms (Table 1).

Each of the social capital dimensions presented in the Table 1 could be a precondition to knowledge sharing at one of three existing levels. Though, the mechanical creating of a certain precondition of knowledge sharing (e.g., speaking common professional language or being included into professional network, etc.) does not guarantee the expected result. Knowledge is always a changing substance, which modifies around products, services, processes, technology, structures, and relationships; therefore, it is problematic to identify knowledge in terms of designing and implementing a knowledge-sharing machine. On the contrary, this process appears extremely difficult to be drawn out other than through the perspective of social relations and social communication. As Allee [1997] claims, we cannot impose rules and systems into knowledge architecture, because it is a social process by its core. Metaphorically, "knowledge will take care of itself in the right supporting environment" [Allee, 1997].

2. Methodological Approaches to Social Capital

The first applications of the term "social capital" appeared with respect to the theories of economic success [Loury, 1977 by Bian, 2000]; local communities and nations [P. Bourdieu,1985]; etc. Generallly speaking, the new concept translated two main ideas: the structure of social connections and the psychological processes making possible those connections that determine the effects produced by the social structure. These ideas were formulated and translated into two approaches known as the closure/cohesiveness argument [Coleman, 1990] and the structural holes/ brokerage argument [Burt, 2000]. Being perceived as two polar approaches interpreting the phenomena of community network versus formal network, the both arguments treat social network as a location/ embodiment/ form of social capital.

The closure argument emphasizes the solidarity and trust between members of dense network [Coleman 1990] as the main characteristics and indexes of social capital. Here it is recognized as a "bottom-up" phenomenon originating with people forming social connections and networks based on the principles of trust, mutual reciprocity, and norms of action [Bullen, Onyx, 1998]. Two of the most famous illustrations of this type of social capital are Jewish jewelry network in the US cited by Coleman [1990] and the Italian regional governments of 70-s quoted by Putnam [1993]. The last one was a very convincing prove of the role of social context in building effective social structure. Then Italian regional governments were formed as virtually identical in form, but different in social, political, economic and cultural context. Some of them turned to be very successful, while the others were lost in the corruption. Since this event, the concept of social capital became a core one in the European political studies. According to Australian social capital theorists, the social capital concept was paid little attention, although it is "social glue", which establishes networks, norms, social trust and facilitate coordination and cooperation for mutual benefit [e.g., Duncan 1999].

The structural holes argument, based on the idea of the need in brokerage, or bridging certain misconnected parts of a network, accents the role of entrepreneurs - those actors, who connect and provide flexible information flow between the network parts [Burt, 2000]. Sometimes Burt's approach is defined as a minimalist view due to his understanding of social capital as individual connections, individual access to favorable personal network [Ostrom, Ahn 2001]. With respect to human capital, which is an individual attribute, social capital is interpreted as an attribute among people. As Bullen and Onyx [1998]

mention, social capital cannot be generated by people acting on their own, it's rather a capacity to form networks. Social capital is also treated as "the stock of formal or informal social networks that individuals use to produce or allocate goods or services" [Rose, 1998, p.6].

2.1. **Closure Argument**

Coleman is often associated with Bourdieu's sociological perception of social capital, which consists in defining social capital as the aggregate of the actual or potential resources, which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" [by Bian, 2000]. Bourdieu does not see social practices as absolutely determined, but stresses their role in how human perception of the world is shaped. Furthermore, social relations are seen as constrained by underlying economic organization, and thus, solidarity, which builds social capital, is caused by the presence of profit. Therefore, the social capital measures, according to Bourdieu, are the factors of social relations, such as: social structure, historical and economic conditions, etc. which cannot be quantified by using individual indicators, because they are not the property of individuals [Port, and Light, 1995; Duncan, 1999]. This approach leads to the qualitative methodology of research, and therefore, network knowledge sharing would be examined through the individual relations and attitudes concerning these relations, caused by certain socio-psychological and socio-cultural factors, in its influence on resulting effectiveness of network. For, example, R. Putnam [1993a], Bourdieu's like-minded, proposes so-called membership-as-social-capital approach. He defines social capital as "features of social organizations, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated action" [Putnam 1993b:167]. Individuals engage in civil society through participation in voluntary organizations or networks, such as churches, clubs, associations, and informal groups that inclines social capital. The key factor in facilitating cooperation is social trust, which arises from different sources: norms of reciprocity and networks of civic engagements. The type of network that increases trust according to Putnam is a dense network of social exchanges [idem].

J. Coleman [1994] defines social capital as a process, which facilitates the creation of human capital and the maintenance of group solidarity. Social capital refers to "the set of resources that inhere in family relations and in community social organization and that are useful for the cognitive or social development of a child or young person. These resources differ for different persons and can constitute an important advantage for children and adolescents in the

development of their human capital" [Coleman 1990]. The forms of social capital are:
- Obligations and expectations
- Informal potential norms and effective sanctioning
- Authority relations
- Appropriate social organizations
- Intentional organizations [idem].

Social capital, though, is identified with the dense network of frequent interactions, mutual trust, and norms of independence. The difference between Bourdieu's and Coleman's definitions lies in how and why social processes develop. For Bourdieu they arise as a result of economic infrastructure. For Coleman they have economic rationalist nature. Social capital is considered as a contract between individuals unconstrained by underlying economic arrangements. Actors are free to choose whether to build networks to further their self-interests. The key component in building network and, hence, creating social capital is a trust that the others will reciprocate their actions and will feel some obligations to do [Coleman, 1994].

Speaking in terms of information flow in network, Coleman focuses on the risks associated with incomplete information. Such risks could be resolved through a dense network, a source of social capital. Closure affects access to information. A person who is not greatly interested in information, but interested in being informed can save the time required to read a newspaper if he can get information from a friend who pays attention to such matters. Closure facilitates sanctions that makes less risky to trust one another in the network. As Coleman [1990] says, an effective norm constitutes a powerful form of social capital. Reputation cannot arise in an open structure.

Thus, on the one hand, the closure argument considers inclusion, solidarity and trust as social capital indicators, but on the other hand, the strong ties and high network density are supported thanks to the sanction mechanisms. This double-existence of trust and sanction seems to be confusing. Enhancing knowledge sharing by enhancing trust leads to the constrained network (which is a form of closed network, where everyone is connected with everyone; the information flow is limited by the network structure). Hence, information gets lower value compared to relational values. The receipt of fresh information is significantly postponed, the network development is critical cause of slow reaction to the external events, and knowledge sharing is problematic because of network informational stagnation. Relying exclusively on closure argument leads to

loosing the perspectives on easy access to diverse information keeping sufficient trust level to share this information.

Summarizing, this approach basically explains the network effectiveness by the phenomenon of trust. The confusion appears when we try to connect different sub-networks each oriented to the specific issue and all joined by the common goal. As the networks are dense and closed to network outsiders, information becomes a property of certain network and not accessible to other actors, or sub-networks. How could we overcome this contradiction?

2.2. Structural Holes Argument

The answer on this question could be found in brokerage/structural holes argument. Such explanation of social capital mechanism has firstly arisen as Granovetter's [Burt, 2000] weak ties social capital approach, and then was improved by R. Burt [2000] in his network structure approach considering sparse network as a social capital. Sparse network contains "structural holes" – disconnections between actors that create competitive advantages for actors whose relations span the holes. Therefore, R. Burt explains the nature of social capital via capacity to bridge and bond isolated sub-networks or actors of network by means of broker or entrepreneur actor [idem]. Structural holes mean the existence of various disconnected information sources and the possibility to organize knowledge exchange between such isolated actors (Figure 1).

As Burt [2000, p.9] argues: "The structural hole between two groups does not mean that people in the groups are unaware of one another. It only means that the people are focused on their own activities such that they do not attend to the activities of people in the other group." Metaphorically, structural holes are perceived as buffers, like an insulator in an electric circuit. It means that people on the opposite sides of structural hole circulate in different flows of information [idem]. Hence, brokering the flows of information by bridging different groups or internal networks permit to control common projects and bring together existing advantages. In other words, possession of the holes allows actors to be less constrained while gaining information and control benefits, thus boosting their economic success.

Actors with contact network rich in structural holes know about and exercise control over more rewarding opportunities. Their strategies could vary, but the opportunity is defined by a hole in the structure of social network. Thus, network rich in the entrepreneurial opportunities is defined as an entrepreneurial network, and entrepreneurs are people skilled in building the interpersonal

bridges that span structural holes [Burt, 2000]. Entrepreneurs monitor information more effectively than bureaucratic control, faster, and to more people. Controlling their surroundings, entrepreneurs easily shift network time and energy from one solution to another.

Thus, expansive network with the weak ties supported by entrepreneur facilitates knowledge sharing. Further interpretations of Burt's model lead to the assumption that such network structure becomes not only the source of social capital, but also the social capital by itself. According to this argument, studying the role of social capital in the network processes involves the issue of network structure parameters and types affecting any positive network effect, including knowledge sharing. As show empirical research, structural holes are correlates of organizational learning, organizational ability to learn and are described as an organizational absorptive capacity, the ability to recognize, assimilate and apply the value of new, external information[Cohen, Levintal,1990]

Discussing two approaches – closure and structural hole arguments – one should notice the difference in the network levels examined. Closure argument is about advantages in a cohesive group. This strategy involves locating a group, or internal network, and closing ranks with like-minded people. In contrast, the hole argument is about advantages of bridges across expansive groups, or internal networks, possible due to the brokerage mechanism. Brokerage involves locating a position at the edges of two groups, and building relations between dissimilar people. Contractor believes [2000] that it is the most difficult strategy, but the further difference is that brokerage is explicitly about the action that cuts across structural holes in the current social structure. The cost of brokerage is justified by transferring from short-run into long-run benefits and perspectives. Thus, it could become a long-term advantage in social structure held by culture; or short-term advantage of brokerage becomes a long-term one, if information grows quickly out-of-date in case of senior managers. Finally, the hole argument is about competitive advantage on the path to equilibrium, or ordering disequilibrium [Burt, 2000].

The source of the advantage of bridging structural holes consists in selecting new ideas from the diverse information available. Here the central position takes creativity and learning being observed when relationships bridge structural holes. There are a number of studies, which illustrate information and knowledge benefits of brokerage on the historical examples. Burt [2000] cites Collins, Caro, Dalzell and other research papers to illustrate this assumption. For example, Collins argues that the greatest philosophers are the persons representing conflicting schools of thought for their time. Caro provides an account about that creation of a Washington Power Base by Lyndon Johnson in

1933 via brokering journalists and prominent people in government. Dalzell describes the process of making Boston Associates (a group of investors to cotton industry) by Francis Lowell through the uncoordinated small manufactures. All those examples permitted to Burt to conclude that social capital is embedded in the network with structural holes, which are spanned through the mechanism of brokerage by so called entrepreneurs.

Summing up, according to the closure argument knowledge sharing is possible in a cohesive dense network with a high trust level. The hole argument predicts knowledge sharing, if the network is sparse and has structural holes to be brokered by an entrepreneur. How could we resolve this issue? These two approaches are not as opposite contradictory as they seem to be from the first glance. The decision lies beneath the network level discussed. If we imagine a network as consisted of a multitude of sub-networks, the both arguments are to be justified. It is clear that not all contacts of a big network can be connected to each other, so closure argument will not work here. At the same time, structural holes in a small network, or team, would hamper, or even make impossible its effectiveness. Each network could be partitioned by sub-networks, or teams, working on the same project. In the situation of direct communication and of orientation to certain objectives, in order to function such a sub-network needs high density and trust, and hence, it is based on the reciprocity and common norms. A whole network includes sub-networks, which should be coordinated through the brokerage. Existing structural holes produce positive effect such that information flow is permanently renovated and refreshed. Actor who plays a role of entrepreneur organizes information exchange and provides knowledge sharing necessary for the high performance. Therefore, analysis of the social capital commences with the structural analysis that includes network partitioning on the base of its structural characteristics. Then, the issues of trust and norms are examined.

3. Business Network Parameters

Social network could be metaphorically described as consisting of actors-as-nodes connected by social ties or bonds. This metaphor conceptualizes social structure as relation-centered, flexible and dynamic [Davern, 1997]. Network is defined as a set of social entities connected by a set of social relationships; such as friendship, co-working or information exchange, and characterised by the parameters, which facilitate or hamper social capital, including knowledge sharing [Burt, 2000].

Being a particular case of social network, business network is characterized by all network structural and relational parameters. Nevertheless, the peculiarity of the business network matter, originating from its primer formality and orientation to economic advantage, replaces the accents. The issue of personal relations, which is often the core element of social network in general, mostly plays the compensatory role in the whole network processes. Moreover, among the known relational network parameters, such ones as norms and sanctions are no more controllable, but those ones that are a part of organizational culture and initially defined by the goals of business network. While a slightest change of the network structural parameters appeared to be a very sensitive matter that is able either assist or hamper or even destroy network functioning. The most influential relational parameter within business network in the conditions of a relative network structural rigidity is trust. This phenomenon, if interacts with the phenomenon of network constraint, could significantly influence the networks processes of knowledge sharing, business performance, etc.

Structural and relational network parameters create unique business network architecture. Scientific research implies to reconstruct this architecture, which could be realized through the techniques of the whole network analysis and partitioning analysis [Garton, et al., 1997]. The whole network approach describes the ties that all actors of a network maintain with all groups inside and outside a network. This approach is based on the criterion of such population boundaries as a formal organization, department, assotiations, etc. The partitioning approach is built on the singling out parts of network, such as actors' positions, groups, and organizations, which plays a role of a sub-network. Sub-network could further be analyzed in terms of an ego-centered network with picking out the ego and the alters of a network analyzed. The latter approach provides the vision of a network through the perspective of the network ego, with respect to which all network actors are defined. Hence, a network should be examined through the structural (positional and functional) and relational parameters.

3.1. Network Structure

Network structural diversity is a focus of the communication and social integration studies that aim finding out positive and negative effects on network functioning [Cummings, 2003]. Structural characteristics of social capital include network homogeneity, constraint, size, density, and hierarchy.

Network homogeneity-diversity consists of different characteristics including demographic, geographic, functional ones. Although there is a little support to

demographic diversity argument in network effectiveness, some authors consider this parameter as a negative factor of organizational knowledge [Cummings, 2003].

Geographic diversity is seen as a positive factor. The access to information is much greater, since the network actors are in different environments, and thus, are more likely to communicate with different people. This type of diversity is presented, e.g., in virtual networks, which profit this advantage via computer technologies [Cummings, 2003].

Positional, or functional, diversity is based on the mixture of functional assignments and draws on differences in trainings and experiences of network actors such, that the network can access other different networks in their respective domains [Cummings, 2000]. A network composed of people from diverse corporate functions spans more structural holes, and so has a faster access to more diverse information and more control over the meaning of the information, than a network composed of people from a single function [Burt, 2000]. Nevertheless, this kind of diversity can imply negative effect if there are communicational difficulties. As soon as communication becomes successful, network gains timing and control advantages due to the access to diverse information [Burt, 2000]. It is well illustrated in Toyota suppliers' network case study [Dyer, Nobeoka, 2000], where the coordination between Toyota diverse suppliers was promoted by investing in infrastructure to facilitate their knowledge transfer and emphasizing their identity as members of the network.

Network constraint describes the extent, to which a network is concentrated in redundant contacts. Constraint is high if contacts are directly connected to one another (dense network) or indirectly connected via central contact (hierarchical network). Increased constraint means an increasing of network closure, and consequently, an increasing of social capital. Network constraint varies within three dimensions of a network: size, density, and hierarchy.

Network size means the number of actors in a network. More actors mean that information is more diverse.

Network density is the average strength of connection between actors. Density is one of the forms of network closure. Actors in a dense network are closely connected via communication, so they can readily enforce sanction against actors, who violate shared beliefs or norms of behavior. At the same time, strong connections between the actors increase the probability that the contacts know the same information, and the direct connections eliminate opportunities to

broker information between actors. Dense network offers less of the information and control advantage associated with spanning structural holes. Density is a form of closure in which contacts are equally connected.

Network hierarchy is an alternative form of closure in which a minority of actors, typically one or two, stand apart as a source of closure. In the extreme case, a network is hierarchically organized around one actor. Where network constraint measures the extent to which ties are redundant, network hierarchy measures the extent to which the redundancy can be traced to a single tie in the network. Network constraint increases with density or hierarchy, but density and hierarchy are empirically distinct measures. Information doesn't differ in the network built around one actor, and this is the information that affects a risk of information availability from any point of the network.

There is one more structural parameter of network, which describes the disconnection between certain actors – so called *structural holes* [Burnt, 2000]. This is a very important parameter from the perspective of constructing the network rich in social capital. Structural holes show possibilities for creating entrepreneurships, managing information flow and, thus, knowledge sharing. Structural holes and closure can be brought together in a productive way. Closure describes how dense or hierarchical networks lower the risk associated with transaction and trust, which can be associated with performance. The hole argument describes how structural holes are appeared to be opportunities to add value through brokerage and entrepreneurship across the holes, which is associated with performance. Brokered structural holes mean the brokerage of such structural divergence that is determined by any kind of network diversity and any kind of network constraint (hierarchy, or density, etc.). Structural holes, disconnecting network actors via brokerage, connect different informational flows and knowledge values, and by that way, create the space for non-standard and new business decisions, either for working out and sharing new tacit collective knowledge.

3.2. Business Network Relations

As we discussed above, the function of network structure consists in forming, configurating, and vectoring network processes. It defines the formal sociometry of a network: the directions of network interactions and the positions of actors within a network. Metaphorically, it could be called a grid, which should be filled with certain content. This very point appears to be a network limitation, as the vectors of interactions themselves don't guarantee and are not sufficient for the creation of social capital, neither knowledge sharing. The relational

component creates such personal predispositions of network actors that assist cooperating and collaborating in order to elaborate a new product or share the proper knowledge. Thus, network structure becomes a contributor into the process of knowledge sharing having been completed with its content - networks relational parameters.

Relations are characterized by content, direction and strength. The *content* of a relation refers to the resource that is exchanged [Garton, Haythornthwaite, Wellman, 1997]. Network actors could exchange different kinds of information, such as administrative, personal, work-related matters. With respect to the knowledge sharing issue, the content of relations mostly is associated with four knowledge types mentioned in the part 1.1. The type of a knowledge that is shared through the relation depends on its (relation) modality and the level of trust. This means that relational parameters, if changed, could define the changes in a level of knowledge sharing, and thus, - the effectiveness of a business network.

A relation can be *directed* or *undirected*. For example, one actor could ask another one certain information, there are two relations, and two corresponding directions here: giving information and receiving information. By contrast, two network actors can be involved in the personal friendship, thus there is no specific direction.

Relations also differ in *strength*, which could be defined in terms of frequency, intensiveness, and significance of exchanged communication or information [Ballen, Onyx, 1998; Grootaert, van Bastelaer, 2002; Krishna, Uphoff, 1999; Stone, Hughes, 2001].

It is clear, that the relations are the quality of the connections in the network. This quality, in line with the views of Bourdieu [1993], Putnam [1993], and Coleman [1988] – the key theorists of social capital –could be measured through the norms of trust and reciprocity. As Stone and Hughes [2001] consider, there is correlation between structural characteristics of network and the norms of trust in network. Their empirical research shows that the levels of trust and reciprocity are highly correlated within network types. They are affected by the structure of social relations, such as density and diversity of a social network.

Bringing up the issue of *trust*, network is understood as "a consequence of people trusting each other rather then trust emerging as a by-product of association" [Rose, 1998, p.4]. People who trust each other interact to form associations in different situations. In the social psychology there have been

accumulated a multitude of studies which proves that trust entails a willingness to take risks. The explanation of this phenomenon lays beyond the sense of confidence that others will respond as expected and will act in mutually supportive ways, or at least that others do not intend harm.

Trust is important and crucial within and between groups, within and between societies, but it is very difficult to measure. Nevertheless, survey questions sometimes reflect the norms of preferences concerning the answer rather behavior [Tsujinaka, 2003]. To overcome this methodical difficulty trust should be examined as an output or close to dependent variables (bonding, bridging, cooperation, coordination etc.).

In the Jarvenpaa and Maki [1998] study on the Finnish museum inter-organizational network there were shown a great importance of trust and interpersonal relations between different museums representatives. Museum personnel knowledge sharing was a primary aim in supporting functions such as marketing, storage management or funding. Core knowledge of museums was shared only occasionally and only in the situation of good relationships.

There is another relational characteristic of social capital, which is closely connected, results, and sometimes is identified with trust - *reciprocity*. Reciprocity characterizes such relations when people care for each other's interests. Individuals provide a service to others, or act for the benefit of others at a personal cost, or expectations that this kindness will be returned at some undefined time in the future in case of need [Bullen, Onyx, 1998].

Social norms provide social control, including the institutionalized legal sanctions. Social norms, written or undermined, serve to determine what patterns of behavior are expected and valued in a given social context. Norms are used as a compensatory mechanism in networks with low trust to join some actors via formal rules and regulations. While, the issue of high legal transaction costs should be discussed and negotiated in advance [Tsujinaka 2003].

Among the examined relational network parameters (content, direction and strength of relations; trust, reciprocity and social norms), trust is appeared to be the core parameter that regulate the relational proximity, as it follows from the mentioned empirical data. The discussion of network relational characteristics has convincingly demonstrated that relations within and between networks bring modality in the network structure and, vice versa, the modality of relations depends on type of the network structure. This assumption means that by changing one type of parameter (e.g., relational one) we could change another

(e.g., structural one) and, thus, we can restructures the network. Then, we can manage the process of knowledge sharing, depending on what type of knowledge we are to share.

3.3. Business Network Typology

The methodology to analyze business network is based on the model of an expansive network that consists of many cohesive and some expansive sub-networks. This expansive network is supposed to be examined via the technique of partitioning mentioned in the part 3. 'Business Network Parameters'. Within the proposed network model there are polar network types (according to two main social capital arguments) that co-exist: cohesive (hierarchic) and expansive (entrepreneurial) networks [Baker, 2001; Burt, 2000]. Cohesive (hierarchic) network is an egocentric network, which is characterized by homogeneity, high density, and high level of trust and reciprocity. The problem of this type of the network is its relative closeness and isolation that result in the difficulties of new development and new information, and the risk to loose the contacts with other networks. Expansive (entrepreneurial) network is built around the actor who spans the structural holes between several sub-networks (bridging function). The advantage of this network is high variability of information, though a process of sharing is hampered. Creation of common culture, shared goals and values, and coordinated actions become problematic. As a result, the network structure is very fragile and produces stress and conflict. If the connecting actor left, the network would fall apart. Proceeding from the research data, these disadvantages could be effective in the right mix of expensive and cohesive sub-networks in the structure of global network, while the majority of the sub-networks are cohesive. (Appendix).

In spite of existing hampering factors, Burt [2000] concluded that all three network types could be rich in social capital and explained this fact by certain advantages in information, relation or control.

1. Entrepreneurial network: information and control that is characterized by sparse, flat structure, independent relations sustained by the ego, abundant structural holes, low redundancy, control benefits, associated with successful ego.
2. Dense network: security that is characterized by dense, flat structure, interconnected relations sustain one another for the ego, no structural holes, high redundancy, social support and control benefits, associated with unsuccessful ego.
3. Hierarchical network: sponsored access to information and control that is characterized by sparse, centre-periphery structure, ties sustained jointly

by ego and it is a strategic partner, structural holes are borrowed from a strategic partner mean second-hand information and control benefits, associated with successful outsider and unsuccessful insider.

With respect to the issue of knowledge sharing, there are some data about increasing business effectiveness via network building. Thus, Toyota case study [Dyer, Nobeoka, 1998] proved that knowledge sharing within network is accomplished through the weak ties, where the breadth and size of a network influence the amount of diverse information available to network actors. Toyota elaborated the strategies based on the phenomenon of structural holes, which were recognized as extremely successful: creating organizational units for accumulating knowledge in network; eliminating "proprietary knowledge" within particular knowledge domains; creating multiple knowledge-sharing processes and nested networks in larger networks [idem]. This case confirms that tacit knowledge sharing is effective through the entrepreneurial business network. The correlation between dense and hierarchical networks and sharing of a certain knowledge type is to be proved.

Conclusions

In the present paper, we have defined knowledge sharing as a process of sharing, diffusing and transferring of different kinds of knowledge (tacit – explicit; collective – individual) between individuals, groups and organizations. This process accomplishes through the connected socioeconomic actors, through business networks. Business network is defined as a union of actors co-coordinately accomplishing certain activities, united by the common purpose of economic advantages, and regulated by formal structural conditions and sanctions. The phenomenon that connects concepts of knowledge sharing and business network is social capital. It guarantees an effective knowledge sharing, and it is an effective network by itself. The analysis of two principal arguments (closure and structural holes) has permitted to obtain and interpret: 1) the typology of business networks (hierarchical network; dense network; and entrepreneurial network); 2) partitioning methodology to examine business network; 3) structural and relational business network parameters and their contribution into organizational knowledge sharing; and 4) three perspectives on organizational knowledge sharing determined by a network type (hierarchical, dense, entrepreneurial). Each network is supposed to be effective in sharing a certain type of knowledge. Dense networks would primarily assist knowledge sharing that concerns tacit and individual knowledge. Hierarchical networks would mostly assist sharing of explicit and collective knowledge.

Entrepreneurial network, in turn, would assist tacit and collective knowledge, which appears to be of a great value. This very type of knowledge contributes to developing and sharing know-how. We have shown that the certain combination of structural and relational parameters determines the type of network, and by changing these parameters we can vary the network type, and thus, the level of knowledge sharing. Enhancing trust in a hierarchical network would transform it into a dense one. Therefore, the network will assist to the sharing of a new type of knowledge – tacit individual instead of explicit one. Creating structural holes would develop a dense network into an entrepreneurial one, and thus, another type of knowledge – tacit collective, or know-how, - would become accessible. Thus, there is social capital that by its nature is modifiable within its different forms and scopes. And at same time, social capital pierces through and connects the phenomena of business network and knowledge sharing that result in an economic effectiveness.

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