Knowledge management, HRM and the innovation process

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Abstract This paper aims to explore Castells’ proposition that the innovation process is being progressively intensified by developments in technological and organizational forms – that knowledge is being applied to the generation of knowledge. The paper focuses on the emergence and implementation of knowledge management (KM), and its particular application in Ebank. A global approach to KM focussing on intranet technology proved unsuccessful. In explaining this outcome, the paper focuses on the constraints posed by the social embeddedness of knowledge as having a crucial effect. In this case, such embeddedness seemed to be linked to the lack of extensive intra-organizational networks and the disparate identities developed by the different business units of the firm. These findings highlight several implications for KM’s role in the innovation process.

Introduction

This paper aims to reflect on current theoretical and empirical work and what it may have to tell us about the implications of knowledge management (KM) for human resources and management practice. The paper’s specific focus is on the role of KM in the management of innovation since this is where the role of KM and its implications for human resources presents the greatest challenge to current management practice. The nature of that challenge is usefully evoked by the following observation from Castells that:

What characterises the current technological revolution is not the centrality of knowledge and information but the application of such knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and the uses of innovation … For the first time in history, the human mind is a direct productive force, not just a decisive element of a production system (Castells, 1996, p. 32).

Castells is one of the most influential commentators on our “network society” and in this observation, he is not only underlining the growing importance of the innovation process in contemporary society, but is arguing that the process itself is being reconstituted by important developments in technological and organizational forms. In considering KM as both a medium and outcome of the innovation process, I will argue that Castells’ analysis suggests a need to refocus our view of innovation to encompass these developments. In particular, I will focus on three major and related changes in the innovation process, which are:

(1) the growing importance of networks;
(2) the critical need to integrate knowledge and action; and
(3) the consequent interactivity that these changes demand with a range of groups inside and outside the organization.

In the subsequent section of the paper I will analyse the extent to which KM can be understood as a response to these shifting features of the innovation process. This highlights KM’s potential role in making knowledge a directly productive force both by collectivizing knowledge and learning, and by increasing the firm’s access to distributed knowledge through its ability to overcome both internal and external organizational boundaries. These espoused features of KM suggest that it represents a significant development in management practices, providing, for the first time, a systematic application of knowledge to the generation of knowledge. As such KM has important implications for the management of human resources, particularly in terms of the development of knowledge-sharing, and it is to this topic that we turn in the first instance.

**KM, HRM and knowledge-sharing**

One of the important implications of KM in relation to the innovation process is the emphasis that it places on the role of human resource management (HRM) factors. While often neglected in the existing literature, the influence of HRM factors on the innovation process is brought into a sharper process if we view that process as the intersection of two flows; the flow of knowledge and the flow of people. While subsequent sections of this paper will highlight the importance of knowledge flows to the innovation process, the initial focus here is on the flow of people and management’s influence on that flow as expressed in HRM policy and practice.

Three aspects of HRM activity are seen as particularly important in shaping the flow of people and their impact on the development of innovations:

1. selection methods;
2. compensation strategies; and
3. career systems.

In their different ways, each of these HRM factors exerts an influence on the flows of knowledge which KM is seeking to maximize. In particular, these factors influence both the kind of knowledge which is acquired and developed by individual employees and their willingness to share such knowledge. First, selection methods are seen as an important influence on the development of the project teams which are often an integral feature of the innovation process. Selection of individuals with both appropriate skills and appropriate attitudes has been identified as crucial to the project team’s ability to integrate knowledge from diverse sources (Grandori and Soda, 1995). Recent evidence suggests that conventional approaches to selection may need to be revised in the light of the unpredictable knowledge flows involved in innovation projects (Newell and Shackleton, 2001). In such settings, it may simply be too difficult to specify the requisite knowledge and expertise in advance. This may lead to the
development of new forms of selection which are more dynamically related to the interests, careers and attitudes of employees. New electronic ways of identifying and up-dating employee competencies may be an important ingredient here (Nordhaug, 1993).

Second, compensation strategies aimed at promoting knowledge-sharing are an increasingly prevalent ingredient in the innovation process. Compensation for knowledge-sharing can be both tangible (bonuses or one-off rewards) and intangible (status and recognition). The problems with such approaches is that rewards for some can create dissatisfaction for others, and they may lead to an overemphasis on the rewarded behaviour rather than effectiveness. Individuals may put more effort into highlighting their personal contribution than in cooperating effectively with other employees. This may help to explain why most organizations do not reward knowledge sharing explicitly. On the other hand, knowledge-intensive environments may permit a novel approach to compensation. Thus, examples of innovative rewards being used to foster knowledge-sharing include the example of Hewlett Packard where free Lotus Notes licenses were distributed to encourage educators within the organization to submit comments and ideas to knowledge bases. Similarly, Rajan et al. (1998) suggest building a personal recognition system based on the number of “hits” per site and using the system to influence decisions over promotion and reward.

Third, career systems are important in shaping the flow of employees over time and the way that this interacts with the acquisition and exchange of knowledge (Rosenbaum, 1984). For example, career systems may reward the individualistic acquisition of knowledge by a few star performers, but may equally be designed to promote the sharing of knowledge among wider communities of practice (Brown and Duguid, 1991). They may also involve a move away from traditional managerial hierarchies. Thus, long-term achievement within a particular discipline may be rewarded by promoting individuals to senior expert positions within a “dual career” system. This practice avoids siphoning off knowledge leaders into mainstream management positions.

The implications of these HRM factors for the management of knowledge and innovation is profound. Where such factors are linked to the firm’s business strategy, they may represent a powerful means of aligning employee skills and behaviour with the flows of knowledge needed to develop innovations. A recent study of consultancy firms in the USA (Hansen et al., 1999) identified two major types of KM strategy which linked people flows and knowledge flows in this way. These types of strategy were termed “codification” and “personalization” respectively. They were described as follows. With codification, “knowledge is carefully codified and stored in databases where it can be accessed and used readily by anyone in the company” (p. 107). Conversely, personalization is where “knowledge is closely
This account underlines the interplay between KM, HRM and knowledge-sharing behaviour. It highlights the need to align selection, compensation and careers to the business strategy of the firm. Codification is seen as requiring the selection of a relatively standardized intake of individuals who can be trained to implement company methodologies. They progress by dint of their contribution to team goals and are rewarded for sharing knowledge via electronic databases. Conversely, with the personalization approach, companies select highly experienced experts and reward them for sharing knowledge directly with their peers.

**KM and the innovation process**

As the above section has made clear, innovations arise at the intersection between flows of people and flows of knowledge (Starbuck, 1992). HRM practices may influence this intersection by promoting or inhibiting knowledge-sharing and by shaping the skills and attitudes of individuals. The focus in KM to date, however, has been less on these issues than on maximizing the flow of knowledge across organizational units. In particular, KM’s possible contribution to innovation has been seen by a number of large multinationals in terms of facilitating knowledge-sharing across geographical and cultural boundaries (Hedlund, 1994).

The following section of the paper reviews the scope and limitations of KM’s contribution to innovation through an empirical study of the development of intranet technology within a global banking organization. Where KM is typically presented as a medium for the innovation process – a means of exchanging and integrating knowledge – this case study allows us to view KM as an innovation in its own right. Although this is only an exploratory study, by studying the development of KM as an innovation we derive a dual benefit. On the one hand, it helps us to identify the significant barriers to the implementation of KM. Understanding such barriers may help to explain the failure of many KM programs. Charles Lucier, the chief knowledge officer of Booz Allen Hamilton consultants, for instance, claims that 84 per cent of KM programmes have no significant impact on the adopting organization (Lucier and Torsiliera, 1997). On the other hand, the limited success of KM programs can also shed some light on the underlying constraints that limit firms’ ability to apply knowledge to knowledge generation in the intensifying feedback loop described by Castells.

**KM as a response to changes in the innovation process**

The changing nature of the innovation process is well evoked by Castells’ claim that the human mind is now “a directly productive force” rather than an element of a production system. In this view, knowledge has, to a significant
degree, been liberated from the physical and structural constraints of the existing division of labour in organizations. One result of this new relationship between knowledge and productive activities is the challenge that it poses to traditional views of innovation. Innovation processes were traditionally predicated on a strict demarcation between the roles played by different groups, and therefore different bodies of knowledge, according to their place in the division of labour. As a result, the innovation process itself was seen as segmented between different “stages” according to the groups and forms of knowledge involved (Rothwell, 1986). Importantly, the designers of innovation were seen as distinct from the “users”, and the process itself involved the progressive objectification of an original idea into a specific product or production template (Clark and Fujimoto, 1989). When knowledge is freed from physical and structural constraints, however, the activities, sequencing and actors encompassed by the process of innovation undergo a corresponding transformation. Broadly, innovation operates on a more distributed basis, with a wider range of groups inside and outside the organization becoming involved. Networks play a crucial role in linking these groups (Swan et al., 1997; Hislop et al., 1997). The process becomes less linear and more interactive as the demarcations between users and designers are blurred (von Hippel, 1988). Increasingly, innovation is seen as the integration of knowledge with action, in the sense of blending the specialist knowledge of a range of groups into specific outcomes of either product or process change. Implementation is thus seen as an integral element of innovation (Leonard-Barton, 1988).

These changes in the nature of the innovation process can be summarised under the following headings.

**Innovation as the activity of integrating knowledge with action**

A number of studies of technology implementation have highlighted the interactive nature of that process. In emphasizing the “mutual adaptation of technology and organization” (Leonard-Barton, 1988) and the importance of links with user organizations (von Hippel, 1988), such studies underline the limitations of discrete and institutionally-bounded models of innovation. As Leonard-Barton (1988, p. 265) puts it, “implementation is innovation”. At the same time, they have displaced assumptions of linearity with a concern for the emergent and processual qualities of implementation.

Also, an overlapping cluster of studies has focussed on the role of knowledge and learning in innovation-diffusion (Leonard and Sensiper, 1998; Leonard-Barton, 1998). Again, this has tended to challenge the analytical separation of diffusion and implementation. Viewing innovations in terms of the transfer of knowledge changes our understanding of such activities. Diffusion is viewed less in terms of a broadcaster-receiver model and more in terms of the commodification and objectification of knowledge (Scarborough, 1996). Technology acquisition and implementation is likewise understood not as a
discrete decision but in terms of locally situated sense-making (Coopey et al., 1997) and the “absorptive capacity” (Cohen and Levinthal, 1990) created by a path-dependent and distributed knowledge-base (Pavitt, 1984; Tsoukas, 1996).

The role of networks in innovation

In general terms, there is nothing new about the proposition that innovation processes are shaped by networks. Freeman notes that empirical studies since the 1950s have demonstrated “the importance of both formal and informal networks, even if the expression network was less frequently used” (Freeman, 1991). In recent years, however, the focus on the role of networks has sharpened, with increasing interest in the implications of different network structures for knowledge flows. Thus, the view of the firm as a “focal organization” within an exogenously determined “environment” has been increasingly questioned (Child and Smith, 1987; Pavitt, 1984, p. 807) in favour of a focus on the role of both inter and intra-organizational networks in communicating and shaping innovations (Ibarra, 1993; Aldrich and von Glinow, 1992).

In considering the role of inter-organizational networks in innovation it is also important to acknowledge the importance of personal as well as organizational networks (Macdonald and Williams, 1993; Conway, 1995). Even where formal, organizational level networks exist, they are supported, below the surface, by a range of personal networks. Inter-personal networks therefore constitute the direct interface through which organizational networks are mediated and managed. Moreover, the “boundary spanning” (Tushman, 1981) activities of individuals who build and develop networks across organizations do not require formal organizational networks to sustain them, and can operate where no formal organizational agreements exist.

Existing evidence suggests that different types of network are differentially effective in this regard. Hansen (1999), in particular, develops this contingency view in observing that networks based on weak ties facilitate the search for less complex knowledge while strong tie networks enable the transfer of complex (non-codified, dependent) knowledge. While Hansen’s (1999) study focussed on intra-organizational networks, other studies suggest that similar tendencies may also operate for external networks. Oliver and Liebeskind (1998), for example, differentiate the roles played by different network relations in terms of the transfer of different kinds of knowledge which are transmitted:

... exchanges of new scientific knowledge take place primarily through interpersonal network relations, both intraorganizational and interorganizational ... while interorganizational ties serve primarily to support knowledge commercialization and encompass transfers of “commoditized knowledge” in the form of intellectual property rights, and of assets essential for its commercial development (Oliver and Liebeskind, 1998, p. 77).

Evidence for the role of external networks in innovation processes comes from a range of recent studies. While much of the debate on social capital has centred
on the advantages of hierarchical forms, Nahapiet and Ghoshal (1998, p. 257) note that some of the conditions leading to high levels of social capital “may also occur in some forms of interorganizational network, thereby enabling such networks to become relatively well endowed with social capital”. Indeed, Dyer and Nobeoka (2000) argue that:

...if the network can create a strong identity and effective coordinating rules, then it may be superior to a firm as an organizational form at creating and recombining knowledge owing to the greater diversity of knowledge that resides within a network (Dyer and Nobeoka, 2000).

Thus internal and external networks may operate symbiotically to allow the exchange of knowledge required by the innovation process.

Innovation as a distributed, interactive process
As the complementary role of internal and external networks underlines, the traditional emphasis which innovation research has placed on the individual firm as the unit of analysis is increasingly difficult to sustain. In particular, with the development of IT-based innovations, innovation processes are increasingly interactive, involving multiple actors distributed within and across organizations with distinctive knowledge and particular interests. Such interactive innovation processes dissolve traditional distinctions between suppliers of innovation, emphasized in innovation creation and diffusion research (Rogers, 1983) and the users of innovation, emphasized in research on implementation and appropriation. They conflate traditional distinctions between supply and demand, design and usage, diffusion and implementation (Fleck, 1987). They also pose particular problems in terms of the development of intellectual and social capital. For example, the factors noted above are potentially much more difficult to establish where innovation processes are interactive, where relevant knowledge is distributed across organizations and where ownership is contested.

Knowledge management as a medium and outcome of the innovation process
The emergence of KM concepts and tools can be seen as a response to the changes in the innovation process outlined above. In particular, KM involves a self-conscious attempt to exploit knowledge as a directly productive force. Many different taxonomies of knowledge have been suggested in the literature on KM – too many to describe here, certainly.

However, summarizing these contributions in shorthand form suggests that we can usefully distinguish four broad types of knowledge, which are analytically, though not ontologically, distinct:

1. know what (declarative or explicit knowledge);
2. know how (procedural or tacit knowledge);
Thus, KM initiatives typically seek to collectivize these different kinds of knowledge which are currently dispersed among groups and individuals within and outside the organization. The aim is to make the knowledge and learning generated in one sub-unit available to others. As Ruggles (1998) puts it:

To a growing number of companies, KM is more than just a buzzword or a sales pitch, it is an approach to adding or creating value by more actively leveraging the know-how, experience, and judgement resident within and, in many cases, outside of an organization (Ruggles, 1998).

Thus KM may be presented as the perfect medium for the networked, interactive and knowledge-driven nature of the innovation process. For example, KM is seen as helping to overcome structural barriers to innovation processes – the “collaboration problems that stem from old habits of hoarding knowledge” (Hibbard and Carillo, 1998) – and is seen as contributing significantly to the knowledge integration required by innovation processes. Moreover, KM is not only said to provide a focus for knowledge-sharing between geographically, politically and functionally dispersed groups – linking users and designers – it also links knowledge to action through a focus on communities of practice and the sharing of tacit knowledge.

But, while the emergence of KM can certainly be seen as responding to the shifting context of the interactive, knowledge-based innovation process, it is important to remember that KM can itself be viewed as an outstanding example of what we have termed interactive innovation, being knowledge-based and dependent on the cooperation of a wide variety of groups. It can also be seen as highly interactive in that KM innovations usually involve the design and development of new work practices and systems (e.g. around the use of company intranets) simultaneously by external consultants, line managers, and IT experts. In this sense, the emergence of KM represents a clear illustration of what Castells terms the “cumulative feedback loop between innovation and the uses of innovation”. Here, it seems, is an instance of Castells’ vision of knowledge being applied to the generation of knowledge. The innovation process is recursively intensified by further innovation. In the remainder of this paper, therefore, I will be discussing KM not as a medium for innovation, as described above, but rather as its putative outcome. Through a case study of KM innovation, I aim to explore the implications of the way KM is implemented for its effectiveness. Does the “cumulative feedback loop” described by Castells operate in the seamless way that he describes, or are there constraints that limit our ability to make knowledge a free-floating resource for the organization?
Global KM at Ebank

Ebank is located across 70 countries worldwide, and is one of Europe’s largest investors in IT. Despite calling itself “the networked bank”, the reality was quite different. Each country and each department operated relatively independently with its own systems, services and processes. Ebank’s “Global KM” project was launched in 1996 when a major client left the bank because they felt they were not getting an integrated service across countries. In addition, the feeling among top management was that resources were being wasted because different units and departments failed to learn from one another and were thus continuously “reinventing the wheel”. The vision from top management then was to develop a global knowledge-base in order to integrate existing knowledge within the bank and to provide a global service portfolio. Significantly, the key to this vision was seen to be the development of a worldwide communications infrastructure using intranet technology.

An intranet pilot project was launched, led by the corporate IT group and funded centrally. The pilot involved mostly technical (IT) specialists from different business units worldwide and was focused on creating a corporate intranet infrastructure which would allow far-flung business units to connect. This pilot highlighted the benefits of the intranet for knowledge sharing and so enthused those involved with the possibilities opened up by the new technology. Many of them had developed a “hobbyist” interest in relevant tools and techniques such as HTML programming. Emboldened by the corporate initiative, they became evangelists of intranet technology to their own divisions. When each individual returned to his or her division, however, their efforts were directed not towards the corporate strategy but to the technological means it had mandated. Corporate management had provided them with the know what and know how of intranet technology, but had not developed the know why and know who. That is, the individual IT specialists had not assimilated the overall strategic rationale for KM, and nor did they have sufficiently well developed networks with groups in other business units to wish to involve them in their initiatives. Instead, they lobbied within their divisions for their own intranet development. Across Ebank, myriad separate intranet projects sprang up, resourced with local funds and people. Intranet technology was viewed not as a means to the end of global knowledge-sharing. Rather it had become an end in itself; a badge of identity pursued by individual business divisions for their own interests.

The consequences of this “fissioning” of the KM innovation were significant. The espoused objective of developing intranet technology to increase knowledge sharing across functional and geographical boundaries within the bank was largely forgotten. Instead the actual outcome was an explosion of different and discrete intranet developments, none of them connected to the rest. Nobody, even at corporate level, could say exactly how many sites had
been developed (although one estimate suggested that there were at least 150 different intranet sites).

The use of these independent intranet sites suggested that they resulted in very limited knowledge sharing even at the local level. For example, the IT division knew about the technical requirements of intranet and had developed their own technically sophisticated intranet (Iweb) specifically designed for knowledge sharing across the IT function. However, when asked what was actually shared via Iweb, the only examples they could cite were the company telephone directory and the corporate bus timetable. The latter gave information of the times of company buses running between different local sites every 20 minutes! Thus Iweb was essentially being used as a digital repository of existing information which was used by some (but not all) of the staff within the division. There was no evidence that the intranet had promoted any sharing of knowledge or expertise relevant to improving business performance or innovation even within the IT division, let alone across the bank.

Moreover, the lessons learnt in the development of this intranet (which was highly sophisticated in technical terms) were not shared with developers of intranets in other divisions, even within the same region. There were many examples where project teams had used resources on developing an application for their particular intranet only to find later that another group had done something very similar which they could have used instead. For example, a number of the intranet projects had used a particular firm of consultants and in each case there had been problems with the relationship and the service provided by this consultancy. However, given that there was little or no communication across the intranet projects, the same mistakes with this consultancy continued to be made. Reinvention, then, was extremely common in an innovation initiative specifically aimed at preventing such reinvention! Further, expertise was not shared across functional specialisms within the bank, especially business management and IT. The result was that some intranets (e.g. Iweb) proved technically very sophisticated but offered little in the way of business-relevant innovation. In others, where business-relevant innovation (e.g. in the form of integrated service delivery) could have been achieved the intranets failed because of difficulties in appropriating the necessary technical expertise. For example, in one case, the failure to anticipate bandwidth problems led to the completed intranet system being abandoned because it took nearly 20 seconds to turn a page.

**Discussion**

Compared to our account of the interactive innovation process, the example of the Ebank KM project demonstrates the strong countervailing tendencies in organizations that make it difficult to manage a knowledge-based innovation. Having highlighted the importance of interactivity, the role of networks and the
importance of integrating knowledge from dispersed groups, we can identify in this case study precisely the organizational factors which limit the success of such innovation projects. First and most importantly, the Global KM project was not managed as an innovation project for Ebank as a whole. Thus, there was little interaction between top management and the developers and users of intranet systems. Knowledge exchange took place only at business division level and not between divisions. Intra-organizational networks were sparse and ineffective. In short, the KM project was managed from a narrowly technical perspective which focussed on intranet technology but not the wider objective of knowledge-sharing. As a result the strategic aim of “Global KM” was re-interpreted by far flung groups with different professional and business interests into many varied local intranet developments which were more or less successful in their own terms, but only exacerbated pre-existing social and organizational differentiation (e.g. between IT and line management and across different business regions). As Cohen (1998) puts it:

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\text{...the Intranet is a powerful tool that when used correctly can enhance communication and collaboration, streamline procedures, and provide just-in-time information to a globally dispersed workforce. Misused, however, an Intranet can intensify mistrust, increase misinformation, and exacerbate turf wars.}
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Ebank’s inability to manage its KM project as an innovation process, or even to recognise that it involved an innovation process, can be explained in many different ways. The bank’s history of growth through acquisition, the consequent levels of decentralization, and the lack of strong corporate control – such structural factors can all be seen as important. However, in assessing the impact of these and other deep rooted factors on the KM project, the critical mediating influence seems to have been their implications for the socially embedded distribution of knowledge within the bank (Tsoukas, 1996). The KM project’s aim of liberating knowledge from structural constraints – of making it a free floating resource – depended on the integration of such distributed knowledge to produce a coherent global knowledge-sharing system. As we noted, however, the end product was a disparate and unconnected collection of intranet developments.

This failure to integrate the distributed knowledge of different groups within Ebank can be related to its social, cultural and professional embeddedness within the different units of the firm (Granovetter, 1985). Thus, we noted the constraints imposed by the professional distribution of expertise (Fincham et al., 1994; Scarbrough, 1996), with IT specialists unable to integrate their knowledge with those of their banking colleagues in developing the use of the intranet. Moreover, added to this was the social and cultural embeddedness of knowledge in the different regional divisions which created the strong centrifugal pressures on intranet development.

The KM project’s inability to “disembed” the knowledge dispersed among different groups (Giddens, 1979) can be linked to two further related factors.
The first was the absence of strong intra-organizational networks linking the different divisions. Such networks had not developed previously due to the bank’s pattern of growth, and the narrow focus on technology development in the KM project did not help to cultivate the new networks that might otherwise have countered the bank’s centrifugal tendencies. Second, the embeddedness of knowledge was linked to the proliferation of a range of different social identities within the Ebank organization. Employees identified with professional specialisms or with their own division, but rarely with the corporate organization as a whole. Thus, when intranet technology was used as a badge of identity, it produced a diverse and unconnected set of intranet sites, which did not include links to each other or even to the Bank’s corporate Internet site. Knowledge sharing was thus seen as a local and not a global activity.

In highlighting the constraints on the KM project posed by the social embeddedness of knowledge, we are also highlighting more general constraints on the ability of KM to apply knowledge to the generation of knowledge. A number of the factors which we have identified as limiting the effective development of the KM project can be seen not as pathological features of Ebank in particular, but as integral features of the firm as a social institution. Indeed, the embeddedness of knowledge in Ebank arises in large part from firm-level characteristics which have been identified, within the knowledge-based view of the firm particularly, as critical to the firm’s institutional raison d’être. For example, specialization – which in this case limited the exchange of knowledge between bankers and IT specialists – has been presented as the major driver of firm evolution (Grant, 1997). Likewise, social identity, which tended to fragment the KM project’s development in this case, is also viewed as one of the key advantages of hierarchical over market-based forms of coordination. More specifically, in advancing their view of the firm as a “social community specializing in the speed and efficiency in creation and transfer of knowledge”, Kogut and Zander (1996, p. 503) argue that organizational identity plays a pivotal role in overcoming problems of communication across the specialized competencies created through the division of labour. Finally, Ebank’s strategic evolution and the localized nature of the social networks associated with it constitute a specific configuration of “absorptive capacity” (Cohen and Levinthal, 1990; Van den Bosch et al., 1999). This produces, but also constrains, the firm’s ability to assimilate new knowledge – in effect, encouraging the segmented implementation of innovations rather than their global utilization.

In summary, the failure of Ebank’s Global KM project can be seen as illustrating the tensions that arise from attempts to free knowledge from structural constraints.

The social embeddedness of knowledge, which is critical to the efficient operation of firms, is at the same time the greatest barrier to the integration of
knowledge required by interactive, knowledge-based innovations. Moreover, in the failure of the Global KM project at Ebank we can also recognise the underlying constraints which operate on KM as a managerial practice. Knowledge cannot be readily extracted from its social setting through purely technological means. Attempts to do so only reinforce and refract existing divisions of knowledge.

To highlight the tensions created by attempts to intensify innovation is not to suggest that such attempts cannot succeed. However, the lessons of the Ebank case in particular, suggest that such attempts need to view KM as a process of innovation and not as the adoption of a tool. That process of innovation itself needs to be managed not as a linear sequencing of activities but as the integration of knowledge presently distributed among a variety of groups. Such integration would depend, as the Ebank case suggests, on issues to do with social identity and the spread of social networks. It cannot be secured through purely cognitive means alone. Rather, it is related, as Boland and Tenkasi (1995) note, to the development of links between different communities. As they put it:

The problem of integration of knowledge in knowledge-intensive firms is not a problem of simply combining, sharing or making data commonly available. It is a problem of perspective taking in which the unique thought worlds of different communities of knowing are made visible and accessible to others (Boland and Tenkasi, 1995, p. 39)

Whereas “perspective making” involves a community developing and strengthening its own knowledge domain and practices, “perspective taking” involves a process of collaboration between experts working across boundaries (Boland and Tenkasi, 1995). Through such collaboration, members of different communities come to appreciate more clearly the worldviews – both their own and that of other groups – in which their knowledge and practices are embedded. Once a greater mutual understanding has been achieved of differing perspectives, the sharing and synthesis of tacit knowledge is more readily achieved.

Conclusions
In this paper, I have sought to explore Castells’ proposition that the innovation process is being progressively intensified – that knowledge is being applied to the generation of knowledge. KM seems to represent one of the most advanced efforts to intensify innovation in this way. In particular, its emergence can be seen as a response to the shift towards a knowledge-based interactive process of innovation.

The latter seems to emphasise KM’s potential role in the key task of integrating different forms of knowledge elicited from a variety of sources.

My analysis of KM’s role was developed through an exploratory case study of the Ebank corporation. This case highlights KM’s dual status as not only a medium but also an outcome of the innovation process. In Ebank the Global
KM project represented a significant innovation for the organization. However, the project was not managed as such, and in its lack of success I identified the constraints posed by the social embeddedness of knowledge as having a crucial effect. In the case, such embeddedness seemed to be linked to the lack of extensive intra-organizational networks and the disparate identities developed by the different business units of the firm.

The implications of the Ebank case and my analysis of it can be summarised as follows. First, KM needs to be managed as a process of innovation not the application of a tool. Focussing on the technological features of KM neglects the level of knowledge integration required by such an interactive, knowledge-based innovation. Second, the failure of the Global KM project at Ebank highlights the difficulties in liberating knowledge from existing structural constraints. Applying knowledge to the generation of knowledge is more problematic than Castells’ notion of a “cumulative feedback loop” indicates. This is because the acquisition of knowledge and learning by organizations creates forms of professional specialization, social networks and social identities which embed knowledge in particular settings. Third, integrating knowledge across such settings is not simply a cognitive process. There is a need to socialize our view of the innovation process. This involves recognizing networks of social relationships as a critical resource for the combination and exchange of knowledge required to promote innovation and create intellectual capital (Nahapiet and Ghoshal, 1998).

References


