COLLABORATION AND KNOWLEDGE MANAGEMENT THROUGH INTRANET TECHNOLOGY. LEARNING PRACTICES AND CONTEXTS IN AN ITALIAN AND A UK COMPANY.

Theme: The Social Processes of OL and KM

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Abstract

The paper, based on an ongoing doctoral thesis, proposes an interrelated analysis of knowledge and technology, starting from a constructivist approach which considers technology as the result of practices of learning and social construction. On the one hand, interpretations of knowledge embedded in two Intranets in an Italian and a UK company are presented, as indicators of interpretative flexibility of technology. On the other hand, knowledge enacted in using the Intranet, referred to older communicational practices and media, is perceived by actors as a 'constrain' to a collaborative, community approach to knowledge management. It also makes clear the ambivalence of the informal and tacit dimensions in the Intranet-as-knowledge-tool implementation and domestication.

Introduction

Knowledge Management (KM) is a burning issue in the debate about contemporary organizations, and an increasing amount of both academic and managerial literature seems to be aimed at defining, enquiring and providing suggestions on what Alvesson and Karreman (Alvesson, Karreman, 2001) define as an 'odd couple' or a 'curious concept'.

On the other hand, the emergence of IT and especially of the Internet/Intranet technological frame (Bijker, 1995) has added further emphasis and interest to the topic of KM, to the extent that 'the combination of the two terms 'knowledge' and 'management' 'can be traced to the emergence of communication technologies that create access to computerized networks that allows for (almost) real-time interaction (…)' (Alvesson, Karreman, 2001: 996).

In particular Intranet technology is addressed as one of the most powerful tools in supporting codification, storing and especially sharing of organizational knowledge (Telleen, http://www.iorg.com/papers/knowledge.html; Curry, Stancich, 2000; Hall, 2001; Scott, 1998; Davenport and Hall, 2002).

The starting point of this paper is an analysis which joins issues concerning knowledge management and Information Technology, namely the Intranet or the 'Internet inside organizations', as an attempt to work around the 'divide between those interested in the technology aspects and those emphasizing the 'people side' of knowledge management' (Alvesson, Karreman, 2001: 997).

Nevertheless, I will neither summarize nor review the wide literature about the concept of KM, since my analysis, based on a Ph.D thesis in progress, is oriented to present some of the findings of the fieldwork carried out in an Italian and a British company in light of categories emerging from a constructivist analysis of technology. Such an analysis, conceptualising technology as socially constructed by relevant social groups and characterized by 'interpretative flexibility' (Bijker, 1992 and 1995) may help to understand how and why the Intranet support for knowledge sharing is not taken for granted.

Even when the explicit aim of the Intranet implementation concerns knowledge management, its results can be very contradictory and unexpected, producing 'electronic fences' instead of global knowledge sharing and turning a de-centring technology into a centralized one (Newell et al., 2001).

In the two contexts I am studying, similar contradictory results can be identified, with reference to the concept of knowledge negotiated and mobilized during both implementation and domestication (Silverstone, 1994) of technology. Such a distinction of different phases or processes is purely analytical since a constructivist approach emphasizes the constant

overlap, or interaction, between developers and users, design and use of the system in spite of a linear model of technological innovation (Bijker, Law, 1992).

An important concept to frame the relationship between knowledge and technology is that of practice (Wenger, 1998; Gherardi, 2000). Practice as negotiation of meaning, reified into artefacts which are part of the Community of Practice repertoire (Wenger, 1998) allows to focus on everyday organizational life and on learning as participation in this life, mainly based on a pre-reflexive learning (Gherardi, 2000). This dimension, which points to 'both our production of the world and the result of this practice' (Gherardi, 2000: 215), does not hide the formal, explicit dimension of knowledge which is well present and important in organizational life. On the one hand, processes of knowledge management based on IT can be aimed at building communities, sharing knowledge and trying to externalize it (Nonaka, Takeuchi, 1995). On the other hand, an 'extended library' approach (Alvesson, Karreman, 2001) can drive, or emerge from, the implementation process, limiting the aim of knowledge management to information exchange. These different approaches can be identified, among others, in the two case studies I am going to present.

The findings of my fieldwork show that processes of Intranet implementation and domestication are characterized by competition and overlap between a structured and unstructured vision of knowledge and by a perception of technology as a constrain (*'something out there'* to use the definition of one of the actors on the field) rather than an enabler or facilitator of knowledge sharing. Such an account shows the crucial role of sense-making processes which shape knowledge-in-practice embedded in the technological artefact. Therefore it happens that an Intranet-based KM system conceived as a collaboration tool becomes a centralized static repository (British Company - BC) as well as an Intranet born as laboratory to disseminate technical knowledge emerges as a 'promotional tool' towards the owner group (Italian Company - IC). Actors' representations and uses of technology both reveals and are shaped by a vaster social imagery concerning the Internet/Intranet as technological frame (Bijker, 1995; Flichy, 1996). However, this imagery always interact with conceptions of knowledge rooted into the organizational history, culture and identity.

The paper is structured in two main sections. The first one concerns the analysis of the discourse of the Intranet as knowledge tool, with particular reference to the definitions provided by actors on the field and visions inscribed (Akrich, 1992) into the technological systems both as texts and routines. Actors' interpretations are considered here as indicators of interpretative flexibility of technology and also as access to different concepts of knowledge embedded in it.

The second part is more centred on the concept of 'knowledge around the system in use', that is the resilience of the tacit world of practice in the use of the Intranet, perceived by actors as a failure or source of disappointment. This section will draw on some issues arising from the mis-use or non-use of collaboration tools (newsgroups and expert groups) in both the organizational contexts. It confirms that technology has to do with formality much more than informality (Brown, Duguid, 1998), showing that to change collaboration processes is not as easy as stated by a widespread imagery about new technologies.

However, first of all I will give an outline of the two case-studies on which the paper is centred, whereas the following points summarize some of the research assumptions concerning knowledge and its management through Intranet technology.

- Knowledge is both formal and informal, both tacit and explicit. It is mainly a practice, that is a process constituted by negotiation and reification of meaning. In the first section I will show some of the negotiation and reification processes occurring in the two case studies.

- Technology is a social construction based on learning and negotiation, finally resulting into a taken for granted artefact, no longer questionable by actors and part of everyday organizational life. Technology embeds knowledge, both in form of codified information, and in form of support for existing (or new) Communities of Practice.
- Imagery is a key-element of knowledge and technology construction but it is not necessarily translated into routines or embedded in new technology.
- Collaboration and learning of new technology mobilize previous communicational media and routines, which are used as 'bypassing devices' but also interpreted as an obstacle to the diffusion of the new technology.

1. The two case studies: comparing Intranets in light of a constructivist approach

The fieldwork was carried out in two companies in Italy (IC) and the UK (BC) between 2001 and 2002, using mainly an ethnographic approach. Participant observation of communicational routines and practices lasted three months in each company. Interviews in different company workgroups/departments were also used. Furthermore, the analysis of the structure and content of the two Intranets integrated observation and interview sessions.

Both the companies operate in the Information Systems Testing and Integration sector, with a particular focus on banking and financial industry. The company size is respectively of 150 (IC) and about 100 (BC) staff. Officially, the two companies were founded almost in the same period (in 1995 IC and in 1994 BC) but IC has a longer and more fragmented history, centred on the exclusive relationship with a major bank client and a stronger focus on mainframe technologies (defined as *'old technologies'* by actors on the field). On the other hand, BC was founded as a company focussed on integration of different technological architectures, even though testing emerged as the very core-business.

Both IC and BC implemented an Intranet site in Autumn 2001.

IC Intranet was born as a community inside a previous group Intranet, in the context of a new strategic plan of internal communication. In fact, IC is owned by a leading national group operating in the banking Information Systems sector. IC Intranet was developed and implemented by a dedicated group, founded to spread new technologies knowledge and skills on the whole company. As it emerged from the fieldwork, the further actors and workgroups are from this 'core' group, the less involved and interested they are in using and participating in the Intranet.

On the other hand, BC Intranet was designed since the very beginning as a KM system, aimed at facilitating knowledge sharing among consultants working at client sites throughout the UK. As many actors emphasized during the interviews, the Intranet was designed *'around consultants'*, but a paradoxical result is that inter organizational constraints do not allow consultants to use the system at client sites. Moreover, consultants feel the system *'does not add any value to their work'* and they think office-based staff (whose expectations about the system were very low) is taking much more advantage of the system, because of 'technical matters' (quicker connection and access).

In both the cases, leading 'visions' or interpretations of the system are in some ways linked to a concept or aim of knowledge sharing, distribution or dissemination, and attempts of making the Intranet a collaboration tool raise fences to knowledge, resilience and even frustration.

2. The Intranet as knowledge tool: multiple leading visions

Studies in Intranet implementation (Damsgaard and Scheepers, 1999 and 2000) have emphasized the characteristic of such technology as 'highly malleable' and 'emergent in nature'.

This means that interpretative flexibility of the Intranet is even more prominent than that of other technologies, so that the role played by relevant social groups (Bijker, 1995) and specific contexts of use are important drivers in the process of technology stabilization.

Multiple, coexistent and contradictory interpretations of technology and knowledge can therefore be enacted. Such interpretations constitute a key access to the system, based on metaphorical language, mental models and representations, that are components of tacit knowledge dimension (Nonaka, Takeuchi, 1995). At the same time, technology as artefact is always reification of a negotiated meaning, that is a practice in Wenger's theoretical framework (1998).

IC Intranet was officially built, as stated in the home page, in the form of 'a building site to experiment new technologies': 'Research and experimentation are the basis of our proposal of work and communication. This is an open building site that proposes and publishes, in an experimental way, their own initiatives, waiting for suggestions'. (From the IC Intranet homepage).

If the knowledge process enacted in the design stage was apparently that of imitation (the Intranet manager told me *'we're trying not to change too much in the structure [with reference to the owner group Intranet] to avoid users get confused'*), the final emerging result is rather different from the previous Intranet. In fact IC site was very rich in graphic design, and many actors emphasized the importance of this element to show the parent company IC skills and ability to gather (and apply) knowledge about new technologies. This interpretation, recurrent especially among the members of the web group, was strongly associated with issues concerning organizational identity and future (IC has constantly suffered from threats of downsizing). In the end, Intranet is a symbolic access to a previously 'unknown' world (new technologies). This approach or interpretation, however, was not shared by some of the workers less included in the web technological frame. One of them, for example, stated that *'In this section [news] they write just good things. It does not make any sense to look at it'*.

The perception of the Intranet as aimed at reaching 'normative control' by prescribing things (Alvesson, Karreman, 2001) is particularly recurrent among groups of 'critical' users, whose interpretation seems to be filtered by a sense of distrust for the company management policies (including the internal communication and the Intranet launch).

On the other hand, at BC the Intranet was conceived since the beginning as a Knowledge Management System (KMS from here onwards):

'the company required a knowledge management solution to deliver five elements: information capture, addition of context, information retrieval, proactive information push and learning capabilities. The objective of the Knowledge Management System is to act as a central repository of knowledge that is readily accessible and searchable by all members of staff, both consultant and office based' (From the Sales Overview).

The above quotation shows a fuzzy overlap between knowledge and information, which seem to be linked each other through the five elements of the KM solution. Furthermore, the description of the KMS corresponds to an 'extended library' approach (information capture and retrieval, repository, are all terms which evoke a knowledge codification or combination perspective). It seems to co-exist with another vision, so summarized by one of the BC managing directors:

'You've still like the difference between a library and a community centre. You know people go to the community centre for a lot of different things and then they have a book area, a library there, whereas what we created is a library, and people need to go to a library when they need to look for a particular book. And I think it's the difference we've got now. There still a sense of community I guess but I think even to have made a small step forward somewhere before through that would have been important, getting by that the very early stages people saying 'I need that'.

Another managing director, however, affirmed that *'we wanted to distribute knowledge, but also capture it. Distribution was not enough'.* Expectation of capturing knowledge is part of the 'repository' analogy, rather than of the 'community centre' metaphor.

It can be said that both the dimensions characterize the KMS at BC. Whereas the library approach seems to have substantially changed routines of office-based staff (instead of impacting on work routine of consultants as projected), there was an attempt to make the KMS a community through the collaboration tool (see paragraph 3).

The technical and the human side of the system are so summarized by the Marketing Manager*: I would see the KMS or an Intranet being a kind of essential place to go, to find, to keep update, to do research (...) It tends to be just a repository for forms and other files.*
(...) I think a Knowledge Management System is not just a physical, technical infrastructure but it's the way people use it, the way people communicate...'.

It is also noticeable that the two terms 'knowledge' and 'information' are almost interchangeable in the actors' perceptions even if BC Quality Manager made clear that

'It acts as a repository from my point of view. I don't tend to use the system to communicate with people. It lets me get the information that good I need. Which means that I don't need to ask questions but just get the information. Information more than knowledge (...) I usually know what I'm going to look for in the KMS'.

Such an excerpt makes clear the role tacit knowledge (embodied in the context) has in filtering the use of technology. At the same time a knowledge codification perspective aimed at reducing knowledge to information (Cohendet, Steinmueller, 2000) similar to what Nonaka and Takeuchi (1995) define as combination (knowledge conversion from explicit to explicit) seems to characterize the processes of both implementation and use of the system.

In the actors' discourses, the KMS is often identified with two major components: the search engine and the collaboration tool, which are at the same time key-features of the system and the main sources of disappointment and frustration in the everyday use.

However, functions and shape of the system changed during the long implementation process and especially after the second release (June 2002). In particular, the search engine, expected to learn *'a lot more better than it does'* was partially substituted by a file structure. This change, addressed as *'disappointing'* by many actors in light of the existence of a similar tool (Windows Explorer), was described by one of the directors as the passage from *'a big pot (...) something unstructured'* to *'a file cabinet'* or, in the words of another director, *'What we try to find in some ways is a middle ground between lots and lots and lots of structure that would be maybe too extreme and no structure at all, just one big database. I think we found one big database not worked, so we've got this middle ground at the moment (...)'.*

Paradoxically, an unstructured model of knowledge (represented by the search engine) contributes to decrease the perceived usability of the system, while more structure (the file cabinet or Windows like model) manifests itself as more suitable (at least 'easier to use') for knowledge sharing. But as one of the account managers emphasized,

'In this change established there is a transition which is not giving anything different or extra'.

Traces of both a mentalistic and a commodification vision of knowledge (Gherardi, 2000) can be found in the two case-studies. Especially at BC many of the actors interviewed emphasized the necessity of retrieving and making available information stored somewhere else, like the BC service delivery manager quoted below:

'We need to change the KMS according to the way we work. It's different way of accessing information in people's head and laptops. (...) When a company has reasonably mature processes it is very difficult to introduce automatic ways of doing things'

The introduction of *'automatic ways of doing things'* is closer to what Brown and Duguid (Brown, Duguid, 1998) define as 'formalization demanded by technologies'.

The following interview excerpt makes clear the kind of knowledge BC management wanted to share:

'We wanted people to be able to find the document when they don't know how the document is called so (...) something like how have we ever done any work on SMP? That's the thing I don't think has been achieved ...So what happens is somebody asks somebody else When do we do this? I don't find the answer quickly [by using the system] And people like talking to people rather than put their question into a machine' (BC managing director).

The last statement makes clear the importance of other media in supporting knowledge sharing or retrieval, which points to the context of use, what I label as 'knowledge around the system'. This is both informal and tacit knowledge, respectively embodied in verbal interaction and in people (Fleck, 1997). Such knowledge can be delegated partly to the system, or be also perceived as a constrain to this delegation, as I shall show in the next paragraph. The result is that, instead of 'disrupting more productive informal relations' (Brown and Duguid, 1998), the emergence of Intranet technology reinforces them in the two contexts considered.

3. Knowledge around the system in use: contextual constraints to collaboration and community building

'At any time a new communication medium is introduced into an organization, we expect that existing genres of communication will influence the use of this new medium, though the nature of this influence will reflect the interaction between existing genres and human action within specific contexts'. (Yates, Orlikowski, 1992: 318).

One of the findings emerging from the two case-studies is the mis-use or non-use of Intranet collaboration tools, in spite of high expectations the management had about these components. As one of the BC managing directors stated,

'Collaboration... I don't think really anybody uses that. I think they've tried to use and given up. It was initially about communities of specialists (...)'.

Notwithstanding this, knowledge sharing and community building are very important issues at BC, since consultants at client sites *'feels native of the client organization'.* The attempt to make them feel closer to BC, also through the Intranet, emerged as a recurrent and relevant point from many interviews, especially among office-based staff and management.

Paradoxically, older routines and informal exchange of knowledge are considered as an obstacle to the use of the system and they lead to the perception of a failure in both the companies. For example, the IC System Administrator complains about people *'popping into the office and bringing paper stuff to be transferred to the Intranet'.* Similarly, BC System Administrator said that *'I know at the beginning lots of people phoned R. to get info that was in the system yet and she e-mailed documents to everybody. I said R: tell people it is in the system and not e-mail them anything more...'.* BC Recruiting Manager stated also that *'They*

[consultants] don't look at the system to find their cv. They ring me to send it out by email and I do it. Maybe I should refuse to do that'.

Nevertheless, if even though a substitutive vision of the Intranet with respect to email characterizes both the organizations at the discourse level, observation of everyday practice showed the enactment of 'bypassing strategies' or 'knowledge shortcuts', that means just to pursue *'the easiest way'*.

As it emerges from the following observation note, concerning the interaction between one of the managing directors (MD) and the sales manager (SM), there is the enactment of shortcuts through which the use of the system is either bypassed or delegated to the person in charge of managing it (in this case, the sales manager).

9th December 2003 10.20 a.m. (The talk involves one of the managing directors – MD and the sales manager – SM))

MD-SM I have a problem. I have to do a proposal and I want to find the format on the KMS.

SM-MD One of the problems on KMS (...) there are just templates. It's easier to send me an e-mail with information you need

MD-SM I'm not creating a proposal. It's because of the macro.

SM-MD Best way is give me the information and I'll put it off.

MD-SM It's just a proposal.. What do you want to know (?)

SM-MD If I show you where the macros are, what you need to do, it's just (...) It's easy as well. What account managers should do, it's to set their laptops…

MD-SM I'll see if I can sort it.

One minute after MD phones SM telling her the format. It's not the right one so SM will search it for him.

However, resilience and convenience of older media and routines in accessing some profiles of information emerged as a key issue also from the interviews. One of the account managers at BC admitted that *'The system can cover six months. And six months in our business is not a long time. (...) In six months you've got used to have a KM system but then there is still the standard telephone channel. So why have the Intranet?'*.

The company size was also addressed in both the contexts as one of the reasons for the very low use of newsgroups and experts groups:

'We don't have many people anyway and they know people who know (...) If you've been working here for years (...) you will know who's able to answer your question' (BC Managing Director).

Again, characteristics of the informal dimension of knowledge make the use of the system neither effective nor valuable to share knowledge (many consultants define their non-use of the system as linked to the fact that *'it does not add any value to their work'*).

However, the high degree of formalization of collaboration tools is addressed as a main reason for their current failure and as an obstacle to the building up of experts groups or micro-communities of specialists:

'I think we should have a discussion whether we can use collaboration in a more relaxed way, in the same way you would do it on the net with the newsgroup ... Maybe in a couple of days somebody will post an answer (...) We might find that trying to use collaboration in that way we don't have expectations of a quick response and it might work better… Like a newsgroup' (BC managing director).

It is interesting that this type of solution (newsgroup instead of quasi-instant tips) did not work at all at IC, where the numerous newsgroups available on the parent company's Intranet were closed after one year, *'maybe because of too much formalization they required [a review committee filtered all the contributions to the newsgroup]'* (IC Intranet manager).

Slowness and difficulties in negotiating access to the system for consultants working at client sites are addressed as the main reasons for not using collaboration tool at BC.

'We had a number of usability problems with it, just in terms of access, caused by the nature of our work because working from customer sites, we can't necessarily connect our laptops on the phone network'. (BC managing director)

'I think the main problem is I can't access it during the day, so I think if it was there, I could access the system (...) because I could doing a service look at how it was done before, and if not I could raise a question to the community and hope so to come back with an answer that will help me. So I think it would be a lot better, I would use it a lot more I think if I could access it during the day. Whereas using it in the evening I use it more for admin work (...)' (BC consultant).

Therefore inter organizational relationships, both in the implementation and in the domestication stage, seem to be very important in constraining potential or alternative uses of the system and in shaping the concept of KM.

Conclusion

Some of the most recent literature about KM tends to state that technology in itself cannot drive neither innovation processes nor successful KM strategies in organizations. Nevertheless, technology is so pervasive both in organizational discourses and practices, that to consider knowledge embedded in technology can shed a new light on success and failure of KM.

The knowledge tool dimension is often assumed to be an intrinsic characteristic of the Intranet. However, this is the result of a complex interplay of actors' interpretations about technology and knowledge in the specific organizational context, as well as of resilience and importance of previous, more stable media and communicational routines.

Feelings of frustration, disappointment and failure associated to collaboration via Intranet in the early domestication stage suggest the opportunity to reconsider the concept of technology in supporting processes of knowledge sharing and distribution, starting from the social dimension of not only knowledge and learning, but of technology itself.

Either resulting in an enabler or in a fence, it can be said that some profile of technological artefact seems to be a contradictory but necessary component of knowledge manageability.

In the end, trying to ask the question on what kind of knowledge Intranet technology can support, another question arises: is this support possible, or better, is it socially desirable to achieve? Concluding with the words of one of the actors on the field, *'The point is we still use face-to-face and phone even if technologically it is possible work collaboratively. (...) But do we want to do that?'.*

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