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Utilisation of Intranets for Knowledge Sharing: a Socio-technical Study

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Abstract

Although intranets appear to be ideal environments for employees to share knowledge quickly and efficiently, usage in practice appears limited. We report findings from two case studies that highlight three key issues limiting intranet utilisation for knowledge sharing: organisational structures and strategies, the impact of the receiver on sharer choices, and the availability of alternative channels for knowledge sharing. This study suggests that for companies to obtain more effective intranets, they need to better align organisational structures and strategies with intranet objectives, develop a comprehensive corporate communication plan, and find new ways to better link sharers with receivers' knowledge needs.

Keywords

Intranet, knowledge sharing, knowledge management

INTRODUCTION

Many modern businesses are adopting a strategy of knowledge management – the systematic enhancement of the creation, sharing and application of knowledge (Zack, 2000). By harnessing and leveraging corporate knowledge assets, companies seek to improve their efficiency, effectiveness and, ultimately, competitiveness. A range of technologies is available to support organisational knowledge management initiatives, a key tool being an intranet – a web-based medium with the potential to enable communication and collaboration, streamline work processes, and provide shared access to a wide range of internal services, information and knowledge (Hall, 2001; Sarnoff & Wimmer, 2003). An intranet also provides the means to reach across borders and time zones to distributed audiences.

Attesting to considerable corporate belief in their potential, intranets have gained widespread global business acceptance. Recent reports estimate corporate intranet deployment at: UK (52%), US (48%), Canada (58%) and Australia (44%) (DTI, 2003). Indicative of particularly high levels of diffusion at the high end, 92% of premiere Australian organisations possessed an intranet in 2001 (Zyngier, 2003). Surveys reveal that companies view intranets as key organisational knowledge management tools (e.g. Edwards & Shaw, 2004). Evidencing continued development, while initial intranet deployments focused on information and knowledge sharing objectives, advanced applications are now appearing, such as self-service, training and communities of practice (Denton, 2003).

Despite these encouraging trends, however, there are mixed reports about the effectiveness and future of intranets. While some agencies forecast continued intranet expansion (e.g. Deloitte, 2004), other more negative studies identify a range of concerns, including end-user difficulties in locating information and finding the time to contribute knowledge; content management issues; the accumulation of vast seas of unmanageable information with calls for rationalisation; failure to achieve communication objectives; disparate intranet islands lacking integration; costly implementations; heterogeneous web presences with web asset proliferation; and insufficient dedicated resources (Brusoni et al., 2002; IDC, 2002; Lamb & Davidson, 2000; Melcrum, 2001; 2004; Newell et al., 1999; Sarnoff & Wimmer, 2003; Stenmark, 2003a). Such reports highlight the need for further investigation of the issues surrounding intranet utilisation, seeking greater understanding, as well as potential solutions.

In searching for a focus for a study of intranet utilisation, we recognised that although intra-organisational knowledge sharing is a key objective in the deployment of intranets, recent surveys indicate that this objective is not being realised (Melcrum, 2004; Stoddart, 2001). This suggested to us that knowledge sharing could offer a

valuable lens through which to study intranet utilisation. Stenmark (2003a) noted that new approaches are needed for studying the progressive adoption of non-hierarchical, web-based technologies such as intranets. We observed that the limited empirical intranet studies in existence have not, to our knowledge, accounted for the complex contextual issues surrounding and affecting end-user decisions and choices to share knowledge on intranets. These contextual factors include individual preference for particular communication channels, multi-purpose usage of knowledge-sharing channels, understanding of technical issues, assumptions about one's own and other people's knowledge, and emerging organisational structures such as contractor teams and profit centres. As an innovation, an intranet's progressive utilisation is socially constructed, and influenced by complex interactions between individual, organisational and technological variables (Galliers & Swan, 1999). Thus an intranet can be understood as, essentially, a socio-technical system (Choo et al., 2000). For these reasons, we eschewed approaches to investigating "the utilisation of intranets for knowledge sharing" that consider standard information system success factors such as "user satisfaction" and "ease of use" (cf. Terrill & Flitman, 2003), and elected to conduct an in-depth, qualitative socio-technical study that investigates:

how and why do end-users make knowledge-sharing choices that include or exclude an intranet, in an organisational setting?

In this paper, we report some of the key findings from the first stage of a larger socio-technical study of the use of information and communication technologies (ICTs) to support intra-organisational knowledge sharing. Elsewhere, we provide other results from this initial stage (Hunter, 2003; Lichtenstein & Hunter, 2005). Following this introduction, we review some of the key sources in knowledge sharing and intranet utilisation, constructing a theoretical backdrop for the empirical investigation. We then introduce the research methodology employed for the study, and describe the cases and main empirical findings. We discuss a set of key issues limiting the value of an intranet for organisational knowledge sharing and other knowledge management objectives, arising from the empirical study. Finally, we summarise the paper, draw conclusions, highlight the limitations of the study and suggest future research directions.

THEORETICAL BACKGROUND

In this section, we provide a backdrop for the later empirical findings by reviewing a selection of relevant literature in organisational knowledge sharing and intranet utilisation.

Our view of knowledge aligns with Barabba & Zaltman's (1991) transformational perspective – data, information, intelligence and knowledge – beginning with codified observations (a collection of data) that are obtained from a marketplace of data which, when placed in some decision context, are transformed into information. In the analysis of this information, intelligence is created. When high levels of confidence are developed in a body of intelligence, knowledge is created. We adopt the epistemological position that knowledge has dual, complementary forms – tacit and explicit.

Knowledge Sharing

Recent theories of knowledge sharing pay special attention to the often-neglected receiver of knowledge and incorporate the process of knowledge transfer. According to Dixon (2002), a knowledge sharer (sharer) is any individual who possesses knowledge and is willing to share that knowledge with others, while a knowledge receiver (receiver) is any individual who is willing to listen to and interpret any knowledge provided by others. The sharer is motivated to share knowledge which is then accessed by an interested receiver to whom the knowledge is transferred.

In order for knowledge transfer to occur, a receiver must (a) be able to relate the incoming knowledge to her existing knowledge and (b) be able to assimilate the new knowledge (Dixon, 2002). If there is insufficient existing knowledge for (a) to occur (Cohen & Levinthal (1990) term this a lack of 'absorptive capacity'), then knowledge transfer will not take place effectively. Gasson (2004) points out that a sharer and receiver may belong to different workgroups and thus experience difficulties relating to each other's knowledge, affecting knowledge transfer. Yet another concern is that a receiver may make incorrect assumptions about the knowledge needed, not realising that she is missing essential relevant knowledge (Dixon, 2002). All such situations can be detected by a sharer only if the sharer is interacting with the receiver. Adding to the complexities of knowledge sharing, the process may be conceived as an exchange guided by the economic principle of compensation for effort and value. Such compensation may comprise financial payment, reciprocity, reputation and/or altruistic reward. Irrespective of compensation, motivation is needed for a sharer to choose to share.

An early view of the goals of ICT support for knowledge sharing included removing barriers, enabling access, locating knowledge carriers or seekers, and improving processes (Hendriks, 1999). A simplified conceptualisation of knowledge sharing with ICT mediation is depicted in Figure 1. If applied to an intranet, this model shows a sharer who chooses to provide knowledge to be published, and provides that knowledge, which is then published on the intranet (depicted by the box 'shared knowledge'). A potential receiver searches for and

finds the required knowledge, retrieves it, relates it to her existing knowledge, assimilates it and can apply it as needed. The fact that the knowledge has been accessed by the receiver, as well as the response to that knowledge, are fed back to the sharer, whose future knowledge-sharing behaviours may change accordingly.

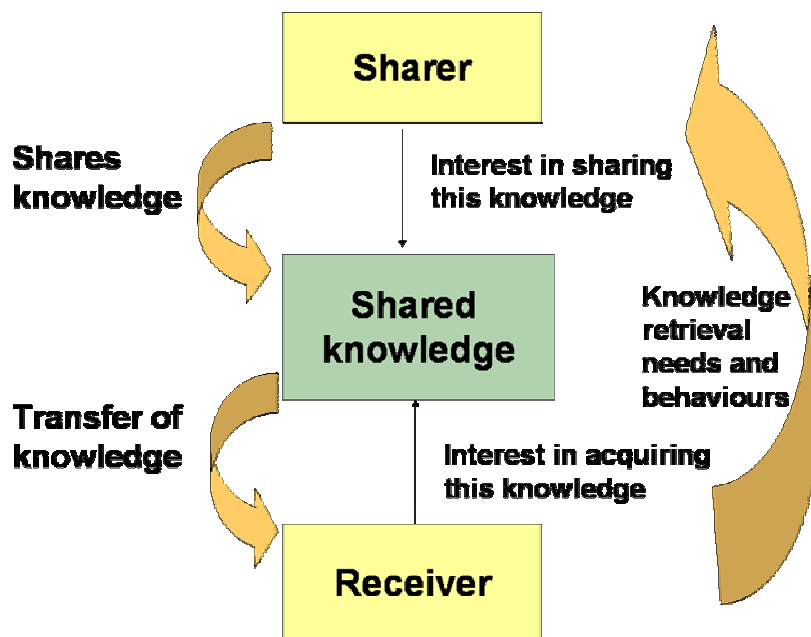


Figure 1: A simplified model of knowledge sharing

Knowledge sharing is not easy to enable in organisations. For example, Husted and Michailova (2002) describe a range of individual and organisational reasons why employees often hoard knowledge while rejecting the knowledge of others. Our interest within the parameters of this paper is particularly in those issues that affect knowledge sharing via intranets, and they are discussed, following.

Intranet utilisation for knowledge sharing

Some experts believe that intranets can support the entire gamut of knowledge management – that is, knowledge creation, sharing and application (e.g. Scott, 1998). There is certainly an inherent potential for this vision to be realised, in that an intranet can both support an unstructured knowledge base and provide a medium for the free flow and exchange of information (Stenmark & Lindgren, 2003). Executives have also expressed high expectations of intranets—including, in one recent study: 55% cost savings, 55% real time information sharing, 62% avoiding duplication of effort, 65% reduction in paperwork, 65% improved efficiency, 72% sharing best practice, 80% improved processes, and 90% improved internal communications (Melcrum, 2001).

However, as mentioned earlier, a raft of diverse influences has interfered with the realisation of such benefits, leading to high costs and poor performance (Brusoni et al., 2002). Concerns identified to date can be classified as *organisational*, *sharer*, *technological / design*, and *knowledge*. In the review below – maintaining the knowledge-sharing lens of this study – we discuss the impact of these issues on knowledge sharing via intranets. Due to reasons of paper length, we focus on selected key issues that exemplify each category. Issues of knowledge retrieval are included in the discussions, as receiver issues can affect knowledge-sharer behaviour (refer Figure 1).

Organisational Issues

Organisational structures mediate communication practices and entire infrastructures that, in turn, reinforce or otherwise shape organisational structures (Cecez-Kecmanovic et al., 1999; Orlikowski, 1996). Thus, the eventual state of such practices and structures may not correspond to the initial strategic vision. Intranets are powerful actors in socio-technical networks in that user roles will be constrained by the embodied patterns of technology and new end-users will renegotiate network activities with existing end-users, until the social order is re-established (Ciborra & Hanseth, 1998; Hall, 2004; Stenmark, 2003a). With this understanding, we see that organisational intranets are formative contexts that lead to drift of the original installed base away from the company's initial intent (Ciborra & Hanseth, 1998; Stenmark, 2003a). For example, departmental intranets are likely to reinforce existing departmental boundaries because they will lead end-users to focus on sharing knowledge intra-departmentally, creating a collection of intranet silos and knowledge workers who know little of

what occurs outside their departments, while allowing little opportunity for integration or innovation to develop from the symbiosis of specialised knowledge shared across departments (Lamb & Davidson, 2000; Newell et al., 1999).

Clearly, the management of intranets impacts the use of an intranet for knowledge sharing. A company lacking a formal knowledge management strategy can find itself with information sharing rather than knowledge sharing (Nielsen & Michailova, 2004). Further, most intranet experts believe that an intranet requires a strategy. In one recent survey, managers attributed the *ad hoc* growth of intranet silos to a lack of intranet strategy (Stoddart, 2001). An intranet strategy should assure senior management commitment, governance, resources, and alignment with business objectives (Melcrum, 2001, 2004; Terrill & Flitman, 2003; White, 2003).

The intranet strategy adopted will govern management style. While a popular viewpoint recommends traditional, centralised, intranet management in which procedures and content are staged, predetermined, and controlled (e.g. Damsgaard & Scheepers, 2000), a contrasting perspective proposes greater end-user empowerment and an evolutionary, bottom-up strategy (e.g. Butler, 2003). An integrative strategy combining elements of both top-down and bottom-up management is advocated by White (2003). Researchers have recently posited that knowledge management systems should be integrated with everyday work tools in order to increase usage (Lichtenstein & Swatman, 2003; Stenmark & Lindgren, 2004). Thus, these researchers essentially argue that an intranet should be directed toward ongoing work, rather than *potentially* valuable knowledge. Complex, often-centralised publication processes can significantly impact knowledge sharing (Stenmark, 2003a). The constraining process of having information published centrally, only after approval, can be a bottleneck. The debate remains open as to which intranet management model is the more effective, in particular circumstances.

An oft-overlooked factor affecting intranet use for knowledge sharing is the presence of alternative channels. Edwards and Shaw (2004) conducted a UK survey of ICTs used to support knowledge management and found that from 16 organisations studied, email, which was used by 15 out of 16 companies, was well ahead of the intranet (9) as the channel of choice. Zhou and Fink's (2003) survey of Australian companies also found email to be the main knowledge-sharing medium, with the intranet and Internet, second and third preference, respectively.

Cultural norms can affect knowledge sharing via intranets (Hall, 2001; Hendriks, 1999; Smith & McKeen, 2002; White, 2003). A knowledge-sharing culture depends on sociability and solidarity dimensions and is one where "people share openly, there is a willingness to teach and mentor others, where ideas can be freely challenged and where knowledge gained from other sources is used" (Smith & McKeen, 2002, p. 5). Without such a culture, all forms of knowledge sharing will be constrained, including intranet-supported knowledge sharing.

Sharer Issues

If end-users are not motivated to share knowledge, they are not likely to be suddenly motivated by the presence of an intranet (Hendriks, 1999). Rather, suggests Hendriks, individual knowledge sharing is enhanced by the presence of motivational factors (e.g. work challenges) but constrained by hygiene factors (e.g. salary). Management practices, reward systems and cultural initiatives can be employed to stimulate active sharing (Hall, 2001). Sharer beliefs about receivers can also influence whether people will share knowledge (Figure 1). For example, trust may be a barrier (Smith & McKeen, 2002), as people are unlikely to share knowledge with others whom they do not trust. As another example, Hall (2001) found that one of the reasons people would not share knowledge on an intranet was their belief that others would not find it. This suggests that sharer preconceptions of receiver knowledge-seeking behaviour may influence intranet knowledge sharing. Various sharer needs may also influence intranet knowledge sharing. For example, 43% of respondents in Melcrum's (2004) survey complained of a lack of control when sharing knowledge via intranets. Social networks enable discussions and relationships to be exploited for knowledge sharing (Tsoukas, 1996).

Technological and Design Issues

When end-users seek information, they seek the *right* information, and want it *quickly* (Sarnoff & Wimmer, 2003). Yet in one recent study, more than 50% of end-users reported dissatisfaction with their ability to find information internally (Delphi Group, 2004). In an earlier study, 40% of end-users reported an inability to find needed information on corporate intranets (IDC, 2002). Issues of information architecture, navigation, search and content management can affect the effectiveness of intranets for knowledge sharing (Damsgaard & Scheepers, 2000; White, 2003). White (2003) suggests the need for an initial knowledge audit to ascertain the knowledge that end-users need, and the need to align intranet content with corporate objectives. 74% of respondents in Melcrum's survey believe that content management is critical to obtaining more effective intranets (Melcrum, 2004).

Knowledge Issues

Some corporate knowledge may be confidential, in which case related access should be resolved and clarified with senior management (Stoddart, 2001), while knowledge security overall is important (Melcrum, 2004). The validation of knowledge kept on the intranet can also be a problem, as end-users have realised they do not know which knowledge on the intranet is current and of high value (White, 2003).

METHODOLOGY

We used an interpretive case study approach, as the research topic is relatively new and currently unexplained by well-accepted theories. Two case studies were conducted in the first stage of the research project as there was a scarcity of in depth studies or recognised theories at the time this project commenced, suggesting the need for initial revelatory results best obtained from a study of only one or two cases (Galliers, 1992).

The two companies selected were a large Australian retail organisation, OzRetail, and the Australian headquarters of a large multinational information technology corporation, GloTech. Both companies had deployed intranet technology for several years at the time of study, although GloTech's intranet use was considerably more advanced, and only GloTech possessed a formal knowledge management strategy. These differences enabled greater insights to be developed in the study.

The units studied at each company comprised several teams of system developers, analysts and corporate marketers – the web services and marketing teams at GloTech; the change control, production, development and testing teams at OzRetail; and relevant team leaders and managers. Thus the views of people with a very good understanding of organisational knowledge management technologies and related issues were tapped. By mainly interviewing people with strong technical backgrounds, we could focus to a greater extent on the influences of the non-technical issues, as the technical issues have been comparatively well covered by existing studies.

Data collected and analysed comprised audio-taped, semi-structured, single interviews and meetings; observations of knowledge sharing venues and intranet use; and relevant documents. Seventeen interviews were conducted in all. The interview questions were based on an extensive literature review of reference domains, and focused on exploring *the wider context* of knowledge sharing and knowledge-seeking choices that may affect the eventual choice of an intranet for knowledge sharing. Included within this scope were the initial decision to share knowledge, the personal rationale for selection of alternative organisational media for sharing knowledge, and the specific factors that led sharers away from the choice of an intranet. Semi-structured interviews of an hour's duration took place between July 2003 and October 2003. A rich set of data was collected from the interviews and other sources. Following qualitative content analysis techniques (Mayring, 2000), coded categories and concepts discovered in the interview transcripts were inductively developed. Concepts evolved to conclusive states over iterative readings, and were grouped into themes at the end of analysis. The remaining data were used to cross-validate and enhance the themes thus identified.

INTRANET DEPLOYMENT AND USE IN CASE ORGANISATIONS

A brief overview of each company's intranet deployment and utilisation follows. All names are fictitious.

Case study 1: GloTech intranet background

GloTech is experienced with intranet technology, having supplied intranet technology to customers for more than ten years. In GloTech's Australian head office, the international knowledge management strategy has not yet filtered down to the team level, and the knowledge sharing culture is noticeably team/group based. Many teams have their own intranets which are viewed as part of the overall corporate intranet, and are actively publishing to them, sometimes through the web services team. Intranets exist for HR, program library, quality control, finance, enterprise portal, system engineers, employee directory, marketing, and corporate news, among many others (exact number unknown by staff interviewed). The Australian web services team develops internal and external web sites for the Australian branch of the company, while publishing and updating content for themselves as well as a number of other teams, including marketing. Knowledge and information shared tend to be corporate rather than personal. On the web services team site, Internet and intranet publishing instructions and procedures are kept, while on the marketing team intranet, promotional and news material is published to keep employees and customers abreast of company events and news. The architecture of the corporate intranet is group-structured, leading to employees taking little interest in other intranets outside their own. Lacking a familiarity with the wider corporate intranet, employees have difficulty finding knowledge outside their own intranet, or knowing when needed information stored elsewhere had been updated or added. The wider intranet plays a marginal role for the two teams studied (web services and marketing).

Case study 2: OzRetail intranet background

In contrast to GloTech, OzRetail is relatively inexperienced with intranet technology, having deployed intranets for only two years at the time of study. There are no formal knowledge management initiatives in the company, the knowledge sharing culture is mostly team/group based, and most intranets have evolved from group motivation and are group-oriented in content. Few intranets currently exist beside the main corporate portal and a few product brand sites that manage marketing and selected sales. Intranets are also maintained by the applications development team, the software management team, and the change management team. The three teams work closely together to develop applications, together with an external software provider. The knowledge and information shared by these teams tend to be corporate rather than personal. Business processes are the main type of knowledge stored. The architecture of the official intranet pages promotes group-based content, leading employees to take little interest outside of their own group's intranet. Lacking a wider familiarity with the corporate intranet, the employees have difficulty finding knowledge outside their own intranet, or knowing when relevant information had been updated or added elsewhere. The wider corporate intranet thus plays a marginal role for the teams studied.

ISSUES INHIBITING UTILISATION OF INTRANET FOR KNOWLEDGE SHARING

Although at both companies, employees (the end-users) expressed an understanding of the value of the intranet, there was plentiful evidence of concerns that were limiting its use for knowledge sharing, as well as the higher order knowledge management objectives of learning, knowledge creation and innovation. In this section, we focus on articulating and discussing these issues.

This study has confirmed and extended some of the previous findings about issues limiting intranet utilisation for knowledge sharing, discussed earlier – organisational structure; lack of learning or knowledge creation due to intranet silos; lack of integration with everyday work; insufficient resources; limited social networks; and low quality content (e.g. Lamb & Davidson, 2000; Melcum, 2001; 2004; Newell et al., 1999; Sarnoff & Wimmer, 2003; Stenmark, 2003a, 2003b; Stenmark & Lindgren, 2004; Terrill & Flitman, 2003; White, 2003). The study has also broken new ground in revealing the following additional issues – receiver impact; lack of intranet content awareness; relative advantage of alternative channels; lack of a range of knowledge templates; knowledge sharing that is closely linked with other work needs; prescriptive rather than descriptive business processes; informal knowledge that is not shared; poorly defined roles and responsibilities; lack of confidence in value of own knowledge; and lack of ownership.

In the discussion of these issues, following, we provide the voices of participants in order to illuminate the findings, as recommended by Williamson (2002) for constructivist research approaches.

Organisational structure: What was produced at both companies was a collection of intranets that were treated by the end-users as distinct repositories, as previously found by Newell et al (1999) and Lamb and Davidson (2000), among others. Each team stored only team-based knowledge on its intranet. As each team was highly specialised, its intranet contained highly specialised knowledge. Thus, people did not find it necessary to search (most of the) other intranets, as they had no understanding of how other knowledge related to the jobs they performed. As one developer remarked:

“Most users may only need information in their division, so it is easy for them to go to their department's section on the intranet to find what they are looking for.” [Developer]

The very few other intranets accessed by study participants were of a generalist (that is, integrated) nature – for example, the Human Resources and Performance Review intranets, which clearly contained important content for all employees.

Also of considerable concern was the way the specific team structures were impacting intranets. In GloTech, in the web services team, contractors were solely responsible for publishing content. However, the contractors felt they were not being paid to update content, and thus, as they were not permanently employed by the organisation, had little incentive to do so. In OzRetail a number of restructures in recent years had led to a loss of motivation and hence, to reduced interest in sustaining an intranet that would be valuable in the longer term. Moreover, in both companies, the web services /developer teams were operating as profit centres. Thus, the publication of knowledge from an “internal customer” unit or team, by web services /developer teams, was charged to the internal customer's unit. This policy had inhibited some internal units from taking advantage of the technical know-how of the web services / developer teams.

Lack of learning or knowledge creation due to silos: Due to the silo effect of existing intranets, little knowledge creation was taking place, other than via the limited learning opportunities available from assimilating the codified knowledge stored on intranets. Moreover, no interactive applications resided on intranets, other than email. This lack of higher order knowledge management contributed to the lacklustre interest in sharing

knowledge by intranet. This finding suggests the need for new strategies to promote knowledge creation via intranets, as suggested by Stenmark (2003b).

Lack of integration with everyday work: Intranets were not integrated with everyday work practices, and this had contributed to their out-of-date content, as updates were not a priority with end-users, even when updating was part of their job. Moreover, other channels were clearly linked to everyday tasks and so were preferred. For example, email was used to communicate directions and answer work-related questions; thus email was integrated with work practices, whereas publishing on an intranet was removed, and only took place as the result of a separate decision. Occasionally, knowledge shared in an email was commended and the author was advised to publish it on an intranet. A limited form of integration of the intranet with everyday work was achieved through the use of email blasts that advertised company events or policies by providing an email introduction and link to an intranet page where the complete content resided. Other than these examples, there was no integration of intranets with everyday work, and given the lack of time to contribute to intranets, which we discuss next, the opportunities to share by intranet were severely curtailed. Researchers have commented recently on the need to integrate knowledge management systems with everyday work to motivate their use (e.g. Lichtenstein & Swatman, 2003; Stenmark & Lindgren, 2004).

Insufficient resources: By far the most remarked reason for not sharing more or improved knowledge via an intranet was a *lack of time*, as has been found by other researchers (e.g. Melcrum, 2001; 2004; Terrill & Flitman, 2003; White, 2003). For example:

“I struggle to find time (to share my technical knowledge with interns).” [Team manager]

Limited social networks: The study showed that most sharers obtained satisfaction from knowledge sharing because they were helping people, team members, or others whom they already knew:

“I share my knowledge with people because people need help, and if I can help them, then I will help them, because it seems like the right thing to do.” [Developer]

Aside from altruistic reasons for sharing, participants sought improved team performance through intra-team knowledge sharing. However, some people shared purely from self-interest:

“I publish my knowledge so that other people will leave me to my work.” [Systems engineer]

However, there was little opportunity for people to share knowledge with people whom they did not know personally, and who were in different teams or locations. Intranets were not being used for supporting communities of any kind, and provided no opportunity to meet people at remote locations, establish social/collegial relationships or share knowledge. As one team manager commented, and as Tsoukas (1996) and others have highlighted:

“Social networks are essential when trying to capture knowledge.” [Team manager]

Low quality content: The consensus from most participants at both companies was that the information on intranets was only about 80% up-to-date at any given time. Contractors working for GloTech mentioned that updating content was considered unproductive by managers, and that they were being paid to show results (which apparently did not include updating). Updates did not present a visible contribution and were considered boring. Two analysts remarked:

“The truth is that no one ever enjoys documentation, and that’s why they won’t do it.”

[Analyst]

and

“I use the intranet as a starting point, knowing it is probably not accurate. Then I ask someone for the rest of the information.” [Analyst]

In both organisations, the publication process was tedious and cumbersome. Due to the team-based nature of intranets, people needing knowledge were easily able to access their teams’ knowledge face to face or by email, thereby avoiding the need to access intranet knowledge and giving content developers little reason to update knowledge as it changed. Another issue was that business process definitions given to developers for publication did not reflect reality. The actual business processes were performed differently (this issue is discussed again later). Content management, as advocated by (White, 2003; Melcrum, 2004) and many others, was clearly needed.

Receiver impact: Importantly, sharers were found to have preconceptions about receivers that sometimes led them not to share knowledge at all, or only via a particular channel. Sharers made judgements about receiver absorptive capacity, specialised domain of knowledge, likelihood of paying attention to a given medium, need to know, level of thirst for knowledge, and level of medium self-efficacy. The receiver’s “need to know” was a very important finding in this category of issues:

“I regularly won’t share knowledge with people simply because the detail I know they don’t need to know to do their job.” [Systems engineer]

The receiver impact issues, and their importance to knowledge sharing in general, are explored in greater detail in Lichtenstein and Hunter (2005).

Lack of intranet content awareness: Many knowledge seekers were unaware of what was on the corporate intranet and thus did not look there for what they needed to know. Sharers were aware of this fact, and this inhibited them from sharing their knowledge via that medium. For example:

“Nobody is aware of it. There needs to be more awareness generated in the company of the information that is being published to the intranet. The marketing team is not generating enough awareness and are not advertising the intranet.” [Team manager]

Relative advantage of alternative channels: An important finding was that some end-users and developers preferred and selected other channels for sharing knowledge, believing other methods and media to be more suitable for different types of knowledge and conditions. Two salient examples follow:

“Recently, I have been sharing a lot of my knowledge face-to-face, relating to organisational structure and how to interact with people. This type of knowledge I have learned through experience and I don’t think that it should be documented on the intranet or written down anywhere.” [Team manager]

and

“I share my knowledge within my team mostly in a one-on-one informal discussion, or by email.” [Team manager]

Due to the team-based nature of the intranets studied, there were faster methods to convey intra-team knowledge than intranets:

“If there is something that is urgent that the group needs to know about, it’s either sent through emails, or basically, we just turn around and talk to our team.” [Developer]

Email and face-to-face were the two most popular knowledge-sharing channels at both companies. The profile of knowledge that was shared by email was: informal, ad hoc, “how people think,” “what is done,” descriptive, situated, time-sensitive, requiring documentation for accountability, commitment and recording purposes, personalised, collectively contextualised, detailed, fragmented, urgent/important, not validated (raw), unapproved/not sanitised, reflective, and customised and targeted to audience. The profile of knowledge that was shared by intranet was: formal, structured, one-to-many, generalised, incomplete, static, complex, non-urgent, not immediately relevant, long lifespan, and prescriptive. This suggests that knowledge of greater value may be being shared by email than by intranet. Sometimes, combination strategies were used. For example, knowledge was initially shared on email, reviewed informally for its potential value to a wider audience, then published on an intranet.

Lack of a range of knowledge templates: A number of people commented that they possessed informal knowledge that could be shared on an intranet, if templates were available to capture such knowledge.

Knowledge sharing is closely linked to other work needs: Workers have multiple work-related needs which are linked to and integrated with communication and knowledge sharing – for example, there is a need to obtain a recorded commitment from others when communicating and knowledge sharing, which favours email use:

“We use email so that we have a documented conversation for both sides.” [Developer]

and

“I send email in order to get a commitment. I have a record so that if the other person doesn’t do anything, I can follow up.” [Developer]

Prescriptive rather than descriptive business processes: Business process definitions on the intranets were prescriptive rather than descriptive. Participants expressed a desire to know what actually took place, rather than what was supposed to take place ideally.

Informal knowledge that is not shared: In the study, only limited examples of useful knowledge stored on the intranets were given, such as business processes and methodologies. Meanwhile, almost every person interviewed stored potentially useful tips, guidelines, cheat sheets and other idiosyncratic knowledge documents on her work PC. When asked why they did not share their PC-based individual knowledge with others, respondents were genuinely surprised that anyone else might be interested. Comments included:

“My cheat sheet for running the process isn’t in a formal structure. (Also) it represents how I think – not ‘what to do’.” [Developer]

Poorly defined roles and responsibilities: Job titles, roles and responsibilities for intranet activity were mostly undefined and changing, contributing to the confusion and to some jobs being done sporadically, or not at all. Accountability for intranet sharing seemed to be absent, both in terms of providing content, and in publishing that content to intranets.

Lack of confidence in own knowledge: Many participants commented that others would not be interested in knowledge that they possessed, displaying a lack of confidence in the value of their knowledge. Thus, much knowledge was not shared to the intranet that could have been valuable to others.

Lack of ownership: The intranet clearly did not meet participants' needs for autonomy and ownership of knowledge. This was illustrated by a comment explaining a preference for email:

“Basically, each person is in charge of organising their emails, and if it's important to them, they will keep it. If it's not, they delete it.” [Developer]

SUMMARY AND CONCLUSIONS

In this paper, we explained the importance of knowledge sharing to businesses, and the potential for a corporate intranet to facilitate this process as well as contribute to higher-order knowledge management goals. A simplified model of mediated knowledge sharing was provided (Figure 1). Issues preventing the full realisation of knowledge sharing on intranets were discussed. We then reported the results of two case studies and provided a discussion of a range of issues that limited knowledge sharing on several intranets.

Our research has highlighted three key issues that have received little attention to date: the influence of organisational structures and strategies on knowledge sharing patterns, the powerful effect of alternative media on intranet use, and the impact of receiver choices on sharer choices. Highlighting the first issue, we discovered a piecemeal approach to the use of an intranet for knowledge sharing. Management and strategy were noticeably missing. In their absence, the grass roots strategy supported by Stenmark (2003a) had taken hold, with intranet silos evolving according to teams' undirected, genuine needs. This evolution had been shaped by existing structures in the organisation, which included contractor-based teams in one case and frequent restructures in the second. Also common to both companies was the silo effect caused by the common practice of sustaining specialised team intranets. These are of limited value outside the teams and of limited value within – suggesting the need for a different strategy.

With respect to the second issue, our research has identified unique knowledge profiles for different knowledge-sharing channels. Of interest, Van den Hooff and de Leeuw van Weenen (2004) suggest that CMCs such as email are antecedents of organisational commitment, and that such a commitment, in turn, influences sharer willingness to contribute and collect knowledge. This study similarly identified email as fulfilling a commitment role. How can other media such as the intranet compete with such CMCs, when they are unable to fulfil this increasingly important work role that seems inextricably linked to interactive communication? Moreover, the increasing use of email as evidence in law seems bound to exacerbate this situation (e.g. Cohen & Lender, 2003). Drawing the concerns together, an integrated communication plan is needed. With respect to the third issue – receiver impact on sharer choices in knowledge sharing on the intranet – educating employees about one another's knowledge needs and behaviours may assist in preventing the many misconceptions revealed in this study. A number of other important influences on knowledge sharing via intranets were also articulated, deserving future research attention.

We note that an intranet is a powerful change agent. It can transform companies into distributed knowledge systems – self-managing systems with explicit knowledge bases that are increasingly coordinated through the medium of email: email is being used to link, translate and clarify the meaning of explicit knowledge stored in an intranet. However, a more effective coordination mechanism is needed to link and integrate the disparate knowledge silos arising from the current, structural aspects of organisations. More importantly, companies and researchers must find ways to make use of the special characteristics of web technologies to create new organisational forms and new opportunities for knowledge sharing.

An intranet is clearly not a convenient tool in its current paradigm. In the two companies studied, intranet publishing, as well as locating intranet-based knowledge, required considerable time and effort. Such difficulties were cited many times by participants in our study. We therefore support Stenmark and Lindgren's (2004) call for integrating an intranet more closely with everyday work tools such as email and spreadsheets, in an attempt to improve the convenience aspect of intranets.

To conclude, this study suggests that for companies to obtain more effective intranets, they need to better align organisational structures and strategies with intranet objectives, develop a comprehensive corporate communication plan, and find new ways to closely link sharers with receivers' knowledge needs. Our study further suggests that the full potential of the intranet will not be realised until proper attention is paid to the complex contextual issues surrounding knowledge-sharing choices.

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REFERENCES

- Barabba, V.P. and Zaltman, G. (1991) *Hearing the Voice of the Market: Competitive Advantage Through Creative Use of Market Information*. Boston, MA:Harvard Business School Press.
- Brusoni, S., Marsili, O. and Salter, A. (2002) *The Role of Codified Sources in Innovation: Empirical Evidence from Dutch Manufacturing*, Working paper 80, Science and Technology Policy Research, University of Sussex, UK.
- Butler T. (2003) An Institutional Perspective on the Development and Implementation of Intranet- and Internet-based IS, *Information Systems Journal, Special Issue on Social and Organizational Aspects of Internet-based Information Systems*, 13(3), 209-232.
- Cecez-Kecmanovic, D., Moodie, D., Busuttil, A. and Plesman, F. (1999) Organizational Change Mediated by Email and Intranet: An Ethnographic Study, *Information Technology and People*, 12(1), 9-26.
- Choo, C.W., Detlor, B. and Turnbull, D. (2003) *Web Work: Information Seeking and Knowledge Work on the World Wide Web*, Kluwer Academic Publishers: Dordrecht.
- Ciborra, C. and Hanseth, O. (1998) From Tool to Gestell, *Information Technology and People*, 11(4), 305-327.
- Cohen, W. and Levinthal, D. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, 35(1), 128-152.
- Cohen, A.I. and Lender, D.J. (2003) *Electronic Discovery: Law & Practice*, Aspen Publishers.
- Damsgaard, J. and Scheepers, R. (2000) Managing the crises in intranet implementation: a stage model, *Information Systems Journal*, 10(2), 131-149.
- Deloitte (2004) *Employers Cite Rising Costs, Promoting Consumerism as Top Priorities for Benefit Plans in 2004*, URL: http://www.deloitte.com/dt/press_release/0,2309,sid%253D2283%2526cid%253D38676,00.html, Accessed 22 October, 2004.
- DeLong, D. and Fahey, L. (2000) Diagnosing cultural barriers to knowledge management, *The Academy of Management Executive*, November, 14(4), 113-127.
- Delphi Group (2004) Spring 2004 Taxonomy Survey, URL:<http://www.delphigroup.com/research/surveys/complete/2004/2004-taxonomy-survey-done.htm>, Accessed 22 October, 2004.
- Denton, D.K. (2003) Intranets: They are not just for employee directories any more, *Computerworld*, March 17.
- Dixon, N. (2002) The Neglected Receiver of Knowledge Sharing, *Ivey Business Journal*, March/April, 35-40.
- DTI (2003) *Business in the Information Age: the International Benchmarking Study 2003*, Dept of Trade and Industry, UK, URL: <http://www.ukonlineforbusiness.gov.uk/benchmarking2003/>, Accessed 22 October, 2004.
- Edwards, J.S. and Shaw, D. (2004) "Supporting knowledge management with IT" in *Proceedings of DSS 2004*, Prato, Italy. URL: http://dsslab.sims.monash.edu.au/dss2004/proceedings/pdf/23_Edwards_Shaw.pdf, Accessed 22 October, 2004.
- Galliers, R.D. and Swan, J. (1999) "Information Systems and Strategic Change A Critical Review of Business Process Reengineering" in Currie, W. and Galliers, R.D. (eds), *Rethinking Management Information Systems*, Oxford University Press, 360-387.
- Galliers, R.D. (1992) "Choosing Information Systems Research Approaches" in R.D. Galliers (Ed) *Information Systems Research: Issues, Methods and Practical Guidelines*, Blackwell Scientific Publications, Oxford, 144-162.
- Gasson, S. (2004) "The Management of Distributed Organizational Knowledge", in *Proceedings of HICSS 2004*, IEEE Society Press.
- Hall, H. (2001) Input-friendliness: motivating knowledge sharing across intranets, *Journal of Information Science*, 27(3), 139-146.
- Hall, H. (2004) "The intranet as actor: the role of the intranet in knowledge sharing" in *Proceedings of the International Workshop on Understanding Sociotechnical Action*, 3-4 June 2004, Edinburgh, Scotland, 109-111.

- Hendriks, P. H.J. (1999) Why share knowledge? The influence of ICT on the motivation for knowledge sharing, *Knowledge and Process Management*, 6 (2), 91-100.
- Hunter, A. (2003) *Utilisation of a Corporate Intranet for Knowledge Sharing and Retention*, Unpublished honors thesis, School of Information Systems, Deakin University, Melbourne, Australia.
- Husted, K. and Michailova, S. (2002) Diagnosing and fighting knowledge sharing hostility, *Organizational Dynamics*, 31(1), 60-73.
- IDC (2002) *Quantifying Enterprise Search*, Report #26826, IDC, May.
- Lamb, R. and Davidson, E. (2000) "The new computing archipelago: Intranet islands of practice" in R. Baskerville, J. Stage & J. deGross (eds.), *Organizational and Social Perspectives on Information Technology*, Boston: Kluwer Academic, 255-274.
- Lichtenstein, S. and Hunter, A. (2005) "Considering the Receiver in Knowledge Sharing: When the Receiver Seems Ready the Sharer Appears", to appear in *Proceedings of 7th Australian Conference on Knowledge Management and Intelligent Decision Support (ACKMIDS 2004)*, Monash University, Melbourne, Australia.
- Lichtenstein, S. and Swatman, P.M.C. (2003) "Sustainable Knowledge Management Systems: Integration, Personalisation and Contextualisation" in *Proceedings of 11th European Conference on Information Systems (ECIS 2003)*, Naples.
- Mayring, P. (2000) Qualitative Content Analysis, *Qualitative Social Research Forum*, 1(2), URL: <http://www.qualitative-research.net/fqs-texte/2-00/2-00mayring-e.htm>, Accessed 22 October 2004.
- Melcrum (2004) *Key Benchmark Data for Communicators 2003-04*, Melcrum Publishing.
- Melcrum (2001) *Managing and Developing Intranets for Business Value*, Melcrum Publishing.
- Newell, S., Scarbrough, H., Swan, J. and Hislop, D. (1999) "Intranets and knowledge management: Complex processes and ironic outcomes" in *Proceedings of the Hawaii International Conference on System Sciences 1999*, IEEE Comp Soc.
- Nielsen, B.B. and Michailova, S. (2004) *Toward a phase model of global knowledge management systems in multinational corporations*, Working Paper 3/2004, Center for Knowledge Governance, Copenhagen Business School, URL: <http://frontpage.cbs.dk/ckg/upload/CKG-WP%202004-03%20Toward%20a%20phase-model%20of%20global%20knowledge%20management%20systems%20in%20multinational%20corporations.pdf> >, Accessed 22 October 2004.
- Orlikowski, W. (1996) "Learning from Notes; Organizational issues in groupware implementation" in (R. Kling, Ed.) *Computerization and Controversy: Value Conflicts and Social Choices* (2nd ed.), San Diego CA, Academic Press.
- Sarnoff, A. & Wimmer, T. (2003) Knowledge Management and Intranets: Putting People First, *Intranet Journal*, April 23, URL: http://www.intranetjournal.com/articles/200304/ij_04_23_03a.html, Accessed 22 October, 2004.
- Scott, J. E. (1998) Organizational knowledge and the Intranet, *Decision Support Systems*, 23, 3-17.
- Smith, H. and McKeen, J. (2002) "Instilling a Knowledge Sharing Culture" in *Third European Conference on Organizational Knowledge, Learning and Capabilities (OKLC 2002)*.
- Stenmark, D. (2003a) "Intranet as Formative Context: a Study of an Under-utilized Corporate Web" in *Proceedings of AMCIS 2003*.
- Stenmark, D. (2003b) "Knowledge creation and the web: Factors indicating why some intranets succeed where others fail", *Knowledge and Process Management*, 10(3), 207-216.
- Stenmark, D. and Lindgren, R. (2004) "Integrating Knowledge Management Systems with Everyday Work: Design Principles Leveraging User Practices" in *Proceedings of HICSS-37*, Big Island, Hawaii, IEEE Society Press.
- Stenmark, D. and Lindgren, R. (2003) "Intranets for Knowledge Management: Applications Affording User Participation" in *Proceedings of AMCIS 2003*.
- Stoddart, L. (2001) Managing intranets to encourage knowledge sharing: opportunities and constraints, *Online Information Review*, 25(1), 1-19.
- Terrill, B. and Flitman, A. (2003) Factors Influencing Users' Satisfaction With Integrative Knowledge Management Systems - A Preliminary Investigation, in *Proceedings of 11th European Conference on Information Systems (ECIS 2003)*, Naples.
- Tsoukas, H. (1996) The firm as a distributed knowledge system: A constructionist approach, *Strategic Management Journal*, 17, 11-25, December.
- Van den Hooff, B. and de Leeuw van Weenen, F.S. (2004) Committed to share: Commitment and CMC use as antecedents of knowledge sharing, *Knowledge and Process Management*, 4(1), 13-24.
- White, M. (2003) *Creating an Effective Intranet*, Intranet Focus Ltd, URL: <http://www.intranetfocus.com/pdf/IntranetMangement.pdf>, Accessed 22 October, 2004.

- Williamson, K. (2002) *Research methods for students, academics and professionals: Information management and systems*, 2nd Ed, Centre for Information Studies, Charles Sturt University, Wagga Wagga, NSW.
- Zack, M. (2000) "Competing on Knowledge" in *Handbook of Business Strategy*, Faulkner & Gray, New York, 81-88.
- Zhou, A.Z. and Fink, D. (2003) Knowledge management and intellectual capital: An empirical examination of current practice in Australia, *Knowledge Management Research & Practice*, 1(2), 86-94.
- Zyngier, S. (2003) The role of technology in knowledge management strategies in Australia: Recent trends, *Journal of Information and Knowledge Management*, 2(2), 165-178.