TACIT KNOWLEDGE AND CULTURE

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Tacit knowledge is characteristically unwritten, but may over time become articulated or codified depending on its nature. Because of the importance of the role tacit knowledge plays in both individual and organisational success, it is important that it's transfer be unhindered from a knowledge management point of view. Culture plays a part in knowledge transfer insofar as people tend typically to associate with others of similar background. We have conducted a series of case studies in a number of IT organisations to determine the extent to which culture affects the likelihood of tacit knowledge flows. Our findings indicate that where the organisation is highly multi-cultural, the likelihood of culture affecting tacit knowledge flows is limited. Nevertheless staff, where they do share a common culture, do generally associate with one another and this in turn may impede the free-flow of soft knowledge.

1 Introduction

Tacit knowledge is obviously contextual, yet at the same time is culturally influenced. Culture in this instance need not necessarily refer to the macro/country level, rather the role of culture is important even down at the ethnic level. For example in Finland much tacit knowledge is transferred in the sauna (Koskinen 2000). Understandably this has led to present-day difficulties as women begin to participate in business to the extent that business in Finland is now moving towards western style boardrooms. The complexity for modern western organisations in particular is to integrate the tacit knowledge backgrounds of their (often) highly multicultural staff. For "cross-cultural working involves the interaction of people whose tacit knowledge has been developed in different ways, and who have learnt different approaches to sense-reading and sense-giving. A necessary first condition for trying to facilitate effective cross-cultural working is to take these cultural differences seriously" (Walsham 2001 :606). Understanding whether culture influences the existence and transference of knowledge is important, as it will impact the applicability of a particular knowledge management strategy.

2 A background to culture and tacit knowledge

The majority of references relating to tacit knowledge literature from a cultural standpoint discuss the differences between western, typically Anglo-American, and eastern, meaning Japanese points of view. Certainly the Japanese approach towards knowledge management differs from a western one, from anything as taken for granted

as *nemawashi* (discussions behind the scenes) to agreement on contracts, which is typically tacit in the Japanese case, to more formally contracted in the U.S. example (Yamadori 1984). The differences in the cultures have also meant that Japanese car designers for example, but not their U.S. counterparts, were able to detect reasons why a vehicle had not been selling well because of the shape of it's grille and headlights (Leonard and Sensiper 1998). Another cultural example of tacit knowledge differences is given by way of Japanese work practices. The Japanese approach is to conduct a morning discussion session where staff are able to 'air' their viewpoints and transfer their tacit knowledge. Such an approach has often appeared to visiting U.S. staff as a waste of time (Nonaka and Takeuchi in Durrance 1998).

Japanese firms also appear to differ with respect to knowledge sharing at an intra – organisational level. The Japanese approach is often to involve many people. The western approach tends to reflect a 'need-to-know' basis, meaning that knowledge (both codified and more particularly tacit) is not so readily transmitted (Hamel 1991 in West and Meyer 1997). Certainly the Australian approach tends to follow the U.S. example. Meetings are conducted on the basis of only involving directly concerned personnel and information is typically transferred on a 'need-to-know' basis. From an articulate/codified knowledge point of view, this makes sense and indeed is practical given the 'information overload' of most professional personnel today. What we do not have sitting on our desks in front of us, we can easily acquire, either through libraries or the Internet. The disadvantage culturally within western spheres is that articulable tacit knowledge (the subset of tacit knowledge that is over time articulated, for example 'trade secrets' or 'street smarts') is not being transferred because of the codified knowledge management 'mindset'. At this stage we are beginning to see the role the organisation plays in regard to soft knowledge.

3 Culture's Role within the many Dimensions and Definitions of Tacit Knowledge

In seeking to understand the phenomena of tacit knowledge and the work that has already been conducted in this field we used grounded theory[1] to examine 68 recently published documents, which we placed in a hermeneutic unit.[2] We found the following definitions to be the most widely cited, in descending order of groundedness, that is to say appearance in the literature. The terms given are subjectively coded 'themes' that have been derived from the literature. The codes which have a groundedness of greater than 2 instances in the literature are as follows:

> Knowledge (80); Individuals (50); Organisational domain (46); Skill (35); Non-Codification (28); Non-verbal (27); Experience (26); Context specific (24); Intuition (20); Learned (16); Know how (15); Not

[1] A grounded theory is a theory that is induced from the data rather than preceding them (Lincoln & Guba 1985 in Cutcliffe 2000; Partington 2000).

[2] A hermeneutic unit is an entity encompassing *documents* worked on, *codes* created out of the documents, *families* of codes that are related, and *links* or *associations* between codes.

formal (13); Action (12); Expertise (11); Culture (10); Contingency based (9); Environment (9); Externalisation (9); Knowing (9); Not easily communicated (9); Practical (9); Sub-consciousness (9); Understanding (9); Cognitive (8), Internalisation (8); Mental models (8); Not directly taught (8); Not easily transmitted (8); Process (8); Abilities (7); Apprenticeship (7); Low environmental support (7); Management (7); Practice (7); Society (7); Two dimensional (7); Behaviour (6); Beliefs (6); Conscious (6); Direct contact (6); Face to face transfer (6); Goal attainment (6); Inferences (6); Learning by doing (6); Maxims (6); Non-awareness (6); Pattern recognition (6); Perceptions (6); Procedural in nature (6); Routine (6); Subjectivity (6); Tasks (6); Technology (6); Values (6); Common sense (5); Decision making (5); Embodied (5); Implicit (5); Implied (5); Information (5); Judgement (5); No idea (5); Not easily codifiable (5); Sharing (5); Taken for granted (5); Unconscious (5); Everyday situations (4); Interaction (4); Job knowledge (4); Know more than we can tell (4); Not easily formalised (4); Not formal instruction (4); Others (4); Physical control (4); Riding a bicycle (4); Rule (4); Schema (4); Time (4); Touch sensitivity (4); Wisdom (4); Abstraction (3); Access constraints (3); Awareness (3); Communal (3); Competitive advantage (3); Embedded (3); Emotions (3); Experientially established cognitive structures (3); Focal awareness (3); Groups (3); Holism (3); Ideals (3); Importance of language (3); Information retrieval (3); Insight (3); Learning by using (3); Meaning (3); Mind (3); Motor skills (3); Observation (3); Oneself (3); Particular uses/particular situations (3); Performance (3); Practical intelligence (3); Procedures (3); Resistance to revelation (3); Rules of thumb (3); Selective comparison (3); Semantics (3); Sense perception (3); Transmission (3).

The above list is not complete, and a significant number of codes remain that contain a groundedness of 1 and 2 instances in the literature (code total 1,310), which were considered too trivial for inclusion. It can be noted from the codes above that tacit knowledge is typically individualistic (50 instances) {beliefs (6); oneself (3)}, it is heavily organisationally 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's being used for competitive advantage (3). One other very important issue, is the need for understanding (9) {internalisation (8); others (4); awareness (3); meaning (3); oneself (3)} on the part of the receiver. Culture appears at number 15 in this ordered list of 110 frequently used notions related to tacit knowledge. Many of the concepts in the list attempt to define tacit knowledge (e.g. knowledge, not-codified, know how, experience, non verbal, etc) and relate to its nature (e.g. learned, action, behaviour, not easily communicated). Culture, on the other hand can be viewed as an influence on tacit knowledge (as with concepts such as individuals, organisational domain and environment). From a knowledge management point of view, a focus on what affects its existence and transfer, rather than a sometimes-futile discussion attempting to pin down its definition, will bring the greatest benefits.

> Saint-Onge (1996) includes intuition, perspectives, beliefs, and values people form as a result of their experiences in his definition of tacit knowledge. When Saint-Onge's description of tacit knowledge at the individual level is congregated into an organisational level, it can approach the definition of culture (Schein 1985 in Brockmann and Anthony 1998).

The above quote goes beyond defining culture as an influencing factor to defining culture as a form of tacit knowledge itself. If we view tacit knowledge as a component of

expertise we can appreciate that an expert in one culture is not necessarily so in another and vice versa.

4 A Study on the effect of culture on tacit knowledge flows

As our research is concerned with the measurement of tacit knowledge within the IT domain we use the following working definition of tacit knowledge as the *articulable implicit IT managerial knowledge* that IT practitioners draw upon when conducting the "management of themselves, others, and their careers" (Wagner and Sternberg 1991a; 1991b). We have conducted an in-depth study involving three IT organisations, which, while also seeking to answer a number of additional research questions, includes the following question directly related to the effect of culture.

Research Question: Do people clique with one another based on biographical factors such as ethnicity? If so, does it affect tacit knowledge transfer?

In this section we describe the design of our study and the instrument used for data collection. In the following sections we introduce the participating organisations and offer our findings related to the above research question. In the final sections we provide some discussion and our conclusions.

4.1 Design of the case studies

Due to the individual and contextual nature of tacit knowledge, each organisation formed a separate case study and involved testing along psychological lines (as developed by Sternberg at Yale) for who may be said to have more tacit knowledge than others, and also how well tacit knowledge is being transferred between individuals using Social Network Analysis (SNA) (Scott 1991). To this end an online questionnaire was developed and deployed in the three organisations of sizes small: roughly 10 IT staff and roughly 16 IT staff and large (roughly 1,400 IT staff). In total 129 IT practitioners were involved. To graphically model the survey data, and to provide a qualitative dimension to data analysis to complement quantitative statistical analysis[3] given the small sample sizes, we employed Formal Concept Analysis (FCA) (Wille 1992).

4.2 The questionnaire

The questionnaire comprised three major components. Firstly a biographical section, secondly a social network analysis section, and finally the tacit knowledge inventory itself. Let us now examine each of these three components in slightly greater detail.

[3] In addition to analysis of descriptive statistics, a Wilcoxon test of matched pairs was conducted on the datasets. It was found there was a limited, but nevertheless statistically significant variation between how expert and non-expert respondents answered the scenarios.

4.2.1 Section A: Biographical

The first component of the questionnaire included questions relating to: gender, age, *language other than English*, occupation of employees today, 3 years ago and 6 years ago, highest formal qualification, technical qualification/certifications; whether the individual was permanent or a contractor, the number of years of IT experience, the number of years with the current organisation and which Australian Computer Society (ACS) level they belonged to determine their level of responsibility in the organization.

4.2.2 Section B: Social Network Analysis

We chose to measure the diffusion of articulable tacit knowledge through the adoption of SNA. Such analysis has a number of underpinnings. These include the assumption that relations among actors or people are considered as channels or thoroughfares of resources. Secondly, that the interaction among actors is directly constrained or aided by the structure of the relationships themselves. Furthermore, that relations taking place between the actors determine all economic, political and social structures (Wasserman and Faust 1994). As a result of this we consider the presence of cliques[4] or groupings of individuals to aid in tacit knowledge flow.

Within this section of the questionnaire respondents were to select (a) the person with whom they networked, (b) how often, (c) the type of working relationship with the person, in other words whether the colleague was superior or subordinate to the respondent. And lastly (d) the type of meeting/communication pattern that takes place. The latter point is particularly important; as evidence would suggest that much information is transmitted face-to-face, in other words tacit knowledge is *not* communicated in electronic form.

[4] Usually defined as a group comprised of at least 3 people.

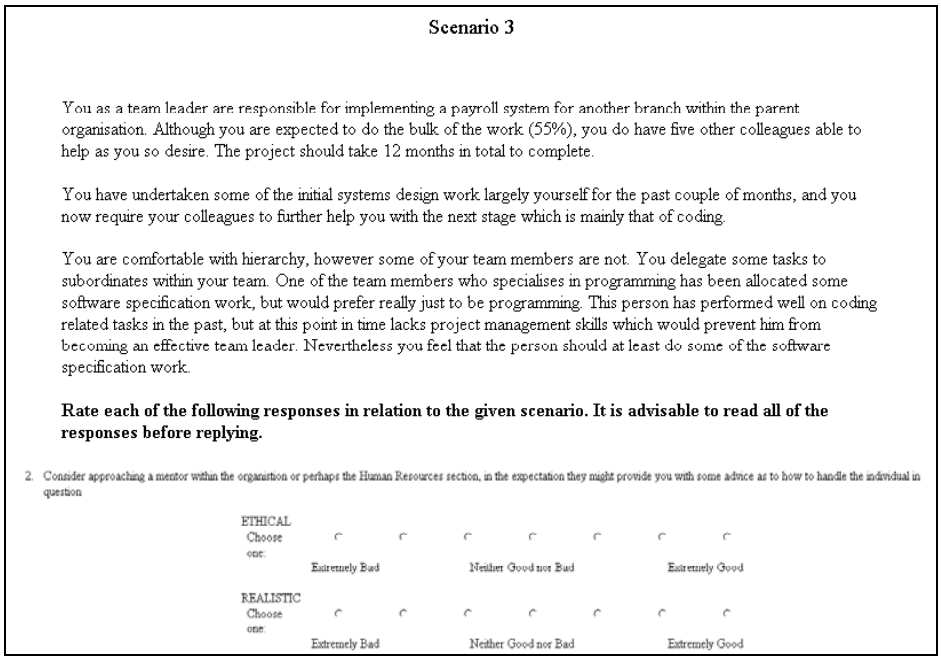

Figure 1: illustrating scenario 3, answer 2 of the IS articulable tacit knowledge inventory

4.2.3 Section C: Tacit Knowledge Inventory

Respondents were presented with a given number of scenarios in a random order from the bank of 16 scenarios and associated answer options we had developed based on interviews, pre-pilot and pilot studies. For each one of the answer options presented there were Likert scales of 1 to 7 in value (Extremely Bad, Very Bad, Bad, Neither Good nor Bad, Good, Very Good, Extremely Good, respectively). Participants did not see a numerical value; only the wording from *Very Bad* through to *Extremely Good* was visible. Two Likert Scales per scenario were presented, requesting both an Ethical and a Realistic value as a means of working out how much a variation there would likely be between what a person 'should' be doing, as opposed to what they would actually and sensibly do.[5] One such example of a tacit knowledge scenario with a Likert scale answer arrangement used in this research may be seen in figure 1 above.

5 Case Study Results

5.1 Background to the organisations

The three IT organisations studied will be referred to as Organisation X (large), Organisation Y (small) and Organisation Z (also small). In keeping with the working

[5] Experience from the pre-pilot showed that respondents felt they should be given the opportunity to state how they *would* answer questions in addition to how they *should* answer them.

definition of tacit knowledge used in the study, we were concerned with IT personnel *only* within these organisations. For example Organisation X is an insurance company, however what is referred to as Organisation X in this paper is in fact the IT support group for the wider organisation. Organisation Y differs insofar as it is a management consultancy with a specialisation in IT. To that end the staff under study represent the *core* of the organisation, rather than the IT support staff, as is the case in Organisation X. Organisation Z is a home and office furniture supply company. However what is referred to as Organisation Z here is the IT group providing support to the logistics of storing and selling furniture items. Thus Organisation X and Z under study are similar insofar as they provide a service role to the wider organisation. Organisation Y differs, as its mission is to deliver IT/IS managerial expertise. As we will see, the mission of the organisation appears to have influenced the degree of multiculturalism found in each organisation.

Taking language other than English spoken as an indicator of multiculturalism, Organisation X is highly multicultural, with over 50 IT staff (out of 108 participating), speaking over 35 languages other than English. Organisation Y is almost totally the opposite, with only one staff member speaking Cantonese and Malaysian, the remainder of the staff (7) being Anglo-Celtic Australian. Organisation Z had seven IT staff (out of 13 participating) that spoke nine languages other than English. To what extent do the varying levels of multiculturalism displayed in all three organisations affect the tacit knowledge flow process?

5.2 Organisation X

In figure 2 we examine the languages other than English utilised by respondents in Organisation X using a concept lattice generated using FCA. In FCA a concept is seen as a set of objects and the set of attributes shared by those objects, thus providing the extension and intension of the concept. In the concept lattice in figure 2 developed with Toscana^{TM}, labeling has been reduced using term subsumption. To find all attributes belonging to an object (in this case a participant) follow all ascending paths. The interpretation of the lattices will be discussed in the relevant subsequent section. The number attached below each node is the code of the participant. An (E) after the code indicates an expert (as identified by their peers in the survey). We note the number of Chinese speakers, whether Mandarin, Hokkien, Hakka or Cantonese. Note also the numbers of experts who speak these languages, but Cantonese primarily. The number of such experts could also imply one of two things. Firstly that Chinese speakers are in some way proportionately more expert than non-Chinese speakers. If this is the case, then it would suggest that people from these backgrounds have had to try even harder than native English speakers in gaining expertise, given the language difficulties people from such backgrounds ordinarily have to face. Or secondly that Chinese speakers are perhaps identifying other Chinese speakers as experts. As we shall later see, there is evidence of cliquing taking place among Cantonese speakers. This last point in particular has serious ramifications for likely tacit knowledge transfer.

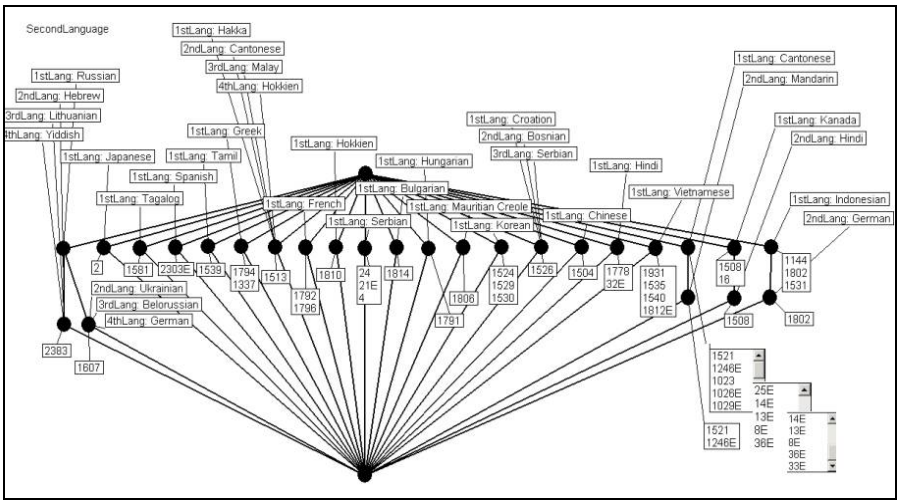

Figure 2: concept lattice illustrating language other than English

5.3 Organisation Y

Organisation Y reveals a staff profile that is senior in terms of age and made up of very experienced staff for the size of the organisation. All of the staff are tertiary educated. The structure of the firm appears very flat and the proportion of individuals identified as experts would indicate quite a close working relationship with one another. This Organisation appears to be a professional bureaucracy along Mintzberg lines. Of interest to this particular study we note that Organisation Y is basically mono-cultural. Of the seven IT staff only one is female and she is also the only multicultural individual. She speaks Cantonese and Malay as languages other than English

5.4 Organisation Z

Languages other than English spoken by the IT staff in Organisation Z, reveals quite some degree of multiculturalism. Although one participant did not include biographical details, we still find seven out of thirteen respondents spoke a language other than English. In all, eight languages other than English were represented. They were in order of popularity {Cantonese, Mandarin}, followed by at least one instance each of {Greek, French, Hindi, Persian, Assyrian and Indonesian}. Of the experts, one spoke Hindi, the other spoke Cantonese as well as Mandarin. The remaining experts (3) spoke no language other than English. Simplifying the language groups there was again a noticeable orientation towards the east-Asian language grouping as in Organisation X.

5.5 Ethnicity and social networks

Having examined the ethnicity of the participants via FCA we wanted to determine if ethnicity had a possible impact on the diffusion of knowledge. Diffusion was mapped via

the capture of the social networks within the organisations. By processing the SNA related questions in the survey we could map the frequency and nature of meetings and develop a picture for each organisation. We found that there were some people in Organisation X who met one another frequently and had an ethnic language in common.

One could reasonably conclude they met partially because of their ethnicity. Whilst it will be observed that there is some ethnic 'collaboration', in fact this is not significant for two reasons. Either the Organisations (X, Z) tend to be so diverse ethnically, that little collaboration is possible because the ethnicities tend to be disparate. Or the Organisation is largely mono-cultural (Y) in which case cliquing behaviour on the basis of ethnicity is not taking place, simply because it cannot. One instance where some cliquing on the basis of ethnicity is taking place is that in Organisation X of Cantonese speakers (figure 3).

In terms of where these Cantonese-speaking individuals belong in the organisation, we find that they are on the same floor within the same building and also in close physical proximity in terms of multidimensional scaling[6] in the SNA diagrams. In the SNA diagrams we can also see participants tagged with the code "ENE" for "expert non experts" which identifies them as individuals not chosen by their peers as experts but exhibiting responses similar to those that were identified as experts. We used FCA for the purposes of identification but do not have space here to describe the process. A key concern in analysing the SNA data was to check whether experts or ENEs were interacting with novices or whether they were primarily unavailable.

[6] SNA software factors in a person's distance from someone else in terms their closeness of relationships with other individuals. In other words the closeness of dots actually has some indication of the distance the person holds with the other person in real life.

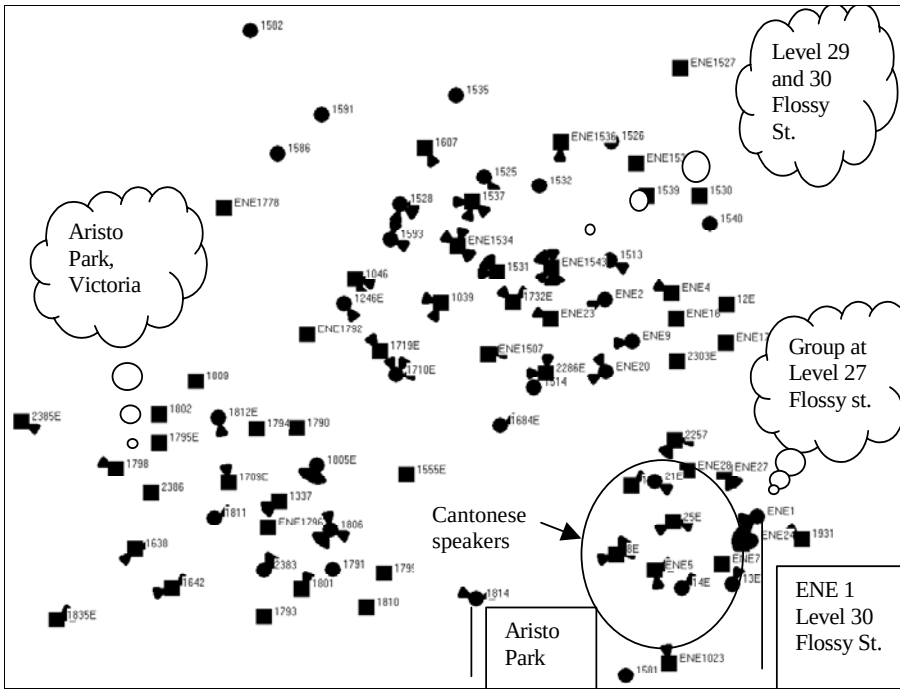

Figure 3: illustrating physical locations of IT staff in Organisation X

The diagrams were also able to visualise the frequency and nature of the meeting. This data was captured via the questionnaire by asking respondents with whom they associated, how often (hourly through to bi-monthly), the type of meeting they had (morning tea to perhaps formal organisational meeting) and the level of importance of their contact with regard to themselves (from 'try not to see' through to 'simply have to see'). There were a trivial number of associations (groups of two only), taking place based on other ethnicities. For example two Melbourne-based Greek speakers in Organisation X met on an hourly basis, whilst two Sydney-based Japanese speakers in the same Organisation met on a daily basis. A couple of Serbian speakers met fortnightly. It is interesting that the third Serbian speaker in our sample who whilst sharing the same language (and one concludes ethnicity), did not in fact communicate with the other two Serbian speakers. No other relations between ethnic groups were distinctly identified. Again we feel this is due to the highly multicultural nature of the organisation, meaning that cliquing on the basis of ethnicity was actually limited. There was some cliquing taking place on the basis of a shared language, of which in Organisation Z, there were only the Chinese languages in common amongst three staff members.

6 Outcomes and findings

We found in our tacit knowledge research that biographical parameters did not play a *significant* role with regard to tacit knowledge utilisation and IT personnel. However there was *some* indication for a higher than average distribution in Organisation X of experts being of Chinese extraction (proportionately speaking with regard to all the ethnic groups represented).

In answer to our research question whether people clique with one another based on biographical factors such as ethnicity and if it affects tacit knowledge transfer we found:

- There was little evidence for cliquing on the basis of ethnicity.
- There was however some evidence for cliquing amongst Chinese speakers, a number of whom were considered experts.
- However the overwhelmingly multicultural nature of Organisations X and Z, meant that cliquing on the basis of ethnicity was not possible to any but a very minor degree.
- Furthermore there was found to be negligible evidence of cliquing on the basis of any of the other biographical factors.

Our literature study revealed that culture is considered to be strongly associated with tacit knowledge. Our definition of culture was restricted to the notion of shared ethnicity based on a shared language other than English. Our case studies have concentrated on the effect of culture on tacit knowledge flow and if individuals of a certain ethnic background exhibited more tacit knowledge than others. Obviously culture can be defined and measured in many other ways besides language/s spoken. Organisations themselves can be said to provide a particular cultural environment, such as supportive, creative, stagnant, dynamic, and so on, which will impact the existence and flow of tacit knowledge. Further, we did not attempt to determine how or whether tacit knowledge is different for different cultures and thus cannot enter into the western vs. eastern debate often discussed when cultural impacts are considered.

Given the contextual nature of knowledge itself and the diversity of even the companies we studied, our findings cannot be easily or confidently generalised to other organisations. Nevertheless, based on the case studies we conducted we can state that:

- some organisations will choose to be primarily multi or mono-cultural as that may be seen to fit better with organisational goals,
- some cliquing may occur based on ethnicity, but that this does not necessarily result in bottlenecking of tacit knowledge and
- some ethnic groups may exhibit more tacit knowledge either because their cultural background (including training and education) has prepared them well for the job (and are thus considered favourably when being selected for a position), or they may be more motivated to improve themselves by acquiring more experience leading to greater tacit knowledge, such as in the situation of migrant employees.

7 Final Remarks

We, in Western societies in particular, have tended to emphasise the value of what Sternberg (1999) refers to as 'book smarts'. The consumption of codified knowledge has been commensurate with the increasing size and complexity of organisations, which in turn has led to lesser emphasis being placed on 'street smarts'. Certain cultures such as the Japanese have managed to better maintain their respect for tacit knowledge all the while modernising into the workforce they have today. They have managed to do this because they try to provide maximum opportunity for face-to-face discussion both within and external to the workplace itself. It is little coincidence that our small firm (Organisation Y) presented the best prospects for tacit knowledge transfer. We found that the parameters conducive to tacit knowledge transfer, such as intimate meetings, lack of electronic communication and repeated contact were ideal for tacit knowledge flows. Certainly it is more difficult for large organisations such as X to achieve this model. But for the sake of effective soft knowledge management, we must at least try.

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