



Understanding and measuring the effect of social capital on knowledge transfer within clusters of small-medium enterprises.

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Abstract

In today's globalised economy, Small-to-Medium Enterprises (SMEs) are facing ever increasing competitive pressures. They need to gain new market information and knowledge to remain competitive. A common strategy is to develop clusters of networks with other SMEs. Clustering enables the development of informal social networks through which knowledge can flow and be used. This paper aims to investigate the mechanisms of informal social networks that promote knowledge transfer. Finally, some issues relating to the measurement of the intellectual value created are explored.

1. Introduction

“Mental friction [sparks of the mind, referring to knowledge and innovation]...only exists where people live together closely, where frequent contact in commercial, scientific, social, civil, and political matters exist, where there is large interchange of both good and ideas.” (List, 1856)

More than sixty years after List's thoughts were published, Marshall (1920) studied industrial concentrations in Europe and concluded, similarly, that the collective efficiency of people may be greater than the proportion of their numbers. These ideas are the basis for the interest in inter-firm networks and regional clusters.

Business people and researchers alike, recognize the significance of fostering mental friction where people are in close and frequent contact. They realize that, by working together, businesses can overcome some of the problems posed by globalization (Rosenfeld, 2002b; Rosenfeld, 2002a; Rosenfeld, 2001b; Rosenfeld, 2001a; Ffwocs-Williams, 2000). More specifically, Ffwocs-Williams (2000) contends that a failure to work as a local team will result in an increasing vulnerability to external competition, thus globalization has driven the need for a new organizational paradigm.

The core capabilities of firms today are knowledge, learning and innovation. These are more likely to be found where suppliers, customers, educational institutions, research laboratories and labour are concentrated (Rosenfeld, 2002b). However, such concentrations are traditionally the domain of cities and large corporations. SMEs, and in particular, those that exist in rural and regional areas, are normally characterized by a deficiency of resources and market presence (Rosenfeld, 2001b). Furthermore, rural SMEs are isolated from other SMEs and their avenues for connection are sparse. Therefore, being a member of a network can give them the ability to outmatch a stronger competitor, easier entry into new markets and access to resources (Pena, 2002; BarNir and Smith, 2002). The networked firm is a key goal for small organisations as the exchange structures with critical resource suppliers can stabilize the firm as a market player (Zeffane, 1995).

Many SMEs face considerable challenges when they try to measure knowledge. Knowledge is unlike any other asset or resource. It provides extraordinary leverage and increasing returns. However, it is prone to fragmentation, leakage and the need for refreshment. It has uncertain value and uncertain value sharing qualities (Truch, 2001). Social networks are a useful strategy for obtaining external knowledge and allow for an exchange of information that may be integrated with existing knowledge. In order to determine the value of informal social networks, SMEs need to evaluate their effects on knowledge acquisition, sharing and use. However obtaining solid figures on such informal, intangible and complex mechanisms can be difficult.

2. Clusters and industrial districts.

Clusters are an increasingly popular model of inter-firm networking. Many researchers have investigated instances of regional clusters across the globe in an effort to understand their effects on regional development and competitiveness (Scheel, 2002; Arbonies and Moso, 2002; Rosenfeld, 2002b; Rosenfeld, 2002a; Boari, 2001; Rosenfeld, 2001b; Rosenfeld, 2001a; Ffwocs-Williams, 2000; Keeble and Wilkinson, 1999).

“Concentration, or clustering, gives businesses an advantage over more isolated competitors... there is an inevitable transfer of knowledge that occurs when people meet and talk business [And] Among all of the advantages of clustering, none is as important as access to innovation, knowledge, and know-how. (Rosenfeld, 2002a:9)

A cluster has been defined as a geographically contiguous group of firms linked by commonalities and complementarities (Porter, 1998). Rosenfeld (2002b; 1997), partially supports the argument, but extends his definition to include the synergies and benefits created by their interdependence. Although economic benefits (such as the creation of economies of scale) are presented to cluster members, it is the intangible economies of scale that is of interest in this paper. These are often not directly transferred to a profit-and-loss statement and may be overlooked by many firms, however they have the potential to provide an even greater impact on the bottom line than hard benefits (Rosenfeld, 2002a; Rosenfeld, 2001a).

There are different types of clusters that can provide different levels of benefits. The degree of networking is used by Brown (1999:45) to determine where a cluster sits on a continuum ranging from atomistic individual firms to industrial districts consisting of “...complex historically and socially embedded relationships”. The industrial district is characterized by a high degree inter-firm networking and dynamicism. An industrial district emerges from a period of cluster growth and sustenance that fosters active development of relationships and pursuit of benefits. An industrial district is a form of cluster that has sufficient attributes to foster innovation, learning and knowledge transfer (knowledge processes) between its members.

An industrial district consists of a multiplicity of socially embedded linkages that enable effective knowledge flow. These links enhance the quality of dialogue between cluster members and establish necessary trust and cooperation (Fwocs-Williams, 2000). Therefore businesses within industrial districts will be better able to create sustained competitive advantage through effective knowledge processes. In order to better analyse the characteristics of a network that delivers such benefits, it is pertinent to divide clusters into its component parts.

2.1. Anatomy of a cluster

Clusters encompass a broad range of networks, including both social and commercial. To be precise, networks are key components of a cluster (Fwocs-Williams, 2000) and a network is comprised of interpersonal linkages and relationships. There has been an element of uncertainty concerning the definition of a network. Rather than networks being equivalent to clusters, Brown (1999), proposes that clusters are about *networks of relationships*. When considered in this manner, networks become an arrangement of relationships. Unlike clusters they do not describe the mode of those relationships.

Chew and Yeung (2001), regard networks as both a governance structure and a process of socialization through which members are connected, logically, for mutual benefits and synergies. The networks are conduits for various types of resources (Galaskiewicz and Zaheer, 1999). However, it is at the relationship level that knowledge resources are identified and exchanged. Industrial districts (effective clusters) emerge as relationships are socially developed and subsequently provide significant benefits.

3. Social Capital

Porter (1998:225, p. 225), proposed that the "...mere presence of firms, suppliers, and institutions in a location creates the potential for economic value, but it does not necessarily ensure the realization of that potential." The potential, he suggests, is realized through the 'social glue' that binds networks together. This is often referred to as social capital.

Social capital has been defined as both the connections between people (Durlauf, 2002) and the factors that bind them together such as trust (Bowles and Gintis, 2002). Social capital is created by networks and benefits networks (Burt, 1992). Inconsistencies in the definitions of social capital demonstrate the embryonic stage of development. This paper will use a multidimensional model of social capital that accommodates the different viewpoints on social capital. Such an approach has been used by many researchers (Chua, 2002; Lesser and Cothrel, 2001; Hazleton and Kennan, 2000).

3.1. Three dimensions of social capital.

The three dimensions of social capital are structural, relational and cognitive. The structural dimension of social capital refers to the formation of ties between individuals. Such ties are used to identify individuals with desired knowledge who are in the network (Lesser and Cothrel, 2001), and potentially enables access to the people and their knowledge resources (Hazleton and Kennan, 2000).

This dimension can be understood by looking at Granovetter's (1973) theory, *The Strength of Weak Ties*. Network relationships (or ties) are structurally categorised as strong or weak. The strength of the tie is characterised by a combination of the duration, emotional intensity, intimacy, and reciprocity of interactions. Strong ties are established through intense and repeated interaction as individuals progressively develop shared social mechanisms that enable effective and efficient communication. Weak ties, however, are found to be a bridge between disparate social groups. Therefore, value is derived from the novel and non-redundant information and opportunities that weak ties make available (BarNir and Smith, 2002). Burt (1992) proposes that the term *weak tie* is inappropriate, arguing that the benefits are not derived from the weakness of the tie but the access to new social groups. Therefore the term *structural hole* is deemed more appropriate to describe a non-redundant tie that accesses novel information.

The relational dimension refers to various social dynamics including trust, shared norms and values, interpersonal obligations and expectations. The formation of effective and stable relationships depends on the existence of relational social capital. This dimension is evident in patterns of behaviour (Arenius, 2002),

Trust is frequently cited as a major element of social capital and is central to this dimension (e.g. Grootaert and Bastelaer, 2002). It has been seen as both pivotal to developing relationships (Lewicki *et al.*, 1998; Cowles, 1997) and a product of effective relationships (Chua, 2002; Selnes, 1998). Two types of trust are particularly important to social capital, benevolence based trust and cognitive based trust (Chua, 2002; Levin *et al.*, 2002).

Benevolence based or affective trust is established upon the perception that others' intentions and motives are mutually beneficial, and that both parties have interpersonal caring. Therefore an individual trusts when they express confidence in others intentions and motives (Lewicki *et al.*, 1998). Competence based or cognitive trust is grounded in

the belief that others' are dependable and reliable. When individuals trust they believe that others will behave as expected and meet their obligations.

The final, cognitive dimension refers to the requirement for a shared context (Snowden, 2002; Nahapiet and Ghoshal, 1998). Context incorporates shared representations, interpretations, and systems of meaning embodied in shared codes, languages and narratives (Arenius, 2002). Context does not refer to a fixed set of surroundings but an extensive dynamic process and can be mutually constituted through social interaction (Augier *et al.*, 2001). It is both constructed through the process of interpretation (Augier *et al.*, 2001; Heyman, 1994) and used to interpret new situations (Augier *et al.*, 2001). Choo (1998), uncovered the relationship between the concepts that constitute this dimension in his sense making model.

The sense making model describes a process where an individual experiences changes in their environment and tries to make sense of them. The individuals are required to understand and establish the significance of the changes that occur in their environment. Heyman (1994), infers that context forms an individual's interpretation of the factors that we use to understand. Therefore the process of interpreting and attaching meaning is determined by an individual's context. The outcome of this process is the generation of new knowledge.

Rather than being mutually exclusive, these dimensions are highly interrelated (Nahapiet and Ghoshal, 1997). Through social interaction (structural), individuals develop trusting relationships (relational) and common goals and values (cognitive). A trusting relationship can lead to the formation of common goals (harmony of interests) (Tsai and Ghoshal, 1998).

4. Knowledge transfer.

The development of social capital is crucial for knowledge sharing within clusters of small-medium enterprises. Knowledge is a dynamic and complex system that changes as it interacts with the environment (Davenport and Prusak, 1998). Davenport and Prusak (1998:5) provide the following definition:

“Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers.”

This definition demonstrates the importance of the sense making process. Knowledge is seen as the outcome of framing and evaluating experiences and contextualising information. Because it originates in the minds of knowers (as a result of sense making processes), it is difficult to transfer.

4.1. How social capital enables knowledge transfer.

Johannessen et al (2002) found four conditions for resources exchange (knowledge transfer) to take place. They were accessibility, anticipation of value, motivation because of personal benefits and capability to exchange. Social capital has a major impact on each of these criteria.

The ties that link individuals together are channels for the flow of knowledge resources (Tsai and Ghoshal, 1998) and determine the range of resources available (Nahapiet and Ghoshal, 1997). Thus the opportunity exists for knowledge transfer (accessibility).

If an individual believes another individual will act in their best interests (benevolence trust), they will feel motivated to exchange with them. They will feel that the exchange partner will not act opportunistically (reduced risk) and they will reciprocate the favour (benefit). If an individual has confidence in another's ability to meet their obligations and perform a task (competence trust), they will anticipate the exchange will result in a positive and valuable outcome.

Finally, cognitive social capital assists with the learning process of the knowledge recipient. For exchanged information to be transformed into knowledge, it must be made sense of. Therefore the information is bracketed and evaluated according to their context. Individuals who share context will be able to construct similar interpretations and meanings. Interpretations and meanings are not just packaged and sent to the recipient. Rather the sender constructs a message that is designed to evoke an intended meaning in the recipient (Holsapple *et al.*, 1996). Therefore effective knowledge transfer has occurred (capability).

5. Problems with measuring intellectual capital within SMEs

The recognition of the value of knowledge created by social networks is by no means new. However measuring this value is something that has only been attempted, with limited success, in recent years, for several reasons. The first, and probably the most significant, is that traditional accounting methods are based on approaches that are linked to tracking the cost of converting raw materials into final goods. The implicit assumptions of measuring scarce resources, such as raw materials, no longer hold true when it come to measuring knowledge. This is because knowledge inventories do not deplete through their application and use.

The second limitation is that most of the new measures for intellectual capital (such as knowledge) aim to measure (or value) intellectual assets as ratios. Although ratios are important measures, particularly over time to measure changes, a ratio does not lead to an absolute value. It is a derived or indirect measure (Caddy, 2000). The problem is therefore to describe knowledge in a way that makes it countable in equivalent units so that we can track the investment required to convert knowledge into bottom-line value (Gomez *et al.*, 1998).

The third limitation is that most of the metrics developed to gauge intellectual capital are straightforward but do not necessarily address the types of knowledge that produce the most value-added benefits for the organization. To compensate for potential drawbacks, new metrics should be created to address these concerns. For example, metrics to determine "return on vision" versus "return on investment" are being developed by such companies as Andersen Consulting (Liebowitz and Suen, 2000).

If we adopt existing accounting methods then intellectual capital should be derived as a net figure by applying the following equation (Caddy, 2000):

$$IC=IA=IL$$

where intellectual capital (IC) is the result of subtracting intellectual liabilities (IL) from intellectual assets (IA).

The retention and reuse of intellectual capital in the marketing process could be the critical element needed to bring a product to market quickly and cost effectively (Duffy, 2001). Understanding the conversion process of knowledge into products and services is important for measuring the contribution of intellectual capital to the bottom-line. Products have an intellectual component and a physical component, and such an analytical separation permits the identification of where value is added (Kenney, 1999).

The intellectual asset associated with a product could therefore be valued as:

$$IA = n \times (1-r) I \times CF$$

where such a product may have net revenues of \$x million in the first year of sale and n is the expected life of the product, r represents some suitable discount rate, and CF represents the contribution proportion that the knowledge attained had in terms of the product's ultimate success (a number between 0 and 1) (Caddy, 2000). The limitation is that the precision of the formula belies the imprecision of the factors included in the formula, as subjective estimates would be required not only for the discount rate but also, with decreasing precision, for the expected life of the product and the contribution proportion of knowledge as well (Caddy, 2000).

Over time, situations may also arise where the SME acquires or develops intellectual liabilities as a product of failed social network membership. For example participation in social networks for economic gain where the other participants in the network might not have the desired knowledge, a loss of time, effort and opportunity could result. Such a loss would contribute to an intellectual liability (Caddy, 2000).

An intellectual liability has many contributing factors and can be represented in the formula (Caddy, 2000):

$$IL = y + z + a$$

where y is the costs that have been sunk into developing a position in the social network and developing an understanding of its culture, structure and the knowledge possessed by its participants, and z is the cost of joining a new social network. The factor 'a' is an estimate of the total opportunity cost lost (both now as well as future opportunity costs suitably discounted) because of failure with the original network and subsequently ceasing to participate in it. Whilst valid objectively derived valuation for y and z might be possible, estimating the opportunity costs (a) would not (Caddy, 2000).

5. Conclusion

SMEs are vulnerable to the pressures of globalisation. To compensate for a lack of resources, SMEs should work together in clusters. Effective clusters are characterised by high degrees of collaboration and dynamicism and nurture strong informal networks. Informal social networks enable the creation of social capital. Social capital, which includes structural, relational and cognitive dimensions, is crucial to the effectiveness of knowledge transfer within these networks. In essence, the formation of clusters establishes the necessary structural connections to develop and strengthen social

capital within the networks. Hence, effective clusters enable knowledge transfer between members creating a dynamic and innovative climate. However the economic evaluation of the benefits derived is in its infancy. More research needs to be done to better understand the effects of social capital on the creation of intellectual capital and subsequently its measurement.

6. References

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