Using Knowledge Management Systems to Structure Knowledgeable Practices

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Abstract

The purpose of this study is to explore the role of knowledge management systems (KMS) in structuring knowledgeable practices within organizations. Specifically, we consider how intellectual property lawyers use knowledge management systems to structure the practice of patenting.

We employ an interpretive case study focused on the knowledge management practices and systems employed by intellectual property lawyers at one site of a large Canadian law firm. Interview, document and observational data were collected during a 15-month period from September 2004 to November 2005.

Using a practice lens, the lawyers employed four technologies-in-practice to structure their use of knowledge management technologies: (i) collaboration, (ii) delegated use, (iii) conversion, and (iv) improvisation. The lawyer’s knowledgeable activity emerged around various contested spaces delineated by these technologies-in-practice. Where the lawyers added the most value for their clients by navigating these contested knowledge spaces, advanced digital technologies were often absent.

1. Consequences of KMS

The motivation for this study is based upon the desire to counter, at least partially, two trends within the extant knowledge management (KM) literature that are potentially limiting our understanding of how knowledge management systems (KMS) are implicated in organizational change. First, are the paradoxical consequences of KMS that arise within a range of technologies and practices. Second, the focus within the KMS literature on digital information technology (IT) enabled KMS to the detriment of consideration of non-digital enabled practices.

The consequences of knowledge management systems (KMS) in organizations have been considered from a range of perspectives. Numerous authors have focused on the consequences of these systems for organizational structure and form as highlighted by the knowledge based view of the firm [6,14,17,28]. In this regard, new organizational forms have appeared in the literature to more effectively exploit knowledge resources of knowledge based organizations: adaptive [38], hybrid [30], flex-form [39], virtual [20], postmodern [5], professional partnership P2 [16] and managerial professional business [7]. In these organizations, KMS are hypothesized to replace the hierarchical bureaucracies and to allow the development of new organic corporations, while in practice, these systems are not necessarily a key or even the most important element in such organizational change [4].

Other authors consider the consequences of KMS in terms of organizational culture. For example, Doherty and colleague [10] premise their work on the impact of data warehouses on IT-induced cultural change, but conclude that IT rarely delivers a quick fix. In this regard, Avison et al. [3] reject the view of culture as a well defined object with hard and fast boundaries, popular in much of the KMS literature, and instead adopt an anthropologist’s perspective whereby cultures are contested, ever changing and emergent, invented and reinvented in social life. Similarly, Robey and Azevedo [31] point to cultural analysis in emphasizing the importance of socially constructed meanings and their relationship to IT’s material properties. The consequences of IT are largely indeterminate since a variety of meanings can be ascribed to the technology, and it is not an autonomous determinant of organizational form or process.

A third area where the consequences of KMS are often hypothesized is with respect to organizational learning. That is, learning organizations achieve higher performance through their ability to learn from past experiences [36]. Organizational learning seeks to explain how organizations learn new responses and why they often fail to learn [2]. The role of KMS in organizational learning is typically considered in terms of storage and retrieval and in supporting...
training and the creation and communication of knowledge [37] although, ironically, these systems might also disable organizational learning when faced with changing environmental conditions [32].

A fourth consequence hypothesized within the literature is between KMS and politics, power and control within organizations. For example, Lynn Markus explicated divergent theories of resistance and demonstrated how the same financial system had contradictory consequences in a single organization due to differing political interests [21]. In a recent review, Jasperson and colleagues [18] identify contradictory views of the relationship between power and IT impacts. Wanda Orlikowski [23] illustrates how the same technology that facilitated integrated and flexible operations also enabled a disciplinary matrix of knowledge and power. While IT is often hypothesized to loosen the hierarchical stranglehold it can also reinforce or strengthen them. Peter Gray [15] notes that much of the KMS research points to the ability of KMS to positively impact power relationships with little consideration for the negative impacts.

A fifth consequence considered by many KMS researchers is in supporting the creation, transfer, and application of knowledge [1]. Alavi and Leidner [1] draw upon the sociology of knowledge to conceptualize organizations as knowledge systems that represent both the cognitive and social nature of organizational knowledge and its embodiment in the individual’s cognition and practices, as well as in the collective practices and culture [1]. A recent review of knowledge management studies published in the leading information systems journals indicates that the majority of research focuses on knowledge transfer [29]. The authors develop an analytical framework based upon two of the most influential knowledge management studies [1,8], in order to identify five core constructs of knowledge management. The five constructs and the approximate distribution of coverage by topic within academic journals are (i) knowledge creation 13%, (ii) knowledge storage and retrieval 22%, (iii) knowledge transfer 39%, (iv) knowledge application 16% and (v) knowledge roles and skills 10%. The authors posit that the focus on knowledge transfer is based on an assumption that digital information technologies support such processes and that many IS researchers focus on the medium rather than the process [29].

Within the extant literature the consequences of knowledge management systems are contradictory in that in some studies the expected consequences do not occur; different consequences result from the use of nearly identical technologies in comparable settings; and contradictory consequences result from the same technology. In the next section we draw upon recent theorizing to explore one approach for addressing such contradictory findings.

2. Embracing contradiction through interplay and oppositional logics

Contradiction is a general term referring to a statement expressing or asserting the opposite of another statement [32]. For example, paradox, irony, hypocrisy, oxymoron, conflict, inconsistency, double bind and dilemma are all types of contradiction. Robey and Boudreau [32] identify a number of strategies for resolving inconsistent findings within and among studies. These include the revisiting of definitional assumptions, employing alternate research methods, and adopting theoretical logics that accommodate contradiction in observed phenomena. While contradictions are generally viewed negatively as something to be resolved, they also are an opportunity for researchers to explore alternate conceptualizations [11]. From a definitional perspective, focusing excessively on digital IT-based KMS, researchers often ignore the numerous and important non-digital IT aspects. Recent calls to re-emphasize the IT artifact in research [26] are consistent with the need to consider the socially embedded IT artifact – where does it come from, who produced it, who developed it, and how it is used in particular practices. Thus within the IS field there is a recognition by some that not all knowledge tools are computer based [33]. Paralleling arguments that information systems are not necessarily digitally IT-based [40], have lead some researchers to more broadly define KMS in terms of people, technologies (manual and computer based) and knowledge [12]. Conceptualized in this manner KMS are viewed more dynamically in terms of both digital and non-digital based systems implicated in a range of knowledge processes.

KMS are often positioned as a determinant of radical organizational change, which once implemented, transform the organization’s key processes. This deterministic logic for the structuring role of information technology has been critiqued, and instead a more complex relationship purported between information technology and organizations that is emergent and reciprocal in nature [9,19,22,24,27,34]. In response to the dominant deterministic logic guiding much research on the consequences of information technology, Robey and Boudreau [32] propose that researchers employ alternative causal approaches, and offer oppositional
logic as one method that is potentially better able to account for contradictory outcomes of information technology in organizations. Oppositional logic explains organizational change by considering opposing forces that respectively promote and oppose social change, which is in contrast to a logic of determination that explains change as the consequence of variation in a set of predictor variables [32]. Thus rather than resolving empirical contradictions and searching for consistency in information technology’s effects on organizations, a logic of opposition approach resolves the “problem” of contradictory research results by using theoretical positions that are able to account for the findings actually observed [32]. This indeterminacy does not imply that organizational consequences of information technology are incomprehensible or unpredictable but instead the use of these theories facilitates the identification of opposing forces and the analysis and interpretation of the complex social processes of organizational change.

Robey & Boudreau [32] conclude their article by noting that structuration theory (ST) incorporates oppositional logic directly through the concept of duality of structure. For Giddens [13], structure is defined as rules and resources, recursively implicated in the reproduction of social systems. Structure exists only as memory traces, the organic basis of human knowledgability, and as instantiated in action (p.377). The relationship between agency and structure is redefined in terms of the duality of structure, which implies that structure shapes people’s practices, but these practices reciprocally constitute and reproduce these structures. Since agents are knowledgeable and enabled by structure, they choose to enact structures in both old and new ways, thus contributing to and transforming the very structures that informed their action in the first place.

Giddens [13] suggests that ST concepts should be regarded as sensitizing devices, to be used in a selective way in thinking about research questions or interpreting findings (p.213). We take this approach in the study presented in the next section.

3. Research design

We address the research question of how do intellectual property lawyers use knowledge management systems to structure the practice of patenting? To address this question we employed an interpretive case study focused on the knowledge management practices and systems employed by the professionals within the Intellectual Property Group at one site (Site A) of a large Canadian law firm. In employing an interpretive case study, this research primarily focused on the meaning of the knowledge management practices for the participants. The study focused on the KM practices of three lawyers (Participants L1-L3), who were also patent agents, and one paralegal (P); all of which we collocated at the primary research site, denoted Site A. In addition, the CIO for the Firm participated in the study, but was located at Site B in another city. The study relied upon observations, interviews and document review of legal case files, which represented an ongoing record keeping of the intellectual property group. To narrow the scope of the study while facilitating the depth of data needed, ten information technology patent cases were selected that covered the range of outcomes for the patenting process (e.g., patent drafted, abandoned, pending, issued). Data collection occurred over a 15-month period from September 2004 to November 2005. The first author was onsite for varying durations between April 2005 and November 2005, on average three days per week, during which time he was able to conduct the case file review that in turn motivated multiple rounds of observation and interviews. Data were collected at multiple levels within the Firm and from the broader literature on the patenting industry and the role of patenting in society. The primary data collected consisted of three bankers boxes of case file data and approximately 20 hours of interview data, which were transcribed into 400 double-spaced pages of interview notes.

Structurational analysis involves studying the modes in which social systems, grounded in the knowledgeable activities of situated actors who draw upon rules and resources in diverse action contexts, are produced and reproduced in interaction [13]. This was accomplished though the technologies-in-practice lens [27, 35], which while not denying the importance of the technological artifact, places renewed emphasis on human agency, in that while technology can embody particular symbolic and material properties, structure is only instantiated in practice [27]. By interacting with certain properties of a technology, structures of technology use are recursively constituted and thus shape the set of rules and resources that then shape their interaction and it is these enacted structures of technology use that are termed technologies-in-practice [27]. In the next section we detail the findings from the study in terms of the technologies-in-practice identified.

4. Findings

Drawing upon Orlikowski and Robey [27], the four technologies-in-practice identified included
follows,

Participant L2 described the collaborative interplay as particular individual on aspects of the document. (e.g., patent application) and then requests input from a responsibility for drafting a particular document (e.g., comment (RFC) whereby one professional takes the collaborate environment is one of request-for-information technologies to facilitate collaboration. The structurational analysis of each of the technologies-in-practice, as illustrated in detail for Collaboration (Figure 1) and Conversion (Figure 2).

4.1 Collaboration technology-in-practice

The professionals rely heavily on a range of information technologies to facilitate collaboration. The collaborative environment is one of request-for-comment (RFC) whereby one professional takes responsibility for drafting a particular document (e.g., patent application) and then requests input from a particular individual on aspects of the document. Participant L2 described the collaborative interplay as follows,

“If you are doing it by paper then I would say usually you start on computer, you get it typed up, then you finally print it out and then that is when you start going over the iterations and once you are done the first four or five then you will get someone else to read it, they will make more changes, they will make another one or two sets of revisions.

Actually drafting a patent I find I do a lot of it on paper which is unusual because everything else I try to be paperless. But it is difficult to have… you want to have drawings in front of you so that you are describing the picture with respect to the drawings. You need to have a numbers list or a parts list so you know all the different elements are and what number you have assigned to them so that when you are doing the detailed description you don’t have to dig around to try to figure out if it’s element 14 or 15. You will have a separate list for that. Then you probably have a pile of prior art as well to refer to as you are describing an element and then you will have the inventor’s disclosure in front of you as well so you actually… if you had seven computer screens in front of you that would work as well but in the absence of that it is very difficult, I find anyways, to just type it out and not have all those things in front of you. Once you have six piles of things that you are referring to constantly and looking at then it is a lot easier to actually start writing out parts of the application.”

The person reviews the document and then offers comments back to the individual responsible. Since the professionals charged for their time on an hourly basis other approaches to collaboration were viewed as an inappropriate use of their time. The professionals needed to balance the benefits of insights gained from input from others with the extra time such activities can occupy. The collaborative activity is premised on the professional idea that collaborative work produces a better end product. There is a strong mentoring orientation within the legal profession and the drafting of documents is an important occasion for mentoring opportunities. This mentoring as part of the drafting process was evidenced in the billing practices.

The professionals were all extremely competent with a range of technologies, and employed these at various points for the purpose of collaboration. The lawyer/patent-agents used email extensively to send documents to colleagues for comment or directed their colleagues to the folder containing the latest version of the document since they openly shared their files within the Site A Intellectual Property group.

All patenting cases considered were collaboratively developed using a range of technologies. The patenting practice was dominated by drafting documents. Primarily this consisted of starting with pen and paper notes during the early drafting stages as the lawyers outlined some of the details of the invention and the claims during phone and face-to-face meetings with the client. This information was then converted to digital form (i.e., conversion) whereby one of the lawyers continued to work on the patent draft alone (using a word processor) until the document was developed to the point where they felt additional input was needed (usually after several draft iterations working alone). At that point the document was printed (conversion) and hand delivered it to a colleague to request comment. The colleague, who was usually another lawyer during the early drafting stages, would then write comments in the margins and return the document to the lead on the case, who would then incorporate the changes in the document as they saw fit. Sometimes the electronic document was emailed or provided via the file server/DMS to the other lawyer for digital mark-up but this was infrequent for the cases considered. Other technologies implicated in collaboration were the Blackberry but this was used...
primarily for email communication in which the lawyers, paralegal and client exchanged details related to various cases. From the case file data, phone conversations, face-to-face meetings and email were approximately equally represented in these communications. Email activity is likely underestimated in my data, however, since not all emails were printed and placed in the case file (conversion) or recorded as activities in the worklogs. Interestingly, the DMS was infrequently implicated in collaborative activity for the cases considered. This is not surprising for the cases that predate the rollout of the new DMS but for the cases that were active (5 of the 10) these findings are interesting given that the DMS was targeted at collaboration. This is illustrated in Figure 1 below.

![Collaboration technology-in-practice](image)

**Figure 1. Collaboration technology-in-practice**

4.2 Delegated use technology-in-practice

The lawyers/patent-agents had considerable autonomy in their practices and were not easily convinced to use any particular information technology. The hierarchical structure of the law firm placed the senior partners at the top, and it was impossible for other groups, and in particular the IT group, to impose any practices or information technologies onto the lawyers. The time-based billing and incentive structure was such that there was considerable pressure on the individual professionals to maximize their billable hours but to do so within a professional way.

For some of the technologies available a particularly interesting technology-in-practice was delegated use. All the professionals were proponents of technology use within their practice and they were all eager to use and test the latest technologies. The use of many technologies, however, was considered to be inconsistent with their needs or cumbersome to use in practice. Enterprise wide applications in particular produced a dilemma for the professionals since the benefit for the organization is arguably only attainable if a critical mass of professionals and staff used them in their ongoing practice. For example, with respect to the current intellectual property system and the new document management system Participant L1 noted,

“I don’t use it much. I’ll push it out. I will ask Participant P to take my drafting and put it into the system and here it is electronically and I can monkey with it from there. I think the DM system will motivate more of that, which is a pity. It takes too much time for me to do so.”

Similarly, Participant P noted with respect to the new document management system,

“We have been using it almost grudgingly because I have found that the lawyers in my department have not been using it, they have been using the old system.”

Many of these systems hindered their individual practices, and so their motivation to record data into these systems for the ‘greater organizational good’ were difficult to justify, especially since clients were unwilling to pay for these activities. For example, setting permissions on files or classifying documents within a document management system were not billable activities. In those situations the professionals used the IT minimally, sporadically and perfunctorily, or more commonly delegated the use of the technology to someone else, either a paralegal or an assistant.

The use of the fax machine, photocopier and scanner was delegated to paralegals and assistants leaving the lawyers/patent-agents free to work on other activities for which they were able to bill. The delegation of the use of these tools was consistent with the professional norms for the lawyers/patent-agents since they were not really expected to be photocopying, faxing or scanning documents. The use of other systems such as the intellectual property management system or the new document management system were directed at professional use, but aspects of the usage of these applications were also delegated to others.

For the patent cases considered there was a noticeable shift in the delegated use of technologies. The lawyers typically delegated answering the phones for general inquiries, using the fax machine and photocopier and scanner since for the most part these activities were not billable. However, the lawyers were increasingly doing their own typing of patents...
since it could not be delegated or it was just as easy to do it themselves as part of the drafting process (collaboration) and email was placing increased demands on their time to respond to client requests as well as the numerous other email requests to the point where the lawyers were beginning to look for ways to delegate much of this usage. Spending time responding to emails was partially billable for those communications that were related to specific cases, however, the bulk of email was unrelated and filtering this began to take considerable time to the point where the lawyers began to rely less on email for their daily work practices and delegated or ignored responding to large quantities of their email. Instead the lawyers shifted to phone conversations and face-to-face meetings for specific cases (thus the preference for printed documents when collaborating since an emailed document would be lost in the tide of daily emails). The lawyers also delegated much of the data entry related to recording their billable time. The lawyers simply recorded their time on paper log sheets and delegated the data entry to the paralegal or administrative assistant. This was done on a weekly basis. However, the most significant delegated usage observed in the cases considered was with respect to the new DMS. The lawyers initially used the DMS, and in fact spearheaded beta-testing it, but as it shifted to daily practice they rapidly began to delegate the use of this system to paralegal and later as new junior lawyers arrived to these individuals. This was the most significant delegated activity from a knowledge management perspective since the senior lawyers with all the experience and contributions to the DMS were appearing to the IT group as users of the system (i.e., their case files showed up in the usage logs) but in fact it was the junior lawyers conducting the perfunctory practices required by the DMS, while never getting to the added value activities envisioned. Ironically, the senior partner (Participant L1) in the end did not even have access to the new DMS directly from his system, and delegated its use entirely to junior lawyers and the paralegal.

4.3 Conversion technology-in-practice

A common technology-in-practice observed in practice was document and data conversion, where the professionals used various IT tools to convert between digital and analog media, as they deemed appropriate. For the same activity, the professionals chose to convert their work to analog while at other times they performed the same activity digitally. A typical example was drafting a document within a word processor, printing the document and then reviewing the printout and making handwritten notes in the margins and then revising the document electronically based upon their handwritten notes. For example, Participant P notes the conversion activities associated with using the billing system designed for Site B for use at Site A.

“Well, with Site B, first of all the bills are produced on Site B letterhead. So I change that. I change the format itself because they haven’t provided us with a layout that we use in Site A and we like to be consistent. The main thing is that the Law Society has dictated that photocopying and faxes, something that we just give an arbitrary number to, we charge the client 25 cents a page for photocopying, we charge the client a buck a page or whatever for faxes, it is not something that we are actually paying out, or disbursing out, so it is not a disbursement. In the law society’s eyes, it’s an other charge, it’s called Other Charges. In Site B they just put it all under disbursements and we are not compliant with the law society if we produce a bill that says that. So I have to create a whole new, well in the Word format, I have to create a whole new table, take out the other charges from the disbursements and then I have to recalculate each table to be the right number, which can be time consuming when you are doing 40 bills and you have to reformat the header and you have to reformat the layout.”

Conversions also occurred with respect to informal note taking as Participant L1 described,

“What I used to do was do it on a computer and that’s fine except your computer is not always available, you may be working on the computer in two different programs and be on the phone and something else and your piece of paper to scratch notes, as it turns out, has the highest utility, you can carry it with you.”

And with respect to drafting of the patent application as described by Participant L2,

“For a lot of people I think the most difficult part of drafting patents is the precision required, so if you are not doing it with everything in front of you there is a good chance you will need lots of re-work and that’s no fun. People that are really really into details may enjoy that but very few people want to proofread the same sentence or paragraph four times, even if the last time they didn’t make any changes, to read it again. Very difficult. Best to be absolutely precise
the very first time you do it and I find the only way to do that is to have everything in front of you so that you know exactly what the parts are numbered and you have to use the exact same terminology throughout, the same numbering throughout because as soon as you change the terminology now you have got a problem. And it just helps diagrammatically to draft as well so if you are doing an IT patent there are lots of flow charts involved, typically lots of methods, to be able to draw those on the fly helps as well. Then to have the drawings to see how things are working helps you to describe the process rather than just describe the process out of thin air. Of course we don’t have good enough computer tools to do that yet. If I had seven monitors and a tablet PC. If I had that now you are talking, but in the absence of that I think it is tough to be as precise as you need to be without almost scratching it out in pen.

There is still a lot of printing. So if I am doing a patent application and I want someone to look at it, I will print it out, I will put it in a file and give it to them. It is much less likely that I will email it to them to review simply because each one of us gets so many emails a day, to go through it and to print everything out."

These conversion activities occurred across many media. An informal email might spawn an informal reply email letter or the generation of a formal printed report. The professionals integrated the various technologies within the structures of the systems available. The pressure to maintain billable hours and get the work done for clients in a professional manner often led to this mixing of digital and non-digital IT based practices in order to get their work done in a timely fashion and at a level of quality expected by their clients.

As noted above in the section on the collaborative technology-in-practice, conversion was highly prevalent in conjunction with collaborative work around drafting the patent. But conversion was highly prevalent in all aspects of the patenting practice. Conversion was evidenced in customer relationship management as various documents were created in digital form and converted to printouts or printouts were scanned into digital form for storage in the DMS. Accounting data was regularly (monthly) printed from the financial management systems and provided to the lawyers to review before being converted to digital form in an updated invoice that was printed and mailed to the client. Many of the activities related to filing were increasingly being converted to entirely digital form but during this study there was a mixture of digital and non-digital approaches in place necessitating ongoing conversions. Beyond those activities related to drafting, conversion was primarily the responsibility of the paralegal. This is illustrated is Figure 2 below.

![Figure 2. Conversion technology-in-practice](image)

### 4.4 Improvisation technology-in-practice

The intellectual property group within the Site A office had a sharing culture whereby files maintained on the in-house file server were openly available among the group. An open door policy existed where it was usually for people to drop by another professional’s office unannounced. Numerous impromptu meetings were observed across the various levels of professionals. There was a learning orientation within the group with respect to the use of the various technologies.

People learned by doing and while formal training was available on specific applications, for the most part the professionals were self-taught. Part of this learning process consisted of sharing what they learned about IT with others in the group. Despite considerable time pressures, the lawyers were always eager to try new technologies and often searched for new tools that might be beneficial to their practice. The improvisation technology-in-practice represented the professional’s use of these IT tools to play with new ways of working. The professionals regularly experimented with new tools and considered how they might improve their practice.

The lawyers regularly improvised their use of technologies in order to experiment with new ways of getting their work done. Participant P noted the response of the intellectual property group at Site A
when they finally cut over to the new document management system,

“They told us that come the end of May we were no longer going to be able to save documents to where we used to save them but as far as I know we still can but I am presuming that everyone else doesn’t know that because our group was part of the pilot group for the DM system so we have way more fun figuring out how to work around it then how to work with it.”

and the reaction when Participant P was unable to perform a specific task with the new DM,

“I can’t save a pdf document from the Site B system onto my desktop but every other type of document I can so if I really want it I have to either email it to myself or attach it to an email. So I have to email the draft, access that draft email from my Site A Outlook, not my Site B Outlook. I found every trick in the book to get every little workaround.”

Improvisation was evidenced for a range of technologies including e-mail, word processor, phone, DMS, and financial management systems. Often these improvisations took the form of workarounds that the lawyers and paralegal developed to get their work done. This was the case for the continued interaction with the financial systems that did not match the local practices. However, these improvisations also took the form of innovations that improved existing practices or used the technologies in innovative ways. This was seen in the lawyers’ modifications of the time sheet or in building macros for use in their word processor, or in developing checklists for specific areas of practice. While these improvisations were less prevalent than the other technologies-in-practice identified their importance should not be underestimated. It is through these improvisations that the lawyers and paralegal were able to ‘glue together’ the various technologies in an integrated way in order to get their work done. These improvisations are also the site where changes in the practice were also evidenced with respect to technology usage.

5. Discussion

The findings presented suggest a number of oppositional forces at play that are managed and balanced through these technologies-in-practice. At the firm level, oppositional forces manifest as professional logics in opposition to emerging business logics. The oppositional pressures of the industry manifest within the Firm from the mergers and acquisition conducted in an attempt to attract and retain clients of national scope. Organizing management to meet the needs of these clients in many respects is in opposition to professional forces to meet individual client needs. That is, the increased management centralization is in opposition to the autonomy typically characterizing professional work. This tension is echoed in the dual management responsibilities to the Firm and to individual offices, which is further complicated by the matrix management structure that intertwines the senior partners in the regional offices with those at the centralized management team through various management committees. Financial incentives emphasize local performance while non-monetary incentives are linked with meeting the Firm mandate since many of the interesting cases are those only the large firm can attract. The increasing centralization, while consistent with senior management objectives was also equally at odds with professional practices.

As the study came to a close, there was increasing opposition to these forces to change the practice to be more business focused. The patent lawyers at each site represent a close knit group with practices, clients and technologies that are often in opposition with those of other groups in the Firm, even those that are, at least in name, in the same area of practice. For the patent lawyers, professional norms around the nature of collaboration, autonomy, mentorship and the need to get work done on an individualized basis for clients are often in opposition with emerging business logics emphasizing the use of standardized practices, increasing billable time and the expected use of enterprise technologies. During the study the forces surrounding individual and local group allegiance remained strong despite ongoing initiatives to increase KM practices across the Firm.

Individual practices, while informed by societal rules and legislation, were more immediately influenced by ongoing practices of the individual and their colleagues within the same area and in the same office. Thus for patenting, over time the business logics that began to dominate practice were slowly abated in favor of individual practices. However, these practices did not return to those observed at the beginning of the study as ongoing practices were increasingly informed by business logics, although not necessarily to the extent envisioned by senior management or the IT group. To a certain extent, the lawyers had obligations to their clients and their immediate colleagues within their group that outweighed those to Firm as a whole, without openly
defying firm level directives. The lawyers were able to accomplish this through a strategic play of opposing forces. So for example, by delegating the use of the DMS to their juniors they provided usage of the system that was partially in line with the senior partners desire for more control but this was unfortunately not the intended user of this system. The intention was for the most experienced people in the Firm to share their knowledge across the organization but those most experienced chose not to use it and instead delegated that work. It was not entirely a matter that it was cheaper to have the paralegals or juniors do the work. Instead these practices entailed an interplay of opposing forces that gave rise to the delegation, which ironically was somewhat hidden behind the issue that it was cheaper for juniors to do it since this appeased both the professional and business logics at play. The core knowledgeable activities of the patent lawyers consisted of their application of their knowledge to navigate three key areas of practice to derive value for their clients. The first is in navigating the prior art to determine where the proposed innovation fits with the previous patented inventions and whether there is business value for their client to continue with a patent application. The second is in drafting the claims to establish any novel contribution that can be claimed and how that fits into the business plans of the client. Finally, negotiating with the patent office to refine the claims and understanding the opinions on the implications for the client was a collection of digital and non-digital information technologies that were integrated in practice through an ongoing negotiation between the needs of the clients and demands of the work environment. This is not to imply that digital-IT is irrelevant to KM for creativity but it does suggest that a greater consideration of non-digital IT in understanding the role of technology in creative work is warranted.

6. Conclusions

Understanding technology-enabled creative activity requires insights into both the social and technical aspects of the practice and the interplay between the two. Employing oppositional logics, like those incorporated into the technologies-in-practice lens via structuration theory, provide an opportunity to identifying forces both enhancing and impeding creativity within the organization so appropriate design of policy and technologies can be accomplished.

7. References