CHAPTER 34

KNOWLEDGE MANAGEMENT: ARE WE MISSING SOMETHING?[*]

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Abstract

As commercial organisations face up to modern pressures to downsize and outsource they have lost knowledge as people leave and take with them what they know. This knowledge is increasingly being recognised as an important resource and organisations are now taking steps to manage it. In addition, as the pressures for globalisation increase, collaboration and co-operation are becoming more distributed and international. Knowledge sharing in a distributed international environment is becoming an essential part of Knowledge Management (KM).

In this paper we make a distinction between hard and soft knowledge within an organisation and argue that much of what is called KM deals with hard knowledge and emphasises capture-codify-store. This is a major weakness of the current approach to KM. This paper addresses this weakness by exploring the sharing of 'soft' knowledge using the concept of communities of practice.

1. INTRODUCTION: MANAGING KNOWLEDGE – THE CHALLENGE

Three major issues facing organisations are globalisation, downsizing and outsourcing and all three have implications for knowledge sharing and management. Downsizing and outsourcing (Davenport and Prusak, 1998) mean a reduction in personnel. As people leave, organisations have come to realise that they take with them valuable knowledge. Globalisation is a separate issue which affects most organisations in some form (Castells, 1996). Many organisations are now undergoing some form of structural change to cope with the increased internationalisation of business. For example, Castells (1996) has

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observed the emergence of what he calls the Network Enterprise, made up of several organisations of different sizes working together. These changes mean that information and knowledge have to be shared between individuals and companies who perhaps never expected to work together. As globalisation impacts upon organisations, they are finding they have to turn to international teams to maintain an essential flexibility (Manheim, 1992). These teams may find themselves operating in different locations, which means that groups need to share knowledge asynchronously between different locations.

The challenges posed by downsizing, outsourcing and globalisation are those of knowledge loss and distributed working.   There is clearly a need to manage such knowledge and Knowledge Management (KM) claims to address this. This paper will explore the state of KM and distinguish between 'hard' and 'soft' knowledge. It will argue that soft knowledge is an aspect of KM that is currently under-explored. The paper will also report on research being done to examine the role of this part of KM in the distributed international environment.

2.   MANAGING HARD KNOWLEDGE

Much of the KM literature has a common view of knowledge that continues to concentrate on the capture-codify-store cycle of management. In this sense, KM does not seem to have moved on from what was previously termed Information Management. For example, the view of knowledge as being 'hard', that is codifiable, has led to attempts to extract knowledge from one group of 'experts' so that it can be used by another, less skilled, group. However, the results of such expert systems have been disappointing (Roschelle, 1996; Davenport and Prusak, 1998).

Another 'hard' knowledge approach aims to support, as opposed to replace, the knowledge worker. With this approach, knowledge is codified into operating procedures or other forms of instruction for action. Orr (1990) reported a study of copier repairers who had manuals containing the procedures to be followed when repairing a copier. These were laid down by the designers and catered only for the problems foreseen by them. However, there were occasions when problems occurred that were not covered by the procedures. The repairers tackled such problems by creating 'workarounds'. Workarounds in this context constituted an example of what we refer to in this paper as soft knowledge.

Despite its evident problems, the management of 'hard' knowledge is now well established and there are many tools and frameworks available for this form of KM. The soft knowledge embedded in the day-to-day working practices of groups is much less amenable to a capture-codify-store approach. Some researchers have begun to recognise the challenges raised by soft knowledge (e.g. Macintosh (1998); Buckingham Shum, 1997) but there is a need to understand more fully the nature of soft knowledge and the means by which it might be managed

3.   MANAGING SOFT KNOWLEDGE

There is a wide body of literature that suggests that there are 'softer' types of knowledge (Nonaka, 1991; Kogut and Zander, 1992). This knowledge is less quantifiable (Kidd, 1994; Skyrme, 1998) and cannot be captured, codified and stored so easily. Examples of such knowledge might include tacit knowledge that cannot be articulated, internalised experience and automated skills, internalised domain knowledge and cultural knowledge, embedded in practice.

Soft knowledge is acquired through the praxis of work and consequently when an organisation loses staff, the soft knowledge that is lost cannot easily be replaced. As companies have cut out layers of middle management they find that they have lost the people who knew who to approach for specific problems; how to deal with different people and who best to use for different tasks. In short, people who knew how to make things happen. The loss of such personnel creates a problem for organisations as they move to cheaper, less knowledge-rich, workers.

As a first step towards the management of such knowledge we need to understand the social processes that govern its construction and its sustenance in an organisation. Lave and Wenger (1991) suggest that soft knowledge is created, sustained and shared through communities of practice by a process called legitimate peripheral participation (LPP). They describe how groups are regenerated by newcomers joining and eventually, replacing existing members. The newcomers learn from "old-timers" through co-practice that is graduated, permitting them to undertake more central and critical tasks. In so doing, they not only learn the domain skills associated with the practice but they also learn the language of the community, its values and its attitudes. Through this kind of participation newcomers move from peripheral positions to more central ones and in so-doing are transformed into old-timers. Membership is legitimated though participation and participation is legitimated through membership.

Seely Brown and Duguid (1991), have extended Lave and Wenger's community of practice model and applied it to technological communities. Their example is based on Orr's description of the work of copier repairers given above (Orr 1990, 1997). When a problem could not be solved by adherence to the manual, or when newcomers had difficulties, they would enlist the help of colleagues. By applying their shared experience, they would arrive at a solution to the problem. But such solutions were not then forgotten, the new knowledge was shared with other members by what Orr describes as the telling of 'war stories'. War stories not only represent the soft knowledge of the community, but their telling also serves to legitimate a newcomer as they move from peripheral to fuller participation. Members will be assayed by the stories they tell and the stories in which they feature. We can discern three trajectories of soft knowledge construction in these communities. Firstly there is the gathering of domain knowledge (for example, how to solve a particularly tricky diagnosis problem). Secondly, the construction of knowledge of

work practices specific to the community (For example, knowledge of an individual machine's idiosyncrasies and how they are catered for). Finally there is the knowledge that the community constructs about the competencies of its members. To quote from Orr directly,

> *"Once war stories have been told, the stories are artefacts to circulate and preserve. Through them experience becomes reproducible and reusable…. They preserve and circulate hard won information and are used to make claims of membership or seniority within the community. …They also amuse instruct and celebrate the tellers' identity as technicians. Such tellings are also demonstrations of one's competence as a technician and therefore one's membership in the community." Orr (1997) p.126.*

These examples illustrate some of the essential characteristics of soft knowledge in communities. Soft knowledge is embedded in the practices of, and relationships within, the group. Secondly, the source of the legitimacy of the knowledge differs from hard knowledge. 'Hard knowledge' is accepted as legitimate by virtue of the formal authority of the designer of the system or the author of the procedure. Soft knowledge becomes accepted by virtue of informal authority and consensus within the group. Although newcomers might have a degree of hard domain knowledge, their soft knowledge only develops as they move from being newcomers to fully-fledged members of the community.

From the point of view of managing soft knowledge in a global industry, one of the striking features of the above examples of communities of practice is that their members are co-located and that the learning and the construction of soft knowledge is a situated activity. This raises the question of whether this co-location is essential to the way that communities of practice share soft knowledge. The next section reports on two case studies that explore this question by studying work in distributed international environments.

4.   THE CASE STUDIES

The central questions driving the studies were:
- Can a community of practice exist in the distributed international environment?
- How can the sharing of soft knowledge be supported?

4.1   Case Study 1
The case study was undertaken with Watson Wyatt, an international actuarial organisation, and was conducted in two parts.

The first part was a survey collecting factual information. A questionnaire was issued to 1500 staff in the UK and Europe. Five hundred and sixty-seven were returned (a response rate of 37.8%). The questionnaire looked for respondents who:
- are in regular contact with colleagues/peers doing similar jobs;
- talk with colleagues to solve problems;

- share projects with other colleagues;
- swap anecdotes/experiences with colleagues;
- learn from discussions with colleagues.

These five metrics were used as indicators of membership in communities of practice and were also divided into 'same location' and 'other locations' in order to differentiate between co-located and distributed communities. Using the above it was possible to identify potential examples of soft knowledge being shared in a community of practice.

The second stage consisted of semi-structured interviews with 22 staff based in two sites. The aim of the interviews was to obtain richer data regarding the types of communities of practice with which people were involved.

4.1   Case Study 2

The second case study took place in the research arm of a major international company. A week was spent with the UK part of a management team for IT support. The other part of the management team was located in the USA. The UK team was identified as having a number of features that were characteristic of a community of practice.

Much of the work is undertaken in the UK and USA cores but the group has full face-to-face meetings approximately twice a year. In between face-to-face meetings, the group communicates by electronic media – e-mail, video, voice mail and Microsoft NetMeeting. The group finds that after a period of time the relationship 'decays' until the next face to face meeting. The UK core consists of four members – an overall manager and three managers of specialist teams within the IT group. These members have equivalents in the USA core (Figure 1)
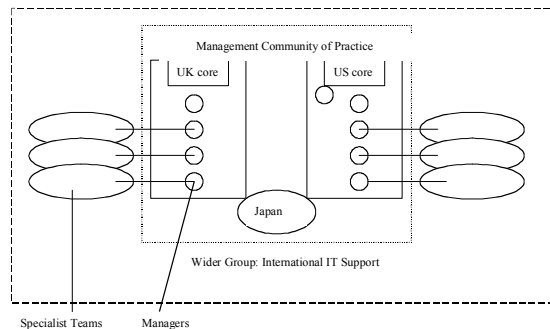

Figure 1: Structure of Group in Case Study 2

A week was spent observing the day to day work of the community members discussing aspects with them and sitting in on meetings.

5. RESULTS

5.1 Case study 1

The questionnaire stage of case study one confirmed the existence of communities of practice in the organisation, and that there was a distributed aspect to them. Interviews supported this general view. A key finding that emerged from case study 1 concerned the development of evolution of groups to a community of practice in a three-stage process:

1) Distributed communities of practice can evolve either from initial informal contact between members or from an official imposed grouping

2) The community of practice may create a link with other *individuals* at other locations who do similar work. These people will possibly be members of other communities of practice. Star and Griesemer (1989) adopted the notion of 'marginals' to describe people who are members of more than one community. Here we have two different types of marginal. There are the people who are members of more than one community – but who seem able to help in sharing knowledge across community boundaries. The other is the person who functions on the geographical periphery of the community of practice. This is in contrast to a traditional community of practice where newcomers function on a social periphery.

3) A community of practice evolves. The group might create links with another group, possibly abroad, which also functions as a community of practice.
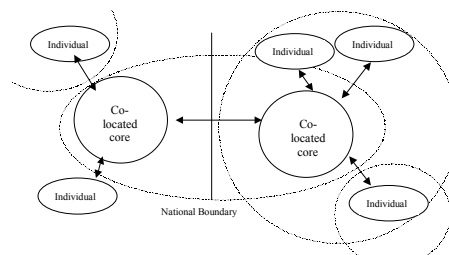

Figure 2: Physical Development of the Communication Links

The findings of case study one provide encouragement for the view that communities of practice can be sustained in distributed international environments. However, at least in the case of Watson Wyatt, these distributed communities are not entirely distributed. The legitimation of newcomers, with no previous domain knowledge, through participation, appears to take place in those co-located cores. Although LPP was key to the regeneration and evolution of the communities of practice of Lave and Wenger (1991) it does not appear to be key to the distributed aspect of communities observed here. In order to explore how soft knowledge sharing is achieved through the communications media it was clear that further data was needed regarding the interactions and practice of such a community.

5.2 Case study 2

In case study two, we explored how a distributed international community of practice supported soft knowledge in a social network and the role that communications media played in this. Over the four days we observed several face-to-face meetings in the UK, and meetings between the distributed communities, using a variety of communications media.

The community of practice in the second study matched perfectly the model shown in Figure 2. There was a co-located core in the UK and one in the USA. Additionally there was an individual member in Japan. The group had evolved by making the links between the two cores and the member located in Japan. The members of this particular community of practice all had a degree of domain knowledge. The learning a newcomer required was concerned with knowledge of group specific terminology, such as who is expert in which field, different roles and ways of working.

Given the apparent role that face-to-face meetings and situated learning play in the construction of soft knowledge, it might be expected that video conferencing would be the media of choice for the distributed community. However, of far greater importance was speed of interaction. As a consequence, telephone conferencing was popular choice of medium for communications between distributed members. Telephone conferencing was often used in conjunction with NetMeeting to support the sharing of documents.

We observed the telling of war stories both in face-to-face meetings and using telephone conferencing and NetMeeting. For example, the UK core were experiencing a difficulty with a technical problem and the US core pointed out that they had already solved the problem and were willing for the UK part of the community to leverage their experience.

In some cases, war stories were stimulated by the discussions around a planning document that the UK core was constructing. The planning document was a shared artefact under construction and its purpose was to make explicit the UK work plan. However, it also served as a catalyst for collaboration both within the UK group and between the UK and the US. The UK had access to a similar document produced in the US and this was used to help construct a document that would be meaningful to the US group. The UK group not only used the US document to help design the UK one, but they also used it to anticipate possible differences in understandings between the two groups. The planning document can be seen as hard knowledge under construction, but in this process, soft knowledge implicit in other documents and in the group's experience was used. An example of this was the discussion of the planning document in an e-meeting between the UK and US cores. The planning document served several purposes here. Each item in the plan was discussed in turn, the cursor of NetMeeting being used to indicate the current item being discussed. Some items stimulated discussions about opportunities for collaboration between the UK and the US. It served to support discussions about problem solving and the identification of experts in the US that may be able to help the UK and vice versa. Problem solving took the form of identifying previous experience with similar

problems. Collaborative solutions and collaborative work plans emerged from discussions around this shared artefact. The hard knowledge represented in the planning document supported the construction of soft knowledge between the distributed groups.

NetMeeting was also used to create minutes of meetings. These were constructed in real time in the shared space of NetMeeting. This meant that people had visibility of what was getting in to the minutes as the meeting progressed and could suggest changes at the time of construction. This avoided the problem highlighted by some authors and increased the trust and confidence of the members. (Cicourel, 1990; Lipnack and Stamps, 1997); *"Sometimes you think the guy that wrote the minutes was at a different meeting"* (Case Study interviewee)

6. DISCUSSION

In exploring possible use of IT to support this under-explored area of KM the case studies have highlighted some interesting issues. Electronic media are constantly being compared with face-to-face in a race to replicate all the cues of face-to-face. The second study in particular indicated that video does not offer much more than the phone and that it is speed of interaction and the use of a shared artefact which are more important in this context. Instead of seeing some media as inferior to others we should be aiming to use the right media for the right task, as indicated by Lipnack and Stamps (1997), with the extra rider of in the right context.

We found the existence of distributed communities of practice but they did not operate in a totally distributed manner – there was an evolutionary aspect to them in that they evolved from co-located cores. Examples of LPP were seen in the first case study but were restricted to co-located situations. This structure was mirrored in the community of practice studied in the second case study. Perhaps LPP does not translate well alone into a distributed environment and perhaps something else is necessary.

Face-to-face communications remain an essential part of communication for communities operating in a distributed environment. The communities of practice that were found in the commercial setting are not totally distributed: they are evolving from co-located cores. Community members appear to need face to face contact to maintain impetus when communication is then restricted to electronic media. The face to face element increases trust and members reported feeling they knew their communication partners better having met them. There were two strong relationships reported in the second case study which had developed over electronic media, however the feeling was that these had taken a long time to develop and were rare occurrences.

In the second case study, an artefact played a role in knowledge creation as community members applied knowledge and it functioned to share embedded soft knowledge. It was interesting to note the use of shared artefacts to aid communication between distributed members, which also seems to support soft knowledge sharing and creation, can serve as

catalysts, focal points and embodiments of soft knowledge.

7. CONCLUSION

This paper has reported preliminary results from two case studies on the sharing of soft knowledge in distributed communities of practice. For case study two in particular, there are still many useful findings to be gleaned from the corpus of data. One of our primary aims for this paper was to determine whether distributed groups currently in existence demonstrated any of the characteristic features of the more familiar co-located communities of practice reported in the literature. Our initial results in this regard are promising and suggest both similarities and differences between co-located and distributed communities.

Our findings extend the concept of peripherality introduced by Lave and Wenger as one of three key aspects of communities of practice. For them peripherality was couched in terms of legitimacy of membership and practice. While this is undoubtedly true in the distributed groups observed in our cases studies, physical and temporal peripherality where also factors that mediated the practice and the quality of interaction.

The exchanging of war stories and the sharing of artefacts via telephone conferencing and NetMeeting also has many similarities to the way in which this occurs in co-located teams. In both cases they have been shown to serve as vehicles for the exchange of soft knowledge, and there is some suggestion in our data about how some kinds of soft knowledge can be made hard through a process of consensus making via shared artefacts.

The area of Distributed Cognition (Hutchins, 1995) provides us with interesting ideas about the use of artefacts. Star (1989), Star and Griesemer (1989) and Sandusky (1997), develop this further with the notion of boundary objects which cross boundaries between communities. These could be useful methodological devices in that they focus attention on the transition between communities.

At the heart of the case studies so far is an unanswered question. This concerns why distributed teams feel the need for face to face meetings and what they mean when they talk of collaboration 'decaying' without such meetings. We might look here to the question of what factors effect the sense of identity of individuals as members of the community. Maybe there are social factors involved, where what is meant by social is quite literally the enjoyment of socialising with like-minded others. As was quoted earlier, Orr (1997) talked of how war stories "amuse, instruct and celebrate the tellers' identity as technicians". Such factors may be a vastly under-rated resource for the sustenance of soft knowledge in an organisation.

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