Where and When was Knowledge Managed?
Exploring Multiple Versions of KM in Organizations

Elisabeth Davenport[1] and Keith Horton

[1]Social Informatics Group, School of Computing, Napier University

Abstract: The chapter presents a case study of new technology in a rapid response social work unit that is part of an e-government program in a Scottish municipality. The objective of the project was to improve the configuration and delivery of resources for housebound clients, and it was construed as a simple knowledge integration exercise by senior management. Taking a social informatics perspective, the authors interpret the case in terms of competing discourses or multiple versions of KM, and suggest that KM versioning is a characteristic, but underexplored, feature of complex projects that involve multiple actors with different knowledge trajectories.

1 Introduction

The chapter explores a case study of a knowledge management project in a municipal public administration in the UK. The case is an instance of service transformation that is driven by major societal programs (e-learning, e-government) initiated by governments within the European Community and elsewhere to enact an "information" or "knowledge" society (Van Bastelaer, 2001). Many of these programs are based on the assumption that knowledge has not been "managed" in the relevant sectors, or that it has been inadequately managed. They are also premised on assumptions about the relationship between knowledge, technology and work that are as much ideological as rational in intent (Davenport & Horton, 2005).

One way to address the intricacies of knowledge management in cases like this is to consider them in terms of versioning. The first section of the chapter explores an extensive and contradictory literature that presents different versions of KM, and raises a number of questions. If knowledge can be shown to have been managed in the case organization before the implementation of government directives, then for whom was the managerialist version, a discourse of "prior incompetence" intended? And for whom was the discourse of "competent intervention" intended, one that was more or less compromised

by "where and when" narratives that emerged in fieldwork? Does KM inevitably involve multiple versions and diverse discourses, some of which gain salience in specific circumstances according to the prevalent political forces in different localities at different times in a KM project?

In a world where multiple accounts (or versions) of KM are available and multiple audiences are addressed, what can a researcher achieve? The second section of the chapter presents a research approach that can accommodate and explicate multiple versions of KM. As analysts working in the Social Informatics domain, we provide a framework that draws on concepts and techniques from our fellow researchers. These provide explanations of sociotechnical phenomena in organizations that span different levels of organizational order, and different timeframes. They allow an analyst not just to identify, and explain conflicting versions, but to track what we call knowledge trajectories, shifts in versions of KM over time which are rarely smooth, as traces of earlier versions persist in later ones.

The case is presented in detail in the third part of the chapter. The starting point is a work environment before a major managerial intervention intended to improve, by means of technology, efficiency and effectiveness (with the parameters of the these qualities left unclear at the start of the projects, and, indeed, defined by external consultants once the projects were underway). The time frame of the case is years rather than months. It is clear that knowledge was managed at many different levels (the "where" of the title) and at many different stages ("when"). Before the intervention, for example, an organizational rationale had to be constructed and articulated, otherwise work could not have been approved that met, more or less, requirements to comply with government directives. One version of KM in the case study involves the work of outsiders hired to implement the (outsourced) systems to produce the desired transformation. Another is the knowledge managed by those whose work was to be transformed. Knowledge at this level could be described as a complex of elements such as professional expertise, organizational acumen and day to day practice, shifting in accord with evolving circumstances. Though many discrepancies can be observed between the different versions of knowledge managed by the "ordering" side and the "receiving" side of the technology implementation described in the case, continuity was broadly achieved through co-development and transformations of practice many of which were not anticipated. Some transformations however, can be seen as degradations rather than enhancements, altering the balance of professional and routine work, managing knowledge "down" rather than "up."

2 Multiple Versions of KM

The term "Knowledge Management" is used in diverse ways, a cause of controversy in the domain. Two broad (and related) analytic trends can be identified: the first is based on semantic analysis, or term occurrence in

relevant publications; the second is based on longitudinal empirical studies of organizational KM, and tracks divergence in usage over time. For some analysts, diversity is indicative of semantic breakdown. Wilson (2002), for example, speaks of the "non-sense of knowledge management." He bases his case on two lines of reasoning: firstly, you cannot manage something that you cannot define, and secondly, according to Wilson's own definition, knowledge is "in the head" and thereby not amenable to management. Wilson reviews occurrences of the term in different journals to demonstrate inconsistency in usage; the sample is based on his own sense of which publications are relevant to information science. In contrast with this approach, Schultze and Leidner (2002), analyzing the use of the KM term in MIS Quarterly, embed their analysis in organizational theory, and suggest that diversity of terminology is a positive quality not a weakness, and that polyvalent KM is a useful focal area for the exploration of a number of intersecting organizational phenomena such as organizational learning and absorption capacity. Ekbia and Hara (2004) discuss versions of KM in terms of the actors involved, focusing on what they call the "guru version." This theme has been developed more fully by Thrift (2005) who couples the occurrence of successive versions of KM with theoretical observations on what he calls "knowing capitalism," characterized by dynamic configurations and ephemeral management theorizing.

Thrift is one of a number of analysts such as Koenig & Srikantaiah (2004) and Huysman (2002) who consider diversity in KM over time, charting the development of KM in both management and academic domains in terms of phases. Huysman for example, describes a trajectory from KM as storage, through KM as sharing, to KM as reflective practice. Earlier phases of KM do not disappear as later versions appear: phases co-exist and the domain thus becomes more complex over time, though dominant or orthodox views can be identified at different periods (Kling and Ekbia, 2003). Within an organization, managers and policy-makers may adhere to different versions, a source of friction and contest in systems implementation.

A number of analysts working in the domain of critical management have focused on the political dynamics of knowledge management, specifically the issue of who decides what counts as knowledge, and thus, how "knowledge" is managed. (Prichard et al. 2000; Ekbia and Kling, 2003; Day, 2002). From this perspective, decisions made at one time and place will have outcomes at other times and places that do not reflect current power structures. Diversity and conflict in KM practice are inevitable. Difference may be actively creative (productive adaptation, situated action and so on) or destructive (Baxter, 2000) or passive, as in cases where those down the line remain in-different, and respond to change initiatives by continuing, as far as they can with the status quo (Horton and Davenport (2004) provide an example of this from the Scottish legal sector). In some cases, difference is due to time-lag: a KM policy initiated in one part of the organization may be perceived as arbitrary in another when it has been overtaken by events. Time-lags work in different ways: decisions about what counts as KM may

be embedded in software and other procedural artifacts—Bowker and Star (2000), for example, have demonstrated how classification has organizational consequences at many levels. Any current demarcation must work its way through an infrastructure of "congealed" policy and designs, the ghosts of earlier definitions, classifications and declarations.

The relationship between different versions of KM and different technologies is not straightforward. Though a specific version of KM may be used to justify investment in a specific ICT system, the coupling of the two is difficult to sustain in practice. In a world of configured systems, where components are assembled from different sources, under the control of third parties, what is implemented may not support the KM vision that triggers a given project. This is not a new phenomenon in systems implementation, but it is exacerbated when an originating version of KM is superseded. Though investment may be written off in small projects that were justified in terms of an earlier KM regime (Gallagher and Procter (2001) provide an example of this in an account of shifting techno-politics in a UK Bank), large technology implementations are less easy to discard, and cumulated legacy systems will further compound the problem of matching vision and practical outcome. Local institutional practice (what Kling and Scacchi (1982) call "packaging and fitting") is as much a site for knowledge management as the storage systems (intranets) or networks (collaborative work platforms) by means of which work gets done. Davenport (2002), drawing on cognate work in the domain of workplace studies (see Luff, Hindmarsh & Heath, 1997) suggests that observation of everyday practices ("mundane knowledge management") can usefully complement accounts of organizational knowledge more readily than those that focus solely on computer applications or specialist expertise.

An analyst may choose to set the starting point of a time-line of inquiry years before his or her current line of inquiry, or "take" on a field situation. From this perspective, KM is a process of unfolding or explication: a case unfolds, the timeline extends farther and farther back in time, and the question then arises of where to draw the boundary of the inquiry. The inquiry itself adds another layer of complication in the form of academic knowledge about what counts as knowledge, made explicit in artifacts—reports, research papers and so on—that must do their own work of persuasion. In a later section of the chapter we present a framework for exploring multiple versions of KM over time, that offers some guidance on how to bound an inquiry (Kling (1987) discusses this problem and suggests that boundaries will establish themselves). We suggest that tracking such knowledge trajectories can explain some of the organizational puzzles that emerge in KM initiatives. Though these are often explained in terms of unintended consequences, we suggest that these are on occasion the consequences of "forgotten" or "past" intentions.

A number of recent organizational studies have explicitly explored timing (see the journal *Organization*, 11(6), 2004) and suggest that it is difficult to integrate accounts of knowledge work that address the phenomenon in different time frames. Widen-Wulff and Davenport (2005) have drawn on this

work in a comparative study of KM in communities of practice in two very different Finnish organizations—a long-established insurance claims handler and a hi-tech start-up enterprise. There is, in addition, a long tradition of work that may be seen as longitudinal KM analysis. One approach is to focus on knowledge trajectories within one organization: an example is Bowker's (1994) organizational biography of Schlumberger. Another is to take an important institutional form, the clinic or the prison, as in Foucault's "archaeological" accounts, or Yates's (1993) study of the 19th century "office." A third is to take a computerization movement (Iacono and Kling, 1994) such as teleworking, or e-government or e-learning or e-science and unpack the work that makes one version of knowledge the dominant form—by tracking the histories of positions, resistance, alignments and diffusion. Other studies take a medium term view: examples are work on domain cultures such as Knorr-Cetina's (1999) account of the high energy physics community, or Latour and Woolgar's (1979) ethnography of the Salk laboratory. And a further line of work takes the short view—accounts of project work (Love et al. 2005), for example, or cases of KM programs over a period of months or one or two years. What is needed, we suggest, is an approach that follows a line of explication through different time zones.

3 From Versions to Versioning

It is not the case that all KM work needs to take a totalizing approach, or that every study should involve deep organizational biography, but at times a long time frame can help explain KM "puzzles," outcomes that appear paradoxical, and other unintended consequences, in smaller space-time composites such as teams and task forces. It may be noted that KM in the context of project management is a current focus of research (see Love et al. passim), though few studies in this area have focused on the time and space issues that contribute to the emergence of multiple versions of KM within temporary organizational forms. (A notable exception is the paper by Newell et al. 2000) One reason for this is the lack of a widely accepted methodology that accommodates transitions across different levels of time, and different levels of organization. The sections that follow present a framework for exploring KM in this way, by tracking versions over time, or KM trajectories ("versioning"). The framework draws on a number of powerful concepts from social informatics and social studies of technology: the web of computing, framing, computerization movements and technology trajectories.

4 A Method to Explore KM Trajectories

The "web of computing" is a framework proposed by Kling and Scacchi in 1982 to account for the complex links within and across organizational units that they had observed in fieldwork in a public administration agency. It identifies

four main perspectives any of which might be the starting point for an inquiry into organizational computing. The larger the number of perspectives that are addressed, the richer the results of such an inquiry will be. One perspective is local and immediate and is explored by asking those concerned about their issues and concerns. This may lead to an exploration of how things "got to be how they are," and investigation from a second perspective, the "production lattice" which is a complex of interests, alliances, negotiations, power-plays, whose outcome is a material installation, the "computing" that raises issues and concerns among those who work in it. A further perspective is infrastructure, the (often hidden) purview of a specialist caste such as the IS or IT department in many organizations. A fourth perspective considers the macro level of sectoral and societal rhetorics and ideologies, and concepts of normative technologies, that shape what organizations think they ought to install, and thus shape the material practices of infrastructure by promoting, for example, some standards (and their associated vendors) over others, or some lines of public investment over others.

The second element in our framework is framing, a concept first elaborated in the social sciences by Goffman (1974). Frames, according to Snow (2004), are a useful unit of analysis for practitioners and researchers. They accommodate multiple levels of inquiry, and involve a range of techniques to analyze different factors that affect the dynamics of social movements such as political opportunity, discursive fields, opportunity structures, and narrative identity. These influence the process of frame articulation, or "the connection and coordination of events, experiences and strands of one or more ideologies so that they hang together as a kind of collective packaging device that assembles and collates slices of observed, experienced and/or recorded reality." The concept was adapted in socio-technical research in the 1980s by Orlikowski and Gash (1994), who explain paradoxical outcomes in systems implementation in terms of contested or conflicting technology frames. The concept was further modified by Iacono and Kling (1998) as a "technology action frame," a conceptual alignment and alliance that attracts resources. This version of framing is a signature concept in what they call "computerization movements," large-scale utopian programs of computer investment justified in terms of unquestioned benefits to society—recent examples are e-government, e-learning and e-science. The "computerization movement" is itself an adaptation of the longer established social science concept of social movements, long-term aggregations of actors, interests and resources who are linked by a desire for change and the opportunities to achieve this. (MacAdam et al. (1996), for example, suggests that social movements are characterized by political opportunism, by a framing process that aligns bystanders with the relevant ideology, and mobilization structures that bind associates materially to the cause).

In addition to framing and computerization movements, a third element has informed our methodology, the notion of the technology trajectory. This emerged in the 1980s in research into the social shaping of technology (Fleck,

1993; Williams, 1997), and seeks to explain the design and development of technology pre- and post-implementation. Technological choice is an important feature of this framework: who makes choices? with whom? for whom? what is chosen? Such are, of course, the questions that have informed our title. By establishing a time-line for a set of choices, an analyst can map the intentions and resources that have characterized that series over time, noting the configurations of actors that are involved and the material traces of these in the form of contracts, project templates, correspondence and other documents. In the next section, we present a case study that shows how the concepts of framing, movements, and trajectories may be applied in the study of organizational KM.

5 The Case Study: Project M

The case that is reported here is not untypical of many ICT initiatives in UK municipalities where a local council seeks to embrace the "modernizing" of it's own activities through the utilization of, in this instance mobile, ICTs. The "mobilization" of the rapid response team who are the focus of the case implicates a larger group of players; the council social services IT department; the social services directorate; the council leaders; the national health service (including: hospital trust managers; hospital trust IT departments; general practitioners); the outsource partner; the government (through policy initiatives); the providers of prostheses and other material aids to the housebound, and of course the citizens who are the recipients of the services involved. The council in this case (a medium-size municipality) aims to have "30% of peripatetic staff ... mobile working by 2005" (City Council, 2004). Whilst this broad aim was "at the back of the mind" of some senior staff with an interest in ICT utilization, it was the unforeseen availability of £ 200,000 that prompted the decision to introduce mobile ICTs into several areas of work. (This is an example of the opportunism that sometimes consolidates collective framing). Negotiations with the council's outsourcing partner (one of the "big" consulting firms that constitute a monopolistic elite in UK e-government contract work), with whom the council have a ten year partnership agreement for provision of ICT services, led to the identification of both technologies and services that could be introduced.

Discussions within the council identified the areas of council work to which the new ICTs could best be applied. One of the areas identified was a social services rapid response team. The Rapid Response Team is a small unit of six people who normally operate in pairs, that is responsible for community care, working with clients, often at short notice, with a view to providing support services, and equipment, that will allow the client to remain living within the community (as opposed to moving into a hospital, or other form of institutional care facility). In spring 2004 we were invited to undertake a quick and dirty evaluation of a pilot "mobilization" project ("Project M"), which

ended at the beginning of 2005. Team members were issued with notebook and tablet PCs, and given access to a (limited) number of information services, and canvassed for their opinions.

6 KM Versions in Project M: Data Sharing

In Project M, we can see a number of versions of KM at work. The first is KM as knowledge (=data) sharing. In terms of this version, the project was rather ambivalent. Problems were identified with the information services. The client database, on a CD-ROM, was never updated during the pilot, and, as a consequence, this data fairly quickly became of little use. This client file was central to the Team's role, yet because it was provided only once at the start of the pilot study it was redundant within days. Effective and timely communication was paramount to the Rapid Response Team's role, and the fax facility was heavily used to contact NHS care providers. The email service was problematic, and hence little used, primarily because the main form that the Rapid Response Team had to use to record client information (and that formed the basis of inter-agency liaison—the ABC form) would not email, for reasons unknown to the Team members. The issue here was the importance of access to both key information (e.g., client file, stores), as well as to communication services (e.g., email, fax) for mobile working to be feasible.

For the future, the provision of all required forms in a format amenable to electronic completion, sharing, and dissemination was viewed as essential. Similarly, there were certain core services that the Rapid Response Team relied upon, such as stores, which they could not access electronically. The perception of Team members was that their role (mobile or otherwise) relied fundamentally upon access to certain information services, and access to effective (and varied—email and fax) forms of communication. Team members commented that it was not possible to utilize electronic versions of the forms that they had to complete and share with other agencies, noting that it was "a shame that no-one had ever thought about using the forms electronically or delivering them electronically when they were designed . . . which seems crazy."

7 KM Versions in Project M: Mundane Practice Knowledge

Rapid Response Team members fully endorsed the data-sharing version of KM, and they were frustrated that no care had been taken to align it with what we call KM Version Two: mundane practice knowledge (sometimes described as "phronesis" in the KM literature). The staff were disappointed that they had not been consulted before being given the technology, with Team members commenting, for example, "They did it back to front . . . it

would have been nice if they'd asked us what we needed, but instead they imposed it on us. Other forms would have been more useful" and "We weren't consulted at the start as to what we wanted on it ... having the link to stores would have been really useful." Mobile working required that all of these facilities (and in particular, accurate data) be available electronically. A further significant problem with the pilot project was the lack of detailed attention to work practices. The ability to utilize the mobile technologies with the client in situ, was viewed as providing a speedier, and thus enhanced level of service (i.e., enabling more people to be independent in the community). The mobile technology enabled some remote working (i.e., undertaking a task from a "remote" location)—but mobile working much less so (i.e., being able to work without having to return to an office/base). Ultimately, the Rapid Response Team's activities remained unaffected by the introduction of the mobile technology. While access to the mobile technologies meant that the Team members felt able to meet up with their own team, and other team members while out of the office (e.g., a client's home to complete an ABC form), apparently this did not affect significantly the time they spent in/away from the office. Rapid Response Team members spent 50% of their time on Rapid Response duties, and the other 50% "picking up cases" within the office. With Rapid Response Team duties seen as extremely arduous, it meant that team members could foresee only spending limited amounts of time working away from the office anyway—irrespective of technology availability.

Historically, the social work team has worked from a local council office, where cases are picked up and discussed, where expert judgment is exercised, and where much of the coordination of services from different agencies is arranged. Work in the office is imbricated with home visits, where initial assessment takes place and this is subsequently discussed with colleagues back at the office before a plan of action is agreed. Traditionally, one might say, a response is "configured" in the office after a more or less lengthy series of moves and deliberations that reflect the expertise and tacit knowledge of the Team, all qualified professionals. Office meetings are also occasions for exchanging and updating knowledge, alerting colleagues to new developments, and discussing client circumstances "off the record." The mobile initiative will diminish information exchange in the team, as it is intended to shift this part of the process to the client's home, where an individual client and one, or two individual team members can configure what is required on the spot, in a process of in situ consultation and coordination. The configuration that is agreed will be entered on the relevant form, and activate a series of data transactions—the configuration is compiled, the relevant resources are coordinated and a response is composed that indicates what will arrive when. While this may "augment" service for an individual client, as they may be given material support sooner by means of the mobile service than in the traditional service, we suggest that service across a group of clients may be diminished as the Team's shared understanding of the community is diluted.

8 KM Versions in Project M: Process Engineering

From the perspective of the outsourced supplier, KM is interpreted in terms of process management and the criteria used in the evaluation reflect this. After the six month pilot study, an evaluation was undertaken by the outsourced partner, and published (internally only) as a collaborative effort between the council and the outsource service partner. The criteria in the evaluation were restricted (a typical maneuver in the discourse of justification in computerization movements), having been defined by the outsource partner, and evaluation focused upon the Return on Investment. The outcome of this evaluation was the calculation of a time saving of 10.4%, and a net "productivity saving" of £2280 per worker per annum. This evaluation document demonstrated a "successful" pilot project, with a demonstrable financial benefit. The document has been circulated within the council, and now forms an important part of the discussion between the council and the outsource supplier as they endeavor to roll out mobile technologies, and integration of information services across other groups within the council.

It may be noted that "process" is defined very narrowly by the supplier group, in terms of incurring staff costs. So far as the Rapid Response Team were concerned, a key service performance measure was how long it took to get a client the equipment/care required to keep them "independent" (13 days at the time of this study). None of the documentation that sought to assess the pilot study made any reference to such service performance evaluation criteria. Furthermore, the supply team did not attempt to evaluate the qualitative aspects of the project, such as the reported (by the team) improvement in the service to clients. Nor were aspects of the electronic information exchange considered, because whilst in some aspects this was valuable, for example in exchanging data with the National Health Service through faxes, in others it was less so—for example in completing online report forms for sharing with other agencies, and in ordering resources to support clients. The process version of KM used by the supplier appears to be highly selective, a means of both consolidating its own track record, and corroborating the municipality's success as a cost effective manager of services. As we note above, contrary to comments made in the "official" evaluation of the pilot project (City Council. Evaluation Paper, issue 1.0, p. 51), there was a perception among the Team that the technology was indeed "a solution thrown over the wall." This was reinforced by perceived lack of consultation about process, as well as about technology requirements. Lack of training in the early stages meant that technology functions, as well as confidence in use, were not maximized.

9 KM Trajectories

The discrepancy between versions of KM in the case study, far from being a weakness, is a powerful driver for deeper investigation. It would be easy to be cynical about the evaluation exercise undertaken by the suppliers and dismiss

it as partial and self-serving. But it achieved exactly what it was designed to do: namely, it validated the modernization program of the municipality. To explain this, we consider Project M as part of a larger KM Trajectory within the Council. The mobilization of the Rapid Response Team is only one of a suite of applications designed to improve customer service. The "process" KM frame that drives prevailing policy fits well with the technology action frame that drives prevailing policy in the municipality, a response, as we imply above, to a mandatory UK "modernizing government" initiative (UK Cabinet Office, 1999), which has introduced the concept of the "managed citizen" into council thinking. The management of citizens is achieved by means of process modeling that combines representation of services and representation of individual profiles. There is little room in this componential model to apply the collaborative knowledge of grounded professionals (the output of rapid response team consultations in the office), as the process model is premised on cost-efficiency in the satisfaction of profiled "consumer" needs, with little attention to pastoral issues. As we note above, the evaluation did not attempt to include the wider set of actors, specifically the citizen-consumers that are central to e-government ambitions.

According to Gröndlund (2002), e-government emerged in the 1990s. He takes the establishment of the NII in 1993 as a starting point, and traces a trajectory in Europe through the Bangemann report, to the eEurope vision laid out in 2000 and beyond. For Grönlund, a Swede, technology is clearly the driver of e-government. In the UK, as in other Western European jurisdictions, the phenomenon is better explained in terms of a privatization movement that has evolved over almost twenty years, starting with the publication of a UK government report in 1986 paving the way for the privatization of government data, and the establishment of an industry-government nexus that has continued to expand. In addition, an uncompromising deployment of e-commerce and business models and applications has produced a service ecology dedicated to improved efficiency and quality of service: E-government in the UK thus promotes itself as process-oriented and customer-focused (Cabinet Office, 1999).

In this area, as in other areas of information technology acquisition and configuration, choices and decisions are rarely straightforward, but in the UK public sector can often involve the spending of hundreds of thousands, or millions of pounds over the course of the project. This can be considered as a part of the gamble of technology (Hamelink, 1988), where ICT outcomes are uncertain but spending is perceived as necessary (and see Thrift, 2005). Within the UK public sector there is considerable scrutiny and reporting of such practice, often unfavorably (Cross, 2005). Increasingly, public services are faced with tasks involving information service integration, which in essence is concerned with addressing complex technology needs with particular configurations of technologies that reflect, and are reflected in the socially and historically situated nature of the proposed usage (Fleck, 1993).

One way of exploring the KM trajectory in this (and other cases) is in terms of two types of community, "interest" and "practice." First, the ideology (or discourse) that defines an "interest" community will tend to simplify the issues involved in systems implementation, and downplay risk by emphasizing the track record of those who share the rhetoric. This discourse is what the public (or external "bystander" audience, that is, any constituency that needs to be mobilized) will hear. The ecology of communities of interest is partly shaped by social network factors. There are, for example, a few very strong players who have links to most of the networks in the relevant field. This elitism is manifest in the small and oligopolistic market that has developed for e-government service implementation, where repeated contracts are awarded to large corporate developers whose previous contracts have not been delivered either to budget, nor on time or to a performance standard that satisfies agreed criteria. The "winning" discourse among competing rhetorics of interest will draw its strength by association with proven players, often those who can offer "integrated off-the-shelf solutions" in the form of implementation plus training, and economies of scale that undercut the costs of those who become involved in detailed local user requirement analysis.

Second, the discourse of a "practice" community, will, in contrast, focus on the artifact, the difficulties of implementation, on ways of working around infeasible features, and of informal education in these processes for newcomers to a workplace. This process has been well analyzed in studies of "articulation" or "invisible" work (Suchman, 1996). The audience for this discourse is internal, though containment may be leaky, when, for instance, apologetic "officers" share details of the "work-around" with clients.

10 Conclusion

We have presented an approach to understanding KM in organizations that takes "versions" and "trajectories" as units of analysis. From this perspective, knowledge management is not concerned with data, or process, or exploiting knowledge assets; it is the manipulation and control of what gets to count as knowledge. The high level units of analysis may be seen as "blocs" in a political landscape, whose boundaries may merge when interests are reconfigured. The blocs are themselves sites of struggle, and a comprehensive account of KM over time will be recursive. The dynamics of configuration are fundamental importance; KM is tightly coupled with organizational evolution; attempts will be made to sustain dominant versions and attempts will be made to resist them. A KM trajectory will reflect these contests and the material traces of historical struggles (like the ten year old contract in the case study that distorted the implementation of mobiles in Project M) may shape, or even distort, a KM trajectory in unexpected ways.

References

Baxter, L. (2000). Bugged. In Prichard, C., Hill, R. Chumer, M. & Wilmott, H. (Eds.), *Managing knowledge: critical investigations of work and learning.* Houndmills: MacMillan Press.

Bowker, G. (1994). *Science on the run: information management and industrial geophysics at schlumberger, 1920–1940.* Cambridge Mass: MIT Press.

Bowker, G., & Star, S. (2000). *Sorting things out.* Cambridge MA: MIT Press.

City Council, 2004. Evaluation document.City Council, 2004. Internal document.

Cross, M. (2005). Public sector IT failures. *Propsect, 115* (10), 48–53.

Czarniawska, B. (2004). On time, space and action nets. *Organization, 11* (6), 773–791.

Davenport, E. (2002). Mundane knowledge management and micro-level organizational learning: an ethological approach. *Journal of the American Society for Information Science & Technology, 53* (12), 1038–1046.

Davenport, E., & Horton, K. (2005). Computerization movements as a frame or e-government studies. Paper presented at the CRITO workshop, Beckma Centre, Irvine 12 March 2005.

Day, R. (2002). Social capital, value and measure: Antonio Negri's Challenge to Capitalism. *Journal of the American Society for Information Science and Technology, 53* (12), 1074–1082.

Ekbia, H., & Hara, N. (2004). The quality of evidence in knowledge management literature: the guru version. Retrieved from www.slis.indiana.edu/research/working_papers/files/SLISWP-04-01.pdf

Ekbia, H. & Kling, R. (2003). Power Issues in Knowledge Management. At rkcsi.indiana.edu/archive/CSI/papers.html

Fleck, J. (1993). Configurations: crystallizing contingency. *International Journal of Human Factors in Manufacturing, 3* (1), 15–36.

S. Gallacher, R. Procter, & R. Williams. (2001). The Politics of Usability: Can One Size Fit All? In L. Trenner & J. Bawa (Eds.) Usability, Politics and New Media. 2001.

Goffman, E. (1974). *Frame analysis: an essay on the organization of experience.* New York: Harper and Row.

Grönlund, A. (2002). *Electronic government: design, applications and management.* London: Idea Group Publishing.

Hamelink C. (1988). Some Reflections on the Technology Gamble. In F. Van Riijn & R. Williams (Eds.), *Concerning home telematics* (pp. 21–25). North- Holland, Amsterdam.

Horton, K., & Davenport, E. (2005). Rapid response service provision in a world of multiple sources. Draft available from authors.

Horton, K., & Davenport, E. (2004). Innovation and Hybrid Genres: Disturbing Social Rhythm in Legal Practice. In T. Leino, T. Saarinen, S. Klein (Eds.), *The European Information Systems profession in the global networking environment (ECIS 2004).* Turku, Finland: Turku School of Economics.

Huysman, M. (2002). *Knowledge sharingin organisations.* Dordrecht: Kluwer Academic Press.

Iacono, S., & Kling, R. (1998). *Computerization movements: the rise of the Internet and distant forms of work.* Retrieved February, 26, 2005, from http://www.slis.indiana.edu/faculty/kling/pubs/Kling_comp.htm

Kling, R. (1987). Defining the boundaries of computing in complex organizations. In R. Boland & R. Hirschheim (Eds.), *Critical issues in information systems research* (pp. 307–362). New York: Wiley & Sons.

Kling, R., & Iacono, S. (1994). *Computerization movements and the mobilization of support for computerization.* Retrieved February, 12, 2005 from http://www.slis.indian.edu/faculty/kling/pubs/MOBIL94C.htm

Kling, R., & Scacchi, W. (1982). The web of computing: computer technology as social organization. *Advances in Computers, 21*, 1–90.

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

Koenig, M., & Srikantaiah, K. (2004). Three stages of knowledge management. In K. Srikantaiah & M. Koenig (Eds.), *Knowledge management: lessons learned* (pp. 3–9). London: Learned Information Inc.

Latour, B., & Woolgar, S. (1979). *Laboratory life.* Princeton, NJ: Princeton University Press.

Love, P., Fong, P., & Irani, Z. (2005). *Management of knowledge in project environments.* Oxford, UK: Butterworth-Heinemann..

Luff, P., Hindmarsh, J., & Heath, C. (1997). *Workplace studies.* Cambridge: Cambridge University Press.

McAdam, D., McCarthy, J.D., & Zald, M. (Eds.). (1996). *Comparative perspectives on social movements.* Cambridge: Cambridge University Press.

Newell, S., Scarbrough, H., Swan, J., & Hislop, D. (2000). Intranets and knowledge management: de-centered technologies and the limits of technological discourse. In C. Prichard, R. Hull, M. Chumer & H. Willmott (Eds.). *Managing knowledge: critical investigations of work and learning* (pp. 88–106). Basingstoke: Macmillan.

Orlikowski, W.J., & Gash D.C. (1994). Technological frames: making sense of information technology in organizations. *ACM Transactions on Information Systems, 12* (2), 174–207.

Prichard, C., Hull, R., Chumer, M., & Willmott, H. (Eds.). (2000). *Managing knowledge*: *critical investigations of work and learning* Basingstoke: Macmillan.

Schultze, U., & Leidner, D. (2002). Studying knowledge management in information systems research: Discourses and theoretical assumptions. *MIS Quarterly, 26* (3), 213–242.

Snow, D. (2004). Framing processes, ideology and discursive fields. In D. Snow, S. Soule & D. Kriesi (Eds.), *Blackwell companion to social movements* (pp. 380–412). Oxford: Blackwell.

Snow, D., & Benford, R. (1988). Ideology, frame resonance and participant mobilization. *International Social Movement Research, 1*, 197–217.

Srikantaiah, S. & Koenig, M. (Eds.). (2004). *Knowledge management: lessons learned.* Medford NJ: Learned Information.

Suchman, L. (1996). Supporting articulation work. In R. Kling (Ed.), *Computerization and controversy: value conflicts and social choices* (pp. 407–423). San Diego: Academic Press.

Suchman, L. (1995). Making work visible. *Communications of the ACM, 38* (9), 56–64.

Thrift, N. (2005). *Knowing capitalism.* Oxford; Oxford University Press.

UK Cabinet Office. (1999). *Modernising Government.* HMSO, London. Retrieved February 10, 2005, from http://www.official-documents.co.uk/document/cm43/4310.htm.

Van Bastelaer, B. (2001). eEurope and user aspects of ICT. COST 269. User aspects of ICT. COST Working paper No. 1. Retrieved February 5, 2005, from http://www.cost269.org/documents/e_Europe_Final.rtf

Widen-Wulff, G. & Davenport, E. (2005). Information Sharing and Timing: Findings from Two Finnish Organizations. In F. Crestani & I. Ruthven (Eds.), *Information Context: Nature, Impact, and Role: 5th International Conference on Conceptions of Library and Information Sciences*, Proceedings of CoLIS 2005, Glasgow, UK, June 4–8, 2005. Lecture Notes in Computer Science: Vol. 3507. Berlin: Springer-Verlag.

Williams, R. (1997). The social shaping of information and communication technologies. In H. Kubicek, W. Dutton, & R. Williams (Eds.), *The social shaping of information superhighways: European and American roads to the information society* (pp. 299–238). Frankfurt and New York: Campus/St. Martin's Press.

Wilson, T.D. (2002). The nonsense of "knowledge management, *Information Research, 8(1)*, 144.

Yates, J. (1993). *Control through communication*: *the rise of system in American management*. Baltimore: Johns Hopkins University Press.