

COLLABORATIVE NETWORKS AND SOCIAL CAPITAL: A THEORETICAL AND PRACTICAL CONVERGENCE

Rolando Vargas Vallejos

University of Caxias do Sul - rvvallej@ucs.br

Janaina Macke

University of Caxias do Sul - jmacke@terra.com.br

Pelayo Munhoz Olea

University of Caxias do Sul - pelayo.olea@gmail.com

Eduardo Toss

University of Caxias do Sul - tospuc@hotmail.com

BRAZIL

This paper addresses the issue of social capital analysis for collaborative networks. The objective of the research project is to understand how collaborative networks can be influenced considering the perspective of social capital. Initially, the authors identified and analyzed relevant works that were developed in the collaborative network field, focusing on the social capital approach. Therefore, nineteen papers have been selected from well-known journals basically extracted from the Business Source Premier Database. Thereafter, a tool for analyzing those papers has been developed. During evaluation, the authors considered twenty six aspects that can be divided into two major themes: the methodological and characterization approach and the theory of social capital and collaborative networks. As a result of this work, we conclude that a great variety of techniques to collect information exists, but that the difficulty of measuring social capital continues.

1. INTRODUCTION

Social Capital is a component of the Social Theory that is being considered as a key-element for the human and economic development of communities. Some reasons that contribute to the interest in Social Capital are: the value of the social relations in social and economic discussions, the transformations of the society and the role of the State, the importance of network relations to improve economic performances and the necessity of concepts to understand the complexity of human being. Social Capital can be understood as a set of informal norms and values, common to the members of a specific group which allow the cooperation among them. Many authors point to the difficulty to measure that concept; most of the time rather the absence of Social Capital instead of its presence is measured. The task of analyzing some experiences and the construction of new concepts needs refined procedures, with results that are closely tied with its context. Considering this, the main objective of the present research is to analyze some experiences of Social Capital

generation, in order to find and establish some evaluation metrics. The results will contribute to the research in the socio-organizational field and will provide the managers with a tool to evaluate collaborative networks (intra and inter-groups).

Considering Collaborative Networks (CN) it is important to analyze the impact of the methodologies of development induction and, consequently, to evaluate aspects of their creation, operation and dissolution, as well as, the success/failure in the implementation of this kind of methodology. In other words, the exploitation and, even though, the generation of Social Capital are closely related to the programming of the groups qualification (induction) and to how the responsible agents for the inductive process were capable to implement each phase of that methodologies.

For that reason, Social Capital is here considered to be a necessary dimension to the local development. In fact, the rational and sustainable exploitation of the resources of a place - with emphasis in the endogenous factor - is a function of three mayor characteristics: stimulate the entrepreneurship (to allow a better exploitation of the local enterprising capacity or to stimulate its creation), support and promotion of many forms of Social Capital (enforcing the civil society) and organize and articulate public politics with the identified elements for the local development.

In the near future, the analysis of experiences combined to the local context will allow the creation of theoretical constructs and consequently, the contribution for the social theory. As practical results, it will be possible to generate elements that will allow the optimization of CN formation and operation processes.

2. COLLABORATIVE NETWORKS

The concept of the network is not new, but its use nowadays has been influenced by global changes in politics, society and economics. Some strong arguments may explain the dissemination of the use of network concept. In an economical perspective, a network may constitute an answer to challenges for organizations because of the intense competition caused by a globalized economy (Castells, 1998; Loiola and Moura, 1996). In a political perspective, a network seems to constitute an answer to the fiscal crisis and to the erosion of the contemporaneous Government supremacy (Castells, 1998).

Among the various types of networks, a special relevance is given to Collaborative Networks (CN). The concept of CN has become stronger in recent years within academic and industrial areas. It constitutes an effort to concretize and modernize the traditional concept of cooperation networks among companies. A CN is constituted by several entities (e.g., organizations and people) that are autonomous, geographically distributed, and heterogeneous in terms of their operating environment, culture, social capital, and goals. These entities collaborate to achieve common goals, and their interactions are supported by a computer network. Unlike other networks, in CN collaboration is an intentional property that derives from the shared belief that together the network members can achieve goals that would not be possible or would have a higher cost if attempted by them individually (Camarinha-Matos and Afsarmanesh, 2005).

A large number of research projects in this area are carried out worldwide and a growing number of practical cases on different forms of CNs have been reported.

CNs are complex systems, emerging in many forms in different application domains, and consist of many facets with proper understanding requires the contribution from multiple disciplines. In fact, the various manifestations of CNs have been studied by different scientific disciplines, including the computer science, computer engineering, management, economy, sociology, industrial engineering, law, etc. (Camarinha-Matos and Afsarmanesh, 2005). In order to contribute to the integration of insights by some of those different scientific disciplines, this paper addresses the issue of Social Capital analysis for CNs.

The concept of Social Capital, when measuring the potential of wealth production that flows of the diverse forms of collective association, allows to explore the impacts of the civil society in the economic performance. It is possible to identify four main ways how Social Capital, found in social networks, stimulates the economic growth (Skidmore, 2001, p. 134): (i) high level of social trust and strong reciprocity norms, reduce the transaction costs (Fukuyama, 1995); (ii) social networks attenuate the risks, allowing that their members engage more in innovations; (iii) social networks facilitate fast information dissemination and with this, they reduce the asymmetries; (iv) social networks allow that its members resolve easily their collective problems.

3. SOCIAL CAPITAL: THE FOUNDATION OF THE RELATIONSHIPS IN NETWORKS

The concept of Social Capital has gained interest in the scientific community in significant variety of disciplines. Elements as trust, networks of relationship and share of norms are topics that have been discussed by researchers from different areas.

The notoriety of the concept came from the publication of the book of Robert Putnam, in 1993, entitled "Making Democracy Work: civic traditions in modern Italy". In this work, Putnam relates the results of more than twenty years study about the Italian society, in which the initial topic was to understand the differences of the development of north and south Italy. The author concluded that the disparities between institutional performance and development of the regions are resulting from a mayor presence of Social Capital (in case of the north of the country). The authors conclusions had strong impact in the scientific community and were corroborated by others studies (Fukuyama, 1995, 1999; 2000; Grootaert, 1998; Onyx & Bullen, 2000).

The World Bank, since 1990, distinguishes in its evaluation of development projects four forms of capital: natural capital (natural resources of a country); financial capital (including infrastructure, capital goods, property, etc.); human capital (health, education and nutrition); and social capital (capacity of a society to establish relationships of interpersonal trust and cooperation networks, with the aim to produce collective goods). The World Bank emphasizes that Social Capital is related to the institutions, relations and norms and is a core element for the economic prosperity and the sustainable local development.

The diffusion of the concept is happening following two theoretical approaches. One treats Social Capital as an individual good, being able to be accumulated by a person. The main representatives of this approach are Bourdieu (2003a; 2003b),

Granovetter (1985) and Portes (1998). For these authors, Social Capital can be internalized by a person and can be used by him or her to produce benefits. Social Capital, in this way, is linked to a worthwhile position (status) of an individual inside a workgroup and indicates power aspects.

The other approach treats Social Capital as an element that belongs to a workgroup, community or society, which should be analyzed as a public good and is present in the relations between persons or groups. Coleman (1990), Putnam (1993; 2000) and Fukuyama (1995; 1999) are the main representatives of this approach. For these authors, the Social Capital is the social tissue to story line or the glue that guarantees the cohesion of a group and is based in trustfulness, in norms of reciprocity, in cooperation and in participation systems. The present study is inserted in this second approach.

After the introduction of these two approaches, it is necessary to identify the different units (or axes) of analysis. The units of analysis differ with regards the context relations: one investigates the relationships inside a group (intra-groups relations); another one studies the relationship between groups (inter-groups relations). In the first case, we find studies about Social Capital evaluation in communities, associations or groups. In the second case, we find studies of Social Capital creation among companies, nations, or other organizational forms. In the present project we do consider both approaches, since the theoretical referential is eminently the same, changing only some specific aspects.

Since the concept of Social Capital emerged, it has been used to explain a lot of social phenomena; most of the research have focused on the role of Social Capital in the human capital development (Coleman, 1990; Loury, 1987), in the economic performance (Baker, 1990), in the development of regions (Putnam, 1993) and in the development of countries (Fukuyama, 1995).

In their study of Social Capital and its importance to the creation of intellectual capital, Nahapiet & Ghoshal (1998) proposed three Social Capital dimensions, which are: *structural*, *relational* and *cognitive*. Although the authors have differentiated analytically Social Capital in dimensions, they point out that a great part of the characteristics studied are highly related, what does not disable the classification, therefore facilitates the construct comprehension.

In the structural dimension of Social Capital the authors analyzed the presence or not of relationships between the actors, the configuration or morphology of the network, describing the standards of connections, through variables as density, connectivity network configuration, stability and ties (Coleman, 1990).

The relational dimension describes the kind of personal relationships, developed through a history of interactions (Granovetter, 1992). This concept focuses on aspects that influence behaviors like respect and friendship, which are going to decide to sociability, acceptance and prestige. Two actors can occupy similar positions in a network, however if their emotional and personal attitudes differ, their actions will be different in many aspects because they are related to a behavioral component, which is revealed through facets as trust and distrust (Fukuyama, 1995; Putnam, 1993; 2000), norms (Coleman, 1990; Putnam, 1993), obligations and expectations (Coleman, 1990; Granovetter, 1992) participation and diversity tolerance (Nahapiet & Ghoshal, 1998).

The third dimension of Social Capital, the cognitive, refers to the resources that emanate shared visions, interpretations and systems of meaning, mainly codes and

narratives shared values and other cultural elements. Some authors affirm that this dimension has not been explored in the literature yet (Nahapiet & Ghoshal, 1998).

Figure 1 below represents these three Social Capital dimensions and their essential elements.

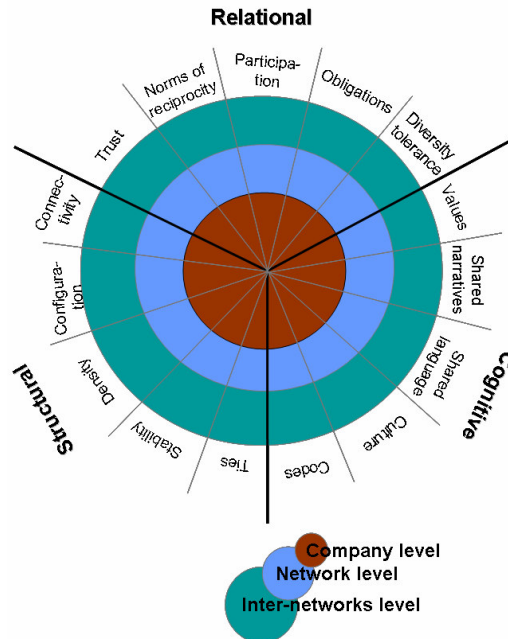


Figure 1 – Social Capital dimensions and their elements.

4. RESEARCH METHOD

Initially, relevant works were identified which were developed in the CN discipline, focusing on the Social Capital approach. Nineteen papers were selected from well-known journals extracted basically from the Business Source Premier Database. Subsequently, a tool was developed in order to analyze these papers considering twenty six items divided in to two major themes; one on methodological and characterization approach and another considering the theories of Social Capital and CNs.

Regarding methodological aspects, the variables analyzed were:

- (i) qualitative, quantitative, qualitative-quantitative approach (Roesch, 1999);
- (ii) epistemological paradigm: functionalist, radical structuralist, interpretive and radical humanist (Burrell & Morgan, 1979);
- (iii) kind of research: applied, results evaluation, formative evaluation, research-action, proposition of plans and diagnosis research (Patton, 1990);
- (iv) strategy of research: case study, survey, action research, ethnography, experiments, phenomenology (Roesch, 1999). The case studies also were analyzed considering: single cases/multiple cases, criteria of choice and unit of analysis;

- (v) nature of the research: exploratory, descriptive, causal/explanatory (Churchill Jr., 1999 *apud* Froemming et al., 2000; Pinsonneault and Kraemer, 1993 *apud* Freitas et al., 2000);
- (vi) temporary nature of the research: longitudinal studies, transversal studies (Sampieri et al., 1991);
- (vii) conceptual map (present or not);
- (viii) techniques of collect and analyses employed.

The authors of the nineteen analyzed papers are: Frank and Yasumoto (1998); Molina-Morales (2005); Valentinov (2004); Rhee (2004); Reagans and Zuckerman (2001); Walker, Kogut and Shan (1997); Duysters and Lemmens (2003); Pollitt (2002); Anand, Glick and Manz (2002); Bellandi (2001); Bellandi (2002); Schuller (2007); Schultze and Orlikowski (2004); Vanhaverbeke, Beerkens, Duysters and Gilsing (2004); Yao, Dingkun and Prescott (2002); Cooke (2007); Grewal, Lilien and Mallapragada (2006); Cross and Sproull (2004); Ikpen and Tsang (2005).

Regarding the already cited theories about Social Capital and CNs it was considered the studies of Macke (2006), Macke and Carrion (2006), Camarinha-Matos and Afsarmanesh (1999) and Vallejos (2005).

5. RESULTS

The nineteen papers analyzed can be separated into theoretical (36,8%) and theoretical-empirical (63,2%) papers. Is possible to state that the most referenced author is Coleman (68,4%) followed by Burt (52,6%), what initially might seem unusual because these authors have different approaches about Social Capital. Coleman defines Social Capital as a "public good" while Burt emphasizes the "personal benefits" associated to the subject. Most of the authors of the analyzed papers use this contrast of theories to reference diverse forms, benefits, dimensions and relations associated to Social Capital. The nature of Social Capital analyzed is predominantly analyzed between groups (inter-groups relations) (63,1%).

Considering the classification of Nahapiet and Ghoshal (1998) we analyzed the occurrence of the three dimensions of Social Capital, which are: cognitive, relational and structural. The dimension that was less cited in the papers was the cognitive, where the elements most discussed were culture (15,8%) and values (10,5%). Taking into account the relational dimension, the elements most discussed were trust (52,6%), norms of reciprocity (42,1%) and obligations and expectations (21%). The structural dimension can be considered as the most cited in the papers and the discussed elements were strong and weak ties (57,9%) and their diverse implications in networks, density of the relations (47,4%), network connectivity (15,8%) and network configuration (15,8%).

Table 1 shows a sample part of one table of the tool developed in order to analyze these papers.

Regarding the research paradigms (Burrell & Morgan, 1979), the authors identified an absolute predominance of the functionalist paradigm (75%), against the interpretive paradigm that was used in 25% remainders papers. The radical structuralism and the radical humanist paradigms did not have any occurrence. This does verify, in that sense, the need of an enrichment of the studies through a more pluralist debate.

Table 1 – Sample of part of one table of the tool developed.

Paper	Cognitive dimension		Relational dimension			Structural dimension			
	Values	Culture	Trust	Norms of reciprocity	Obligations and expectations	Ties	density	connectivity	configuration
Frank and Yasumoto (1998)			x	x	x	x	x		
Molina-Morales (2005)		x	x			x	x		
Valentinov (2004)			x	x					
Rhee (2004)						x	x		
Reagans and Zuckerman (2001)						x	x		
Walker, Kogut and Shan (1997)				x			x		
Duysters and Lemmens (2003)	x		x			x	x	x	
Pollitt (2002)			x			x	x		
Anand, Glick and Manz (2002)									
Bellandi (2001)		x	x	x	x	x			
Bellandi (2002)									
Schuller (2007)	x		x	x					
Schulze and Orlikowski (2004)			x		x				
Vanhaverbeke, et.al. (2004)						x	x		x
Yao, Dingkun and Prescott (2002)						x		x	x
Cooke (2007)			x	x					
Grewal, Lilen and Mallapragada(2006)						x			
Gross and Spruill (2004)				x					
Ikpen and Tsang(2005)		x	x	x		x	x	x	x

Despite the difficulties to measure Social Capital, most of the studies have a quantitative approach (75%) and use the survey method for the research (83%). Transversal studies are predominant (75%), it means, the instant image of a phenomenon.

The nature of Social Capital is analyzed predominantly between groups (63%), showing a strong relation with networks, mainly with the relational and structural aspects. The intra-groups Social Capital relation was analyzed in 21% of the studies and other 16% were studies comparing intra and inter-groups analysis. The CNs forms most cited were strategic alliances (36,8%) and industrial districts (26%).

The most organizational variables cited are knowledge transfer (47,4%), organizational behavior (42,1%), innovation (26,3%), cooperation (21%), turn over (21%) and learning (21%). Knowledge transfer is considered as a core element due to benefits that are related to Social Capital development inside a network.

6. CONCLUSIONS

With this study we conclude that:

- (i) the issue of Social Capital in the CN context does need further exploration. Although the word "trust" appears most of the time, it is related as an isolated concept and not as an element of Social Capital;
- (ii) concerning the dimensions of Social Capital, the cognitive dimension is receiving not much attention. Some papers treat "knowledge transfer" without a link with the cognitive aspects of this process;
- (iii) although a predominance of quantitative studies exists, persist methodological difficulties to measure Social Capital, that can be observed in the structural and relational dimensions;
- (iv) important variables for the study of Social Capital like participation, commitment and pro-activity were rather not discussed in the studies. *Commitment* appeared only in two papers, while *participation* and *pro-activity*, were not mentioned in any of them.

To cope with these difficulties, we are developing a model to analyze the Social Capital in CNs. In this model we deny the usefulness of endogenous resources like technology in general. Technology is available to most of the companies and,

therefore, will not be a long term competitive advantage. We propose that CNs will be more competitive and successfully if they invest in two core elements that are organizational culture and people.

In this way, the model under construction (figure 2), starts with the partners core competencies identification, for the analysis and/or formation of a CN, in order to establish the main processes and expected results for the local development. Relevant organizational variables are investigated and the Social Capital approach that is used as a cement of the relationships among the CN.

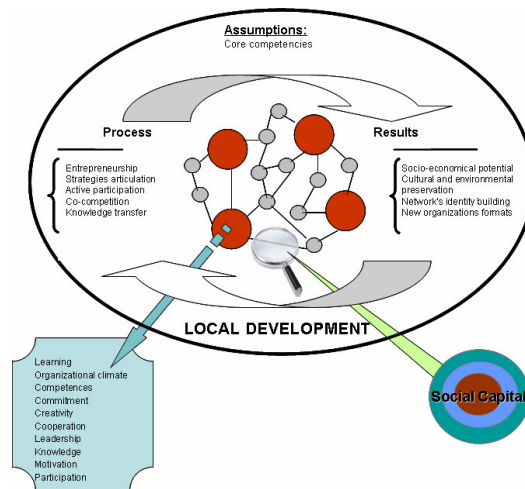


Figure 2 – Social Capital and Collaborative Networks: a proposal of a model “as is” for local development analysis.

As an early result of this work it is possible to conclude that there is a great variety of techniques to collect information, but remains the difficulty to measure Social Capital. The epistemological paradigm is essentially functionalist with emphasis on structural and relational dimensions of Social Capital. The results of this meta-analysis are being considered as background for the discussion and the development of a methodology to study CNs with the Social Capital approach.

In short, the Social Capital concept is very important for the environment of networks. Social Capital is linked to models that influence the performance and productivity of a CN, contributing, in general, to the local development.

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