Knowledge management technology-in-practice: a social constructionist analysis of the introduction and use of knowledge management systems

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ABSTRACT

This paper argues that Knowledge Management Technology (KMT) is socially constructed in use based on the affordances and constraints of the technology artefact. Since many Knowledge Management Systems are introduced with vague purposes (such as to improve knowledge sharing) it is therefore their affordances and constraints which strongly shape the socially constructed "KMT-in-practice". The paper argues that knowledge is also socially constructed and that knowledge creation requires an element of surprise and challenge to routine. Using a case study of the British Council's knowledge management programme between 1998 and 2003 the paper explores the social construction of a KMT as it is developed and used; describing how various

features afforded by the technology influence its adoption and institutionalisation. The paper concludes by arguing that KMTs-in-practice, which are successful in supporting knowledge creation, must paradoxically remain in a state of neither stabilisation and acceptance, nor abandonment and disuse. Practical implications of how this might be achieved are provided.

Keywords: knowledge management tools, knowledge management system, information systems, theory of knowledge, groupware, case study/studies.

Introduction

This paper considers the way in which Knowledge Management technology (KMT) is socially constructed. The paper begins from the premise that social activity is, in many contexts, necessarily mediated through technology and that technology is a powerful and available instrument enrolled in all human practice. Technology has a significant role within knowledge creation activities and forms part of the social context in which they occurs. The paper thus asserts that a richer view of KMT is required which acknowledges that KMT is socially constructed in development and use, and which also takes into account social constructivist perspectives towards knowledge (Schultze 2000; Venters, Cushman et al. 2003; Tsoukas 2005) and in this way researches how social construction influences how knowledge is created, shared and stored using such KMT.

Drawing upon a theoretical framework based on a practice lens of technology (Orlikowski 2000), the concept of materiality (Orlikowski 2007; Orlikowski and Scott 2008) and a view of technology based on affordances and constraints (Norman 1990; Norman 1999; Hutchby 2001) the paper seeks to show that a KMT's success, when viewed through a social constructionist lens, depends upon its ability to neither stabilise

as a routine taken for granted technology, nor become abandoned as an unusable technology.

This study contributes to demands to theorise the IT artefact within information systems (Orlikowski and Iacono 2001) and reflects debates within science and technology studies to explore technology's place in social action (Latour 1999); introducing these debates into the knowledge and organisational learning literature. The paper extends previous literatures which have considered the role of KMT within social settings (Schultze 1998; Schultze 2000) and adds further empirical and theoretical depth to the limited literature on the social construction of KMT (of which Makoto, Wilensky et al. (2007) and Park and Hossain (2003) are examples).

The empirical contribution of the paper draws upon a case study of the introduction of KMT as part of a global organisation's Knowledge Management (KM) programme between 1998 and 2003. As with many KM programmes the strategic intent was vague and focused on broad cultural goals such as improving communication, developing community and learning. Similarly the KMT was introduced without a predefined advertised purpose that was meaningful to users. The KMT was introduced with the broad aim to "transform British Council [employees] into a community and maintain such a community" (taken from the definition of the KM system's objectives). This bland, arguably meaningless, statement suggests that the KMT's meaning was at the outset unstable or even incoherent. This is not unusual; many intranets, websites, groupware tools, and social network technologies have also been introduced with broad expectations of positive consequences: as acts of technological faith. In such cases, as here, the technology's purpose maybe undefined but the vision of technology is clear serving as a powerful proxy for a general commitment to modernise, change and improve. We thus argue that without a strong vision for the technology its purpose is socially constructed from the interaction of users with its material form.

The paper unpicks this vision of KMT as an act of technological faith and lacking purpose. This is undertaken through the analysis of the case study using a theoretical framework of social construction of knowledge, design and practice, in which technology is both an artefact of design, and enacted in practice (Orlikowski 1998). The paper explores the research question: how is KMT socially constructed in use, and how does the materiality of the KMT affect both the social construction of the technology, and the social construction of knowledge (which is itself the primary aim of the technology).

The paper concludes by arguing that once a KM technology becomes "technology-in-practice" (Orlikowski 1998) and stabilizes within the routine work of users it loses its "knowledge-managementness" and it ceases to have any transformative potential and hence becomes little more than an information or data management tool (Galliers and Newell 2001). Yet, despite this, much of the focus of KMT aims at becoming routine, taken for granted and even institutionalised – essentially stabilised.

The next section of the paper reviews the literature KMT and in so doing develops the theoretical framework for the paper based on social constructionist ideas. This is followed by a brief description of the methodology employed. The case study is then presented, discussed and finally conclusions are reached.

Literature Review

While there are no intrinsic characteristics which define an ICT application as a Knowledge Management Technology (Hendriks 2001), there are a range of technologies which have been closely aligned with the field (Venters 2006b) and employed within KM initiatives. Such technologies can be defined in two waves (Huysman and Wulf 2006), the first focused on managing knowledge, supporting individual learning and direct communication. Examples of these included decision support systems, intranets, data-warehouses and video conferencing (Davenport and

Prusak 1998; Wilson and Snyder 1999; Alavi and Leidner 2001; Butler 2002). The second wave of KMT research (Huysman and Wulf 2006) focused on the collective emergent nature of knowledge sharing (Brown and Duguid 2000). This later literature recognised that "socio-psychological" factors are important in determining KMT's success (Malhotra 2005) and focused on social networking technologies and Web2.0 (O'Reilly 2007) including taxonomies and the semantic web (Thompson and Walsham 2004; Venters and Ferneley 2009). Yet both these waves of research have taken little interest in the social construction of KMT (two exceptions are (Makoto, Wilensky et al. 2007) and (Park and Hossain 2003) though these papers are not empirically grounded). Instead they see KMT as outside the individual knowledge creation – as its medium or capture device, rather than (as this paper argues) a fundamental part of the social construction of knowledge.

This lack of focus on the sociology of knowledge and of KMT reflects a dichotomy within the field of knowledge management in which the field seems split between opposing dimensions. Those who have attempted to classify the field observe these two dimensions; defined by Shultze as functionalist and interpretivist (Schultze 1998) so reflecting the philosophical opposition also dominant in the social sciences (Burrell and Morgan 1979) and in studies of technology in organisations (Orlikowski 1998). Functionalist approaches consider knowledge as an objective representation of the world waiting to be discovered, and focus on technological and informational means to transfer understanding (Schultze 1998). This is similar to Earl's categorisation of "technocratic approaches" to knowledge management (Earl 2001), Nonaka and Takeuchis SECI model (Nonaka and Takeuchi 1995), Hansen, Nohria *et al.*'s "codification approaches" (Hansen, Nohria et al. 1999) and Newell, Robertson *et al.'s* "Cognitive Model" (Newell, Robertson et al. 2002). Knowledge is capable of some degree of objectification, suggesting a technocentric perspective in which KMT should

support the gathering, organisation, refinement, analysis and dissemination of knowledge in the form of data (Jackson 1999). The central focus is on the KMT as a repository (Schultze 1998), and on taxonomies (Farquhar, Fikes et al. 1997; Avram 2006) and ontologies (Milton, Shadbolt et al. 1999; Stojanovic, Stojanovic et al. 2002; Gou, Schwartz et al. 2009) as a backbone for categorisation and search (Schultze 1998; Stojanovic, Stojanovic et al. 2002). Technology is part of a process whereby human knowledge is ordered, transferred, searched or disseminated within the machine (Russ, Lytras et al. 2008, pp. xvii) and by which work practices become more knowledge efficient (Makoto, Wilensky et al. 2007). Web 2.0 folksonomies (such as delicious.com, Digg.com or Facebook.com(Avram 2006)), blogs (Pluempavarn and Panteli 2008), games, simulations and wiki's (Hasan 2008) might be examples.

In contrast, broadly "interpretivist" (Schultze 1998) approaches to knowledge management, which Hansen terms "personalisation" (Hansen, Nohria et al. 1999) and which align with Earl's "Behavioural" approaches (Earl 2001) and Newell*et al.'s* (2002) "Community Model", intrinsically link knowledge with human action and so suggest an anthropocentric view of technology in which it is employed to support social practices of humans; usually through better communication. KMT should attempt to integrate with social activity and "recognise the tacit basis of all sense-reading and sense-giving activities, and try to make these activities more meaningful and valuable to all parties" (Walsham 2001, p601). Such KMT aims to "reconcile the informational features of computer technology with the social needs of individuals engaged in knowledge work" (Venters 2006b, p350). Capabilities such as threaded discussions, e-mail, newsgroups and videoconferencing are often associated with such interpretivist perspectives (Venters, Cornford et al. 2005) as are social networking technologies and peer-to-peer communication technologies including instant-messaging, Wikis, FaceBook.com, LinkedIn.com and Skype.

Obviously many Web 2.0 services are used to support both these two perspectives (social networking sites in particular, but also Wikis and Blogs (Avram 2006) enabling both codification and personalisation (Hansen, Nohria et al. 1999)) and some researchers have even attempted to challenge the dichotomy (for example by introducing the idea of "implicit knowledge" (Frappaolo 2008) or re-casing KMT as socio-technical and organisations as 'sensible' (Hasan 2008)). The dichotomy however still remains prevalent as a means of structuring and understanding KM interventions (Venters and Ferneley 2009). More importantly however, as Schultze and Stabell (2004) have acknowledged, polarising the field in this way has denied alternative perspectives towards KMT, overplaying the role of KMT as either the deterministic capturing of knowledge-objects, or as a basic support or medium for social processes of interpretation which are centred on the human. This bi-polar view of KMT simplifies technology's role in social practices by denying its role in intrepretivism's underlying suggestion that social reality is socially constructed (Schultze and Stabell 2004), with knowledge seen as a continuous accomplishment (Kogut and Zander 1996). Where knowledge is considered as socially constructed there seems to be considerable ambivalence towards the role of technology (e.g. (Brown and Duguid 2000; Brown and Duguid 2001; Hara 2009)) and it is this gap which the paper sets out to address.

The social construction of knowledge referred to here is rooted in phenomenology and focuses on the social context within which knowledge is constructed between individuals. Reality is socially constructed as an ongoing dynamic process reproduced by the actions of individuals based on their interpretation and knowledge of the world (Berger and Luckmann 1966). It is a dialectic construction of meaning through which knowledge and society are socially constructed. Extending this to consider the social construction of KMT is consistent with Berger and Luckmann's (1966) argument regarding the social construction of knowledge; for they argue that a

study of human knowledge must include a study of the taken-for-granted reality which is socially constructed by such knowledge; a reality which they acknowledge includes technological artefacts which are themselves socially constructed. This puts the role of technology centrally within knowledge practices - indeed Polanyi's (1967) famous "tacit dimension of knowledge", regularly quoted in KM debates, is creative and sensory and so linked to "things" which are interacted with. Similarly, the famous example of tacit knowledge as the inexpressible skill of "riding a bicycle" fails to focus on the materiality of the bicycle itself required in this knowing. Likewise, Nonaka and Takeuchi's (1995) famous bread-making example includes dough, kneading, timers, ingredients and the experience of such "things" in use, and the social construction of these and other things in the engineers laboratory. "We know more than we can tell" (Polanyi, 1967 p4)} because our experiential knowledge is influenced by things.

Adopting this social constructionist stance towards knowledge management, indicates the need to further investigate KMTs' role as material artefacts within the social construction of reality through this process of knowing – a call reflected in recent work on the materiality of technology (Orlikowski 2007; Orlikowski and Scott 2008) in which it is argued that "knowing is material" (Orlikowski 2006).

This realignment of the view of technology is a move away from asking what features a KMT might provide benefit alongside or for a knowledge practice, to instead ask how knowledge practices are shaped and institutionalised by the affordances and constraints of such features within the social construction of reality.

As Leonardi and Barley (2008, p161) makes clear;

> "Materiality matters for theories of technology and organizing because the material properties of artefacts are precisely those tangible resources that provide people with the ability to do things in new ways and to do things they could not do before. The materiality of information technology remains grossly

under-theorised (Orlikowski and Iacono 2001; Zammuto, Griffith et al. 2007), in large part, because conflating materialism with determinism poses subsidiary challenges that make it difficult to tease apart the role of the material and the social".

Theoretical Framework

In exploring the socially constructed role of technology within knowledge management, Orlikowski's practice lens is adopted, considering KMT as inscribed with designers' intention, but socially constructed through use within recurrent social practices (Orlikowski 2000). This reflects Hendrick's (2001) suggestion that KMTs cannot be considered intrinsically as "knowledge management tools" based on their own characteristics, but that they "become" KMT through the method and situation in which they are employed (Hendriks 2001). Orlikowski argues that experiential differences affect the way technology is appropriated and used and hence "in using a particular technological artefact in particular ways in particular conditions, users enact a situated technology which structures their ongoing interaction with the artefact" (Orlikowski 1998, p3), a situated technology which she titles "technology-in-practice". Through this analytical framework the role of "KMT-in-practice" (within the aspirations of broadly using KMT to create, share and communicate knowledge) is explored.

This paper's analytical focus is also on the affordances of the material technology that lead it to become technology in use. As Leonardi and Barley eloquently argues researchers "pay too little analytic attention to a technology's material constraints and affordances, and focus, instead, on showing how people organize around the technologies they employ" (Leonardi and Barley 2008, p163). In this context an affordance is the technology's "call-out" to human beings (Gibson 1979; Hutchby 2001) it is the fixed notion which "constrains the ways that [technologies] can be 'written' or

‘read’” (Hutchby 2001). An example of this might be that that a door-handle affords turning or a button affords pushing (Norman 1990).

> “The affordance of something does not change as the need of the observer changes. The observer may or may not perceive or attend to the affordance, according to his needs, but the affordance, being invariant is always there to be perceived… The object offers what it does because it is what it is.” (Gibson 1979, p138-9)

Similarly, technology might not afford something a user desires and may have constraints which constrain action. “Technologies resist” (Leonardi and Barley 2008, p163), by not allowing users all the possibilities they want and thus users must alter their practices correspondingly in response to these constraints.

Focusing on these affordances and constraints attends to the demand to directly address the means by which specific features of a technology become entangled in the social practices of individuals undertaking knowledge work (Pickering 1995; Knorr-Cetina 1999; Leonardi and Barley 2008). In addition, it focuses the analysis on new things enabled by KMT, and not simply on their role in replicating existing knowledge practices (Karat, Karat et al. 2000; Zammuto, Griffith et al. 2007). It must be acknowledged that certain structures (which embody social rules and political interests) are embedded within any technology’s design (Orlikowski 1992) in the affordances and constraints of the technology. Therefore the KMT-in-practice is based on the materiality of the technology itself, reflecting the designers’ intentions and beliefs.

This theoretical framework (technology in practice, constraints and affordances) is used to analyse how, within the case study, the material artefact of a KMT, and its affordances and constraints, become embodied within the Knowledge Management practices and either become (or fail to become) stabilised (and subsequently institutionalised) within the organisation. This provides empirical evidence and

explanation for Huysman and Wulf's (2006, p40) observation that "most tools designed to support knowledge sharing, do not become institutionalised within organisations".

Methodology of the Case Study

The interpretive case study is drawn from action research to develop and introduce a KMT as part of the British Council's knowledge management initiative dating from 1998-2003. While the case study is now quite old (the organisation and its KM practices have changed considerably in the intervening period), and hence its relevance to modern KMT may be challenged, it is also advantageous as it is a less complex technological context in which to analyse materiality and the social construction of technology. Unlike today's organisations where Web 2.0 technology abounds, the case provides an example of the introduction of a new collaborative knowledge management system into an organisation with a scant communications infrastructure consisting of only email and a simple flat-file Intranet. Given that this research is not focused on the form of technology *per se* but rather explores how the materiality of any KMT becomes used, so the case is beneficial since the lack of a wider Web 2.0 context, the lack of integration of systems, and the limited features of the KMT itself makes it easier to demonstrate and explore its socially constructed and material nature. It is hoped that by returning to an earlier and simpler case study it may be possible to demonstrate KMT's socially constructed nature and demonstrate such a perspective's relevance to contemporary interests in social networking technologies. The action research study has been described elsewhere in relation to the institutional impact of the KM strategy (Venters 2003; Venters and Wood 2007) however it is uniquely used here to focus on the social construction of a KMT during its development and use.

Action research involves an intervention by a researcher into a real organisational context with the aim of both improving the context and at the same time

gaining relevant knowledge of the intervention. Soft Systems Methodology (SSM) was employed within the action research as the systems development methodology (Checkland and Scholes 1990). Here however, one cycle of this SSM intervention is used as an interpretive case study (Walsham 1993; Walsham 1995; Walsham 2006). The wider intervention is described elsewhere (Venters 2003); however here, the qualitative data collected for this cycle of intervention was interpreted to make sense of the social construction of the KMT in practice. Crucially the researcher's involvement within the case, and the subsequent reflexive analysis of this involvement (Ashmore 1989; Alvesson and Skoldberg 2000), allows the case study to penetrate deeper into the designers' intentions than a conventional interpretive case study may have allowed. Action research ensures the active interest of the organisation's management and further enables access to situations usually unavailable to other research approaches (Fox 1990; Gustavsen 1993; Kock 1997). Significantly for this research, alternative accounts may have been unable to document the abstract attributes of the technology that are embedded within their design (Kallinikos 2004) and the political impact of the technology. Using action research, the researcher was undertaking such design and was involved in the implementation and thus can report on this. In this way the study provides a unique historical account of the process of designing and constructing a Knowledge Management System. The research was conducted over a five and a half year period. During this period over fifty research interviews were undertaken across six countries (Spain, South Korea, Hungary, France, Slovenia and the UK), alongside many months of participative interaction with the actors (filling ten research diaries). The researcher was given full access to the organisation's intranet, IT infrastructure and document archive during this period.

Case Study

The British Council is a non-profit organisation, partially funded by the UK Government's foreign and commonwealth office, which aims to develop relationships with overseas stakeholders by gaining recognition for the UK's values, ideas and achievements (Lee 1995). At the time of the research the organisation had a headquarters in London and in Manchester with about 1000 members of staff administering around 5000 employees based in about 257 offices in 110 countries. As a truly global organisation focused on innovation, learning and knowledge sharing, its senior management felt knowledge management to be of paramount importance to the organisation's success (Khalid and Marsden 1999; Venters and Wood 2005). Its knowledge management programme aimed to "design and implement measures which will encourage people working in the Council to generate and share information and knowledge in ways which advance our purpose and strategic objectives and will become a permanent feature of the way we work" (Internal British Council Memo 1999). Its global nature meant that most members of the organisation could not physically meet and unsurprisingly technology was seen as central to the KM programme. Specifically the programme aimed to exploit new technology (particularly the organisation's Intranet) in "creating a comprehensively networked organisation" that would engender a greater sense of the organisation being a community. The intervention described was founded on a desire to engender "a sense of community" and develop communities of practice (Lave and Wenger 1991; Wenger 1998) among senior staff in the organisation and drew heavily on the literature providing advice on achieving this (Wenger 2001; Wenger, McDermott et al. 2002).

As an action researcher, the researcher's role in the Knowledge Management programme was defined as "to provide the British Council with pilot tools to support the knowledge sharing needs of [the Country Director] community" (terms of reference

produced by the Knowledge Manager). The pilot tool was titled CD:net and in developing it the Knowledge Manager assumed a project management role with the researcher acting as the developer, designing and programming the system. In addition, a recently retired Country Director was employed as a consultant to provide "expertise in understanding the needs of the Country Director community…to edit, produce and publish information to be provided to the community and to support the community in its knowledge sharing…[and]…to support the rest of the team in understanding the community" (Consultant's terms of reference).

The aim of CD:net was not precisely defined, other than "to support this overloaded and pressured group" of Country Directors through the provision of "knowledge management tools". This was to be achieved by "bringing people overseas more closely into the [general] debate" (Internal British Council Memo 1999) through providing Intranet technology which would "comprehensively network" (ibid) them.

It was decided to provide Country Directors with an easy to use KMT that could be developed further as its use changed. While some structure was imposed, it was seen as inevitable that once introduced the use made of the technology would be different. The CD:net team used the metaphor of a "mobile phone" in designing the service; suggesting that CD:net should aspire to become like a mobile phone in that Country Directors could use it without real thought in a huge variety of ways to make life easier for themselves. In this way CD:net would act as a conduit for complex social practices. Unlike many Knowledge Management Systems at that time, CD:net would not aim to codify the work of Country Directors, as their work was considered too varied (one Country Director described his work as of "Butterfly nature"). To develop a "sense of community" among the group the consultant would take on the role of "catalyst" to encourage participation by prompting questions, seeding articles and representing users.

Material affordances and constraints

The CD:net technology's design was constrained by the organisation's IT policies, costs and by their chosen technological infrastructure. These constraints included issues of security, network bandwidth availability and corporate standards for Intranet sites. As the cost of installing software on PCs globally was large, the service was forced to run entirely using server-side Internet technology and was only accessible through a web browser. The system had to conform to the organisation's standards for Intranet sites, imposing a series of constraints on the graphic design. Similarly, the use of website technology itself constrained the provision of capabilities to develop a sense of community. HTML (and the underlying HTTP protocol) is designed for rendering hypertext information and is thus more suited for simple information provision than for complex interaction (Berners-Lee and Fischetti 1997), therefore leading to systems that are argued to support a more codified than personalised approach to knowledge (Sørensen 2002). While other technologies existed which could have enabled this (e.g. client-side Java or ActiveX controls), these were forbidden from use on the organisation's Intranet, as was Instant Messaging and similar groupware technologies. Within these constraints, the service was designed wherever possible to promote social activity through discussion. CD:net provided the usual features of generic knowledge management systems focused on personalisation (Hansen, Nohria et al. 1999; Venters 2006a) including hierarchical discussions, new postings, advanced search, linking to websites and personal details pages linked to comments.

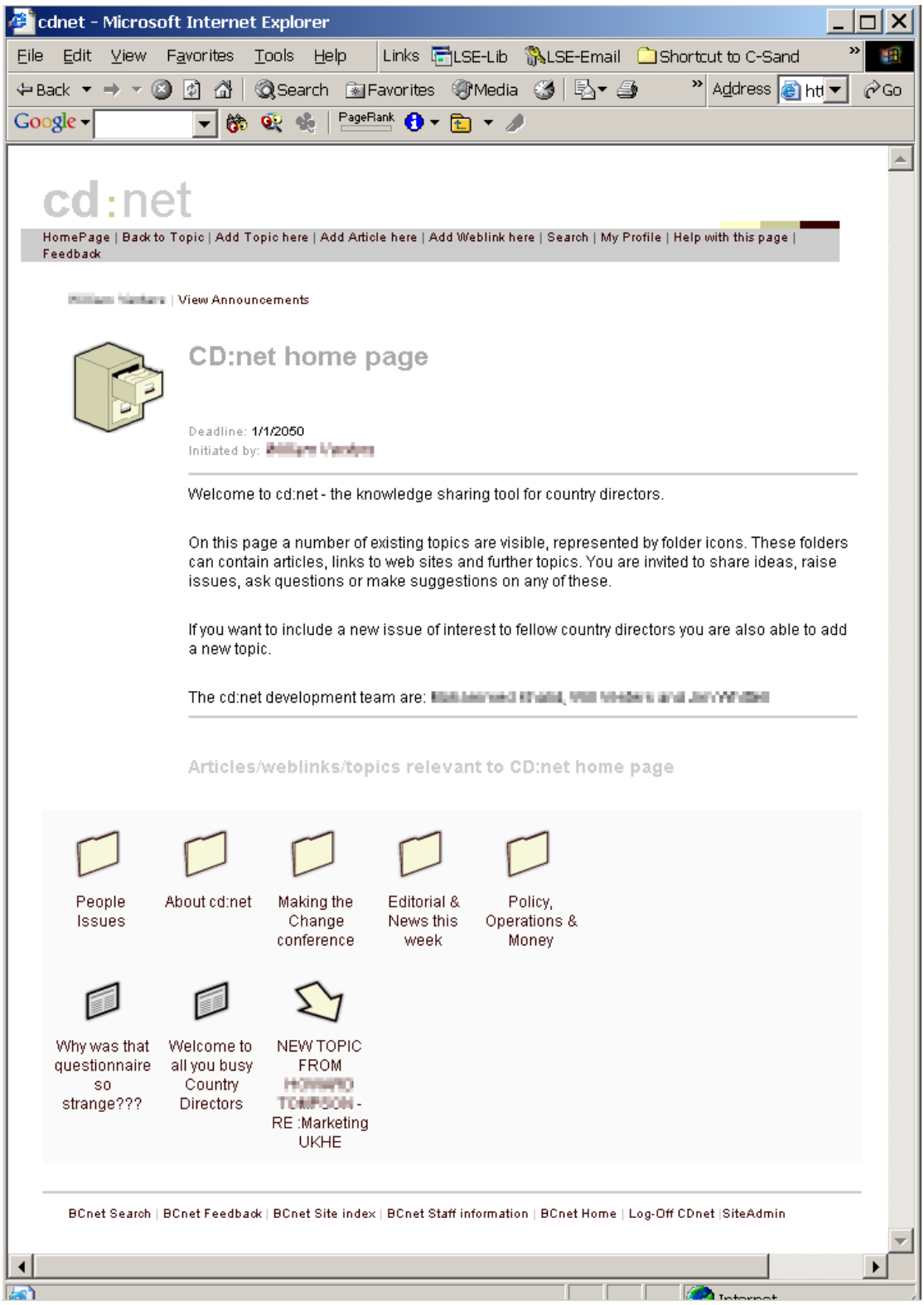

Figure 1: CD:net page: This shows the home page with folders and discussions at the bottom of the page (folders contain further discussions, the newspapers are individual messages and the arrow is a link to a website) . The author's name is associated with every message. Names have been pixilated.

These facilities afforded different levels of participation, and allowed the consultant to separate the website into areas for various types of discussion. The system's content was to change regularly as users posted messages and as the consultant commissioned articles. While a small part of the CD:net system was public (i.e. all members of the organisation could view them), the vast majority of the system required a software-token and password so that only registered Country Directors could access it. Such privacy was provided for three reasons. Firstly, the system required the software-token so that it would know the identity of the user and could tailor the webpages accordingly. Secondly, the security requirements of the organisation necessitated passwords being issued to Country Directors – something that was interpreted as ensuring privacy. Thirdly, the development team felt it was important that country directors should be provided with a safe-enclave for debates (Hayes and Walsham 2000) or for asking embarrassing questions. The service was not however advertised as 'private' *per se*, though the security measures were interpreted by Country Directors as ensuring their privacy. Furthermore a number of Country Directors were keen that discussion on CD:net would remain private – as one stated: "[CD:net] should be an open forum where staff can post ideas, complaints, rants brainwaves etc without fear of retribution, regulation or sanction".

CD:net was launched with only a small number of articles and postings (mostly solicited by the consultant). This was because the consultant felt, on the basis of consultation with Country Directors, that the imposition of a strong structure and large volume of material would overload Country Directors, and that their interest in CD:net was to gain opinions and discussions from other Country Directors, not to receive large volumes of information. This was supported by many Country Directors, one of whom stated during the design: "The danger of imposing something [structured around specific issues] is that you channel the way people think, within a medium which should

be liberating". Similarly another stated that "a strong structure should only be imposed when the service becomes too anarchic to be useful and user friendly. If straight away you put a structure to it, then you might stop people thinking laterally". CD:net was therefore launched reflecting the consultant's view that Country Directors wished to discuss simple issues of "policy, people and money", and that the system should be used to enable wide-ranging discussions of policy in these areas.

CD:net in practice

The system was launched by an e-mail from the development team containing a software token to access the site. This introductory email, including a high-level champion's message of support, focused on the value of the service to Country Directors. Upon launch, the CD:net service was used actively for a couple of months, whereupon its use slowed and eventually ceased. This section considers how the CD:net technology was understood by users, and how this led to it falling from use. This discussion is based on interviews while the system was in development, in use, and shortly after it was abandoned.

Country Directors had a wide variety of demands for the system. Some wanted it to support their personal lives in overseas countries, for example aiding them in tax and financial arrangements of working overseas. Others wanted to use the system for keeping in touch with friends who were Country Directors and were keen to share ideas so that "you can see where everyone is coming from…". In particular that was seen as "useful in getting feedback from all colleagues and could save time". Others saw the system as a tool to discuss local problems with countries that may face similar concerns. One Country Director felt the system enabled policy decisions to be better disseminated. In particular they felt that "it shouldn't be the personal choice of a Country Director who dictates the focus of activity" within their country, rather they "would like to use CD:net to share experience with [countries in their region]".

One Country Director complained of “too much top-down thinking” decreed from headquarters and felt CD:net was part of redressing the balance. Finally others were uninterested in the wider views of Country Directors, and felt the technology simply supported “a series of little networks” to which people register an interest.

A small number of Country Directors were concerned that the system did not ignore the political aspects of a Country Directors job (at a time when they faced significant strategic change) and that it should “handle dissent”. This contrasted with another Country Director’s view that “there is a danger of creating an underground movement… [if you don’t involve authority] you might get conflict!”

The messages posted on the service reflected these various interpretations of CD:net. Some posted messages about personal issues of living in overseas countries, others posted requests for advice, and suggestions for activity. A final group however soon began a discussion on the specific ramifications of an organisation wide strategic change initiative – something which was considered quite political.

Once a small number of ‘political’ messages began to be posted, other Country Directors appeared to change their interpretation of the system. The areas of the discussion board focusing on politically benign topics began to also see political messages posted (as users perceived CD:net afforded a space to discuss political issues), while others slowly stopped being used. This appeared to suggest that those who interpreted CD:net as “unpolitical” were confused about the nature of the tool. Country Directors who had valued the ability to discuss issues away from the glare of senior management began to interpret the tool not simply as a safe enclave for knowledge sharing, but rather as a political tool; even describing it as “subversive”. Significant pressure was placed on the development team to provide senior management with passwords. Indeed trust in CD:net became an issue with a Country Director stating “I would not trust CD:net…I know many people would send things straight to [senior

management]", while another stated "I would not trust any electronic medium; every time you send an e-mail you have in your mind that the message may get out to other people's hands". And yet CD:net was not designed to afford a hidden 'dissention support system' – but as a community-engendering tool where knowledge might be created and shared. Ironically, CD:net seemed to be increasing mistrust among Country Directors rather than engendering a "sense of community" as the organisation's KM strategy had intended.

Analysis of CD:net through a Practice Lens

The social construction of reality is determined by technological arrangements (Crotty 1998) of which, in the British Council's case, CD:net aspired to form part. If successful as a KMT (i.e. supporting knowledge construction and sharing) CD:net would form part of the dialectic construction of meaning (Berger and Luckmann 1966), by which its users co-construct their knowledge in a reciprocal interaction with others alongside and through the CD:net technology. A Country Director participating in the world (a world including CD:net) might simultaneously externalise their being into the world (perhaps posting messages on CD:net) helping form social order, and internalise such social order (including CD:net and its messages) as an objective reality (Berger and Luckmann 1966). This process would be undertaken over time, as the Country Director is inducted into a particular social dialectic and so gains knowledge (Berger and Luckmann 1966).

In using CD:net, within such a social dialectic, Country Directors draw upon its various affordances to construct their enacted technology-in-practice by which they construct the subjectivity of others. The form the KMT-in-practice takes will therefore influence the knowledge created through it (for it forms part of the social reality of knowledge construction). Orlikowski suggests that in constructing technology-in-practice individuals are influenced by "the properties comprising the technological

artefact – those provided by its constituent materiality, those inscribed by the designers, and those added on by users through previous interactions (e.g. specific data content, customised features or expanded software/hardware)" (Orlikowski 2000, p410). She goes on to suggest that users draw upon their own "skills, power, knowledge, assumptions, and expectations about the technology" which are influenced by factors such as communication about the technology and previous experiences of similar technology" (Orlikowski 2000, p410) drawing on (Orlikowski and Gash 1994). If a KMT-in-practice is to form part of the knowledge creation practices of individuals it is necessary to consider the influence of these factors on users' construction of a KMT-in-practice, or on their abandonment of the technology – noting that their influence would not be the same for all users (for some an affordance might be irrelevant, for others the same affordance might presents rich possibilities). Here CD:net is considered in relation to these suggested factors.

In constructing their "KMT-in-Practice" CD:net users were unlikely to have been strongly influenced by organisational communication about the technology since, as outlined in the introduction, CD:net was introduced without a predefined advertised purpose. Rather, CD:net blandly aspired to "support the knowledge sharing needs of [the Country Director] community". This suggests previous communication would have had little impact on the forms of technology-in-practice which emerged. Similarly, past experience of similar technology would align users' interpretation with the rather bland and uncontroversial corporate Intranet (the BC:net) since the IT policies required CD:net to use only HTML, to confirm to Intranet design standards and to operate very much like an Intranet site.

One affordance which appeared to strongly influence a range of users' "technology-in-practice" was the security properties imposed by the designers and the British Council's IT policies, which provided a sense of privacy from non-Country

Directors. This was reinforced by the consultant's view that the system should handle dissent and closed discussion, and perhaps by the title "CD:net" suggesting a network of and for Country Directors. These factors perhaps led some Country Directors to interpret CD:net as a 'political' tool in which it was safe to dissent from corporate policies.

Given that lack of strong material factors shaping CD:net, the most significant factor in the construction of the KMT-in-practice for users was the messages added by others. These messages formed the means by which knowledge would be socially constructed for users. A Country Director exploring CD:net would be faced by the subjectivity of others made available as messages and technology (not necessarily independently interpreted). The knowledge they constructed would thus be a hermeneutic process of meaning construction on the basis of the text posted on CD:net (alongside other similar interaction). Yet their interpretation of the meaning of a posting on CD:net would be influenced by many factors including their perception of its author (who they may know); the meaning they gleaned from the text; the meetings they have attended in which the topics were discussed; and the meaning gleaned from the technology's afforded features. Upon launch CD:net included discussions on a range of topics from a range of individuals and its users appeared to interpret the technology in a range of ways (as a place to discuss working overseas tax arrangements -a key issue for staff, a place to keep in touch and as a place for discussing local issues) perhaps inconsistently. However, perhaps influenced by the material affordance of security, once CD:net began to be used for political postings challenging the strategic aims of the organisation others' interpretation of CD:net appeared to change. By using CD:net in this way (that is, posting messages of a politically contentious nature because it was perceived as secure and available for this) the KMT was itself changed (since it incorporated political messages which other Country Directors could observe) and seen

as subversive. CD:net was enacted in practice, so we cannot easily separate the interpretation of the postings on CD:net, from the interpretations of CD:net itself. The KMT-in-practice is "both a medium for and outcome of users' patterned interaction" (Orlikowski 1998, p 2). Similarly, the dialectic of meaning construction suggests it is not possible to separate the messages on CD:net from CD:net as a technological platform for both are drawn upon in knowledge construction. Messages posted form part of the technology and the basis by which people construct meaning. When political messages were posted, CD:net was interpreted differently and became a different technology-in-practice, and hence the way CD:net was used quickly shifted. A Country Director upon perceiving CD:net as political might fundamentally change the nature of CD:net by posting a further political message, or by avoiding it, and either way further reinforcing its "politicalness". One can speculate that only by challenging such political messages (perhaps through a request to have the message censured, or by initiating an open discussion on the purpose of the tool) could this have been shaped in another manner. The overall perception of a KMT will not be homogenous. During the political discussions on CD:net messages were still being posted, for example requesting support for events, describing recent activity, though these quickly ceased as the purpose of CD:net stabilised around "dissention", "subversion" and politics and so users quickly moved away, ultimately leading to its abandonment.

This discussion, in which weak material properties and minority perceptions of CD:net were reinforced and so became dominant, ultimately leading to CD:net as a "subversive" dissention support system feared by senior management, appears to suggest that there is a need to impose a strong structure and purpose to a KMT so creating a powerful technological form which strongly influences the form of KMT-in-practice around which users stabilise their habitual practices. Indeed it has traditionally been argued that for any technology to be successful, a user's interpretation of a

technology must stabilise (Bijker 1995) whereupon its meaning may be black-boxed. Only upon such stabilisation of meaning can a technology-in-practice form part of the recurrent working practices of users so structuring their actions (Orlikowski 2000). Furthermore, such continued habitual use of the KMT will reinforce its structure over time (Orlikowski 2000) and avoid a technology falling out of habitual use and being abandoned as occurred with CD:net. Such stabilised technology-in-practice would generally be considered as successfully well used technology though in CD:net's case this failed to happen and it was abandoned. It is perhaps for this reason that so many call for a strong vision and leadership within Knowledge Management (Davenport, DeLong et al. 1998; Blackler and McDonald 2000; Earl 2001).

And yet, taking the social construction of knowledge perspective, there seems to be a paradox in this position. For what role would such habitualised, routine, stabilised-in-use KMT have in the dialectic construction of meaning? Would such a technology enable the creation and sharing of knowledge – its essential "knowledge-managementness"? Berger and Luckmann (1966) assert that our knowledge creation occurs in a foreground of deliberation and innovation, while habitualized actions' meanings "become embedded as routines in [an individual's] general stock of knowledge, taken for granted." (Berger and Luckmann 1966, p71). It is only when surprise, challenge and reflection are faced with breakdown that we learn (Schön 1982; Winograd and Flores 1986; Argyris and Schön 1996). The social construction of knowledge (Berger and Luckmann 1966) suggests that stabilisation and habiltualization of a KMT aiming to create knowledge might inhibit its ability to create meaning and knowledge; and hence the KMT simply becomes another stagnant information dissemination tool rather than a place of debate and conflict and learning. Had CD:net's meaning stabilised (for example as a basic discussion board on tax arrangements) its potential to create and share knowledge would have diminished – it would simply have

become a repository of advice on tax arrangements. Perhaps if, or when, a KMT stabilises it may fail to create the ongoing breakdowns of the meaning (Winograd and Flores 1986) necessary for knowledge creation to occur, and indeed become just another data management technology as Galliers and Newell (2001) argue that most KMTs are little more than. Indeed one could argue that CD:net ***was*** successful in creating increased knowledge among Country Directors of the political situation within the organisation. Certainly, its users gained knowledge of the political landscape of the organisation at that time and particularly on issues of trust relating to how fellow Country Directors act when presented with such dissent – perhaps demonstrated in the quote "I would not trust CD:net" noted above.

Given this paradox it is of little surprise that few Knowledge Management initiatives succeed as expected (Schultze and Boland 2000; Storey and Barnett 2000; Hendriks 2001), while many of those that survive stabilise to become little more than data management tools (Galliers and Newell 2001). Yet the above analysis suggests that a successful knowledge management technology should aspire not to stabilise in use, but rather remain an unstable, poorly understood and challenging technology-in-use so enabling the social construction of knowledge – essentially remaining "Fad" like (Swan, Scarbrough et al. 1999). Unfortunately such faddishness leads to the regular abandonment of technology (as it fails to stabilise), or to its stabilisation and descent into being a straightforward information management system.

Perhaps the challenge is therefore to take seriously the social construction of technology within Knowledge Management as a significant actor with a powerful role to play, and to value the faddishness of such technology as an important component in knowledge creation and sharing. Similarly, rather than aiming for stabilisation and longevity for KMTs, we should perhaps consider them as of-the-moment and requiring frequent or constant re-invention.

Conclusions

This paper has presented a case study of the development, introduction and use of a knowledge management technology, CD:net, within the British Council. The system was introduced as an act of technological faith without a predefined, advertised purpose. Drawing upon a social constructionist account of knowledge the paper asserts that there must be correspondence between an individual's meaning and the meaning of others in order to share a common sense of reality and so learn (Berger and Luckmann 1966). Employing Orlikowski's (2000) practice lens towards technology the paper explores how CD:net was enacted in use based on recurrent social practices, but influenced by the designer's intentions inscribed within the technology's affordances and constraints. This theoretical framework enables a discussion of the stabilisation, or lack of stabilisation of KMT-in-practice. The study shows how external factors such as the organisation's security policy and Intranet standards were embedded within the CD:net's form; how such factors influenced the CD:net technology-in-practice for Country Directors; and how this in turn shaped the CD:net technology.

While traditional accounts of technology suggest stabilisation as the ultimate goal of successful technology, this research on the social construction of KMT suggests that stabilisation of a KMT aiming to create knowledge might inhibit its ability to do so; and lead to KMT simply becoming a stagnant information dissemination tool rather than a place of debate and conflict. Had CD:net stabilised, its potential to create and share knowledge would have diminished. This paper therefore suggests that if a KMT is to achieve its desire to enhance knowledge creation and sharing then, perhaps, stability should not be desired. But there is a paradox for one might equally argue that without stabilisation the KMT cannot survive, as demonstrated by the British Council case. It is then of little surprise that few Knowledge Management initiatives succeed as expected (Schultze and Boland 2000; Storey and Barnett 2000; Hendriks 2001), while many of

those that survive stabilise to become little more than data management tools (Galliers and Newell 2001). In either case, it is argued here, that technology is central, and not incidental to the experience.

What is required is a new understanding of technology within Knowledge Management, in which the socially situated and enacted technology's properties (including communication about the technology, materiality of the technology, and messages on the technology) are employed to maintain the technology as neither stabilised nor rejected. This can only be achieved through the ongoing engagement of a designer appreciating users' technology-in-use. It is interesting to note that successful social networking technologies (of which FaceBook is an obvious example) reflect this by enabling the user community to develop applications which run on the social network and allow groups of users to develop new uses for the platform. However, such systems are not directed or managed – they emerge and many also fail and die as they stabilise and become boring, or become too chaotic (Friends-Reunited.co.uk, SixDegrees.com, and increasingly MySpace are examples). Those developing KMT in the future should consider whether it is possible to engender a system to somehow lie between stabilisation and failure. This research suggests that a strong vision of the purpose of the KMT may help. Such a vision should focus on the work practices of those involved rather than on Knowledge Management related ideas. Issues of security and privacy should be considered in relation to their potential interpretation. Similarly the design of the system should be undertaken with user involvement which specifically considers how the new KMT might be interpreted. Finally, once the system is introduced, care should be given to moderating the service with time spent discussing, within the KMT, its purpose.

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References

Alavi, M. and D. Leidner (2001). "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues." *MIS Quarterly* **25**(1): 107-136.

Alvesson, M. and K. Skoldberg (2000). *Reflexive Methodology: New Vistas for Qualitative Research*. London, Sage Publications.

Argyris, C. and D. Schön (1996). *Organisational Learning 2 :Theory, Method and Practice*. Reading, Mass, Addison-Wesley.

Ashmore, M. (1989). *The Reflexive Thesis*. Chicago, The University of Chicago Press.

Avram, G. (2006). "At the Crossroads of Knowledge Management and Social Software." *Electronic Journal of Knowledge Management* **4**(1): 1-10.

Berger, P. and T. Luckmann (1966). *The social construction of reality*. London, Penguin Books.

Berners-Lee, T. and M. Fischetti (1997). *Weaving the Web*. San Francisco,CA, Harper.

Bijker, W. (1995). *Of Bicycles, Bakerlites and Bulbs; Toward a theory of Socio-Technical Change*. Cambridge, MA, MIT Press.

Blackler, F. and S. McDonald (2000). "Power, Mastery and Organisational Learning." *Journal of Management Studies* **37**(6): 833-851.

Brown, J. S. and P. Duguid (2000). *The Social Life of Information*. Boston, Massachusetts, Harvard Business School Press.

Brown, J. S. and P. Duguid (2001). "Knowledge and Organization: A Social-Practice Perspective." *Organization Science* **12**(2): 198-213.

Burrell, G. and G. Morgan (1979). *Sociological Paradigms and Organisational Analysis*. London, Heineman.

Butler, T. (2002). *Exploring the Reality of Knowledge Management Systems: A Case Study*. The Third European Conference on Organisational Knowledge, Learning and Capabilities, Athens.

Checkland, P. and J. Scholes (1990). *Soft Systems Methodology in Action*. Chichester, John Wiley & Sons Ltd.

Crotty, M. (1998). *The Foundations of Social Research*. London, Sage.

Davenport, T., D. DeLong, et al. (1998). "Successful knowledge management projects." *Sloan Management Review* **39**(2): 43-59.

Davenport, T. and L. Prusak (1998). *Working Knowledge: how organisations manage what they know*. Boston, Harvard Business School Press.

Earl, M. (2001). "Knowledge management strategies: Toward a taxonomy." *Journal of Management Information Systems* **18**(1): 215-233.

Farquhar, A., R. Fikes, et al. (1997). "The Ontolingua Server: a tool for collaborative ontology construction." *International Journal of Human-Computer Studies* **46**(6): 707-727.

Fox, W. (1990). "An interview with Eric Trist, father of the sociotechnical systems approach." *The Journal of Applied Behavioural Science* **26**(11): 259-279.

Frappaolo, C. (2008). "Implicit Knowledge." *Knowledge Management Research and Practice* **6**(1): 23-25.

Galliers, B. and S. Newell (2001). *Back to the future: From knowledge management to data management*. The 9th European Conference on Information Systems, Bled, Slovenia, Moderna Obganizacija,.

Gibson, J. J. (1979). *The Ecological Approach to Perception*. London, Houghton Mifflin.

Gou, T., D. Schwartz, et al. (2009). "Codifying collaborative knowledge: Using Wikipedia as a basis for automated ontology learning." *Knowledge Management Research and Practice* **7**(3): 206-217.

Gustavsen, B. (1993). "Action research and the generation of knowledge." *Human Relations* **46**(11): 1361-1365.

Hansen, M. T., N. Nohria, et al. (1999). "What's your strategy for managing knowledge?" *Harvard Business Review* **77**(2): 106-116.

Hara, N. (2009). *Communities of Practice: Fostering Peer-to-Peer Learning and Informal Knoweldge Sharing in the workplace*. Berlin, Springer-Verlag.

Hasan, H. (2008). "Back to the future for KM: the case for sensible organisation." *Knowledge Management Research and Practice* **6**(1): 26-30.

Hayes, N. and G. Walsham (2000). Safe enclaves, political enclaves and knowledge work. *Managing knowledge: critical investigations of work and learning*. C. Prichard, R. Hull, M. Chumer and H. Willmott. London, Macmillan**:** 69-87.

Hendriks, P. (2001). "Many rivers to cross: from ICT to knowledge management systems." *Journal of Information Technology* **16**(2): 57-72.

Hutchby, I. (2001). "Technologies, Texts and Affordances." *Sociology* **35**(2): 441-456.

Huysman, M. and V. Wulf (2006). "IT to support knowledge sharing in communities, towards a social capital analysis." *Journal of Information Technology* **21**: 40-51.

Jackson, C. (1999). "Process to Product: Creating tools for knowledge management." Retrieved 13/7/1999, from www.brint.com/members/120205/jackson/.

Kallinikos, J. (2004). Farewell to constructivism: technology and context-embedded action. *The Social Study of Information and Communication Technology: Innovation, Actors and Contexts*. C. Avgerou, C. Ciborra and F. Land. Oxford, Oxford University Press.

Karat, J., C.-M. Karat, et al. (2000). "Affordances, Motivation, and the Design of User Interfaces." *Communications of the ACM* **43**(8): 49-51.

Khalid, M. and E. Marsden (1999). Internal Consultation Paper: Action to promote knowledge sharing in the British Council. Manchester, British Council.

Knorr-Cetina, K. (1999). *Epistemic Cultures: How the sciences make knowledge.* Cambridge, MA, Harvard University Press.

Kock, N. (1997). "Negotiating mutually satisfying IS action research topics with organisations: and analysis of Rapoport's initiative dilemma." *Journal of Workplace Learning* **9**(7): 253-262.

Kogut, B. and U. Zander (1996). "What Firms do? Coordination, Identity and Learning." *Organization Science* **7**(5): 502-520.

Latour, B. (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Boston, MA, Harvard University Press.

Lave, J. and E. Wenger (1991). *Situated Learning: Legitimate Peripheral Participation*. New York, Cambridge University Press.

Lee, J. M. (1995). "The Reorganisation of the British Council: Management Improvisation and Policy Uncertainty." *Public Administration* **73**(3): 339-355.

Leonardi, P. and S. Barley (2008). "Materiality and change: Challenges to building better theory about technology and organizing " *Information and organisation* **18**(3): 159-176.

Makoto, N., H. Wilensky, et al. (2007). *The Gospel of Knowledge Management in and out of a Professional Community*. International ACM Conference on Supporting Group Work, Sanibel Island, FL.

Malhotra, Y. (2005). "Integrating knowledge management technologies in organizational business processes: getting real time enterprises to deliver real business performance." *Journal of Knowledge Management* **9**(1): 7-28.

Milton, N., N. Shadbolt, et al. (1999). "Towards a knowledge technology for knowledge management." *International Journal of Human Computer Studies* **51**(3): 615-64.

Newell, S., M. Robertson, et al. (2002). *Managing Knowledge Work*. London, Palgrave Macmillan.

Nonaka, I. and H. Takeuchi (1995). *The knowledge-creating company: how Japanese companies create the dynamics of innovation*. New York, Oxford University Press.

Norman, D. (1990). *The Design of Everyday Things*. London, The MIT Press.

Norman, D. (1999). "Affordance, Conventions, and Design." *Interactions ACM* **6**(3): 38-43.

O'Reilly, T. (2007). "What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software." *Communications & Strategies* **1**(65): 17.

Orlikowski, W. (1992). "The duality of technology: Rethinking the concept of technology in organisations." *Organisational Science* **3**(3): 398-426.

Orlikowski, W. (1998). Out of the Shadows: The Role of Human Agency in Technology. *Sloan School of Management*. Cambridge, Massachusetts Institute of Technology.

Orlikowski, W. (2000). "Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations." *Organization Science* **11**(4): 404-428.

Orlikowski, W. (2006). "Material knowing: the scaffolding of human knowledgeability." *European Journal of Information Systems* **15**(5): 460-466.

Orlikowski, W. (2007). "Sociomaterial Practices: Exploring Technology at Work." *Organization Studies* **28**(9): 1435-1448.

Orlikowski, W. J. and D. C. Gash (1994). "Technological Frames: Making Sense of Information Technology in Organizations." *ACM Transactions on Information Systems* **12**(2): 669-702.

Orlikowski, W. J. and C. S. Iacono (2001). "Research Commentary: Desperately Seeking the "IT" in IT Research--A Call to Theorizing the IT Artifact." *Information Systems Research* **12**(2): 121 -134.

Orlikowski, W. and S. V. Scott (2008). The Entangling of Technology and Work in Organizations. *ISIG Working Papers Series*. London, London School of Economics.

Park, J.-H. and L. Hossain (2003). *Social-embed-ness of EPR Systems in KM practice*. IEEE Managing Technologically Driven Organisations: The human side of

innovation and change., Albany, LA, IEEE International Engineering Management Conference.

Pickering, A. (1995). *The Mangle of Practice*. Chicago, Chicago University Press.

Pluempavarn, P. and N. Panteli (2008). Building Social Identity through Blogging. *Exploring Virtuality Within and Beyond Organisations*. N. Panteli. Basingstoke,UK, Palgrave Macmillan.

Polanyi, M. (1967). *The Tacit Dimension*. New York, Doubleday.

Russ, M., M. Lytras, et al. (2008). *Knowledge Management Strategies: A Handbook of Applied Technologies*. Hershey, PA, USA IGI Publishing.

Schön, D. (1982). *The Reflective Practitioner: How Professionals Think in Action*. New York, Basic Books.

Schultze, U. (1998). *Investigating the Contradictions in Knowledge Management*. IFIP WG8.2 & WG8.6 Joint Working Conference on Information Systems: Current Issues and Future Changes, Helsinki, Finland, Omnipress, Wisconsin, USA.

Schultze, U. (2000). "A confessional account of an ethnography about knowledge work." *MIS Quarterly* **24**(1): 3-41.

Schultze, U. and R. J. Boland (2000). "Knowledge management technology and the reproduction of knowledge work practices." *Journal of Strategic Information Systems* **9**(2-3): 193-212.

Schultze, U. and C. Stabell (2004). "Knowing what you don't know? Discourses and Contradictions in Knowledge Management Research." *Journal of Management Studies* **41**(4): 549-573.

Sørensen, C. (2002). *Knowledge Discourses and Information Technologies*. 35th Hawaii International Conference on Systems Sciences, Hawaii, IEEE.

Stojanovic, N., L. Stojanovic, et al. (2002). *Evolution in the ontology-based knowledge management systems*. European Conference on Information Systems, Gdansk, Poland.

Storey, J. and E. Barnett (2000). "Knowledge Management Initiatives: Learning from Failure." *Journal of Knowledge Management* **4**(2): 145-156.

Swan, J., H. Scarbrough, et al. (1999). *Knowledge management: The next fad to forget people?* 7th European Conference on Information Systems, Copenhagen, Denmark.

Thompson, M. and G. Walsham (2004). "Placing Knowledge Management in Context." *Journal of Management Studies* **41**(5): 725-747.

Tsoukas, H. (2005). *Complex Knowledge: Studies in Organizational Epistemology*. Oxford, Oxford University Presss.

Venters, W. (2003). The Introduction of Knowledge Management Technology within the British Council: An Action Research Study. *Information Systems Institute*. Salford, University of Salford**:** 375.

Venters, W. (2006a). *Knowledge Management: The fad that forgot technology*. International Conference on Organizational Learning, Knowledge and Capabilities (OLKC). Warwick, UK.

Venters, W. (2006b). "The use of Technology within Knowledge Management: A Review." *Journal of Intelligent Systems* **15**(1-4): 329-356.

Venters, W., T. Cornford, et al. (2005). "Knowledge about Sustainability: SSM as a Method for Conceptualising the UK Construction Industry's Knowledge Environment." *Journal of Computing and Information Technology* **13**(2): 137-148.

Venters, W., M. Cushman, et al. (2003). *Motility Of Practiced Knowledge: An Exploration Within The UK Construction Industry*. Organisational Knowledge, Learning and Capabilities, Barcelona, Spain.

Venters, W. and E. Ferneley (2009). "Guest Editorial: To codify or collaborate - Introduction to the special issue on Knowledge Management and e-Research technologies." *Knowledge Management Research and Practice* **7**(3): 192-195.

Venters, W. and B. Wood (2005). *Organizational Knowledge, Learning and Capabilities in action: The case of the British Council*. The Sixth European Conference on Organizational Knowledge, Learning, and Capabilities, Bentley College, Boston,MA.

Venters, W. and B. Wood (2007). "Degenerative structures that inhibit the emergence of communities of practice: a case study of knowledge management in the British Council." *Information Systems Journal* **17**(4): 349-368.

Walsham, G. (1993). *Interpreting Information Systems in Organizations*. Chichester, Wiley.

Walsham, G. (1995). "Interpretive case studies in IS research: nature and method." *European Journal of Information Systems* **4**(2): 74-81.

Walsham, G. (2001). "Knowledge Management: The Benefits and Limitations of Computer Systems." *European Management Journal* **19**(6): 599-608.

Walsham, G. (2006). "Doing interpretive research." *European Journal of Information Systems* **15**(3): 320-330.

Wenger, E. (1998). *Communities of practice : Learning, meaning and identity*. Cambridge, Cambridge University Press.

Wenger, E. (2001). "Supporting communities of practice; a survey of community-oriented technologies." Retrieved March, 2001, from http://www.ewenger.com/tech/.

Wenger, E., R. McDermott, et al. (2002). *Cultivating Communities of Practice*. Boston, Massachusetts, Harvard Business School Press.

Wilson, L. T. and C. Snyder (1999). "Knowledge management and IT: How are they related?" *IEEE IT Professional* **1**(2): 73-75.

Winograd, T. and F. Flores (1986). *Understanding computers and cognition*. Norwood,NJ, Ablex.

Zammuto, R., T. Griffith, et al. (2007). "Information Technology and the Changing Fabric of Organization." *Organization Science* **18**(5): 749-762.

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