The Impact of Question Structure when Sharing Knowledge

Heather Bircham
University of Waikato, New Zealand
hjb@waikato.ac.nz

Abstract: This paper investigates how the structure of a question may hinder or assist in the knowledge sharing process. It presents a theoretical framework that posits the notion that the structure of the question asked of the source may have an effect on the recipient's attitude toward the knowledge received. Question structure is examined from the perspective of knowledge articulation and attitude toward the knowledge received is considered from the position of relevance and value of the knowledge to the recipient's decision-making processes.

1. Introduction

Perhaps the most perplexing aspect of knowledge in the business context is that it originates from individuals, but is realised in products or services promoted by organisations. In a business environment where the knowledge of an organisation is regarded by many as a resource that gives rise to competitive advantage (McEvily & Chakravarthy 2002; Spender & Grant 1996), it is reasonable to suggest that an organisation should exploit the knowledge of its employees. However, before the knowledge of individuals can be combined, utilised and/or exploited by the organisation it first must be articulated by those that possess it, shared and then transferred within the firm (Lubit 2001).

Research into knowledge sharing and transfer at the unit level of the individual in an organisation is relatively underdeveloped, yet almost every day companies request their employees to share their knowledge on organisational matters. This sharing can occur through emails, reports, meetings, compliance and self-assessment surveys, audits, information and knowledge warehouses searches, etc. A number of recent studies suggest factors that can affect knowledge sharing and transfer in an organisation, including knowledge tacitness (Argote & Ingram 2000; McEvily, et al. 2002; Simonin 1999), internal stickiness of knowledge (Szulanski 1996), motivation for sharing (Kalling 2003), the ability of the source to share (Foss & Pedersen 2002) and the ability of the recipient to accept knowledge (Gupta & Govindarajan 2000). In general these studies have focused on the transfer process and the types of knowledge being transferred (tacit, explicit), with the a priori assumption being that individuals will share their knowledge. However, key to an individual sharing their knowledge is that the individual must first receive a stimulus or invitation to share, such as a chance remark, formal question or organisational requirement.

Some consider that the asking of questions is the key to revealing and sharing new knowledge (Lloyd 2002, p 11) and that question formulation is an important component of the management of organisational knowledge (Meso, Troutt & Rudnicka 2002). More broadly, question structure (e.g. open or closed) has been found to influence a respondent's answer and also the usability of the response (Dohrenwend 1965). If this is so, then there is the possibility that question structure may impact on the knowledge sharing process between a source and a recipient in an organisation. Furthermore, often the questions that are asked to gather organisational knowledge are presented to employees in a formal written format, such as those often found in compliance and self-assessment surveys or audit questionnaires, rather than interview style questions. In such circumstances, the structure of a question may affect the response and therefore, when attempting to glean knowledge on an organisational topic, irrespective of the subject matter, the question can be posed: "Does the structure of a question to which the source of the knowledge responds influence the recipient's attitude toward the knowledge they receive?"

This paper examines the proposed question and is organised as follows. The next section provides an overview of research on knowledge sharing and questioning, including factors that may inhibit individuals from sharing their knowledge or receiving the knowledge of others. The theoretical framework is then outlined, followed by a discussion of the possible implications of the framework for knowledge sharing in organisations. The paper concludes with a brief synopsis for future research directions.

2. Background literature

2.1 Knowledge sharing and attitude

Sharing of knowledge between individuals in an organisation can occur both informally and formally, one on one or in a group situation. Informal knowledge exchange can take place either in response to a chance remark in the corridor or in the tearoom for example, or in response to a direct question. The individual who holds the knowledge either responds by sharing their knowledge or aspects of their knowledge or chooses not to respond. More formal knowledge exchange resides in organisational manuals, document warehouses, reports, emails and correspondence between employees and takes place in formal meetings, seminars and presentations, etc.

When knowledge sharing occurs between two individuals, the individual whom is the source of the knowledge shares their knowledge with the recipient. The process of sharing has the presupposition that the recipient may or may not use the received knowledge. Yet, if the recipient makes use of the received knowledge, by way of incorporating it into a new product, process or even just simply making a decision, knowledge transfer is said to have occurred (Darr & Kurtzberg 2000). Knowledge transfer therefore is predicated on knowledge sharing; sharing has to occur prior to transfer.

On the presumption that an individual in an organisation has been presented with a reason to articulate and share their knowledge, research suggests that there are clusters of factors that may affect knowledge sharing (Andrews & Delahaye 2000). These include the reluctance, willingness or even ability (Foss, et al. 2002) of the individual to share, the motivational disposition of the individual (Gupta, et al. 2000) and trust towards the recipient party (Andrews, et al. 2000; Davenport & Prusak 1998; Huemer, von Krogh & Roos 1998; McDermott & O'Dell 2001; McEvily, Perrone & Zaheer 2003). A source's perceived trust in a recipient may also impact on the degree of openness they have towards sharing (Nahapiet & Ghoshal 1998).

Further, if the source considers that their knowledge, if shared, is favourable to the organisation, this may foster the notion that retention of knowledge enhances bargaining power, through knowledge ownership and control (Davenport, et al. 1998). In some circumstances this may be related to the perceived value of the knowledge being shared (Gupta, et al. 2000). A contrasting perspective suggests game theory can be used to understand knowledge sharing behaviour (Chua 2003). For example, an individual's perceived payoff for sharing their knowledge maybe contingent on the knowledge sharing behaviour of others in the organisation; if you share I will share, but it you do not share then I will not share. The relevance of game theory to organisational culture and climate can be debated, but there can be little doubt that organisational culture and climate can encourage or impede knowledge sharing. For example, if the source individual perceives the organisation climate to be one where mistakes are not well received and the required knowledge to be shared is about failures of projects or mistakes, then attitude toward sharing this type of knowledge may be negative (Husted & Michailova 2002).

In the same way that the source of knowledge may have an attitude towards sharing their knowledge, a recipient may also have an attitude towards the knowledge they receive. Although the attitude of the recipient has not been examined in detail in the literature, it has been suggested that the recipient may form an attitude towards receiving knowledge from others given their current situation and perception of the sharing individual (Husted, et al. 2002). Some suggest that the more valuable the knowledge the more likely it is that the recipient will use it (Gupta, et al. 2000), but the value of the knowledge to the recipient may also depend upon the relevance of the knowledge to the decision-making requirements of the recipient (Schulz 2003). Knowledge that adds to that required by a recipient for their organisational duties and decision-making may be perceived to have more value than knowledge that does not contribute to their job domain.

There also remains the aptitude of the recipient and whether or not he or she is willing to accept knowledge, irrespective of the relevance of the knowledge to their organisational decision-making requirements. The absorptive capacity of the recipient and the extent and depth of their prior understanding of the area of knowledge being shared may affect their ability to accept and comprehend the knowledge being provided (Cohen & Levinthal 1990). Further, beliefs such as the not-invented here syndrome (Katz & Allen 1982) may also result in the recipient being not willing to accept knowledge. The recipient of knowledge may also have a

perception of the trustworthiness of the source, in the same way that the source of knowledge may or may not trust the recipient. That is, perceived trustworthiness may have some bearing on whether or not the recipient perceives they are receiving accurate, quality knowledge from the source.

Irrefutably, research is revealing the significance and importance of the attitude of the source and recipient in knowledge sharing in an organisation. However, there is no exact indication of what individual beliefs constitute an attitude towards sharing or an attitude towards accepting knowledge. Nor does the knowledge management literature allude to how the attitude of the source or recipient can be operationalised. In an endeavour to clarify the effects of a source's attitude to knowledge sharing and a recipient's attitude to receiving knowledge, a brief consideration of the theory of reasoned action is appropriate.

The theory of reasoned action (Fishbein & Ajzen 1975) has been used to assist in the prediction of the behaviour of an individual in contexts or circumstances similar to those of knowledge sharing or knowledge acceptance. Its fundamental and underpinning premise is that a person's attitude is strongly based upon their beliefs about performing a particular behavioural act. If this theory is applicable to knowledge sharing then the attitude of an individual towards performing a behavioural act such as sharing knowledge, for example, could be expected to affect their intention to carry out that behaviour, to share their knowledge; intention both precedes and is predictive of actual behaviour. The theory also proposes that subjective norms or an individual's beliefs about how peers consider that he or she should behave will influence intention and consequently behaviour.

In the context of knowledge sharing, the theory of reasoned action has been examined in two studies (Bock & Kim 2002; Ryu, Hee Ho & Han 2003). The first (Bock, et al. 2002), used the theory of reasoned action model to examine beliefs, attitude and intention to share against actual knowledge sharing behaviour. Results found that actual knowledge sharing behaviour was highly correlated with intention to share knowledge and attitude toward sharing had a significant effect on intention. The second study presented a modified model of the theory (Ryu, et al. 2003) and found that subjective norms had the greatest effect on intention, both indirectly and directly through attitude. Although Ryu et al., (2003) included subjective

norms which could be used as a proxy for an individual's perception of the organisational climate towards sharing, both studies failed to consider the belief of many that trust towards the recipient party may impact on knowledge sharing (Andrews, et al. 2000; Davenport, et al. 1998; Huemer, et al. 1998; McDermott, et al. 2001; McEvily, et al. 2003). Further, neither the findings from the studies, nor the theory of reasoned action provide insight into what triggers an individual into sharing their knowledge. That is, individuals have no need to volunteer their knowledge unless asked to.

2.2 Questioning and question structure

The findings of Okhuysen and Eisenhardt (2002) suggest that asking individuals to question one another on their knowledge is more productive to new knowledge generation than just asking them to share their knowledge. Everyday individuals in an organisation are questioned about their knowledge of a domain of expertise etc. Responding to such questions may involve individuals searching for explicit and already documented organisational knowledge, inquiring of their internal knowledge domain and or, cognitively integrating knowledge from a number of different sources in an attempt to discover and articulate a reply. And, all too often neither the question nor the articulated response is communicated in face-to-face conversation; but in the form of a memo, request for a report, compliance or self-assessment survey or response, etc, where the structure of the question has the potential to influence the response.

Open-ended and closed questions implicitly have different presumptions with respect to knowledge extraction (Vinten 1995). Underpinning open-ended questions is the assumption by the questioner that the respondent (the source), has an extent and depth of knowledge about the topic and can therefore respond appropriately. Further, a respondent may perceive that they have more control over an open-ended than a closed question as they can choose how they will respond by articulating and sharing variable amounts of knowledge. Although the open-ended question appears to allow for more scope and potential value to be extracted from the response since it permits almost unlimited knowledge to be provided by the source, open-ended question do not always possess an advantage of depth in response over questions of a closed structure (Dohrenwend 1965). For example, if a questioner is attempting to elicit

predefined specific attitudes, then closed questions where the respondent may only select from fixed options may provide greater depth to the questioner; open questions may fail to properly direct the respondent to articulate their attitudes in the response.

Closed questions on the other hand, implicitly assume that the questioner is already in possession of substantial information about the responding individual's knowledge (Vinten 1995). In the context of sharing knowledge in an organisation, this implies that the recipient is already knowledgeable on the question subject matter. For example, the response to a closed question with an answer format of "yes" or "no" may only be intended to confirm that which the recipient already knows. Closed questions also allow the questioner to control the context of the response (Knippen & Green 1999), potentially focusing responses towards the knowledge and decision-making domain of the recipient. However, although closed question structures are considered to be easier to respond to (Foddy 1993), there remains the issue: "Do closed structure questions provide the respondent or the source of knowledge sufficient scope to articulate their knowledge to the extent to which they choose to share."

Schuman & Presser (1979) found that open-ended and closed types of questions of the same question content elicited two quite different responses, with answers to closed questions being influenced by the choices presented, whilst responses to open versions of the same question differed between respondents. If so, this difference in response has the potential to impact on the attitude that a recipient has towards the response. Anecdotal evidence from self-assessment surveys suggests that when respondents to closed questions are confronted with response options that do not conform to their knowledge and experience domains, they will select the option that has the least future impact upon

them (Bircham 2003). For example, by responding affirmatively to a question to confirm compliance on an organisational issue the respondent may prevent further questioning. However, a non-affirmative response and thus non-compliance may result in the respondent being asked to explain why and clarification may not be the desire of the respondent.

This brief review of the literature provides a basis for a theoretical framework for the articulation of knowledge in an organisational context, where the sharing of knowledge cannot realistically be achieved through chance remarks or opportunistic questions in tearoom or corridor interactions. In this context, large multi-layered and often disaggregated organisations, a structured and formal process is required, which in turn requires emphasis upon knowledge sharing using formal written rather than interview-style questions. In view of the fact that question structure is important it is appropriate to ask what impact question structure may have on the way that knowledge is shared in an organisation, and furthermore, how the structure of a question may impact a recipient's attitude towards the knowledge they receive.

3. Theoretical framework

The proposed framework is predicated upon the existence of a relationship between the articulation of an individual's knowledge and the attitude a recipient has towards the knowledge received. Three main constructs are derived from the literature: question structure; the recipient's attitude towards the knowledge received; and the source individual's attitude towards sharing their knowledge. The relationships between these constructs are represented in the theoretical framework (Figure 1).
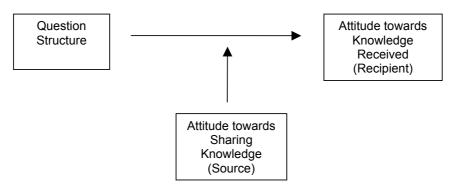

Figure 1: Theoretical Framework

The principal relationship is between the structure of the question asked and the impact this may have on a recipient's attitude towards the knowledge they receive. The framework proposes that this is potentially moderated by the attitude the source of knowledge may possess towards sharing their knowledge. Although the framework requires the source to have shared their knowledge, the quality of what the source shares may vary for example, with circumstance, environment, associations, and whether or not the recipient of the knowledge is known to the source.

The two attitudinal constructs in the theoretical framework, that of the source and that of the recipient are independent of each other. The framework proposes that when the individual who is a potential source of knowledge is presented with a question of a certain structure (e.g. closed, open-ended) to which they respond with their knowledge, then the structure of the question and the corresponding response will have an effect on the recipient's attitude towards the knowledge received. For example, if the source is confined to responding only to a closed ended question they may not be able to articulate all their knowledge and subsequently the response may not be complete. This incompleteness may result in a less than favourable attitude of the recipient towards the response since the response may not add value to the recipient's knowledge domain and or, organisational decision-making requirements. In contrast, if a recipient receives a response that is underpinned by an open structured question the attitude of the recipient may vary.

Without attempting to measure the behavioural act of the recipient using the newly acquired knowledge, as this would result in knowledge transfer rather than knowledge sharing, the framework proposes that a recipient can have an attitude toward the knowledge they receive. That is, the shared knowledge may be cognitively processed but not necessarily used until later, at a point in time when it is relevant and valuable to the recipient. Using the constructs of beliefs and attitude presented in the theory of reasoned action, an individual's attitude is said to be strongly correlated with their beliefs. Therefore, as suggested in the literature, a recipient's beliefs of perceived trustworthiness of the source (McEvily, et al. 2003) and the not-invented-here syndrome (Katz, et al. 1982) may assist understanding when examining attitude towards knowledge received. Further, since subjective norms are also considered to influence attitude (Ryu, et al. 2003), a recipient's perception of the prevailing organisational climate or the opinions of peers towards accepting the knowledge may also be significant.

Although the theoretical framework is underpinned by the a priori assumption that the recipient is already in possession of the knowledge and therefore the source has shared their knowledge, the attitude of the source towards sharing their knowledge is relevant and of importance. If the implicit suggestion in the knowledge literature that attitude factors and or, behavioural beliefs affect the quality or quantity of knowledge that the individual shares, then the act of sharing knowledge is in all likelihood subject to the source individual's attitude towards sharing their knowledge. Attitude towards sharing knowledge is influenced by behavioural beliefs such as the perceived trustworthiness of the source (Andrews, et al. 2000; McEvily, et al. 2003), will they act with integrity etc. Further, subjective norms such as the prevailing organisational climate towards sharing (Sveiby & Simons 2002) may also affect an individual's attitude towards sharing.

The theoretical framework proposed has support from the literature, but lays no claim to have included all possible factors or behavioural beliefs that may affect the source sharing or recipient accepting knowledge. Nonetheless, the framework provides a basis for both empirical research and further theoretical analysis.

4. Implications for the organisation

It is obvious that knowledge has to be shared in an organisation since no one individual can possess all knowledge. However, often the formal channels that are used to extract knowledge in organisations, such as reports, compliance, self-assessment and audit surveys fail to meet the expectations of those that commission them. Whilst some knowledge is extracted and shared, frequently the value of the responses to the recipient is less than that expected, making the recommendations or decisions the recipient is required to make difficult. Perhaps the wrong questions are being asked or maybe the structure of the questions limits the extent and depth of the responses.

The framework presented in this paper highlights a number of key issues that are relevant to organisations that wish enhance knowledge sharing amongst employees; and

there can be little doubt that question structure is both significant and important.

The use of closed questions (yes-no format) in audit and compliance surveys is a relatively straightforward way of collecting knowledge from large numbers of employees. But this format makes no provision for the situation where the correct and accurate response is neither "yes" nor "no"; and the respondent is faced with having to make a choice when neither response option is really applicable. All too often the option chosen reflects the respondent's perception of what the recipient expects, or what they perceive will have least future impact on them. The ramifications to organisational decision-making processes are self-evident. Not only has the knowledge sharing process been inhibited by the structure of the question asked, the recipients of the knowledge and the organisational decision-makers do not know that their knowledge is incomplete or of suspect value.

The attitudes and beliefs of both the employees that respond to the questions and those that receive the responses are also significant. If there is any disparity of trust between the two individuals then it is possible that the quality of what is shared and the willingness to accept the shared knowledge may also impede the knowledge sharing process and potentially impact organisational decision-making. Even when the source shares their knowledge, senior management may not be willing to accept knowledge they do not understand, or knowledge that they have not developed themselves. In an environment where knowledge of employees maybe key to sustainability, the challenge for organisations will be to assist employees to overcome such problems. Such a change is not only directed at the individual level, it must also be supported by the values of an organisation; does the culture promote knowledge sharing?

Organisational decision-makers are often faced with having to make non-programmed rather than programmed decisions. Whereas programmed decisions tend to follow established routines and guidelines and have the implicit assumption of continuity of environment (Senge 1990), non-programmed decisions require a response to an unpredictable or discontinuous environment where knowledge for decision-making is often incomplete. All too often, those that have the required knowledge are not asked to articulate their knowledge because the decision-makers

do not have the leadership skill of asking questions (Foster & Kaplan 2001). "Knowledge… is of little value if not supplied to the right people at the right time" (Teece 2000, p 38).

5. Conclusion

For many, the imperative that knowledge be shared is just plain commonsense in any organisational context. However, before an organisation can acquire new knowledge, it first must be articulated into a form that can be cognitively processed by others, a process that is often initiated by a chance question or remark. If, however, the prompt for the articulation and sharing of knowledge is initiated with a formal question, then the brief survey of the literature reported in this paper gives credence to the view that the structure of the question may impact both the response and the attitude of the recipient towards the knowledge received.

The inclusion of the attitudes of both the source and recipient of knowledge in the proposed framework is supported by empirical research into the validity and or applicability of the theory of reasoned action, which maintains that performing a behavioural act can be predicted by intention, pre-empted by attitude and beliefs. Then, from the perspective of the source of knowledge, beliefs surrounding trustworthiness and their perceptions of the prevailing organisational climate may influence attitude towards sharing knowledge given an organisational context. Further, the attitude of a recipient towards accepting knowledge may be strongly related to the beliefs, as described by their perception of the trustworthiness of the source of the knowledge, the relevance and value of the knowledge to their decision-making domain and their perception of the prevailing organisational climate to knowledge sharing inclusive of the not-invented here syndrome.

The proposed framework is not without its limitations. It does not allow, for example, for the circumstance where the source and recipient have reciprocity and can question each other to obtain clarification on knowledge already shared. Opportunities for reciprocity include face-to-face interviewing or discussion where the recipient can question the source for further knowledge and vice-versa, or email communication over a period of time, etc. However, not all knowledge sharing scenarios have such reciprocity opportunity. Responses to formal requests for a report or compliance, self-assessment or audit questionnaires often

only allow for knowledge to move in one direction, from the source to the recipient. If the questions comprising such questionnaires are not structured in a way that facilitates the sharing of knowledge by the source of the knowledge, then the quality and quantity of knowledge shared may not meet the expectations of the recipient thus impacting their attitude towards the knowledge received.

As organisations become increasingly more global in their focus and outlook, disaggregated and operating in a number of different time zones, the requirement for more structured approaches to knowledge sharing and extraction could well increase. At the same time the opportunities for the chance question or remark to initiate the articulation process are likely to diminish even with increased audio-video communication, primarily because such communication tends to be structured and not unstructured.

But overriding the above is the need for the right person to be asked the right question at the right time to extract the knowledge that is required for decision-making and strategy formulation in today's era of discontinuity engendered by globalisation. This cannot be left to opportunistic chance and question structure is a key element in sharing and transferring knowledge within an organisation to improve the prospects of knowledge-based competitive advantage.

6. Acknowledgements

References

Andrews, K. M. & Delahaye, B. L. (2000) "Influences on knowledge processes in organizational learning: The psychological filter", *Journal of Management Studies*, Vol 37, No.6, pp797-810.

Argote, L. & Ingram, P. (2000) "Knowledge transfer: A basis for competitive advantage in firms", *Organizational Behavior and Human Decision Processes*, Vol 82, No.1, pp150-169.

Bircham, J. (2003) "Personal Communication - Discussion about the results from an organisational compliance survey", Melbourne, Australia.

Bock, G. W. & Kim, Y.-G. (2002) "Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing", *Information Resources Management Journal*, Vol 15, No.2, pp14-22.

Chua, A. (2003) "Knowledge sharing: A game people play", *Aslib Proceedings*, Vol 55, No.3, pp117-129.

Cohen, W. M. & Levinthal, D. A. (1990) "Absorptive capacity: A new perspective on learning and innovation", *Administrative Science Quarterly*, Vol 35, pp128-152.

Darr, E. D. & Kurtzberg, T. R. (2000) "An investigation of partner similarity dimensions on knowledge transfer", *Organizational Behavior and Human Decision Processes*, Vol 82, No.1, pp28-44.

Davenport, T. & Prusak, L. (1998) *Working knowledge - How organisations manage what they know,* Harvard Business School Press, Boston, MA.

Dohrenwend, B. S. (1965) "Some effects of open and closed questions on respondents' answers", *Human Organization*, Vol 24, No.2, pp175-184.

Fishbein, M. & Ajzen, I. (1975) *Beliefs, Attitude, Intention and Behaviour: An Introduction to Theory and Research,* Addison-Wesley Publishing Company, Philippines.

Foddy, W. (1993) *Constructing questions for interviews and questionnaires: Theory and practice in social research,* Cambridge University Press,

Foss, N. J. & Pedersen, T. (2002) "Transferring knowledge in MNCs: The role of sources of subsidiary knowledge and organisational context", *Journal of International Management*, Vol 8, pp49-67.

Foster, R. & Kaplan, S. (2001) *Creative Destruction,* Double Day, New York.

Gupta, A. K. & Govindarajan, V. (2000) "Knowledge flows within multinational corporations", *Strategic Management Journal*, Vol 21, pp473-496.

Huemer, L., von Krogh, G. & Roos, J. (1998) "Knowledge and the concept of trust", in G. von Krogh, J. Roos and D. Kleine, *Knowing in firms: Understanding, managing and measuring knowledge,* SAGE Publications, London.

Husted, K. & Michailova, S. (2002) "Diagnosing and fighting knowledge-sharing hostility", *Organizational Dynamics*, Vol 31, No.1, pp60-73.

Kalling, T. (2003) "Organization-internal transfer of knowledge and the role of motivation: A qualitative case study", *Knowledge and Process Management*, Vol 10, No.2, pp115-126.

Katz, R. & Allen, T. J. (1982) "Investigating the not invented here (NIH) syndrome: A look

at the performance, tenure, and communication patterns of 50 R&D project groups", *R&D Management*, Vol 12, No.1, pp7-19.

Knippen, J. T. & Green, T. B. (1999) "Clarifying communication", *Journal of Workplace Learning*, Vol 11, No.5, pp161-163.

Lloyd, B. (2002) "Leadership and knowledge management", *Leadership & Organization Development Journal*, Vol 23, No.5, pp11.

Lubit, R. (2001) "Tacit knowledge and knowledge management: The keys to sustainable competitive advantage", *Organizational Dynamics*, Vol 29, No.4, pp164-178.

McDermott, R. & O'Dell, C. (2001) "Overcoming cultural barriers to sharing knowledge", *Journal of Knowledge Management*, Vol 5, No.1, pp76-85.

McEvily, B., Perrone, V. & Zaheer, A. (2003) "Trust as an organizing principle", *Organization Science*, Vol 14, No.1, pp91-103.

McEvily, S. & Chakravarthy, B. (2002) "The persistence of knowledge-based advantage: An empirical test for product performance and technological knowledge", *Strategic Management Journal*, Vol 23, pp285-305.

Meso, P., Troutt, M., D & Rudnicka, J. (2002) "A review of naturalistic decision making research with implications for knowledge management", *Journal of Knowledge Management*, Vol 6, No.1, pp63-73.

Nahapiet, J. & Ghoshal, S. (1998) "Social capital, intellectual capital, and the organizational advantage", *Academy of Management Review*, Vol 23, No.2, pp242-266.

Okhuysen, G. A. & Eisenhardt, K. M. (2002) "Integrating knowledge is groups: How formal interventions enable flexibility",

Organization Science, Vol 13, No.4, pp379-386.

Ryu, S., Hee Ho, S. & Han, I. (2003) "Knowledge sharing behavior of physicians in hospitals", *Expert Systems with Applications*, Vol 25, pp113-122.

Schulz, M. (2003) "Pathways of relevance: Exploring inflows of knowledge into subunits of multinational corporations", *Organization Science*, Vol 14, No.4, pp440-459.

Schuman, H. & Presser, S. (1979) "The open and closed question", *American Sociological Review*, Vol 44, pp692-712.

Senge, P. (1990) *The fifth discipline,* Random House, Sydney, Australia.

Simonin, B. L. (1999) "Ambiguity and the process of knowledge transfer in strategic alliances", *Strategic Management Journal*, Vol 20, pp595-623.

Spender, J.-C. & Grant, R. (1996) "Knowledge and the firm: Overview", *Strategic Management Journal*, Vol 17, No.Winter Special Issue, pp5-9.

Sveiby, K.-E. & Simons, R. (2002) "Collaborative climate and effectiveness of knowledge work - an empirical study", *Journal of Knowledge Management*, Vol 6, No.5, pp420-433.

Szulanski, G. (1996) "Exploring internal stickiness: impediments to the transfer of best practice within the firm", *Strategic Management Journal*, Vol 17, No.Winter Special Issue, pp27-43.

Teece, D. J. (2000) "Strategies for managing knowledge assets: The role of firm structure and industrial content", *Long Range Planning*, Vol 33, pp35-54.

Vinten, G. (1995) "Open versus closed questions - an open issue?" *Management Decision*, Vol 33, No.4, pp27-31.