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Intellectual and Social Capitals Development

A Case in Malaysian's ICT Companies

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Abstract

Intellectual capital is said to be a source of competitive advantage and there is evidence that business success can be partly explained by its intellectual capital. It is argued that the main dimensions of social capital of relevance to intellectual capital are structural, cognitive, and relational capitals because these, among other things, foster the exchange of knowledge and resources among the organization members. The objective of this paper is to investigate the importance of social capital in fostering the development of intellectual capital among the engineers. This study used case study method and data were collected through interviews. Data were analysed using within-case and cross-case analysis. The analysis shows that the most important dimension for intellectual capital development is structural capital. The findings also suggest that structural capital is a prerequisite of relational capital among engineers in an organizational project. The findings also demonstrate that frequent meetings and interactions, relationship, hierarchy or status, and shared language are among the factors that foster the sharing of knowledge among engineers. This study also elucidated that structural and relational capitals play important role in knowledge sharing and hence intellectual capital development.

Keywords: Intellectual capital, Social capital, Relational capital, Cognitive capital, Structural capital, Organisational capital, Knowledge sharing, Engineers

1. Introduction

In a knowledge-based economy, the generation and exploitation of intellectual capital plays the predominant part in the creation of wealth. The effective management of intellectual capital has been proposed as a critical element of organizational flexibility and innovation (Rockart, 1988). Therefore, organizations should learn to improve continuously and this could be carried out through innovation.

It is believed that the most flexible and innovative organizations are those which have effective learning system and those which could maximize both their abilities to acquire information about their customers, competitors and technology, and their abilities to digest that information. Tushman & Nadler (1986) suggest three critical factors in managing innovation: informal organization, organizational arrangement and individual. These three critical factors are similar to the three dimensions of intellectual capital (people, external, and internal) introduced by Bontis (1998); Sveiby (1997); Roos *et al.,* (1997) and Stewart (1997).

The people dimension incorporates competencies, knowledge, know-how and experience of the individuals in an organization. The internal dimension includes organization structures, routines, processes, and management systems. This also includes the norms and culture of an organization, and the systems and work processes; including information technology (IT), communication technologies, images, concepts, and models of how the business operate, databases, documents, patents, copyrights and other codified knowledge (Allee, 1998). Meanwhile, the external dimension is referred to the external constituencies and structures such as links to customers, suppliers, and other stakeholders and networks (O'Regan, O'Donnell & Heffernan, 2001).

Organizational flexibility and innovation require the management of an organization to hire, develop, and train a set of individuals with diverse skills and abilities, and has the capacity to innovate. Social capital is an important mechanism to give individuals access to crucial resources available in other people (Coleman, 1988). As a key enabler for

knowledge sharing (Brachos, Kostopoulos, Soderquist, & Prastacos, 2007; Chaminade & Roberts, 2002) and hence intellectual capital development, it encourages organisational members to form relationships, communicate with each other, and act together more effectively in achieving organisational goals (Adler & Kwon, 2002; Burt, 1997; Cohen & Prusak, 2001; Nahapiet & Ghoshal, 1998; Putnam, 1995; Tsai & Ghoshal, 1998). Thus, we argue that strong partnership among engineers are a key piece of achieving competitive advantage Therefore, it is a challenge for organizations to develop effective social capital throughout the organization (Nelson & Cooprider, 1996; Rockart, 1988; Reick & Benbasat, 2000).

The objective of this study is to investigate the importance of social capital dimensions in intellectual capital development. It will also identify the most influential dimension of social capital in fostering intellectual capital. Apart from that it examines and distinguishes the differences among three dimensions of social capital: structural, cognitive, and relational (Nahapiet & Ghoshal, 1998) for intellectual capital development. It also tends to investigate factors that foster or hinder the development of intellectual capital among the engineers. ICT companies were chosen because this type of organization must continuously innovate in order to maintain its competitive position.

2. Literature Reviews

In today economy, the essential apprehension of organizations is how to manage their intellectual capital (Teece, 2000; Nahapiet & Ghoshal, 1998). There is a significant and growing body of research suggesting that intellectual capital is associated with important outcomes and processes in the organizations (Nahapiet & Ghoshal, 1998; Meyer, 1994; Nohria & Eccles, 1992). Organizations must be positioned to anticipate in developing the needs of the customers and in responding to these needs through additional innovative products and services. Organizations do not have brains but they have cognitive systems and memories (O'Keefe, 2002). Furthermore, consumers nowadays are becoming more sophisticated in their selection of products and services, and they have wider choices in the market and expect new and improved products, superior services, and lower prices.

There is no universally accepted definition of intellectual capital in the literature. However, most of the definitions and frameworks of intellectual capital include human, customers, suppliers, and organizations as factors (e.g. Roos & Roos, 1997; St Onge, 1996; Van Krogh & Roos, 1996). For the purpose of this study, three classifications of intellectual capital are used: relational capital, human capital, and organizational capital. The term relational capital refers to external capital of organization and it includes relation with the suppliers, customers, and other members of its external community. Human capital refers to the know-how, skills, capabilities, experiences and expertise of an organization's members. Human capital present in an organization but the organization has imperfect ownership of it. Human capital is used to accomplish tasks at hand and ultimately achieve organizational goals and missions (Youndt, Subramaniam & Snell, 1996). But this human capital can leave the organization. Organizational capital refers to the internal configurations and system of an organization. It consists of two components: innovation that includes intellectual property and intangible assets, and process capital that includes organizational structure and operating procedures (Roslender & Ficham, 2001). The organization has perfect ownership of its organizational capital (Roslender & Ficham, 2001; Sveiby, 2001).

Although intellectual capital has been characterized as an attitude of the individual (Simon, 1991), the dominant view is that it is an organization level construct (Brown & Duguid, 1991; Nelson & Winter, 1982). Nahapiet & Ghoshal's (1998) theory argue that the presence of social capital will facilitate the creation of intellectual capital and leading to organizational advantage. However, to extract values from social and intellectual capital, they must be managed properly through knowledge management activities (Lee & Yang, 2000).

Thus, this study argues that the intellectual capital development among the engineers is highly influenced by their social capital. Social capital can be defined as *the sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or social unit* (Nahapiet & Ghoshal, 1998). We applied the three dimensions of social capital that create the value of the intellectual capital introduced by Nahapiet & Ghoshal (1998): structural, cognitive, and relational.

Structural capital refers to the network structure or connection between the actors. It consists of the number of people in the network, their willingness to lend support and their willingness to do so. This relationship is very important as it can enhance both the firm and individual performance in two ways; first by facilitating access to information and resources, second by helping co-ordinate task interdependencies (Gargiulo & Benassi, 2000). Relational capital refers to the nature of the personal relationship such as trust, toleration, & cooperation that develops between specific people (Nahapiet & Ghoshal, 1998). Trust and relationship will lead to positive attitudes and behaviour among the workers (Sparrow & Cooper, 2003; Gambetta, 1988). According to this theory, workers have to be able to trust others to discharge their obligations. It is not only enabler to increase cooperation but also as catalyst to improve flexibility, lower cost or coordinating activities and increase level of knowledge transfer (Mat Isa & Ameer, 2007; Inkpen, 1997). Without trust and sense of reciprocal obligation, workers will be less committed and less loyal, which will lead to high turnover

intention. Cognitive capital is defined as a degree to which actors of the network share a common understanding to the achievement of common goals and outcomes (Inkpen & Tsang, 2005).

3. Malaysian ICT Industry

The Malaysian Government recognizes that in the knowledge-based economy, educated and skilled human resources, or human capital, is the most valuable asset. The Government of Malaysia is emphasizing on the development of human capital as being in the forefront towards the continuous development of the country. The development of human capital is of paramount importance in competing in this era of globalization. Qualified, knowledgeable and highly skilled work force is essential to ensure that Malaysia can be competitive and succeed in the knowledge-based economy. The development of human capital has been placed as one of the principal agenda in the implementation of the Ninth Malaysia Plan (RMK9), as well as given specific emphasis in the second Malaysia National Mission, which is to enhance the country's knowledge and innovative capacity and to inculcate first class mentality.

In a knowledge-based economy, a high proportion of its Growth Domestic Product (GDP) derives from knowledge-based and knowledge-enabling industries such as high technology and medium high-technology industries, financial and other business services, and the teaching profession. The Information Communication Technology (ICT) industry is one of the knowledge-services which are vital to compete in the global economy, increasing productivity and efficiency, and enabling the enhancement of quality of life. The Malaysian ICT industry is demonstrating high growth rates and emerging as a strong contributor to the country's employment and economic growth. Malaysia is moving with rapid speed in establishing itself as a technology leader and is ranked 26 out of 127 countries in the Networked Readiness Index in the Global Information Technology Report 2007-2008. The Malaysian Government invested substantial funds in creating the Multimedia Super Corridor (MSC) in 1996 to attract domestic and foreign investors to its ICT industry. The MSC is the backbone of ICT infrastructure in Malaysia.

4. Research Methodology

The objective of this study is not to search for a conclusion based on statistical generalizations, but rather the findings from this study are meant to enhance the understanding of the development of intellectual and social capitals. Intellectual and social capitals are still new and not much study have been conducted particularly in Malaysia. According to Benbasat, Goldstein & Meeds (1987), and Eisenhardt (1991), case study method is especially appropriate when the research is at the formative stage. Therefore, case study use case study in order to explain and understand the intellectual and social capitals development in Malaysian ICT companies. According to Benbasat, Goldstein & Meeds (1987), the advantages of employing case study research are: (i) the researcher can study the topic in a natural setting, and generate theories from practices, (ii) the case study method allows the researcher to answer 'how' and 'why' questions, that is to understand the nature and complexity of the process taking, and (iii) a case study approach is an appropriate way to research an area in which few previous studies have been conducted.

Furthermore, case study method is used in order to understand the phenomenon under research and interpret the respondents' experiences and beliefs in their own terms (Gilmore & Carsen, (1996). Yin (1994, page 23) pointed, "a case study is an empirical inquiry that investigates a contemporary phenomenon within its real context, when the boundaries between phenomenon and context are not clearly evident and which multiple sources of evidences are used". This triangulation process will increase the meaningfulness of study and make the evidence more convincing (Cresswell, 1998).

This study employed multiple-cases approach because the evidence from multiple-cases is often regarded as more convincing and strong than a single case study approach. According to Benbasat, Goldstein & Meeds (1987), "multiple-case approaches are desirable when the intent of the research is description, theory building or theory testing. Multiple-case approaches allow for cross-case approaches and this allows for more generalization and transferability from the single-case approach". The single case analysis involved identifying and extracting key issues for each company in this study. Within case analysis involved detailed case study write-up for each case.

In this study, 35 engineers from 3 ICT companies were chosen based on their involvement in organizational projects. Interviewing was used as the principle method of investigation. Nahapiet and Ghoshal's model (1998) informed the research, rather than asking direct questions about all the three dimensions under social capital, the respondents were asked questions that encourage them to speak openly about their opinions, views, and experience. For instance, they were asked about their relationships with other team members, and the medium and frequency of interactions. Interviews were open and flexible and all were tape recorded, transcribed, and coded against the dimensions suggested by Nahapiet and Ghoshal (1998). To aid consistency, interview data was initially coded, based on the coding of social capital developed by us.

5. Findings and Discussion

This study helps us understand the complex process in which outcomes expectation of social capital influence intellectual capital development among engineers. The results indicate that all social capital dimensions have a significant impact on the development of intellectual capital.

5.1 Structural Social Capital

The structural dimension of social capital refers to network structure or connection between actors (Nahapiet & Ghoshal, 1998). It consists of the number of people in the network and the way they gain knowledge to develop or gain access to intellectual capital. The data provide evidence that there were cross functional networks among the engineers as they were chosen from different departments and have diverse skills and knowledge. Formal activities carried out when working in a project (for example; meetings, presentations, briefings, and workshops) cultivate the opportunity for knowledge sharing among the team members. Hence, formal activities are perceived as a focal point connecting the team members.

Based on the interviews, meeting is seen as important because it creates the opportunity for the team members to share knowledge and hence developed their intellectual capital. One of the interviewees mentioned that:

This project involved many people from other departments; sometimes I don't know some of them. I discovered that this meeting is useful for me as I know who is responsible for what, it makes it easier for me to ask the person concerned if problems occur.

In line with the argument that network closure would be more likely to promote the sharing of resources (Nahapiet & Ghoshal, 1998; Coleman, 1990; Bourdieu, 1986), our findings suggest that in a project context, close network which is a result of organisation as institutional setting is important for the sharing of knowledge (Moran & Ghoshal, 1996). It can be posited that closure or density of the group is necessary realistic in a project context for example through formal interaction such as periodic meeting in which the leader seeks the input of employees, hence knowledge can be shared (Bartol & Srivastava, 2002).

Findings also suggest that previous interaction helps the engineers to have connection or relationship which can be transferred to another setting. It was also apparent that engineers had favoured to return to the team members who had behaved flexibly in the past. Their perceptions were that it was of obvious benefit to be in a position where they had previous experience of working together. The quotes below indicate their concerns.

I would say that it is much easier to work with somebody that you know or have been working together before rather than a total stranger…because you don't know what to expect.

I find it easier to interact with the team members if we had worked together in the previous project. Furthermore, I will know better about their expertise.

We went for a two weeks training together. I guess I know her much better than before. I am quite 'OK' with her compared to others.

Consistent with the previous studies (Newell *et al.,* 2004; Koskinen *et al*., 2003), project members can use existing social capital that has been built up over time through previous involvement in other projects, job rotation or other relations such as training and workshop. These socialization activities lead to the conversion of new tacit knowledge into the existing tacit knowledge. In addition, individual tacit knowledge will communicate through this interaction process. This is in line Lee & Yang (2000) who suggest that interaction process will lead to knowledge innovation in the organisation. Knowledge innovation is one of the most important activities in knowledge management.

Findings from the interviews also suggest that most of the knowledge sharing entailed a significant amount of face-to-face or at least telephone interaction. Researchers have confirmed that face-to-face meetings are the key driver for knowledge transfer and crystallisation of new ideas, and are the best method for the manifestation of alternative opinion (Swan *et al.*, 1999; Bennett & Gabriel, 1999). The finding from this study confirms that complex information is transmitted face-to-face in an office. In line with the media richness theory, preference for face-to-face interaction is due to a need for clarity, understandability, facial expression and feedback. Media richness theory also argues that people use less Computer Mediated Communication (CMC) compared to face-to-face communication especially if the required knowledge is complex.

However, the findings from this study also suggest that apart from face-to-face interaction, the younger members aged 35 and less prefer to use CMC. Although most of the participants were provided with fixed telephones, the younger generation, preferred to use mobile phones, and it was assumed that this preference was associated with the text message facility. The following quotes indicate their views:

Sometimes, when I was with my clients and they asked me about things that I was not sure of, I just called or sent a text to my colleagues

I prefer to use text messages ... I don't know… everybody use text messages … I find it convenient.

I prefer to use text messages, I don't know…everybody use text messages…I find it convenient.

In terms of position or hierarchy, findings from the interviews indicated that the interviewees internalised a feeling of vulnerability from the status they held in the project. Consistent with suggestion by De Long & Fahey (2000) that status differentiation can lead to 'silo mentality' which encourage employees to spend time defending their unit's perspective and an overall unwillingness to express ideas. Consequently, engineers accepted the prevailing norms of behaviour which emphasised status differences such as senior and junior. Status different among the engineers can also hamper their willingness to contribute their knowledge for the project. For example, they were suspicious of others looking at them as not competent or blaming them for failure that they had no chance of avoiding. Indeed, the interviews revealed that status differences, and the team members' actual roles in the project or in the workplace generally, did affect their interaction, as indicated by the following quotes:

Sometimes, I feel afraid to talk because if I give suggestions, and it turns out to be unconstructive, people will put the blame on me.

The team members never asked me, so, I would just keep quiet. I don't know when the management would change and want to listen to us.

The findings are similar to Wasko & Faraj (2000) that individuals are less likely to contribute when they feel their expertise to be inadequate. On the other hand, by asking for help, an individual may fear looking incompetent and thus suffering a blow to his or her image (Edmondson, 1999). Brown (1990) contends that asking for help, admitting errors, and seeking feedback illustrate the kinds of behaviour that could pose a threat to face. In addition, the unwillingness to express one's ideas and knowledge for fear of being criticised also characterises an environment in which diversity of opinions and perspective is devalued or altogether not valued. Unfortunately, network structure properties such as hierarchy and status may hamper the development of intellectual capital (Nahapiet & Ghoshal, 1998)

5.2 Cognitive Social Capital

Cognitive capital refers to the shared representation and systems of meaning among parties. It enables the network actors to share a common understanding to the achievement of common goals and outcomes (Inkpen & Tsang, 2005). However, it requires the ongoing dialogue of shared meanings among parties. Cognitive effect of social capital on intellectual capital was fostered by the existence of a shared engineering culture and language (Koruna, 2004). Interestingly, when asked whether they expect other members to reciprocate in the knowledge sharing activity, most of the team members from the three companies responded by saying:

Some of the team members do not understand me, probably because of the jargon that I used. Only engineers will do.

Similar to Koruna (2004), the findings of this study indicate that engineers developed and institutionalized their owned 'language' obstructing and complicating conversation with other team members. In line with our expectation, shared language has a significant impact on the intellectual capital development.

Furthermore, findings from the interviews also suggest that area of expertise inhibits the ability of the engineers to communicate beyond their boundaries and discipline. They are also reluctant to accept others' opinions and suggestions. Koruna (2004) mentioned that this is the engineers' syndrome who always rejected ideas from outside.

5.3 Relational Social Capital

Engineers could generate relational capital based on the resources and capabilities housed within the organisation. This finding seems to provide support to the argument that relationship may not be developed in organisational project context due to short term relationship, lack of shared history, infrequent interactions, lack of co location, and lack of co presence (Cohen & Prusak, 2001; Nahapiet & Ghoshal, 1998; Nohria & Eccles, 1992). However, despite the lack of relational capital, engineers still share and disseminate knowledge when they are structurally embedded in a network. Surprisingly, engineers do not expect others to contribute, nor do they expect help in return. This is because among the engineers, reciprocity norms were not important in governing relationship with other team members. Engineers were willing to do extra work because they believe it is their duties and responsibilities. It is evident in the statements below:

I will share what ever I know with the senior staff. After all, this is my responsibility to make sure the project is successful.

We always discussed together. I want my staff to come and see me often. They can ask whatever they want regarding the systems.

Sometimes you cannot do the task on your own without collaborating with other partners. We can get things done quickly if we work together.

This is in line with the suggestion by Putnam (2000) that some people will help other "without expecting anything immediately in return and perhaps without even knowing you, confident that down the road you or someone else will

return the favour." The interviews revealed that engineers help others in the team not because they expect something in return from the same person. Some of them mentioned that they help because they don't want to disappoint others and feel bad if they rejected their requests. It could be postulated that their action is due to not wanting to damage the relationship among the team members and on the other hand would just keep to them for all the consequences. However, this reciprocity may be abused when there is influence from the hierarchy (Edelman *et al*, 2004). Interviews indicate that the junior engineers were willing to share their knowledge with senior members although they do not get credit from it because of power distance or seniority.

Contrary to our expectation, trust did not have a significant impact on intellectual capital. One possible explanation may be that individuals are willing to share their knowledge due to responsibility towards the achieving goals of the project. However, this study shows that for a longer term, social interactions such as social ties, reciprocity, trust may increase individual knowledge sharing and hence intellectual capital.

Ultimately, relational capital is a property of the dyad or network that is jointly generated and owned by the engineers. Although they have the opportunity to develop the interpersonal relationship, it is still up to their initiative to establish and preserve it (Inkpen & Tsang, 2005). Moreover, these relationships are rewarded by repeated transactions due to commitment, obligation, and reciprocity. However, the culture of engineers may hamper the development of relational capital.

In summary, this study has explored the structural dimension of social capital showing how the configuration of team members as shaped by formal structure as well as informal structure assist the engineers to access to knowledge and developed their intellectual capital. This study shows that structural capital provides an opportunity for the engineers to develop a network or access to other team members. Engineers are required to be positioned in the structural network so that they can have frequent interaction with others, be more open and can understand other people. For instance, by working together in the project, it serves as an intra-network which can be further prolonged in the future. The formal meeting and informal meetings that they have attended serve as a connection with others and from there they can identify the potential members with relevant knowledge. The findings also suggest that structural capital together with relational capital helps to promote the development of interpersonal relationship among the engineers. Having said that, both prior history of relationships (Krackhardt, 1992), and opportunity for frequent interactions are requirements for the development of relational capital. These in turn encourage the development of intellectual capital. However, cognitive capital plays a role only among engineers but not with other team members as 'language and culture 'of the engineers hamper their ability to communicate with others.

6. Implication for Research and Practice

The findings indicate that the roles of organisations are to ensure that the engineers are structured carefully to build further relationship. They can provide place enablers for the engineers to enhance their relational capital. It should also be possible to develop richer theory of institutionalisation, one that explicitly addresses both the regulations and enabling roles for social capital development. The reason is social capital need to be developed among the organisational members and it can be managed (Llewellyn & Armistead, 2000). However, once developed it can die if not maintain.

Dimensions of social capital positively relate to the development of intellectual capital. This research contributes to an overall conceptual understanding of the nature and important of intellectual capital development. Indirectly, this study also contributes to knowledge sharing theory. Our findings suggest that dimensions of social capital are helpful in identifying the determinant of intellectual capital development.

The results indicated that social capital dimensions are significant predictor of individual intellectual capital. Managers interested in managing the intellectual capital development should develop strategies or mechanism to encourage the development of social capital among engineers. For example, the company should encourage frequent face-to-face interaction and encourage knowledge sharing through virtual communities. It is also important to ensure that engineers have an understanding and appreciation for the business in building social capital among them.

Collaboration should be encouraged by restructuring structural capital. For instance engineers should mingle with other staffs, share their expertise and learn to accept other team members' ideas and opinions. Management also can invite experts in different field to give talks to them so that they will be more open and knowledgeable in other field as well. The findings also revealed that younger engineers are more open and willing to accept others' opinions and ideas compare with the senior or older engineers. Thus, to motivate younger engineers, they should be given motivating rewards such as encouragement or praise.

7. Limitation and Suggestion for Future Research

This study has limitations. First, the findings could not be generalized to all types of professional and other industries such as manufacturing and service. Therefore, further research is necessary to verify the generalisability of our findings. Second, this study is based on the cross –sectional data collection. While social capital and intellectual capital

development requires time and history of interactions, ideal empirical design would be a longitudinal study in order to capture the dynamic interrelationship of social capital dimensions and its impact on the development of intellectual capital.

8. Conclusion

The aim of this paper is to develop further the idea of intellectual capital development among the engineers within the social capital perspective. This study confirms that engineers are required to have social capital in order to develop their own intellectual capital. Our research findings confirm Nahapiet & Ghoshal's framework (1998) that social capital embedded in structural relationship, is the key intellectual capital development among engineers. Our findings allude that social and intellectual capitals are co-evolve. Apparently, the finding found that engineers are more comfortable when dealing with engineers. Their cognitive capital is only developed among engineers and it hinders them from accepting "outsider' opinion. Therefore, in order to enhance their career development, engineers have to strengthen their relational capital with other organizational members.

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