Generation of Human and Structural Capital: Lessons from Knowledge Management

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Abstract: Interorganizational and social relationships can be seen as part of the intellectual capital of a firm. Existing frameworks of intellectual capital, however, fail to address how relationships should be managed to generate more intellectual capital. Drawing on the interaction approach and the fields of intellectual capital and knowledge management, this paper develops a framework for managing relationships. The framework is illustrated with a case study. It is also noted that firms can improve relationship management and thus generate more intellectual capital.

Keywords: Intellectual capital, structural capital, human capital, interorganisational relationships, social relationships, relationship transformation

1. Introduction and purpose

Establishing and maintaining relationships are costly processes that should be considered as investments. Consequently, relationships and the uses to which they can be put should be seen as part of the stock of capital of the firm. In fact, relationships can be seen as part of the firm's intellectual capital. However, the fields of research focusing on relationships, on the one hand, and on capital investments, on the other, are rarely integrated. Therefore there seems to be limited understanding of investments in relationships and limited terminology available for describing this process. There also seem to be limited recommendations for managers available as how to manage this process. The purpose of this paper is, therefore, to link the literature on relationships to the literature on intellectual capital and to provide a framework for generating intellectual capital through investments in relationships.

The rest of this paper breaks down into six sections. Below the concept of "relationship" is further developed (2), followed by a discussion on intellectual capital (3). The subsequent section argues that relationships can be seen as part of the firm's intellectual capital (4). In the next part, an empirical illustration of this phenomenon is provided (5), resulting in a discussion of how different types of relationships are transformed in firms for different purposes, drawing on literature from the knowledge management area (6). The paper then pulls together its different strands, while also providing some recommendations for practice (7).

2. Relationships: A multidimensional concept

Increasingly in business research, relationships are considered valuable intangible assets. Here a relationship is considered an intangible connection between two actors that can be defined according to a number of dimensions including commitment, trust, cooperation; communication, influence and mutual adaptation (see e.g. Hakansson & Snehota, 1995). An important distinction between different types of relationships must be made, though. This distinction concerns the unit of analysis, i.e. who are considered to be the parties of the relationship. The literature separates between the organization as actor and the individual human being as actor. I.e., there are interorganizational relationships between firms and other organizations, and there are social relationships between people.

At the interorganizational level, relationships are typically considered as institutionalized, their existence not depending on the actions of single human beings. While individuals carry out those activities that initiate, build and maintain relationships, organizations are considered as partners in relationships. Interorganizational relationships can be formalized, e.g. through contractual or other legal bonds, or they can be informal. Some involve exchange of products (goods, services, knowledge etc.) for monetary compensation, i.e. exchange relationships. Others are based on e.g. competitive pressure or regulative frameworks. In essence, an organization is seen as having relationships with all those other organizations that it affects or is

Reference this paper as:
Agndal H, and Nilsson U (2006) "Generation of Human and Structural Capital: Lessons from Knowledge Management" *The Electronic Journal of Knowledge Management* Volume 4 Issue 2, pp 91 - 98, available online at www.ejkm.com

affected by, either in direct interaction or indirectly, e.g. through other relationships.

In social relationships, human beings are the parties. When considering the usefulness of social relationships for firms' business purposes, relationships can be sub-categorized. There are social relationships that serve no business purposes and there are those that (can) serve business purposes, e.g. depending on their origin, strength and the contexts to which they provide access (see Agndal & Axelsson, 2002). Here we are primarily interested in the latter, i.e. task-related (Hallén, 1992) relationships where individuals act in their representational role (Halinen & Törnroos, 1998). These may be referred to as professional social relationships. However, professional social relationships may become non-professional social relationships (and vice-versa), as the representational role of an individual changes.

Table1: Relationship categories

		Purpose (usefulness) of relationship	
		Business purposes	Non-business purposes
Actor level (Relationship type)	Organization (Interorganizational relationship)	Exchange interorganizational relationship (e.g. between supplier and customer)	Non-exchange interorganizational relationship (e.g. between competitors or between firm and government)
	Human being (Social relationship)	Professional (task-related) social relationship (e.g. between employees of supplier and customer)	Non-professional (non-task related) social relationship (e.g. between two friends who do not do business together)

While many scholars studying interorganizational relationships recognize the role of people, most of the business literature on relationships focuses on the firm as the unit of analysis. Limited attention is directed towards social aspects of building and maintaining relationships. There are, nonetheless, scholars who attest to the importance of the social dimension, and who try to establish a connection between social and interorganizational actor levels. E.g., when discussing the importance of relationships for entrepreneurs, Dubini and Aldrich (1991) regard both social and interorganizational relationships as crucial in the development of firms as well as for the fate of entrepreneurs. Similarly, Hallén (1992) regards "contact nets" (of social relationships) as vital for the creation of "industrial" (inter-organizational) relationships, since the former provide a necessary infrastructure for the latter to be created. Others (e.g. Holmlund & Kock, 1998) regard social relationships as a sub-form of interorganizational relationships. Welch et al. (1998) state that, while there are both interorganizational and social relationships, these often overlap. Hertz and Mattsson (1998) make a similar distinction. There are, thus, those who regard social relationships as crucial for the development of interorganizational relationships, there are those who regard the two as inseparable or different aspects of the same phenomenon, and there are those who regard them as separate entities that may or may not fertilize each other.

Relationships are not static entities, though, and there is some literature dealing with how relationships with business purposes develop over time. The assumption is that the relationship is a cumulative process. The way a single transaction is carried out is based on experience from the previous transactions, rather than being carried out in social vacuum. This has been described as different stages in the relationship life cycle (Dwyer et al., 1987; Wilson & Mummalaneni, 1986), a process during which parties get to know each other, and relationship elements like trust, investments, mutual understanding and commitment develop.

3. Intellectual capital

There are various definitions of intellectual capital, although the term is generally used to describe intangible assets on a company level, referring roughly to the difference between adjusted equity and market value of a firm (Edvinsson & Malone, 1997). During the last decade, two different approaches to intellectual capital can be identified, measurement of intangible assets and measurement stressing decision making (Habersam & Piber, 2003). The notion of intellectual capital has been widely discussed since market value often exceeds book value. According to some researchers, the reason why the market is willing to pay more for a firm than the value of its tangible assets can be traced to the intellectual capital of the company and its expected future economic value. There are therefore obvious motives for an interest in intellectual capital. On the other hand, intellectual capital is highly problematic to control due to its intangible character and it is complicated to establish exactly what intellectual capital is (Zhou

& Fink, 2003). Creating absolute models of indicators of intellectual capital is not really possible (Mouritsen et al., 2005).

In the most frequently cited model of intellectual capital, however, Edvinsson and Malone (1997) have divided it into two main sub-categories, human capital and structural capital. Human capital refers to the employees of the company and their creativity, competence, social skills etc., but also to company values, culture and philosophy. Roos et al. (1997) express this as human capital being the soul of the company and Edvinsson and Malone (1997) note that the company cannot own human capital. Structural capital, on the other hand, covers a number of different notions related to the company rather than to the specific employee. Structural capital is divided into organizational capital (innovation and process capital) and customer capital (Edvinsson and Malone, 1997), in short what is "left at the office when the employees go home" (p.11). See Figure 1 below for an overview

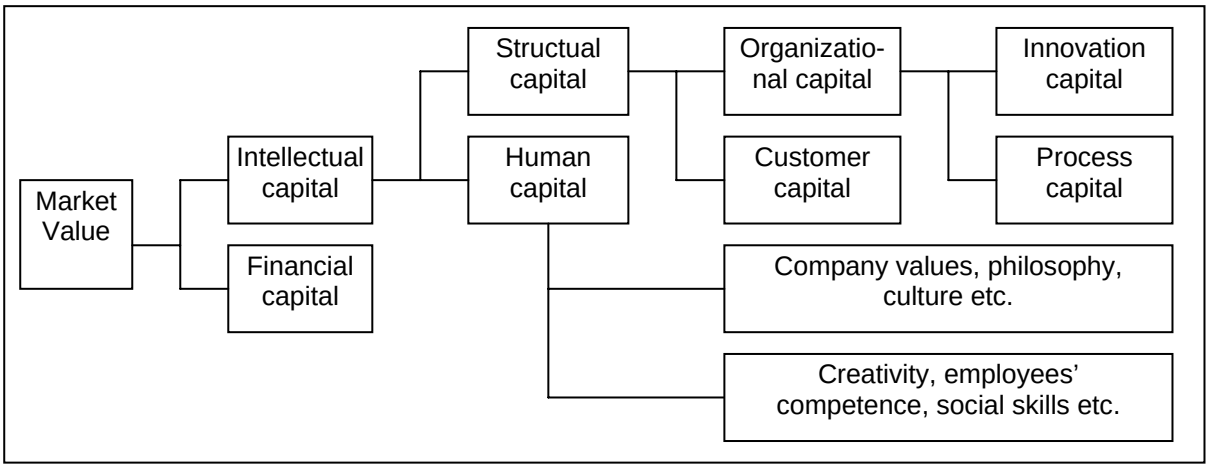

Figure 1: Intellectual capital. Source: Edvinsson & Malone (1995:52), adapted.

Roos et al. (1997) create a similar distinction. Intellectual capital is broken down into human and structural capital, human capital in turn being broken down into competence, attitude and intellectual agility, while structural capital is broken down into relationships, organization, and renewal and development. Another similar and often mentioned model is "The Intangible Asset Monitor" proposed by Sveiby (1997). Other authors could be cited, but the logic behind most models is similar regarding what are considered the components of intellectual capital, although the categorization varies somewhat (see Andriessen, 2004, for an overview of categorizations).

Theorising about intellectual capital has primarily been concerned with knowledge resources as a static entity, and less so with the dynamic process of generation and maintenance of intellectual capital (Roos et al. 1997). I.e., research has more focused on definitions, distinctions and methods of valuation of intellectual capital, than looking at how it comes about. Consequently, a significant drawback of current intellectual capital theorising is that it largely fails to explain relationships between different elements of the various intellectual capital models (Leitner & Warden, 2004). Further, intellectual capital models do not specify how intellectual capital is used in the process of creating value, even if this aspect is arguably more important than the identification of components of intellectual capital. However, in order to interconnect individual components of intellectual capital as well as to link them to value creation, the strategy of the company is of great importance. At least as a performance monitoring system, intellectual capital is intimately connected to firm strategy (Mouritsen et al., 2005). This indicates that another type of model or framework might be necessary (Leitner & Warden, 2004), where intellectual capital components are regarded as driving factors rather than static components. However, not even models related to corporate strategy (value chain scorecard, BSC etc.) are able to provide a reasonable picture of the flow between different components the firm's intellectual capital or how the combination of the components generates value.

4. Relationships as intellectual capital: a missing component

In the discussions above, one can see a connection between the notions of relationships and intellectual capital, although apparently few studies take this approach (see Das et al., 2003, for a study of strategic alliances and intellectual capital). Roos and Roos (1997) and Roos et al. (1997), however, argue that relationship capital

should be seen as part of the firm's structural capital. Human capital is argued to include competence, attitude and intellectual agility, but not relationship capital, which is only seen as belonging to the structural capital category. The way, in which relationship structural capital is defined, however, focuses on relationships with "customers, suppliers, alliance partner, shareholders and other stakeholders" (Roos et al., 1997:43). I.e., in their view relationship capital corresponds to interorganizational relationships.

Our discussion on relationships distinguishes between social relationships (between individuals, which can be professional or non-professional) and interorganizational relationships (between firms). We note that social relationships can be an important source for the formation and maintenance of interorganizational relationships, but where do social relationships of employees (and the uses to which these can be put) figure into established models of intellectual capital? We would argue that social relationships of employees can be said to belong to the human capital category, while interorganizational relationships of the firm belong to the structural capital category. Interorganizational relationships are "left at the office when the employees go home" (cf. Edvinsson & Malone, 1997:11), while social relationships cannot be owned by the company.

5. A brief empirical illustration with comments

Below is presented a brief summary of a case study of the internationalization process of a Swedish industrial SME (see Agndal, 2004). Internationalization is a good context for studying the phenomena in focus in this paper. More or less since the inception of the internationalization field, the dominant theoretical perspective has regarded internationalization as a process of knowledge internalization (see e.g. Johansson & Vahlne, 1977), and later the importance of relationships came strongly into focus (Johanson & Mattsson, 1988; Axelsson & Johanson, 1992; Blankenburg Holm, 1996).

5.1 Method

The project from which data are drawn focused on charting international relationships of 16 Swedish industrial SMEs, primarily through interviews with 52 key informants. By focusing on the relationship as the micro unit of analysis, it is possible to generate a comprehensive picture of how internationalization processes form over time, and how these processes are influenced by existing and newly formed relationships. In essence, it can be shown how structural and human capital impact internationalization process formation and how new intellectual capital is generated. The vignette below is selected because it is particularly illustrative.

5.2 GC Inc.

GC Inc. manufactures and markets garbage compactors. The firm was founded in 1971, currently has 90 employees and a turnover of US$20 million. Internationalization began shortly after the firm was founded with sales to a UK distributor encountered at a trade fair. GC Inc. soon ran out of capital, though, and was acquired by an industrial group. This gave GC Inc. access to distributors in most of Western Europe and the US. In essence, the acquisition seemed to generate considerable structural capital for GC Inc., interorganizational relationships rapidly expanding in number. However, with the introduction of new products, it became apparent that the industrial group's foreign distributors were not well suited to marketing GC Inc.'s products, which were aimed at different market segments. Therefore, in 1981 the manager of GC Inc. acquired the firm. He then set out to find new distributors. Interestingly, in the case of Norway, the Netherlands and France, the new distributors were firms started by employees of the former distributors, wanting to work specifically with GC Inc. Thus, existing interorganizational exchange relationships formed the basis for new interorganizational exchange relationships. In intellectual capital terms, existing structural capital was used to generate new structural capital.

The manager of CG Inc. again wanted to expand into the US market. For several years GC Inc. had been working with a Swedish supplier, a firm managed and owned by an acquaintance of GC Inc.'s manager. The owner-manager had sold his firm a few years earlier, however, and had moved to the US. GC Inc.'s manager then suggested that his acquaintance should start a new firm there to become GC Inc.'s US distributor, which also happened. In this instance, a social relationship, at that time a non-professional or non-task one, formed the basis for a new interorganizational exchange relationship. Thus, what may be termed human capital was employed to generate structural capital.

After an intense period of finding new distributors in the early and mid-1980s, a more reactive stance to new relationship initiation emerged. A break in this trend occurred in the mid-1990s when GC Inc. hired a new member of staff who had been working in Latin America for a long time. His personal contacts there were used to find several new distributors. Again, it can be noted that human intellectual capital was used, although

here the social relationships may be termed professional (i.e. task-related). When this individual left CG Inc. a few years later, the distributors remained with GC Inc. I.e., the relationships had, in effect, been institutionalized and structural capital had been generated from human capital.

More examples could be cited, but these will suffice for the discussions at hand. This case clearly indicates that social as well as interorganizational relationships are important aspects of intellectual capital. The case indicates something even more interesting, though. Apparently, structural capital in the form of interorganizational relationships can be transformed into human capital in the form of social relationships, and vice-versa. Below, this phenomenon is explored further.

6. Relationship transformation: insights from knowledge management

As noted above, much of the literature on intellectual capital focuses on its constituent components. Unlike many writers in the field, Nahapiet and Goshal (1998) also stress the creation of intellectual capital. They argue that this can be done in two ways, either through a process of combination or through a process of exchange, i.e. either through recombining existing resources or through exchange activities with other parties. Based on our observations, these thoughts are a useful starting point for further discussion on the importance of relationship transformation processes in the creation of intellectual capital. Relationships are created and deepened through exchange, and existing relational resources may be recombined to form a basis for new relationships.

The case above indicates that relationship transformation processes do indeed go on in real life, and that firms create human and structural intellectual capital. The issue is somewhat more complex than initially hinted at, though. One issue of special importance is how social relationships can be transformed into interorganizational relationships and vice-versa. I.e., how can a firm make use of social relationships of their employees and ensure that relationships are not lost if employees leave the firm? Similarly, how can firm foster good social relationships between its employees and employees of other organizations to improve business interaction? Simply put, how can social relationships be transformed into interorganizational relationships and how can interorganizational relationships be transformed into social relationships? How can these processes be understood and described? Can parallels be dawn from other research fields?

In recent years, the field of knowledge management has been concerned with intellectual capital (see e.g. Zhou & Fink, 2003; Sveiby, 1997) and some writers have focused on knowledge creation through knowledge transformation and exchange in a social context (Chua, 2002). Interestingly, the notion of relationship transformation is similar to the well-known ideas of knowledge transformation as discussed by Nonaka and Takeuchi (1995). They present a framework arguing that “tacit” and “explicit” knowledge can be transformed into new tacit or explicit knowledge through four different processes. By tacit knowledge is understood knowledge that is “[...] personal, context-specific, and therefore hard to formalize” (Nonaka & Takeuchi, 1995:59). By explicit knowledge is meant “[...] knowledge that is transmittable in a formal, systematic language” (p. 59). The four transformational processes are denoted as follows: transforming tacit to tacit knowledge is referred to as socialization; transforming explicit to explicit knowledge is referred to as combination; transforming tacit to explicit knowledge is referred to as externalization; and transforming explicit to tacit knowledge is referred to as internalization. Socialization of knowledge takes place through sharing experiences, while combination entail systematising different strands of knowledge, primarily through formal methods. Externalization of knowledge is a process of forming explicit and communicable knowledge out of knowledge residing in individuals, while internalization is an individual’s process of learning from outspoken or formalized knowledge (Nonaka, 2004; Nonaka & Takeuchi, 1995).

Several parallels can be drawn between social relationships and tacit knowledge on one hand, and interorganizational relationships and explicit knowledge on the other. Like structural capital (of which explicit knowledge could be said to be a part), explicit knowledge stays in the firm. Like tacit knowledge, social relationships reside in and are tied to individuals and cannot be owned by the firm. Other similarities between relationship formation and Nonaka and Takeuchi’s (1995) framework as a whole can also be identified; Knowledge transformation cannot be undertaken in isolation. Like relationship formation it requires interaction. Also, relationships, like knowledge, are created by individuals rather than by organizations as such. The organization, though, can provide conditions for facilitating the exploitation of relationships, just like the organization can facilitate or hinder knowledge transformation.

Thus, Nonaka and Takeuchi's (1995) framework of knowledge transformation might be useful to gain insights into relationship transformation processes and consequently generation of intellectual capital. Indeed, their framework (1995:62) can serve as inspiration for the formation of a two-by-two matrix of relationship transformation (see table 2).

Table 2: Relationship transformation

		To	
		Social relationship	Interorganizational relationship
From	Social relationship	Socialisation	Institutionalisation
	Interorganizational relationship	Personalization	Extension

From the firm's point of view, social relationships form an important part of the human capital category of intellectual capital. The firm, however, is concerned with task-related social relationship, i.e. those relationships that can be of use to the firm. Individuals, through interaction with other individuals, develop such task-related social relationships, normally when acting in their professional capacity as representatives of their employers. As task-related social relationships involve individuals, they can be transferred between different firms as individuals change places of employment. Firms can influence the formation and maintenance of social relationships, e.g. through providing individuals with legitimacy and arenas where such relationships can be formed. Here we refer to this as *socialization*, which is similar to the process of socialization in Nonaka and Tekuchi's (1995) framework.

Social relationships of employees should be regarded as an investment that should be controlled in order to be more beneficial to the firm. Similarly, from the individual's point of view, it should be of interest to create social relationships based on the relationships that firms are part of. In essence, interorganizational relationships form the basis for social relationships and human capital is developed in a process much like the process of transforming explicit knowledge into tacit knowledge referred to as internalization in Nonaka and Takeuchi's (1995) model. I.e., through social interaction, what is at the beginning an established interorganizational exchange relationship between two firms, leads to the formation of a social relationship. Here, we refer to the process of building social relationships based on interorganizational relationships as *personalization*.

Task-related social relationships can then be used to develop interorganizational relationships. Through a process that we refer to as *institutionalization*, structural capital is generated for the firm. A relationship is thus turned into structural capital when it survives single humans, i.e. the contact is no longer dependent on the individual – it has been institutionalised. We see this, e.g., when a relationship continues after an individual has left a firm. Therefore, institutionalisation changes the intellectual capital from human capital to structural capital.

Of course, existing interorganizational relationships can also generate new interorganizational relationships, like the transformation of explicit knowledge into new explicit knowledge. This is referred to by Nonaka and Takeuchi (1995) as combination, and is an issue much dealt with in the literature on interorganizational relationships. Here we refer to the process of generating new interorganizational relationships based on existing ones as *extension*.

7. Conclusion and managerial implications

This paper argues that intellectual capital in the form of interorganizational and social relationships is very important for business success. It also shows that social relationships can form the basis for creating interorganizational relationships and vice-versa, which is part of a vital process of human and structural intellectual capital generation. The main theoretical contributions of this paper lie in linking the interorganizational and social relationship literature to the literature on intellectual capital, and providing a framework for relationship transformation by drawing on some of the literature on knowledge transformation. However, what are the implications of these arguments for managers?

For social and interorganizational relationships to be of value to firms, relationships must have enactable or enabling dimensions. This is part of the intellectual capital of the firm. Chang and Birkett (2004) point out two dimensions of managing intellectual capital: (1) intellectual capital should be maintained and (2) intellectual capital should be employed efficiently. Relevant questions to consider, however, are to what extent firms actually allow for intellectual capital generation, and how these processes are managed. Four ideal types can be identified if a two-by-two matrix is constructed (table 3), the

axes of which consist of levels of human capital generation and levels of structural capital generation .

Table 3: Ability to generate intellectual capital

		Ability to generate human capital	
		Low	High
Ability to generate structural capital	Low	Low ability to generate and exploit intellectual capital	High ability to generate human capital but low ability to exploit it to generate structural capital
	High	High ability to generate structural capital but low ability to exploit it to generate human capital	High ability to generate and exploit intellectual capital

This matrix indicates situations where firms provide arenas for human capital generation, but lack the ability to transform this into structural capital. Accordingly, firms may also have the ability to create structural capital, but lack arenas for creating human capital. In the ideal type of firm there are arenas for human interaction and mechanisms for transforming social relations into interorganizational relations and vice-versa, thus generating intellectual capital for the firm.

The processes of intellectual capital generation may, thus, be facilitated by the firm through the provision of arenas for social interaction and the implementation of more efficient and consistent routines for formalization of social relationships. From a firm's point of view, there is an incentive to highlight the organization and control of social interaction in order to increase the benefits this might lead to. Firms should also strive to implement systems for tracking extant human capital (e.g. employees' social relationships) and create structures to consistently exploit human and structural capital, not unlike knowledge management systems implemented in many larger firms. An important aspect of managing intellectual capital is, thus, how to increase transparency of intellectual capital. Habersam and Piber (2003) identify four different levels of transparency: what can quantified, what can be written down, what can be explained, and what cannot be explained. This applies also to relationship management and exploitation. Some relationships can be precisely characterised according to certain pre-determined criteria, others can only be recorded more generally, while some relationships cannot be meaningfully recorded at all even if they offer potential for exploitation, and in some cases not even this is possible or meaningful. Perhaps the greatest managerial challenge lies in identifying which relationships belong to which categories, how these should be recorded and shared, and how great their potential for exploitation is.

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