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Sharing capability: the development of a framework to investigate knowledge sharing in distributed organisations

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Sharing capability: the development of a framework to investigate knowledge sharing in distributed organisations

1   Introduction

The aptitude and willingness of individuals to share knowledge[1] is recognised as a capability crucial to knowledge management (KM) and organisational learning. The level of sharing within an organisation impacts the efficiency with which it can create, transmit, store and share knowledge assets. Researchers in the Social Informatics Group at Napier University are currently exploring the issue of motivating knowledge sharing with particular reference to intranet use in large distributed organisations. The work presented here develops themes highlighted in earlier work on communities of practice and organisational learning (Davenport & Hall, 2001; Davenport & Hall, 2002), and motivating knowledge sharing across intranets (Hall, 2001a; Hall, 2001b).

The work relates directly to a paper presented at last year's OKLC conference held in Leicester (Hall, 2001b). This set out the theoretical framework for an investigation into whether social exchange theory can be extended without modification to knowledge sharing practice within large, distributed organisations. The expectation was that such a study would address some of the emerging perspectives of social exchange theory.

2   Shared capability: previous work as a research resource

Previous work based on a survey of the literature has identified a number of rewards that organisations might offer – whether explicitly or not – to encourage employees to benefit the company by sharing openly and freely what they know. It has been established that such "bargains" for knowledge sharing might be conceived as being struck in a knowledge market (Nahapiet & Ghoshal, 1998). Here both "hard" and "soft" currencies are tender (Hall, 2001a; Hall, 2001b). Hard rewards for knowledge sharing include economic benefits, guarantees related to career advancement and security, and privileged access to information and knowledge. The pursuit of enhanced reputation and personal satisfaction form the basis of soft rewards. The actors engaged in reward trading are not necessarily conscious of operating in a knowledge market, nor would they regard themselves as buyers and sellers of knowledge. The rewards established in the earlier literature review (Hall, 2001b) with examples, are summarised in Table 1 on page 3.

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[1] "[A] robust definition of knowledge remains elusive" (Schultze, 2000, p. 4). For the purposes of this paper "knowledge" might be simply defined as "the understanding that is derived from information" (Hall, 1998, p. 88). It is "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms." (Davenport & Prusak, 1998, p. 5). In a commercial environment knowledge permits decisions that lead to reduced costs; eliminated losses; increased sales; improved utilisation of resources; prevention of fraud; improved or new products and services; effective change management. Some interviewees discussed their own individual interpretations of the term "knowledge". Where this has a bearing on the results of the larger study this will be discussed.

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Table 1: Rewards for knowledge sharing

Reward category	Reward	Examples
Hard/explicit rewards	Economic reward	Enhanced pay, stock options, bonuses
	Access to information and knowledge	Expertise from members of a mailing list
	Career advancement/security	Promotion, guarantees of future contracts
Soft rewards	Enhanced reputation	Status gains
	Personal satisfaction	Seeing the positive results of helping others

As well as being motivated by rewards, the knowledge sharing behaviour of individuals and teams is determined by the context in which they work (Cohen, 1998; Constant, Kiesler, & Sproull, 1994; Ruggles, 1998). Focussing attention on creating a work place environment conducive to knowledge sharing, rather than on reward schemes, is advocated because organisations have learnt that "such mechanisms produce the very opposite of the behaviour they were intended to produce" (Kelleher & Levene, 2001, p. 50). Some claim emphatically that over-reliance on rewards is harmful to an array of desired organisational behaviours: "[it] provides temporary compliance, ruptures work relationships, inhibits organizational learning, discourages risk taking, and undermines interest in the work itself" (Judge, Fryxell, & Dooley, 2000, p. 44). The environments believed to be most conducive to aggregating desirable behaviour are identified as those that are supported by the appropriate social, technical and boundary infrastructure. These are summarised in Table 2.

Table 2: Infrastructure for supporting knowledge sharing

Infrastructure category	Condition	Examples
Social[2]	Create a sense of community[3]	Promotion of openness, co-operation, loyalty, trust; provision for social interaction: co-location of staff, social events
	Make knowledge sharing an explicit responsibility regardless of the originator's position in the organisational hierarchy[4]	Senior management buy-in
	Relegate status	Promotion of the idea that everyone is a knowledge contributor, regardless of their organisational rank
	Encourage experimentation	Provision of autonomy, permission to fail
Technological	Provide user-friendly systems	Ease of use; usefulness of use obvious[5]
	Ensure that systems integrate with communities	Systems used in conjunction with "human" interaction
	Generate critical mass	Value of system seen to be monitored
Boundary	Provide for artefacts, people or spaces that can act as common points of reference for different work group constituencies[6]	Provision of shared repositories Provision of taxonomies and classification schemes Shared social space Opportunities for staff to become networked

[2] As defined by Davenport and Hall (2001).

[3] Where knowledge is regarded as a public good sharing is motivated by moral obligation and community interest, rather than self-interest (Wasko & Faraj, 2000, p. 155).

[4] Social learning theory would suggest that imitating others and seeing consequences of the actions of others are important determinants of behaviour (Huitt, 2001, p. 5).

[5] Belief in the usefulness of use can be articulated in terms of one of the cognitive theories of motivation, viz expectancy theory (Huitt, 2001, p. 2).

[6] The concept of the boundary object was introduced by Star and Griesemer (1989). It has been taken up by some researchers in information science (for example, Albrechtsen & Jacob, 1998; Robinson, 2000). Practical applications

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The full study has been set up to investigate both rewards and conditions for knowledge sharing. The paper presented here has limited its scope to a preliminary consideration of rewards in a knowledge market. It suggests the degree to which the operation of rewards systems might demonstrate the application of the concepts of exchange theory and social exchange theory in a case study organisation.

3 Sharing capability in the case study organisation: research design

3.1 The sample

A large, distributed, information-intensive, multi-national company is the case explored in this research project. Primary data has been sought from the "official" agents of knowledge exchange in the company, i.e. those in designated KM roles who operate as mediators and facilitators of knowledge exchange. In the period scheduled for the main data collection exercise (October-December 2001) fourteen individuals held the post of Knowledge Manager[7] in the case study company across the UK. One further post was vacant. Arrangements were made for all the Knowledge Managers in post to be interviewed individually.

Given that this is a company that promotes its intranet as a primary tool for knowledge exchange[8] it was also felt appropriate to interview senior representatives of the Web Site Manager community along with the Knowledge Managers. There are approximately 140 UK staff engaged part-time or full-time in the design, structure and navigation of intranet content. Of these, six senior Web Site Managers with full-time intranet responsibilities were interviewed.

It was anticipated that the Knowledge Managers would have more to say about strategic issues related to connecting systems with user needs than the Web Site Managers whose daily work is concerned with manipulating content provided by others into a suitable format for further exploitation. The sample represented all but one[9] of the company's major lines of business and functions, and two of its infrastructure groups.

3.2 The interviews

3.2.1 Interview setting

The interviews were conducted on four separate visits to offices of the case study organisation in the weeks beginning 1st October 2001, 19th November 2001, 3rd December 2001 and 10th December 2001. The interviews were held in meeting rooms in the company's offices and lasted for approximately one hour.

3.2.2 Interview schedules

The first five interviews conducted in the week beginning 1st October 2001 were treated as pilots. Their function was to test the suitability of the questions prepared in a pilot interview

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of boundary objects as tools for knowledge sharing are found in the literature of several domains, for example: Accounting (Briers & Chua, 2001); Artificial Intelligence (Strubing, 1998); Design Engineering (Henderson, 1998); History of Science (Galison, 1997; Hong, 1999) Information Systems (Harvey & Chrisman, 1998); Organisational Science (Boland & Tenkasi, 1995).

[7] Most, but not all, carry the job title "Knowledge Manager".

[8] The UK portion of the global corporate intranet comprises 200 sites over approximately 250,000 web pages held on 16 file servers. It makes up to 60-70% of the global intranet resources. Between 7000 and 7500 individuals access these sites each working day (figures current October 2001).

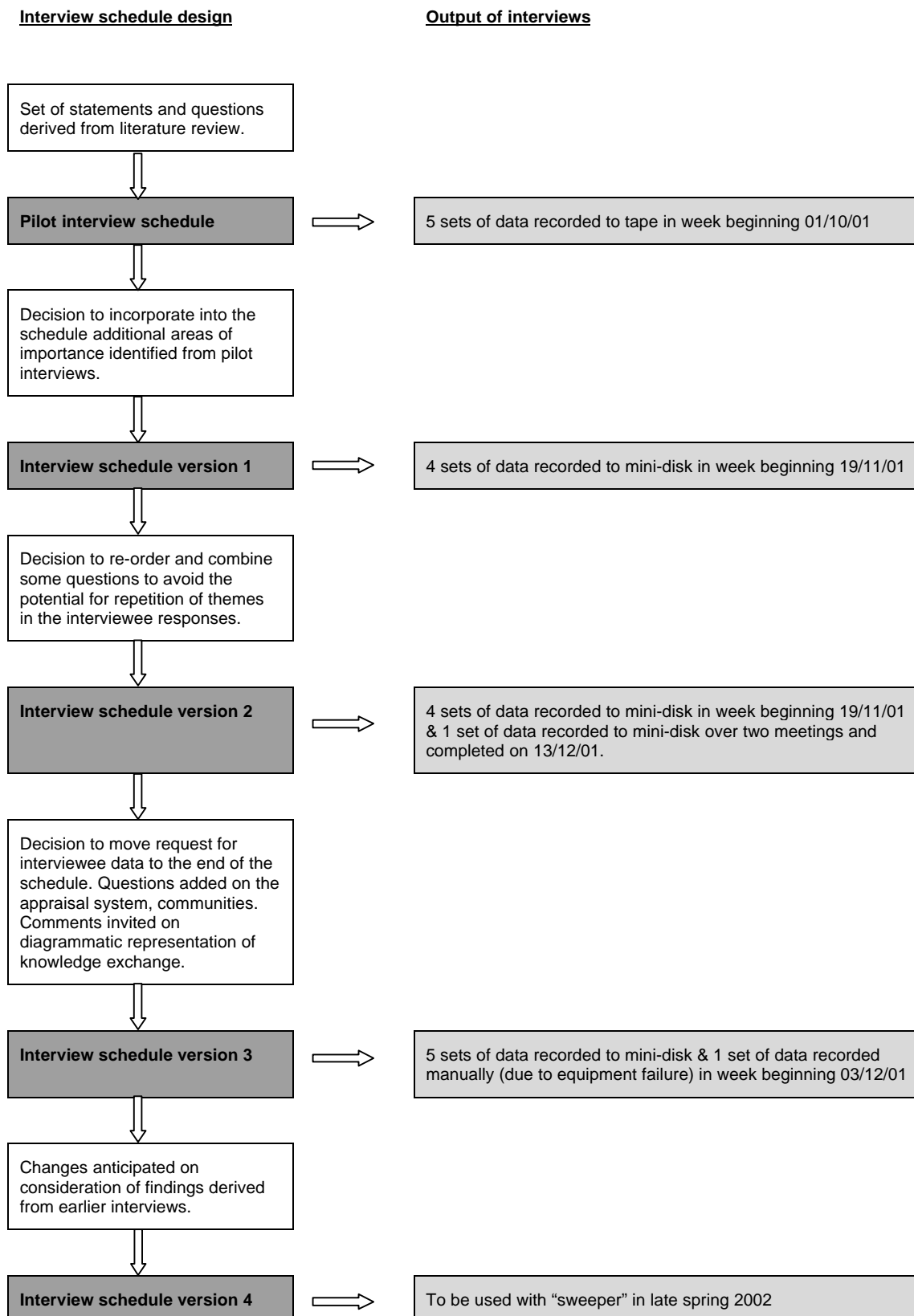[9] The missing unit is the one where there was the vacancy.

schedule, and the validity of the proposed research instrument as a whole. A set of statements and questions derived from the review of the literature was used as a basis for these semi-structured interviews. The design and output of the interviews is shown in Figure 1 on page 6.

The interview protocol evolved in three stages in "snowball fashion" as new issues emerged in the growing sample of interviewees. For example, prior to the interviews held in December 2001, processing of interview data collected in October and November revealed that there were gaps in the data about the company's appraisal system as providing rewards for knowledge sharing, and on the operation of communities. It was also felt that it might be worth asking the last set of interviewees to comment on a diagrammatic representation of knowledge exchange. The opportunity to cover these three issues was taken in editing version 3 of the interview schedule. It is perhaps also worth pointing out that by December immersion in the case study organisation was such that questioning in the later interviews was more likely to be conducted in emic[10] terms. This factor may need to be taken into account when the main data analysis exercise is conducted for this study.

The main data collection process was completed on December 13th 2001. One Knowledge Manager remains to be interviewed. This interview will take place after further analysis of the data collected. The intention is to use this interviewee as a "sweeper". It is anticipated that a new version of the interview schedule will be used to take into account findings of the data analysed from the earlier interviews.

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[10] Questions were posed using the vocabulary learnt over the course of the interviews. A definition of "emic" is "of or relating to features or items analysed with respect to their role as structural units in a system" (*Dictionary.com*, 2000).

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Figure 1: Interview schedule design and output

Interview schedule design   **Output of interviews**

Set of statements and questions derived from literature review.

Pilot interview schedule	⇒	5 sets of data recorded to tape in week beginning 01/10/01

Decision to incorporate into the schedule additional areas of importance identified from pilot interviews.

Interview schedule version 1	⇒	4 sets of data recorded to mini-disk in week beginning 19/11/01

Decision to re-order and combine some questions to avoid the potential for repetition of themes in the interviewee responses.

Interview schedule version 2	⇒	4 sets of data recorded to mini-disk in week beginning 19/11/01 & 1 set of data recorded to mini-disk over two meetings and completed on 13/12/01.

Decision to move request for interviewee data to the end of the schedule. Questions added on the appraisal system, communities. Comments invited on diagrammatic representation of knowledge exchange.

Interview schedule version 3	⇒	5 sets of data recorded to mini-disk & 1 set of data recorded manually (due to equipment failure) in week beginning 03/12/01

Changes anticipated on consideration of findings derived from earlier interviews.

Interview schedule version 4	⇒	To be used with "sweeper" in late spring 2002

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4   Data analysis

To date ten sets of interview data (of a potential total of twenty-two) have been partially analysed to produce these preliminary findings. The sub-set of interview transcripts was selected to represent the profile of the whole sample. Thus the interviewees who provided the data for this paper comprise seven Knowledge Managers and three Web Site Managers representing a cross section of business units: six work in functions, three are allocated to particular lines of business and one supports an infrastructure group. The gender split is 50:50. It should be noted, however, that in this paper all interviewees are labelled as "he" for purposes of anonymity. At the time of interview the length of service of these individuals ranged from just under a year to almost three decades. The majority (eight of the ten) had been with the company for less than four years. The backgrounds of these interviewees are as varied as the sample as a whole: qualifications are held in a range of subjects from the arts to engineering. A number of interviewees have post-graduate qualifications and, again, these are varied. All versions of the data collection schedule are represented in the sample data selected for the preliminary data analysis exercise. The data was coded on the basis on what was found in the interviews.

5   Sharing capability in the case study organisation: preliminary research findings

The analysis work to date has focused on developing an understanding of the interviewees' opinions on just three broad issues related to knowledge sharing. These are (1) the nature and degree of knowledge sharing activity in the case study organisation (2) perceived barriers to knowledge sharing in the organisation and (3) rewards for knowledge sharing. It is acknowledged that even in the simplest articulation knowledge sharing would be presented as at least a two-way process. The themes highlighted for the paper, however, are considered in the main with specific reference to motivating user contributions to intranet content, i.e. the input of material generated elsewhere for mounting on the common system.

A potentially important point has emerged at this stage, which will be explored in greater depth in subsequent analysis. The data collected reveals that, as far as the interviewees were concerned, the management of the process of establishing intranet content for individual constituencies is of greater interest than the means by which these resources are exploited. Perhaps this should not be surprising since (a) prior to being interviewed the interviewees were informed that they were going to be asked about knowledge management issues and the intranet, and (b) their job functions focus on managing content for others to use. An implication of this, however, is that wider issues related to knowledge sharing, such as re-use of submitted material, have largely been ignored.

Where appropriate, the work relates the findings to the concepts of the knowledge market and exchanges (as explained in Hall, 2001b). Attention has been paid to identify instances where interviewee comment might point to practices of knowledge *trading* in the organisation. It should be noted that at this stage that references to enabling conditions for knowledge sharing (as summarised in Table 2) have only been highlighted in the cases where interviewees have made direct and explicit reference to them as incentives or inhibitors of knowledge sharing. It is anticipated that fuller analysis of the complete set of data will provide a more extensive set of perspectives.

The interviewees are named P1-P10. Numbers in the text refer to the line numbers assigned to the transcripts by *The Ethnograph 5.07.*

5.1   The nature of knowledge sharing in the case study organisation

The analysis to date has focussed on motivating and "de-motivating" factors rather than motivation per se, that is structural supports and barriers rather than cultural and affective factors.

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The interviewees recognised the value of knowledge sharing, most frequently associating it with economic advantages to the company (for example, P5:250-261; P9:581-583). Additional, and more specific, benefits were highlighted. For example, the better support of end user information needs achieved through effective knowledge sharing improves prospects for staff retention (P7:500-502) as well as eases the workload of KM staff (P5:1365-1375; P7:248-253).

The interviewees acknowledged that there are some who are excellent at knowledge sharing in the organisation (for example, P9:769-771). P5 claimed that knowledge sharing is a more prevalent activity than people realise:

> "There's a lot of [knowledge sharing] actually goes on and does work… which we often forget… because it's almost part of the wallpaper" (P5:852-855).

Interviewees spoke enthusiastically about the support that they receive from their colleagues who are tuned into the benefits of knowledge sharing. For example, P10 said:

> "Some of the guys I work with are just so pro-knowledge management that they're awesome… They'll do anything to help, they'll really get involved, their teams are enabled, they see the value of giving their teams a couple of hours to set aside and get on with some other stuff" (P10:1135-1142).

"Champions" at senior level are also appreciated (P1:275-278; P10:954-957).

The overall impression from the analysis of interview data to date, however, is that the encouragement of knowledge sharing, particularly with regard to building intranet content, is a difficult act, despite the value gained when it does happen (for example, P10:1491-1494). P10 described the consequences of not recognising the importance of knowledge sharing as a support of colleagues in co-dependent relationships:

> "We have fallen over each other. We have tripped each other up. We have looked utterly stupid in front of really important people because we were not communicating. We weren't talking about what was going on and we didn't trust each other… It's terribly important that we do get on, and understand what's going on, or we look daft" (P10:661-674).

There is also disappointment that although senior staff appear to support KM in principle (P6:1311-1312), the actual demonstration of this supposed support depends upon an individual's focus in the organisation (P6:1316-1321). P10 reflected on how the apparent low level of knowledge sharing contradicts the message of the company's declared values in its mission statement: "It's written on the walls, but it's not lived" (P10:866-867).

One interviewee claimed that there are currently many strategies employed to achieve enhanced knowledge sharing capabilities in the company (P2:274-276). The "means" most frequently cited in the interviews, however, was nagging colleagues for intranet content (for example, P4:190-192; P7:242-246; P8:142-152; P9:388-392). There was strong support for more specific training of staff in genuine knowledge sharing capabilities (P9:631-633; P9:674-676) supported by senior staff buy-in (P5:1164-1169). P1 commented that the company is "kind of verging on the sharing of knowledge, but… still not doing the education" (P1:1670-1672). Training, it was felt, would address many of the current difficulties in building up knowledge resources. For example it would lead to a reduction in duplication of effort across business units (P6:550-559). Interviewees made reference to the centralised KM team's attempts to have knowledge sharing recognised as an integral part of people's jobs and not seen as a separate activity (P6:1213-1220). This was echoed in the personal opinions of some of the interviewees (for example, P8:1561-1562). It was also suggested that better resourcing would allow for more sophisticated use of IT-enabled knowledge sharing environments such as discussion groups: P5 felt that poor adoption of such tools was partially due to their heavy resource requirements (P5:649-660). It is interesting to note that interviewees employed the vocabulary of evangelism when talking about encouraging knowledge sharing. For example, P5 advocated "preaching" (P5:1470-1475) and "spreading

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the word" (P5:1203-1205). They said that they needed more time themselves to devote to this (P4:758-759; P4:903-4) so that they can persuade others that it is worth their investing in the own knowledge sharing capability building (P5:728-730).

There was also recognition of the limits to which knowledge sharing activity can, and should, be formalised. For example, P2 said:

> "We're trying to put in place as much opportunity to officially share knowledge as possible. But, I think, undoubtedly, we'll never get to the utopia where every article and every example of knowledge sharing is recorded. And that's fine actually. I mean, the fact that there are some very natural networks occurring is great, so it's not all artificial or imposed" (P2:1032-1042).

> "I personally don't think we should get too torn up about trying to codify every piece of information in everyone's head" (P2:723-725).

In some cases the over-promotion of knowledge sharing is not beneficial. P5 illustrated this by relating an anecdote from another organisation. Someone fed up of being nagged for intranet content simply submitted the organisation's telephone directory (P5:1153-1154). P3 explained:

> "Just lobbing things over the fence [is not] a good idea. I'm not interested. It serves no purpose other than clutter up the database" (P3:616-620).

Indeed, P5 made the interesting comment that he was not particularly concerned about the lack of content generated for his intranet sites. He believed that the receipt of more content just adds to information overload problems (P5:595-596). This tallied with a comment made by P4 who said that a downside of showing gratitude to knowledge sharers is that this can over-encourage them in their efforts, with a resulting increase in the workload of KM staff (P4:1784-1785). P5 also felt that knowledge sharing as an issue only becomes a real problem if no one does it at all (P5:606-608). He believed that a focus on sharing is just part of a much bigger picture: "I feel that just trying to focus on sharing, isn't enough" (P5:1178-1179).

Many of these comments on knowledge sharing in the company can be translated into concepts of the market place. For example, support for KM from senior level staff is the equivalent of product endorsement; "evangelising" is a common technique of sales representatives. Further parallels can be drawn in the analysis of the barriers to knowledge sharing and the use of rewards as discussed below.

5.2   Barriers to knowledge sharing in the case study organisation

With other interviewees P5 pointed to the complexity of understanding the barriers to knowledge sharing. There are "tons of excuses" (P5:281-282). These are "intertwined with personnel issues and cultural issues, budget issues, promotion issues, management issues – all and each of them having *its* own side effect that you don't even think of" (P5:1497-1503).

It has been noted that the larger purpose of this project is to investigate the extent to which exchange theory, and particularly social exchange theory, can be extended to knowledge sharing practice within large, distributed organisations (See Section 1 on page 2). If the analogy of the "knowledge market" (Nahapiet & Ghoshal, 1998) is adopted, it is possible to express the barriers to knowledge sharing, as identified by the interviewees, in the terminology of the market place. These barriers are summarised and illustrated, with reference to the main concepts of exchange theory as discussed in Hall (2001b), in Table 3 which starts on page 10.

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Table 3: Barriers to knowledge sharing in the case study organisation

Trade barrier category (exchange theory concepts)	Nature of the barrier	Illustration and comment
Imposed restrictions on the trade of certain goods (exchange resources)	Withholding of confidential information limits knowledge that can be shared.	Confidentiality of client information is a legitimate issue for company employees (P5:293-296; P10:1271-1278). However, P9 believes that confidentiality is often falsely used as an excuse not to knowledge share (P9:760-804) or for the provision of sub-standard material for sharing (P9:317-321).
	Withholding of "bad news" stories limits knowledge that can be shared.	It is more difficult to extract knowledge on failed projects that it is on successful ones, even though lessons from failure provide greater opportunities for learning (P7:312-314).
	Withholding of "intellectual property" limits knowledge that can be shared.	P9 highlighted individual concerns about ownership of material that might become widely disseminated once mounted on the intranet: "When it comes down to … intellectual property... people then become very defensive" (P9:716-721).
Unrecognised assets not traded (exchange resources)	Individuals who do not realise that they have something worth contributing are not empowered to knowledge share.	Some employees, particularly those of lower status, do not realise that they have valuable contributions to make to the growth of the corporate knowledge base (P5:280-281; P9:2029-2033). Efforts that have been made to recognise that everyone has something to share have been successful in P8's unit (P8:1718-1725). The status of KM staff can also be a problem when trying to persuade others to participate as knowledge sharers (P9:467-470).
Lack of trading partners (exchange actors and exchange structures)	The fewer knowledge exchange partner relationships an individual maintains the lower is the opportunity for knowledge is sharing.	Interviewees highlighted the value of developing personal relationships for knowledge sharing (for example, P8:1045-1053; P10:135-142). The are difficulties in building and maintaining face to face relationships because it is sometimes a struggle to make friends in the company (P4:1086-1089; P4:1103-1108; P6:525-529; P9:1443-1444; P10:634-635). This is for a number of reasons, including the rate of change in the organisation (P4:830-831; P9:1187-1188). Interviewees have deliberately sought out relationships in order to strengthen their contacts for knowledge sharing (for example, P10:348-350).
Lack of market stimulation or intervention in the "official" economy (support of exchange structures)	A lack of organisational commitment to knowledge management undermines attempts to encourage knowledge sharing.	In general it is felt that buy-in to KM is not strong across the whole organisation (for example, P2:1163-1165; P3:548-551; P9:408-409; P10:869-874). It needs to be seen at the highest level to have an impact (P9:481-491). Lack of buy-in to KM is demonstrated, for example, by a lack of general understanding of KM within the organisation (P2:1176-1182; P3:536-541; P5:242-245; P10:1540-1543) (and in particular confusion over the difference between knowledge management and information management (P7:1310-1312; P10:20-22)); no apparent attempts of the organisation to measure the value of KM (P10:936-948) or knowledge sharing (P8:1597-1600) (although whether this is feasible is debatable (P3:495-499)); and negative comments about KM from both lower level (P9:449-451) and senior staff (P10:899-905).

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Table 4: Barriers to knowledge sharing in the case study organisation contd.

Trade barrier category (exchange theory concepts)	Nature of the barrier	Illustration and comment
Lack of market infrastructure in the "official" economy **(support of exchange structures)**	Under-use of the organisational systems set up to support knowledge sharing restricts the potential for knowledge sharing activity.	As far as buy-in to the *global* information system is concerned P9's comment that "The buy-in… is non-existent" (P9:888-889) would appear to be shared by the interviewees, who criticised it harshly (for example, P1:290-294; P2:77-82; P6:255-256; P6:261; P6:547; P7:109; P7:145-147; P9:853; P9:863-864). Although the interviewees are not responsible for the global system, any system in the company that is not well regarded can influence people's views of systems that the KM staff are trying to promote. P9 said that "no matter how much you try and 'big' it up, to market it, if people go in and get [poor] performance that makes me look bad. And that also means that when I say something else is good next time they'll think 'Well, he showed us that other thing and it was useless'… I think sometimes, for the Knowledge Managers, the technology's giving us a bad name" (P9:907-909). As far as the UK system is concerned the interviewees have mixed opinions regarding buy-in. Seven made specific reference to low usage (P2:401-403; P4:621-626; P6:63-76; P7:206-207; P8:66-67; P9:824-831; P10:434-435). P4 explained that he did not believe that low usage necessarily means poor buy-in, but is rather a symptom of staff time pressures (P4:621-626). Where there is buy-in it appears to be highly localised: P1 said that buy-in in his unit was "pretty good" (P1:264) with senior staff support (P1:275-278). P8 and P2 also have good local buy-in (P2:346-347; P8:66-67).
Inappropriate regulatory frameworks **(support of exchange structures)**	Operational priorities and associated practices mitigate against knowledge sharing.	Staff in the case study company are treated as individuals (P4:453). The achievement of their targets is largely down to individual effort and this rewarded by individual gain, for example promotion (P4:1507-1510). There are several implications of this. Staff do not think first of the collective good. Their time is devoted to activities that have an obvious connection with improving the bottom line (P3:1066-1070; P3:1298-1299; P4:625; P5:283-284; P6:1249-1254) and so they don't have time for anything else (P1:86-92; P4:426; P4:492-493; P5:282-283; P6:1293-1303; P6:1421; P9:467-470) even though efforts have been made to minimise the work required in the mechanics of knowledge sharing, for example in providing material for intranet repositories (P5:448-454; P5:452-459). Although the company would claim that it provides time for knowledge sharing activity. In practice this is not the case (P5:1446). This view is reinforced "officially" in that staff timesheets provide no code for knowledge sharing activity (P1:1713-1718; P2:1136-1140 P5:1451; P8:483). These operational priorities reinforce the view of knowledge as a source of individual power (P2:1494-1496; P9:130-136; P9:512-516; P10:558-560; P10:1392-1395). It was suggested that a tighter set of rules on knowledge sharing would help embed it into processes. P10 had already seen success of such an approach (P10:589-591) and P1 advocated making certain procedures mandatory, so that they become part of the routine and the eventually second nature (P1:1984-1991).

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Table 5: Barriers to knowledge sharing in the case study organisation contd.

Trade barrier category (exchange theory concepts)	Nature of the barrier	Illustration and comment
Physical barriers between the market and traders (support of exchange structures)	"Distance" between people inhibits knowledge sharing.	The distributed "geography" of the company (with staff working in company offices, at home and at customer sites) makes it difficult to build relationships (for example P10:294-296). Even where colleagues are co-located there are problems. For example, one interviewee who works surrounded by his own colleagues commented that the environment was not conducive for knowledge sharing because people treat their cubicles like chambers (P4:847-848) and have nowhere nearby to gather informally (P4:1121-1124). P1 also commented that the organisational structure in the abstract "boxes" individuals into particular domains (P1:1155-1164). This supports the creation of knowledge silos and mitigates against cross-unit knowledge sharing.
Existence of grey and black markets (support of exchange structures)	Knowledge that could benefit a larger audience becomes trapped in closed groups.	The KM staff are aware that they often operate at the margins of groups where there might be strong friendships and "clique markets" (Sawyer, Eschenfelder, & Heckman, 2000, p. 196). This is problematic because groups that "are as thick as thieves may be "immovable on some things" (P9:1611-1613) and "to capture [their knowledge] and remove it from a tacit environment can be very difficult" (P2:716-722).
Existence of an entire alternative economy (support of exchange structures)	Systems set up to support knowledge sharing are undermined, thus the incentive to use them is also undermined and efforts to knowledge share "officially" are less successful.	Interviewees could cite colleagues whose knowledge sharing is conducted without reference to the "official" channels supported by the intranet. This goes beyond exploiting the company grapevine, which was believed to be beneficial in the business sense (9:1482-1496). For example, non-users employ mediators to access material (for example P1:93-94; P8:497-496; P9:830-831) and/or work off their personal contacts to meet their information needs (for example, P8:641-644; P10:1500-1508). One interviewee felt that he is the surrogate for the entire intranet: "It's almost as if they use me as the intranet… They ask me 'can you give me this?' and then [they disappear]" (P4:704-705). Groups may attempt to set up alternative "official" or "semi-official" economies (P6:133-142 & 1103-1110): "Some teams are using their own standards and completely subverting what's supposed to be the standard" (P6:206-210). One interviewee explained that he knew of an extensive collaborative initiative proposed by two groups, one of which was located in the UK. He was particularly frustrated that the UK group was willing to put considerable investment into this initiative yet was unwilling to populate local intranet pages (P9:750-753).

5.3   Rewards for knowledge sharing in the case study organisation

Rewards for knowledge sharing in the case study organisation are summarised in Table 6 below with commentary and examples in sections 5.3.1 to 5.3.5 on pages 13 to 17.

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Table 6: Rewards for knowledge sharing in the case study organisation

Reward (exchange resource/process)	Employed in the company?	Comments related to the operation of a knowledge market
Economic and career gains	Technically yes. In practice not uniformly applied.	Other exchange processes are deemed as more effective routes to these resources. The process is too difficult to implement.
Access to information and knowledge	Informally.	Primary exchange resource of KM staff, but of lesser importance to others. Many opportunities for free-riding.
Enhanced reputation	Informally.	Contributes to the exchange resource of economic and career gains.
Personal satisfaction	In some cases. Highly dependent on individual personality attributes.	This exchange resource is an incidental in a market driven by other factors.

5.3.1   Economic and career gains as hard rewards

The issue of acknowledging knowledge sharing with economic and career rewards in the case study company is not straightforward. Knowledge sharing features as one of the criteria in the official appraisal process and is therefore supposed to be tied in with economic and career rewards (for example, P2:1374-1377; P3:64-69; P4:1651; P9:555-561; P10:1303-1305; P10:1312-1317).

Only one interviewee was enthusiastic that this system can work. He said that "some people will readily buy in to the promise of reward for knowledge sharing" (P2:1501-1504). He was of the opinion that individuals who demonstrate knowledge sharing capability as part of their team-working skills are recognised (P2:1420-1425). P6 said that whether the system worked or not depends on individual manager views (P6:1620-1622). Other interviewees indicated that career rewards might have some bearing on motivating people to knowledge share, but that their impact was not strong (P1:1938-1942; P4:1360-1361). An exception was made for staff whose roles are KM-related. Knowledge sharing capability plays a high priority role in the appraisal meetings of KM staff (for example, P8:2081); even so, some of the interviewees (all KM related staff) did not see this as an over-riding factor for their own career success (for example, P9:2183-2188).

In the main, it was believed that knowledge sharing in the case study company was not rewarded with economic or career benefits *in practice* (P1:1845-1850; P4:1690; P8:2069). For example, P9 said:

> "[The company] has values, one of which is we would openly and practically share knowledge, but I think that's a … token gesture because we'd be appraised on it if it were to be true – properly appraised on it" (P9:555-561).

P10 indicated that knowledge sharing capability is not always taken seriously at appraisal meetings:

> "If you speak to people within [the company] then you will discover that by the time you get to the knowledge sharing bit of your appraisal everybody's a bit bored. You've been there for a couple of hours and you need to get out, so it's swept under the carpet. In theory, absolutely, we are all rewarded, both bonus and salary wise, against our ability to share knowledge. Do I think that happens? No, I don't" (P10:1312-1317).

P10 initially showed apparent enthusiasm for the system "You have to be able to demonstrate that you share knowledge to be promoted" (P10:1351-1353), but this was tempered by the

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comment that "You need to be able to *demonstrate* it, but some people live it and some don't" (P10:1366-1368).

Interviewees offered reasons why the system as it stands does not work. One explanation is that knowledge sharing capability is over-shadowed in importance by other criteria at appraisals. P6 remarked that the appraisals rely more on managers' general perceptions of the work of individuals, rather than on the criteria specified in the appraisal documentation. A number of interviewees referred to the ultimate test of the bottom line. For example, P9 said:

> "I've not looked at other people's appraisals, nor am I able to, but I wonder how much their actual work is judged on [knowledge sharing]? They're judged on how much money they bring in" (P9:571-576).

A further explanation is that career success does not necessarily depend on what happens as part of the appraisal process. Strategies other than demonstrating knowledge sharing capability, and which may undermine organisational attempts to knowledge share, better serve the meeting of career goals. For example, some interviewees declared that deliberately withholding information and knowledge as a "bargaining chip" (P10:560) is a better long-term strategy for career success than demonstrating knowledge sharing capabilities (P9:513-516). P7 referred to individuals acting as gatekeepers "who've built their whole career on the fact that they know people and therefore don't want to share things" (P7:1003-1007).

The third significant reason given for the failure to link knowledge sharing capability to economic and career rewards was the question of measurement. Two issues were discussed: (1) the difficulty of designing a reward system that provides quantitative measurements (for example, P8:1566-1573) and (2) operating it in an environment where team, and cross-team, working is prevalent so apportioning credit is problematic (for example, P5:1122-1131). P3, for example, thought that measurement of individual participation in knowledge sharing efforts was "a nice notion, but not a very practical notion" (P3:469-479). One interviewee felt that because the company claims that it will reward on certain criteria, yet is unable to do so because it has no means of measurement, "there's no real way to tell people that they're not doing it properly." (P5:1171-1177). There was also concern that subversive behaviours as highlighted in 5.1 on page 7 prevail when simplistic systems of measurement are introduced:

> "If you measure it on the number of things you submit, you will get a lot of submissions. Whether they'd be of any use or not is another matter" (P5:1140-1144).

Some interviewees felt that the link between sharing capability and economic and career rewards could be strengthened. For example, P8 supported the company's centralised KM team's attempts to make knowledge sharing a more prominent issue in appraisals (P8:2097-2104). Interviewees spoke of their own efforts to persuade the management in their local teams to tie rewards more obviously to knowledge sharing: P4 is trying to promote this with lower grade staff in his unit with the hope that this will provide him with more support in his role (P4:1346-1351). P6 felt that the message that people can earn more and enhance their career if they knowledge share should be advertised more widely (P6:1788-1792; P6:1801-1804). P1 advocated greater use of economic rewards because, he said, "The money aspect is, I think, is probably more important than I think people will let on… I think people are pretty motivated by money" (P1:2040-2048). This, he believed, applies especially to attempts to kick-start initiatives (P1:2067-2070). P5 suggested a strategy for tying knowledge sharing to career success more explicitly by using the example of the company's online CV system. He suggested that if the rule were made that individuals were not eligible to be chosen for new projects unless they submitted material to the CV system, then the CV system would hold more reliable information and have higher practical value and usage (P5:1053-1058). The question "What's in it for me?" would then be met with the sensible answer of "Career progression" (P5:929-935). Although some interviewees made comments that perhaps knowledge sharing should not be explicitly rewarded since it should be an part of the working role (for example, P6:1230-1235), none could be considered as keen advocates of dismissing rewards altogether.

The implications of these views with relation to exchange theory and trading are discussed in 5.3.3 on page 15.

5.3.2 Access to information and knowledge as hard rewards

Examples of "trading" were much in evidence from the responses of the interviewees to questions on access to information and knowledge as reward. The interviewees adopted the vocabulary of exchange using terms such as "two way benefits game" (P8:1117-1118), and employing the metaphor of back scratching (P1:2023-2027; P3:597-599). Setting up relationships to exchange information and knowledge is an important modus operandi for those in KM roles (for example, P1:2023-2027; P3:597-599; P3:606-608; P6:1643-1647; P8:2114-2122; P8:2233-2237; P9:1151-1161; P9:1171-1179). This is illustrated by P8:

> "I think there's definitely a two way benefits game there… If you can prove the benefit of somebody spending time on doing something like knowledge sharing, they will do it. And if it's successful and it worked well, I think that they would give something back to you…. a give and take relationship" (P8:2114-2122).

P8 demonstrated the use of deliberate ploys in setting up exchanges:

> "It's almost like a strategy. If I add a bit of gossip in here, it'll butter them up. Or, you know, make them easier to approach in the future" (P8:2233-2237).

As well as admitting to their own trading relationships, the interviewees have observed them operating between other parties. For example, P10 spoke about people actively swapping secrets with one another and P4 described the nature of a special relationship that he witnessed developing between two of his colleagues (P4:1990-1992).

There were, however, concerns that these trading relationships are not balanced. For example, P8 pointed out that promoting access to information and knowledge as a reward for contributing information and knowledge motivates more taking from the common resource than giving to it (P8:1657-1663). In effect, there are extensive opportunities for tolerated "free riding" (Dyer & Nobeoka, 2000, p. 349; Weisband, Schneider, & Connolly, 1995, p. 194). P2 observed that some people will buy in to the idea of rewards for knowledge sharing and others won't (P2:1501-1504). Suggestions were made to strengthen the message of this incentive. P5 suggested that the issue could be tackled by presenting the message in terms that end-users would readily understand. With reference to project debriefs, he proposed that arguing "it's almost like converting this engagement into a methodology" (P5:431-437) would encourage users to participate more fully in the knowledge sharing process.

5.3.3 Hard rewards as exchange resources in a knowledge market

It would appear that the current framework for providing economic and career gains to those with demonstrated knowledge sharing capabilities does not provide genuine exchange support. Using a trading analogy it could be argued that this creates trades description difficulties: part of the appraisal system is based on a set of declared values which cannot be upheld in practice. These are largely due to factors of the external environment. (See also the trade barrier of "inappropriate regulatory frameworks" in Table 3.) This problem may also be expressed in terms of currencies. The "traders" are unused to dealing in the currency of "knowledge" so it is much easier to measure using other established systems, for instance those which look at straightforward figures such as profit and revenue growth.

It has been demonstrated, however, that the KM staff feel that they enjoy better exchange support where the currency of reward is access to information and knowledge. Since the exchange resource in this instance is the currency of information and knowledge, i.e. a resource for which they have major responsibilities, the KM staff have a large degree of control. They are able to put in place the conditions to support the exchanges, for example by negotiating relationships with key potential information and knowledge providers (the trading partners highlighted in Table 3). KM staff are empowered to provide access to information and knowledge resources to an extent that is not possible with relation to economic and

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career rewards: they have no say in how salary increases, bonuses or promotions are awarded to their end-user colleagues.

Taking the rewards together as two sets, i.e. (1) economic and career rewards, and (2) access to information and knowledge, the key problem then appears to be an economic set-up that does not support one of its official currencies. Related to this is a set of KM issues arising from the employment of multiple currencies. P2 drew attention to this in explaining that the favoured currency of KM staff is access to information and knowledge (P2:1653-1654). They would like people to trade information and knowledge *for* information and knowledge. However, often the people with whom the KM staff trade see the bargain differently. They don't want to put information and knowledge into the system simply in order to get information and knowledge back out of it. They give to the system to enhance their prospects of a good appraisal (P2:1682-1694). One implication of this is, then, that submissions are made assumes greater importance than the quality of what is submitted. This relates to the trade barrier of imposed restrictions on the trade of certain goods as described in Table 3.

5.3.4   Soft rewards: enhanced reputation and personal satisfaction

The literature review (Hall, 2001b) established that people are motivated to knowledge share by opportunities to enhance their reputation. Others gain personal satisfaction through the act of sharing knowledge. These themes were discussed by the interviewees.

It would appear that staff in the case study company are status conscious. Interviewees made direct reference to the importance of profile when questioned on the subject (for example, P4:594-601). They also acknowledged status differences more subtly when talking on other themes. For example P2 unnecessarily categorised individuals by grade when discussing communities (P2:601-603) and P9 made a distinction between "real" and support workers in the company when outlining his views on team loyalty (P9:1055-1057). The main identifier of status is grade (for example, P2:1316; P6:1446). Status distinctions can also made on other criteria, for example, by qualifications held (for example, P7:1030-1034; P10:368-370). The interviewees provided evidence that colleagues organise their work around the potential for status gain, for example by electing to work with certain high profile people or teams (P3:637-639; P7:1299-1301; P9:486-491).

It was also demonstrated that knowledge sharing takes place when the act presents opportunities for individuals to enhance their reputation (for example, P10:1418). P7 spoke of how his group uses this wish for recognition to encourage staff to knowledge share:

> "When people have developed a new methodology or a new solution they want to talk about it. They want to show how wonderful they are… So we let them do that by saying 'OK [share your idea using the intranet]'." (P7:1266-1270)

Naming contributors on web pages, in repositories and newsletters have an impact on creating a knowledge sharing culture (for example, P1:2035-2039; P2:1454-1464; P6:1661-1663). P2's group produces a publication which names high profile knowledge sharers:

> "[It] acknowledges where people have been successful in contributing to learning and development, to knowledge sharing and being successful parts of project teams… We are able to identify who the key contributors are. So we're able to identify where we've got strong knowledge sharers" (P2:1454-1464).

One interviewee was less enthusiastic about the power of the promise of status enhancement, doubting that "putting names in lights" really helped individuals to develop their reputations within the company: "They just get a mention, I suppose" he said (P6:1669-1670).

There was support for the view that some people will knowledge share for the personal satisfaction of making a contribution. The degree to which someone is an inherent knowledge sharer depends on the individual (for example, P4:1503-1505; P6:1704; P7:1286-1288). P1 referred to this incentive as a "hearts and minds thing" (P1:99-100) for people who are community spirited (P1:2081-2083). This kind of person will act in this way whether or not

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hard rewards are on offer (P1:1859-1863). They want to participate "to get rid of the urge to change things" (P4:2032-2034). P9 explained that he made a point of showing his gratitude for the efforts of his constituency to knowledge share in the hope that this might increase the want or need to knowledge share again (P9:1183-1186). Some of the interviews claimed that they were in a good position to recognise inherent knowledge sharers since they exhibited such characteristics themselves (for example, P8:2174-2181; P10:1450)

5.3.5 Soft rewards as exchange resources in a knowledge market

It has been established that the current "regulatory framework" of the case study company is aligned with strategies that promote individual efforts for personal gain in terms of economic and career success (see Table 3). Providing rewards that promote reputation may be seen as an input to the process that determines the distribution of hard rewards related to economic and career gain. This soft reward may therefore be regarded as an exchange resource in the knowledge market under discussion. However, this resource is of limited importance since those who have the most direct interest in motivating contributions to company knowledge bases are not the same people who allocate economic and career rewards. Similarly, that some people seem to simply gain pleasure as a result of demonstrating their own altruistic and pro-social behaviour and seeing the positive results of their efforts to knowledge share, appears to be an incidental in a market that is driven by other factors. The true extent to which the market operates for rewarding by status gain or gratifying a need for personal satisfaction is difficult to gauge.

6 Further incentives to promote knowledge sharing

6.1 Sticks to encourage knowledge sharing

In section 5.1 on page 7 reference was made to "nagging" as a means of extracting content to be shared on the company intranet. This is the "stick" to which P7 alludes (P7:278-279). Some interviewees are not keen on using this strategy (for example, P4:190-192). Others accept that this is part of their role (for example, P9:1197-1201) and will escalate cases where there is non-compliance (P7:242-243). One interviewee was even able to put a figure of 80% on the proportion of material that is extracted through the nagging process (P8:142-152). This could be reduced if procedures were brought in to make certain knowledge sharing activity mandatory (P5:377-382; P5:581-584).

It is worth considering how "nagging" might be perceived in a knowledge market. The current system in the case study company often requires KM staff to approach those who "hold" the required knowledge and ask them to hand it over. The KM staff may offer in exchange for this (1) access to information and knowledge, (2) gratitude, or both. Neither of these is as enticing as the other rewards that can be offered by the company for other types of work, i.e. economic and career gains because (a) information and knowledge is there for the taking anyway and, (b) KM staff do not have the status or power to influence the career prospects of potential submitters. This has two implications in a culture where knowledge sharing is not an established norm (even if it is supposed to be so). Firstly, such exchanges may be treated as gifts, or appear to put a low value on knowledge. Secondly, when people "give" in response to approaches for little or no return the act parallels that of donating to charity. This can explain to a degree some of the quality issues associated with intranet content (see Table 3). P9's remark illustrates this:

> "They're keen to get something on and get rid of me 'cos then that way I don't bang on 'Where's the content?!'" (P9:388-392).

6.2 Conditions for knowledge sharing

It is acknowledged that exchanges take place under certain enabling conditions. These do not rely on the straightforward reciprocity of individuals trading knowledge as a private good. A

discussion of organisation factors as conditions of exchange in the case study organisation is outside the scope of this paper, but will be addressed in future work. Indications to date are that the social infrastructure (see Table 2 on page 3) is a significant factor in this company.

7   Conclusions

The early results from this research provide some pointers to how knowledge sharing might be encouraged or inhibited in large, distributed organisations that rely on intranet technology to support their operations. As other case studies have shown, the intention of designers of systems to promote knowledge sharing are rarely realised in implementation (for example, Newell, Scarborough, Swan, & Hislop, 1999). This may be because the rhetoric that drives design for knowledge management is both broad and shallow, and most systems strategy is indeterminate and the results are not what was envisioned. There is some evidence to support the view that the concepts of social exchange theory are applicable in a knowledge market in that the interviewees have pointed to the importance of good personal relationships to facilitate knowledge trading. However, the parallels with exchange theory, as related to broader metaphors from economics, are more easily drawn. This may be because data analysis to date for this interim report has focused on the discussion of reward systems with the interviewees. It has not yet considered organisational factors and conditions that support or inhibit knowledge exchange, one of which is social infrastructure. Further work on the full data set for this project will provide a more extensive consideration of the extent to which social exchange theory applies to knowledge management.

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