

Exploring the dichotomies within the tacit knowledge literature: towards a process of tacit knowing in organizations

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Abstract

Purpose – The purpose of this paper is to critically examine the definition and conception of tacit knowledge in existing peer reviewed literature and to suggest how research agendas can be established to clarify understanding for praxis.

Design/methodology/approach – The methodology involved an in-depth literature review of tacit knowledge as part of the knowledge management discourse.

Findings – There is considerable disagreement in the literature over the definition and role of tacit knowledge in management studies and organizations. These polemics are reflected in a lack of systematic research agendas being established. Conversely the more meta level concept of knowledge management has been the subject of an increasing amount of research. However, it is suggested that an improved understanding of tacit knowledge is needed to underpin and further develop the knowledge management discourse. From the literature the concept of tacit knowing is advanced as a means for establishing research agendas and improving understanding in praxis, within the tacit knowledge domain. This approach enables definitional differences to be further probed along with the role and purpose of tacit knowledge within organizations.

Practical implications – The paper suggests a number of ways in which tacit knowledge can be developed in organizations at organizational, group and individual levels.

Originality/value – The paper shows how the concept of tacit knowing can help in understanding the dichotomies within the tacit knowledge literature and in advancing understanding of the subject.

Keywords Tacit knowledge, Literature

Paper type Research paper

Introduction

Central to effective knowledge management, as a source of competitiveness, is an appreciation of the skills and processes involved in the application, communication, development and retention of tacit knowledge in the work place. Much of the knowledge employee's gain through experience is not recorded, shared or effectively used (Leonard and Sensiper, 1998; Kreiner, 2002; Zack, 1999; Tsoukas, 2003).

Nelson and Winter (1982) suggest that tacit, subjective, idiosyncratic knowledge which individual actors hold is the kind of knowledge that is important for understanding organizational routines. The tacit dimension of knowledge has been highlighted in difficulties related to sharing and understanding in organizations (Zack, 1999; Tsoukas, 2003). Factors such as perception of management's support, trust (Huemer *et al.*, 1998; Connelly, 2000), reward structures, organizational status differentials (Connelly, 2000), leadership, social networks (Cross *et al.*, 2001) and organizational cultures have been linked with the sharing process.

Zack (1999) also suggests that a deeper understanding of difficulties associated with sharing and working with tacit knowledge, needs to be obtained for organizations to realize the value of tacit knowledge. Existing empirical research on tacit knowledge has been

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technologically driven; there is a need to explore the people dimension. Hence, there is a need to clarify the role of enablers and barriers for knowledge sharing (Ichijo *et al.*, 1998).

The aims of this paper are to critically examine the definition and conception of tacit knowledge in existing literature and to suggest how research agendas can be established to clarify understanding for praxis.

The importance of tacit knowledge

This ability to create knowledge and to continue to learn from it can become a competitive advantage because interactive knowledge developed today will become the core knowledge of tomorrow (Zack, 1999).

Grant (1996) asserts that knowledge, and notably tacit knowledge, is an organization's most strategically significant resource. Sobol and Lei (1994) and Nonaka (1991) also indicate that tacit knowledge is the most strategically-important resource of the firm and that it will become the only renewable and sustainable base for an organization's activities and competitiveness.

Brown and Duguid (1998) suggest “an organization's core competency is more than the explicit knowledge of “know-what.” it requires “tacit know how” to put “know-what” into practice. Moreover, Lawson and Lorenzi (1999) state “explicit knowledge is for everyone to find and use but tacit knowledge separates the masters from the common”. Current literature on knowledge emphasizes the importance of tacit knowing not only as a form of competitive advantage and as strategy (Johannessen *et al.*, 2001) but also as related to learning (Lam, 2000), innovation (Lam, 2000) and product development (Kreiner, 2002).

Wagner (1987) states that the ability to acquire and manage tacit knowledge is hallmarks of managerial success. Opportunities to use tacit knowledge are prime factors in attracting and maintaining a talented and productive workforce. Reportedly, 90 percent of the knowledge in any organization is embedded and synthesized in tacit form (Wah, 1999b). Most tacit knowledge is an invisible line item in corporate budgets. However, it is tacit knowledge that plays a key role in leveraging the overall effectiveness of knowledge in organizations (Wah, 1999).

Until recently tacit knowledge has been overlooked or toned down in relation to organizational competitiveness, by academics, managers and policy-makers (see Sveiby, 1997; Howells, 1996; Fleck, 1996). Howells (1996, p. 91) states:

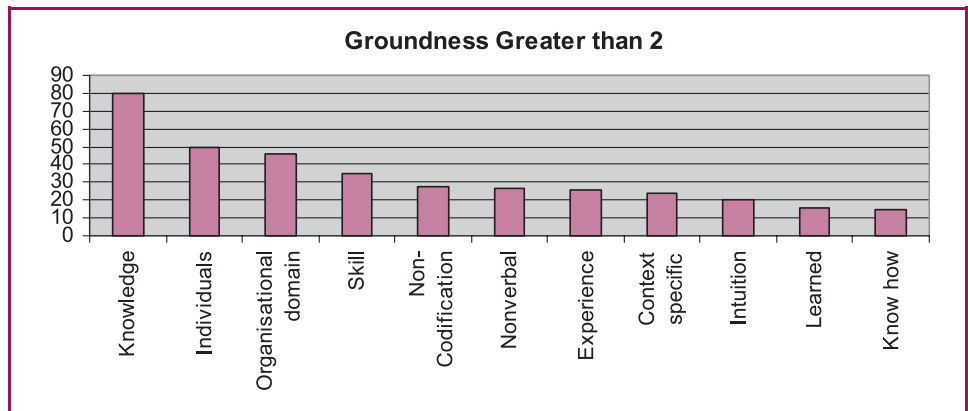
Just as technological innovation up until the 1960s was treated as an unexplained variance in economic growth and performance, so tacit knowledge as an element within technological innovation has, until recently, been seen in a similar way.

However, Nonaka (1994), Nonaka and Takeuchi (1995) and Grant (1996) suggest that tacit knowledge is increasingly being “recognized as playing a key role in firm growth and economic competitiveness” (Howells, 1996, p. 91).

Definitions and understanding of tacit knowledge

In seeking to understand the phenomena of tacit knowledge and the work that has already been conducted in this field the authors analyzed the interpretations of tacit knowledge in a range of business and management journals. The following definitions are the most widely cited, in descending order of appearance in the literature. The terms given are subjectively coded “themes” that have been derived from the literature. The main reoccurring themes are summarized in Figure 1.

Figure 1 Tacit knowledge descriptors in the literature



It can be noted from the codes above that tacit knowledge is typically individualistic (50 instances) (beliefs (6); oneself (3)), it is heavily organizationally based (46), it is directly related at least to skill (35) and it is context specific (24). Furthermore it tends to be practically (9) rather than theoretically oriented in nature (practice (7); learning by doing (6); learning by using (3); practical intelligence (3)), and given the nature of human competition, it is acquired in conditions of low environmental support (7) (Sternberg *et al.*, 1995), which leads to it being used for competitive advantage (3). Many of the concepts in the list attempt to define tacit knowledge (e.g. knowledge, not-codified, know how, experience, non verbal) and relate to its nature (e.g. learned, action, behavior, not easily communicated).

Knowledge has a number of dimensions, including explicit, implicit, and tacit. By suggesting that “we can know more than we can tell”. In research studies from a variety of disciplines, tacit knowledge has been characterized as follows: personal, difficult to articulate fully, experience based, contextualized, job specific, held within, both known and unknown to the holder, transferred through conversation and narrative, and capable of becoming explicit knowledge and vice versa (Gourlay, 2002, 2004).

Tacit knowledge is defined as “being understood without being openly expressed” or knowledge for which we have no words. Tacit knowledge is automatic, requires little or no time or thought and helps determine how organizations make decisions and influence the collective behavior of their members. This highly personal, subjective form of knowledge is usually informal and can be inferred from the statements of others (Sternberg, 1997). Therefore, tacit knowledge tends to be localized and is not found in manuals, books databases or files.

Tacit knowledge is also technical or cognitive and is made up of mental models, values, beliefs, perceptions, insights and assumptions. Moreover it is demonstrated when someone masters a specific body of knowledge or uses skills like those gradually developed by master craftsmen. Cognitive tacit knowledge incorporates implicit mental models and perceptions that are so ingrained that they are taken for granted. Cognitive models help in the process of sensemaking. People use metaphors, analogies, demonstrations and stories to convey their tacit knowledge to others. Tacit knowledge as context is often easier to remember and talk about than explicit knowledge or content (Wah, 1999)

Tacit knowledge, the knowledge that workers possess but do not articulate, is associated with terms such as “skill,” “know-how,” “working knowledge,” and “expertise” that are used to describe knowledge about and ability to perform work. Learning that takes place through apprenticeships draws heavily on tacit knowledge. It has been connected with informal learning and organizational learning (Collis and Winnips, 2002). Recently, its role in knowledge management has been explored (Gourlay, 2002, 2004).

From his review of the literature, Gourlay (2002, 2004) identifies two issues associated with tacit knowledge. The first is whether tacit knowledge is an individual trait or a trait that can be

shared by both individuals and groups, and the second is whether tacit knowledge can be made explicit. To some degree these issues are interconnected, as one of the goals of making tacit knowledge explicit is to enable it to be shared throughout the organization. Sternberg and his colleagues “view all tacit knowledge simply as knowledge that has not been made explicit” (Gourlay, 2002, p. 7). Tacit knowledge needs to be made explicit if it is to be used in knowledge management systems. Instead of “extract[ing] knowledge from within the employees to create new explicit knowledge artefacts,” organizations should focus on creating a “knowledge culture” that encourages learning and the creation and sharing of knowledge (p. 1014). Bordum views the move to capture tacit knowledge in knowledge management systems as an exercise of power by managers over workers.

Hager and Farrell suggest that tacit knowledge is an ambiguous concept, and in many cases labeling something as being tacit knowledge only renames a problem and therefore closes off further inquiry. Farrell discusses how globalization with its emphasis on a knowledge economy is leading to the redesign and standardization of local practices in many workplaces. When this happens, local knowledge, much of which is tacit, is discounted.

In summary, tacit knowledge is an important element in work and workplace learning and needs to be examined closely in terms of how it is incorporated into organizational practices.

Sternberg, in his work on practical intelligence (Sternberg *et al.*, 2000; Wagner and Sternberg, 1986), proposes a definition of tacit knowledge that has three characteristics which present a useful starting point for the study of tacit knowledge:

1. It is acquired with little or no environmental support.
2. It is procedural.
3. It is practically useful.

Sternberg’s definition of tacit knowledge suggests that tacit knowledge “generally is acquired on one’s own” (Sternberg *et al.*, 2000, p. 107). The reasoning behind this limitation is that if outside sources facilitate the acquisition of knowledge, the sources also engage in some sort of selective encoding, selective combination, or selective comparison. Sternberg *et al.* (2000) suggests that knowledge is most robust when learners engage in these three acquisition processes on their own and suggests that some explicit learning environments may actually decrease the likelihood and extent of the acquisition of tacit knowledge. Furthermore, they report that they found that procedural knowledge is a superset of tacit knowledge.

All tacit knowledge is procedural, although not all procedural knowledge is tacit (Sternberg *et al.*, 2000, p. 108).

In summary, they suggest that tacit knowledge is acquired through first-hand experience, and the subtleties of this experience are what add depth and robustness to the tacit knowledge.

For the purpose of this paper it is necessary to have a workable definition of tacit knowledge. Taking cognizance of the literature a working definition is as follows:

Tacit knowledge – knowledge-in-practice developed from direct experience and action; highly pragmatic and situation specific; subconsciously understood and applied; difficult to articulate; usually shared through interactive conversation and shared experience.

Issues and dichotomies within the tacit knowledge literature

There is widespread agreement that tacit knowledge is an important phenomenon. Nonaka and his colleagues regard it as the root of all organizational knowledge (Nonaka and Takeuchi, 1995, Gourlay, 2003). Collins (2001) regards tacit knowledge as being fundamental to all human knowing and knowledge. Beyond such general agreement however there are important differences of opinion over many key aspects of tacit knowledge, such as the level at which it is manifested, how it is acquired, what its function is, and whether or not it can be made explicit in organizations.

“ Knowledge has a number of dimensions, including explicit, implicit, and tacit. ”

Conceptual differences

Polanyi put tacit knowledge on the agenda with his dictum that “we know more than we can tell” (Polanyi, 1966). In general, tacit knowledge is seen as being one of two types of knowledge, the other being explicit knowledge. It has been suggested that one of the central dynamics of knowledge creation is the transformation of knowledge from tacit to explicit (Nonaka and Takeuchi, 1995). However, as pointed out by Brown and Duguid (2001), Polanyi’s original conception of tacit knowledge was that tacit knowledge was not a separate category of knowledge; rather it is an integral part of all knowing. Thus a key dichotomy in the tacit knowledge literature exists. Are tacit and explicit knowledge two separate types of knowledge as suggested by (Nonaka and Takeuchi, 1995) or as Polanyi (1966) argues two dimensions of one?

Knowledge can be viewed as a spectrum where one extreme is seen as completely tacit and implicit knowledge and the other as completely explicit or codified knowledge (Leonard and Sensiper, 1998; Augier *et al.*, 1999). Knowledge resources have pertinently been described as an iceberg (Ancori *et al.*, 2000). The structured, explicit knowledge is the visible top of the iceberg. This part of the knowledge resource is easy to find and recognize and therefore also easier to share. Beneath the surface, invisible and hard to express, the hidden part symbolizes the tacit knowledge resources. Polanyi (1966) expressed this, as “we know more than we can express”. Brockmann and Anthony (1998) expressed that structured and explicit knowledge is important; however to achieve excellence in a job one has to master higher levels of knowledge, namely, the unstructured and intangible tacit knowing.

As outlined, knowledge can be categorized in two different categories: explicit and tacit knowledge (Nonaka and Takeuchi, 1995). Explicit knowledge can relatively easily be formulated by means of symbols and can be digitalized. Thus, this knowledge can thus with relative ease be transferred to others (for example the use of information technology). Tacit knowledge (Polanyi, 1958, 1966) is entrained in action (practice) and is linked to specific contexts. This knowledge is difficult to communicate to others as information, and can at best be difficult to codify and quantify. Tacit knowledge is defined by Howells (1996, p. 92) as:

Non-codified, disembodied know-how that is acquired via the informal take-up of learned behavior and procedures . . . tacit knowledge does not involve the generation and acquisition of tangible products and processes, or the more formal element of intangible knowledge flows associated with specific research, technical or training programs.

Fleck (1996, p. 119) describes tacit knowledge as:

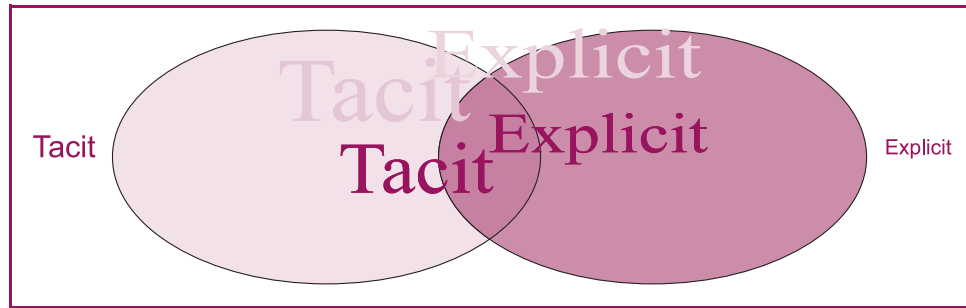
A subtle level of understanding often difficult to put into words, a trained recognition and perception, a good feeling for the technology. This form of knowledge is wholly embodied in the individual, rooted in practice and experience, expressed through skilful execution, and transmitted by apprenticeship and training through watching and doing forms of learning.

Polanyi’s theory about tacit knowledge (see Polanyi, 1958, 1966) describes how individuals develop and use knowledge in a processual and action-oriented manner.

If one was to accept the view of Polanyi (1966) and Tsoukas (2003) that all knowledge is tacit rooted then it is logically to assume that explicit and tacit knowledge are two dimensions of knowledge (Figure 2), rather than two distinct categories of knowledge as suggested by Nonaka and Takeuchi (1995).

Polanyi (1966) argues that tacit knowledge belongs to the personal domain, but is still embodied in the meeting between the individual and the culture he/she belongs to. This view

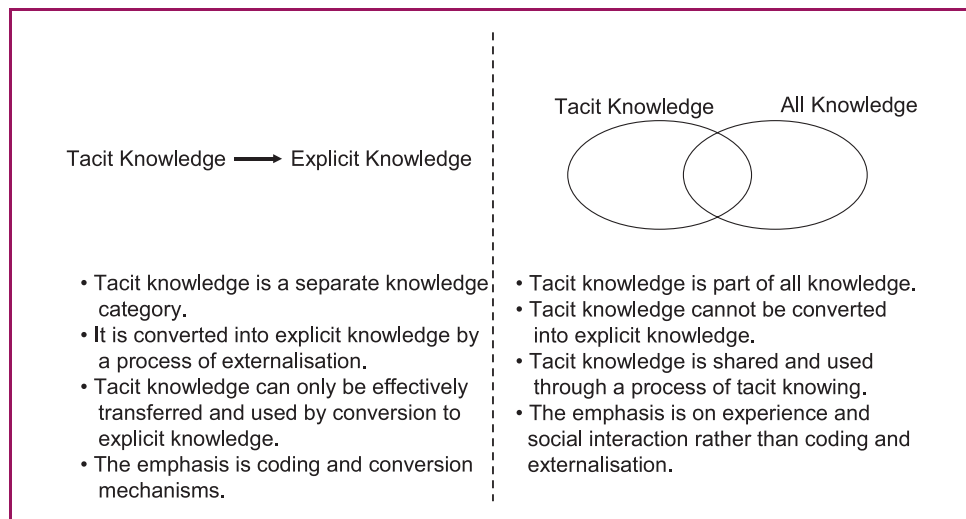
Figure 2 Explicit and tacit knowledge as two dimensions of knowledge



supports that of Vygotsky (1978, 1986) who suggested that all knowledge is social in some way (and hence has tacit roots), and is thus contingent on social structures existing in social systems. Moreover, Vygotsky views knowledge as existing in the collective structure existing in social systems (Figure 3 – right hand side). Therefore tacit knowledge cannot be studied without regard to the explicit part of the knowledge base (Senker and Faulkner, 1992).

Tsoukas (1995), also, building on Polanyi, claims that tacit and explicit knowledge are mutually constituted, or two dimensions of knowledge (Figure 2) and should not be viewed at two separate types of knowledge. In a critique of Nonaka, Tsoukas further argues that tacit knowledge is not explicit knowledge internalized. Rather, tacit knowledge is inseparable from explicit knowledge since tacit knowledge is the necessary component of all knowledge. Tsoukas considers that the two are so inseparably related that to even try to separate the two is impractical. All articulated knowledge is based as an unarticulated and tacitly accepted background of social practices. He suggests that we come to know the unarticulated background by being socialized into a practice and thereby internalizing an understanding that is not only cognitive but also embodied. It is useful to treat tacit knowledge separate from explicit knowledge, only so long as the two are seen as two separate aspects or dimensions of knowledge and not as different types or categories of knowledge. Polanyi's understanding of tacit knowledge is related both to the society in with one acts and to personal interests and commitments. Individuals are socialized into a knowledge tradition that forms an unarticulated background for understanding. Experience in the environment is interpreted in the light of tradition, where tradition is merged with personal interests and experience, Polanyi refers to this tacit knowledge as personal knowledge. Therefore, the

Figure 3 Conceptual dichotomies of tacit knowledge



knowledge that is tacitly embedded in our tradition and culture can be used as an unarticulated background against which we distinguish events and context (Polanyi, 1958, 1962). Understanding requires familiarity with both concepts and the context. This understanding, which is tacit gives meaning to words and actions and thus all knowledge has an intrinsic tacit dimension. This view implies that treating tacit and explicit knowledge as two separate components of knowledge (Figure 3 – left hand side) could lead to oversimplification and a lack of emphasis on developing tacit knowledge through experience and action.

In contrast to Polanyi's view, Nonaka and Takeuchi (1995) separate the definitions of tacit and explicit knowledge (Figure 3 – left hand side) and use the distinction to explain how an interaction between the two categories forms a knowledge spiral, where explicit knowledge is shared through a combination process and becomes tacit through internalization. Tacit knowledge from this perspective is shared through a socialization process and becomes explicit through externalization. Although referring to and building on the arguments of Polanyi, different scholars come to contradictory conclusions. Cook and Brown (1999) argue, in what they claim is in agreement with Polanyi, that "explicit and tacit are two distinct forms of knowledge (i.e. neither is a variant of the other), and that one form cannot be made out of or changed into the other" (ibid. p. 384).

Nonaka's model ignores the essential ineffability of tacit knowledge and is unsustainable as it oversimplifies the tacit dimension of all knowledge (Figure 2). The emphasis should not be on the need to convert tacit to explicit knowledge; rather there is a need to start recursively drawing our attention to how we draw each other's attention to events and phenomena to assimilate and develop tacit knowledge. There is not so much a need to operationalize tacit knowledge as there is to find new ways of talking, fresh forms of interacting, and novel ways of distinguishing and connecting.

Groups or individuals?

Choo (1998, pp. 111-119) distinguished between Polanyi's type of tacit knowledge in individuals, and a similar phenomenon that is a characteristic of groups. In viewing the limitations of existing theories and supporting, Davenport and Prusak (1998) and Zack (1999) suggest, that despite the recognized importance of tacit knowledge it is still largely unexplored and not fully understood compared to work on explicit knowledge at group or individual level. Zack (1999) argues that there is a need for managers to identify and manage tacit knowledge as current research in the area has failed in enhancing understanding of the nature of tacit knowledge in individuals and groups. He also suggests that a deeper understanding of externalization and diffusion of tacit knowledge must be obtained for organizations to effectively use tacit knowledge resources.

While Polanyi addressed tacit knowledge at an Individual level, others have suggested it exists within group settings. Nelson and Winter (1982) suggest that organizations maintain their structure and coherency through tacit knowledge embedded in organization routines and employees.

It is argued that the emphasis should be on developing and demonstrating tacit knowledge (Figure 3 – right hand side), rather than on that of capture and coding. It cannot be captured- it can only be demonstrated through our expressible knowledge and through our acts. Tacit knowledge is a backdrop against which all actions are understood.

Sharing tacit knowledge

The conceptual differences in relation to tacit knowledge give rise to different approaches to sharing tacit knowledge. There are two different schools of thought regarding externalization and codification of tacit knowledge. One view espouses that tacit knowledge must be made explicit for sharing and another that regards tacit knowledge as always being tacit. For example, Nonaka and Konno (1998) assert that converting tacit knowledge to explicit knowledge using a process of externalization before sharing can take place. However, Polanyi (1966) suggest that to be able to share tacit knowledge the possessor of it must first become conscious of the knowledge he/she possesses and then find a way to express the

knowledge. Only after this occurs can a sharing of knowledge take place. They suggest that many of the traditional methods of knowledge sharing are not suited to this approach.

Irrespective of the need of externalization in sharing tacit knowledge there is an agreement in the literature that tacit knowledge diffusion is more difficult than the sharing of explicit knowledge. Many of the existing methods for knowledge sharing in organizations assume an overly mechanistic or coded view of tacit knowledge and how it is shared (Brockmann and Anthony, 1998). Tacit knowledge cannot be taught, trained or educated (Brockmann and Anthony, 1998), it can only be learned and facilitated.

How is tacit knowledge shared in organizations? What are the methods experts use to share their tacit knowledge? Are there ways to surmount the difficulties and make use of the hidden part of the iceberg of knowledge resources in organizations? The arguments are summarized as follows:

- the explicit knowledge of “know-what” requires the more tacit “know-how” to put the “know-what” form into practice (Brown and Duguid, 1998);
- the efficiency of making decisions, serving customers or producing goods is improved by the use of tacit knowledge (Brockmann and Anthony, 1998; Bennett, 1998); and
- the diffusion of tacit knowledge to resolve the problem of “reinventing the wheel” which occurs when one staff leave the company.

Function of tacit knowledge in organizations

Discussion of the role or function of tacit knowledge also reveals important ambiguities. On the one hand tacit knowledge is said to be essential for competent performance in concrete situations (“practical intelligence” – Wagner and Sternberg, 1986, p. 51), to enable individuals to deal with new situations, and to fill in the gaps in formal training (Horvath *et al.*, 1999; Argyris, 1999; Collins, 2001a, b). These issues suggest that tacit knowledge facilitates adaptation to new situations particularly since it enables people to act quickly and become more agile and responsive to changing conditions (Josefson, 1988, p. 26; Herbig *et al.*, 2001, pp. 688-690). On the other hand, in so far as tacit knowledge stems from experience (Torff, 1999) then implicitly it could hinder radical change where existing norms are no longer relevant since such knowledge is relatively fixed. Argyris in particular notes the contradictory duality of tacit knowledge suggesting it is both the basis of successful management, and of defensive routines (Argyris, 1999, p. 123).

Similar contradictions can be seen at the organizational level. Some writers view tacit knowledge as the source of all knowledge, and particularly of innovative ideas, in organizations (Nonaka, 1991; Ichijo *et al.*, 1998, p. 180; Nonaka and Takeuchi, 1995) and for others it is the source of sustained competitive advantage (Ambrosini and Bowman, 2001; Baumard, 1999; Choo, 1998; Johannessen *et al.*, 2001). Others, however, note that it in so far as it is manifested in traditions, tacit knowledge is a conservative rather than an innovative force (Johannessen *et al.*, 2001, p. 11; Fleck, 1996, cited in Johannessen *et al.*, 2001). However, it may be because it is conservative and tradition-bound that tacit knowledge can be a source of sustainable competitive advantage because traditions cannot easily be copied.

Difficulties in regard to the use of tacit knowledge include the fact that it is by definition personal and context based, that the holder might stand to lose by making it explicit, and that explication requires a supportive environment involving trust and appropriate organizational structures (Torff, 1999, p. 195; Fleck, 1996 quoted in Johannessen *et al.*, 2001, p. 4; Spender, 1996, p. 58; Nonaka and Takeuchi, 1995; Wagner and Sternberg, 1986; Wagner and Sternberg, 1991).

In the light of the conceptual difficulties with tacit knowledge it is not surprising to find claims that the notion is under-specified, that it carries too many meanings, or that we only have a nascent understanding of tacit knowledge, and that it resists operationalization (Ambrosini and Bowman, 2001, p. 811; Leonard and Sensiper, 1998, p. 127; Spender, 1996, p. 58).

“Tacit knowledge is an important element in work and workplace learning and needs to be examined closely in terms of how it is incorporated into organizational practices.”

There is general agreement that tacit knowledge is acquired through an individual's direct experience of whatever their tacit knowledge concerns (Herbig *et al.*, 2001, pp. 688-690). At work, for example, on the job training and informal learning are important means of acquisition (Wagner *et al.*, 1999, p. 157).

There is widespread agreement that personal contact with and observation of others is critical factors in its acquisition (Collins, 2001a, b; Leonard and Sensiper, 1998, pp. 121-124). While little is usually said about what “personal contact” means, detailed accounts (Cook and Brown, 1999, 391 ff.; see also Collins, 2001a, pp. 74-79) suggest a complex iterative process of acting on the materials or processes being transformed, working with others more expert in the field and receiving their judgment on organizational transformation efforts.

Towards tacit knowing

“Knowledge is an activity which would be better described as a process of knowing” (Polanyi, 1969a, p. 132). Polanyi wrote of “tacit knowing” as a process focusing on the operationalization or “how to” of tacit knowledge, rather than emphasizing what is tacit knowledge. His emphasis on process as a perspective on tacit knowing can provide a useful framework for conceptual and empirical work specifically in relation to developing understanding and sharing of tacit knowledge (Gill, 2000). Polanyi concluded that scientific discovery is due to “the tacit powers of the mind and its content . . . can only be tacitly known”. “Tacit knowing” is thus a “tacit power”, an “act of integration” or perhaps more specifically the power of perceiving coherence among thousands of clues. It is a fundamental power of the mind (Polanyi, 1969, p. 156). In summary, Polanyi has drawn attention to knowing, an activity, which other writers also suggest should be the focus of tacit knowledge studies (Blackler, 1995).

There is agreement in the literature that tacit knowing is highly personal (among others Davenport and Prusak, 1998; Gore and Gore, 1999; Wagner and Sternberg, 1985; Nonaka and Konno, 1998) abstract (among others Polanyi, 1958, 1966; Lubit, 2001) and difficult to express (among others Polanyi, 1958, 1966; Boisot, 1995; Lubit, 2001; Nonaka and Konno, 1998; Wagner, 1987). There is also agreement on the difficulty of tacit knowledge sharing is acknowledged among groups and individuals (Polanyi, 1966; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998; Bennett and Gabriel, 1999; Leonard and Sensiper, 1998; Zack, 1999; Holtshouse, 1998).

Experience is also identified as being a main source of tacit knowledge creation (Polanyi, 1958; Nonaka and Takeuchi, 1995; Augier *et al.*, 1999; Wagner and Sternberg, 1985). It is suggested that tacit knowing should be related more to practical actions, rather than focusing on tacit knowledge definitions (Wagner and Sternberg, 1986).

Epitomes of tacit knowledge

Horvath *et al.* (1999) suggests that identifying subtypes of tacit knowledge could be used to optimize or tune approaches to knowledge management. Subtypes used in this paper are epitomes of tacit knowledge. In everyday life different forms of epitomes for tacit knowledge are used. These epitomes are artifacts to help us articulate the diffuseness of tacit knowing to make it more explicit (Haldin-Herrgard, 2003).

These epitomes can be used to increase understanding in regard to tacit knowing (see Giunipero *et al.*, 1999; Somech and Bogler, 1999).

The literature review has revealed different epitomes of tacit knowledge used.

The most frequently used epitomes of tacit knowledge were as follows (Figure 4):

- Intuition (Augier *et al.*, 1999; Leonard and Sensiper, 1998; Sternberg and Horvath, 1999; Durrance, 1998; Giunipero *et al.*, 1999; O'Dell and Grayson, 1998; Saint-Onge, 1996; Cook and Brown, 1999).
- Skills (Polanyi, 1966; Augier *et al.*, 1999; Bennett and Gabriel, 1999; Brockmann and Anthony, 1998; Nonaka and Takeuchi, 1995; Cook and Brown, 1999).
- Insight (Leonard and Sensiper, 1998; Durrance, 1998; Giunipero *et al.*, 1999; Bennett and Gabriel, 1999; Brockmann and Anthony, 1998; Brown and Duguid, 1998).
- Know-how (Giunipero *et al.*, 1999; O'Dell and Grayson, 1998; Nonaka and Takeuchi, 1995; Brown and Duguid, 1998; Cook and Brown, 1999).
- Beliefs (Durrance, 1998; Saint-Onge, 1996, Nonaka and Takeuchi, 1995; Brown and Duguid, 1998).
- Mental models (Leonard and Sensiper, 1998; Durrance, 1998; Nonaka and Takeuchi, 1995; Gore and Gore, 1999).
- Practical intelligence (Giunipero *et al.*, 1999; Somech and Bogler, 1999).

Intuition is expressed as directly knowing or learning without conscious reasoning or making choices without formal analysis (Brockmann and Anthony, 1998). Related expressions to intuition are non-analytical behavior, automatic knowledge, or flashes of inspiration or insight.

Skills can include negotiation, physical, coordination or cognitive skills. This is perhaps the epitome that is most used without any form of definition. Some other terms such as ability, crafts and practical knowledge are closely related and often used in the same meaning.

Insight is used as understanding, often in a sudden form but also as "glimpses" into knowledge (one's own or others).

Know-how is often expressed as the ability to put know-what into work which is to great extent the product of experience (Brown and Duguid, 1998). It also includes practical and collective know-how.

Beliefs used as a set of understandings that reflect our perspective of the world.

Beliefs are expressed as opinions (Giunipero *et al.*, 1999) and sometimes as attitudes (Leonard and Sensiper, 1998; Brown and Duguid, 1998).

Mental models are cognitive structures formed by the abstractions of experience. They reflect our perspectives of the world around us (Giunipero *et al.*, 1999). Other epitomes of tacit knowledge like cognitive schemas; mental maps and schemas are used with similar meanings.

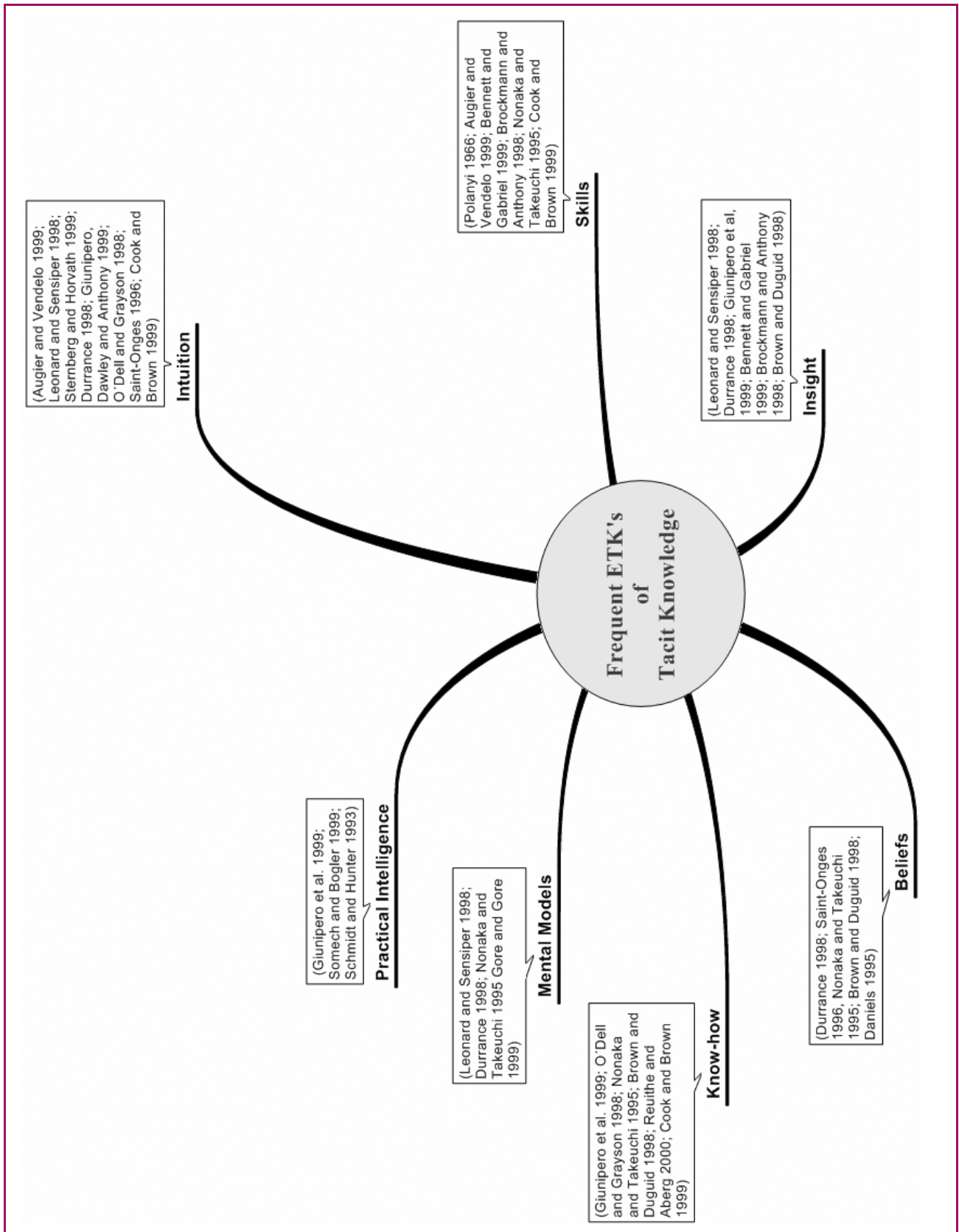
Practical intelligence is expressed as "a person's ability to apply components of intelligence to everyday life" (Somech and Bogler, 1999).

A distinctive feature of epitomes of tacit knowledge in the literature is difference in levels of abstraction. Another distinctive feature is based on the actors involved. Although tacit knowing usually is perceived as highly individual and personal many of the epitomes refer to more collective forms of tacit knowing.

Although the main characteristic of tacit knowing is tacitness as abstraction, it can be seen that the extent of abstraction varies from completely abstract to quite concrete in the concepts used. Several of the concepts can be considered abstract in the sense that they cannot be conveyed to others. Intuition is one of the most used epitomes of this category. Intuition as well as hunches, gut-feelings, "feelings", beliefs and mental-models, can not be tapped into by others than those involved in the specific situation and can therefore be considered intangible.

Other epitomes of tacit knowledge may in themselves be considered intangible but lead to more concrete results expressed in behavior or in the work outcomes. Examples are

Figure 4 Epitomes of tacit knowledge



insights, talent, judgment, rules-of-thumb, and practical intelligence. Although the knowledge in itself may be of abstract character it can appear in more tangible forms.

Although there are difficulties in articulating tacit knowing, high visibility can be seen in many of the epitomes. These epitomes can be considered highly visible both for individuals, groups and organizations. Examples are best-practice, skills, improvisation, instinctive reaction and ability.

Some epitomes of tacit knowledge include only the individual as an actor. The same feeling of intuition, insight, taste, artistic-vision, gut-feeling or hunch cannot be felt by more than one individual and it is impossible to transfer the same feeling to another actor. Epitomes of tacit knowledge like mental models, attitudes, know-how, judgment, skills and improvisations include not only individuals as actors but also teams and groups of actors. In teams shared mental models and a collective know-how developed by former and present member's know-how can also be found.

The practicality of tacit knowing is discussed by a number of writers (e.g. Tsoukas, 2003). This is reflected in a great variety of epitomes of tacit knowledge used in practical work. Most commonly used is know-how and skills including epitomes such as experience, best practice, rule-of-thumb and practical intelligence.

In research on tacit knowledge difficulties has been connected to the nature of tacit knowing. Characteristics like abstraction, difficulties to articulate, implicitness, individuality and practicality, all raise different difficulties to researchers studying tacit knowing. An extended concept of tacit knowing and its associated epitomes offers new possibilities to study tacit knowing. A conscious use of epitomes of tacit knowing can also be useful in methods including articulation, such as interviews. For example, an interview method based on epitomes of tacit knowledge is "cards on epitomes of tacit knowledge" (Haldin-Herrgard, 2003). The method, which has been based on epitomes of tacit knowledge, offers a means for collecting comprehensive and focused empirical material on the use, meaning and importance of tacit knowledge in organizations (Haldin-Herrgard, 2003).

A main difficulty in tacit knowledge management is the difficulty in diffusing and sharing tacit knowing. If tacit knowing is seen as less personal and abstract than we have earlier perceived and as including groups, then there are new possibilities to create methods that enhance tacit knowledge diffusion. Tacit knowing emphasizes the positive role social interaction and teamwork has in diffusion of tacit knowledge and also raises the possibility of developing methods based on expressive form other than that of articulation.

Building on existing theories of tacit knowledge and their limitations the review has highlighted the need for recognition of tacit knowing at a more practical level and the need to take responsibility for tacit knowing at individual, group and organization level. The view presented accepts the works of Baumard (1999) and Choo (1998) that tacit knowing exists at individual, group and organizational level. The argument presented is that recognizing and taking responsibility for tacit knowing and the barriers and enablers that exist in sharing tacit knowledge can enhance the process of sharing this knowledge.

Conclusions and recommendations

The review of the literature has identified two issues associated with tacit knowledge, which supports the views of Gourlay (2002, 2004). The first is whether tacit knowledge is an individual trait or a trait that can be shared by both individuals and groups, and the second is whether tacit knowledge can be made explicit.

Firstly, is tacit knowledge something that characterizes individuals, or both individuals and groups? Von Krogh and Roos (1995) provide conceptual arguments for tacit knowledge being wholly a trait of individuals. For Nonaka and Takeuchi (1995), it is a personal form of knowledge, but they also denote that groups can have shared tacit knowledge. Baumard (1999) argues that tacit knowledge can be both individual and collective.

The second issue concerns whether tacit knowledge can be made explicit. Von Krogh and Roos (1995) and Baumard (1999) state that it cannot be communicated. Nonaka (1994) states that it is difficult to make explicit.

To some degree these issues are interconnected, as one of the goals of making tacit knowledge explicit is to enable it to be shared throughout the organization (e.g. Collis and Winnips, 2002). Because Sternberg and his colleagues “view all tacit knowledge simply as knowledge that has not been made explicit” (Gourlay, 2002, 2004), they (Sternberg *et al.*, 2000) have developed ways to measure tacit knowledge.

If it is to be used in knowledge management systems, tacit knowledge needs to be made explicit. Bordum (2002) views the move to capture tacit knowledge in knowledge management systems as an exercise of power by managers over workers.

Other issues related to tacit knowledge have been raised by Hager (2000) and Farrell (2001). Hager suggests that tacit knowledge is an ambiguous concept, and in many cases labeling something tacit knowledge only renames a problem and therefore closes off further inquiry. Farrell discusses how globalization with its emphasis on a knowledge economy is leading to the redesign and standardization of local practices in many workplaces. When this happens, local knowledge, much of which is tacit, can be mistakenly discounted.

A growing body of academics support the view that in order to gain a deeper understanding of tacit knowledge one needs to explore further the barriers and enablers of its existence, rather than its conversion to explicit knowledge. It is recommended that managers keep abreast of current developments in the field of tacit knowledge to ensure that emergent themes are incorporated within their organizations at each of the levels suggested, namely corporate, group and individual. Ultimately, there is an opportunity to leverage this learning and development into increased innovation and competitiveness (Tsoukas, 2003; Lawson and Lorenzi, 1999).

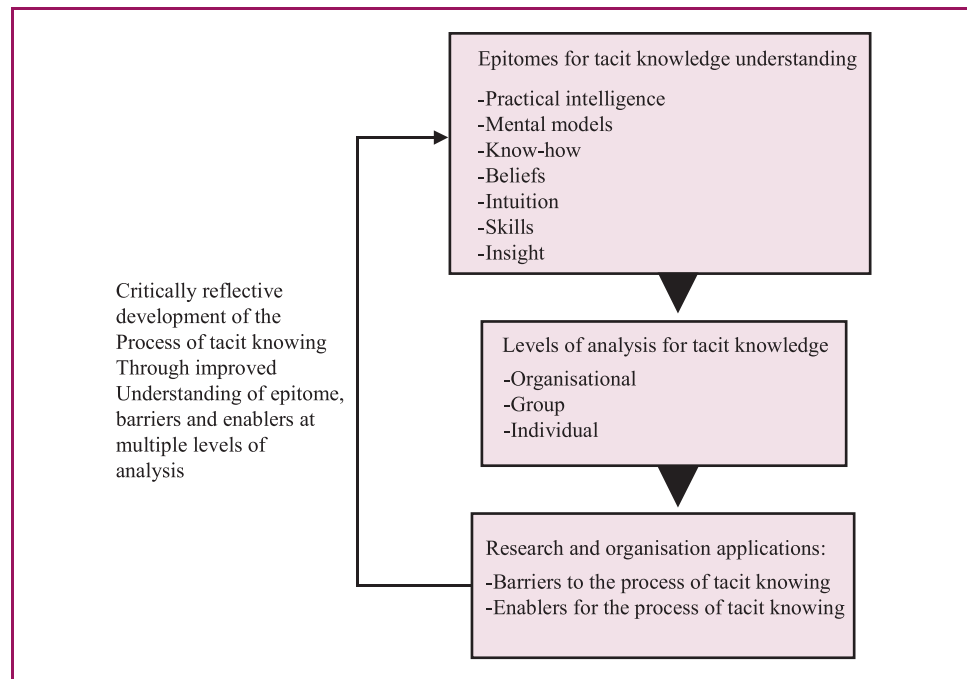
How is tacit knowledge diffused? Which are the methods experts use to share their tacit knowledge? Perhaps we then can find ways to surmount the difficulties and make use of the hidden part of the iceberg of knowledge resources in organizations? The arguments are summarized (Figure 3) as follows:

- The explicit knowledge of “know-what” requires the more tacit “know-how” to put the “know-what” form into practice (Brown and Duguid, 1998).
- The efficiency of making decisions, serving customers or producing goods is improved by the use of tacit knowledge (Brockmann and Anthony, 1998; Bennett, 1998).
- The diffusion of tacit knowledge to resolve the problem of “reinventing the wheel” which occurs when one staff leave the company.

Overall, there is a need for research studies and organizational applications of tacit knowledge, as represented in the conceptual diagram in Figure 5, which prompts the following questions:

- How is tacit knowledge currently understood in organizational practice?
- How can the epitomes of tacit knowledge be further developed and clarified to act as constructs for conceptualizing and applying tacit knowledge?
- What are the barriers and enablers to the process of tacit knowing at multiple levels of analysis (i.e. organizational, group and individual)?
- How can organizations become more effective in enabling tacit knowledge sharing and understanding?
- What mechanisms can be used to ensure that critically reflective learning takes place in organizations in relation to epitomes, barriers, enablers and the overall process of tacit knowing?

Figure 5 Conceptualizing the developing the process of tacit knowing in organizations



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