The Implementation of Knowledge Management Practices: A Theoretical Perspective Including both Cooperation-based Analysis and Conflict-based Analysis

Ao Chen*

Abstract

This paper explores how knowledge management practices are implemented in everyday IT professionals' jobs based on a theoretical perspective, including both cooperation-based analysis and conflict-based analysis, which has been relatively marginalized by the existing knowledge management literature. To fill this gap, 36 semi-structured interviews were conducted with IT professionals from different organizations, and a thematic analysis approach was adopted to analyze the qualitative data. The results reflect that, in order not to experience a complete loss of autonomy as well as to keep a certain degree of compliance with management rules and regulations, IT professionals continually adjust their behavior to maintain a delicate balance between cooperation-based activities and conflict-based activities, which take place iteratively and simultaneously respond to management control. This result contributes to the existing literature by proposing a new theoretical model and expanding the applicable scenarios of the existing theory.

Keywords: Knowledge Management Practices; IT Professionals; Cooperation-based Analysis and Conflict-based Analysis; Qualitative Research Approach

Introduction

"The physical toll of manufacturing is being replaced by a world where we work more with our heads than our hands" (Sewell, 2005). The end of the twentieth century witnessed this transformation, resulting in knowledge becoming the key asset for the organization. The effective management of knowledge is believed to increase the competitive advantage of organizations (Andreeva & Kianto, 2012; Heisig et al., 2016; Mehra et al., 2014; Swart, 2011). Thus, both scholars and practitioners have been paying extra attention to managing knowledge, knowledge work, and knowledge workers in business organizations. This discussion has contributed a significant amounts of value works to the existing literature.

However, most of the works in the body of literature are developed based on either a cooperation-based orientation, which assumes a consensual and harmonious relationship between managers and knowledge workers or a conflict-based orientation which assumes dissent and a relationship marked by struggle between managers and knowledge workers. The cooperation-based perspective tends to place knowledge workers, as other types of workers, in a typically subordinate relationship to managers, whose interest is always in line with what the management demands (Heizmann & Olsson, 2015; Liao, 2008). On the contrary, the conflict-based perspective argues that knowledge workers holding knowledge critical to their organization or these who possess highly sought-after skills in labor markets are more likely to be less subordinate to managers. While managers try to set a series of directives, processes, and regulations to control knowledge work and knowledge workers' behaviors, knowledge workers also may use bargaining power to struggle with management restrictions to hold on to their autonomy and creativity (Contu & Willmott, 2003; Tsoukas, 2000). However, there is relative silence about reaching a better understanding of how both sides manage knowledge differently. Thus, to fill this gap and expand the applicable scenarios of the existing theory, this paper will explore the implementation of knowledge management practices in everyday IT professionals' job based on a theoretical perspective including both cooperation-based analysis and conflict-based analysis. The research question of this paper is:

RQ: How are knowledge management practices implemented in IT professionals' everyday jobs based on a theoretical perspective including both cooperation-based analysis and conflict-based analysis?

The following sections include the literature review, research methodology, empirical results and discussion, and finally the conclusion and recommendations of this study.

Literature Review

Knowledge management

Knowledge management is considered a process that supports the acquisition, generation, storage, transfer, and application of knowledge (Alavi & Leidner, 2001; Gangeswari et al., 2015; Mannie et al., 2013; Mariano & Awazu, 2016; Oluikpe, 2012; Song & Sun, 2018). In today's knowledge economies, the ability to manage knowledge has become more critical than ever before. Knowledge management capabilities enable the efficient use of resources while improving both innovativeness and performance of organizations (Bogner & Bansal, 2007; Darroch, 2005; Mariano & Awazu, 2016; Rossi et al., 2016). Griffiths and Evans (2011) define knowledge management as a series of means that enable the acquisition, storage, sharing, and creation of knowledge assets for tactical use within the organization to meet the

end of innovation and adaptive capacity. Inkinen (2016) conceptualizes knowledge management as the conscious management practices intended to achieve organizational goals through efficient and effective management of the organizational knowledge resources. Andreeva and Kianto (2012) point out that knowledge management is a set of management activities aimed at efficient, and effective management of organizational intellectual resources - knowledge.

However, these previous studies have considered knowledge management a cooperation-intensive activity, emphasizing the importance of mutual benefits and common interests between management and employees for the effective implementation of knowledge management practices (Contu & Willmott, 2003; Santos et al., 2017; Schultze & Stabell, 2004). For example, Desouza (2004) and Serenko (2013) both pointed out that the effective implementation of knowledge management practices cannot be separated from the high quality of cooperation among personnel in organizations. Chen et al. (1998) and Smith et al. (1995) also emphasize that cooperation as a synergistic force is a core organizational process driving knowledge creativity and effectiveness.

However, some scholars argue that knowledge workers pose a challenge to conventional managerial practice. Their scarce skills and knowledge to their organization make them a less subordinate position to management (Chen, 2015; Tsoukas & Vladimirou, 2001). To maintain their autonomy and creativity, knowledge workers often develop context-specific capability, twist rules and regulations, and to a certain extent, bargain with the management. Thus, knowledge management is not always a cooperation-intensive activity but can also be very contradictory and oppositional. The conflict is a part of the nature of the organizational knowledge processes. For instance, Scarbrough (1999) discusses the inherent struggle between the competing demands of capital accumulation and of professional knowledge through a conflict-based analysis. Kiernan et al. (2020) explore the conversational strategies that teams use to negotiate conflict and help reach consensus in knowledge management practices. Kundi and Badar (2021) examine how interpersonal conflict at knowledge work might enhance employees' propensity to engage in counterproductive work behavior. Thus, existing studies addressing knowledge management issues begin to add a conflict-oriented perspective to expose the dissensus among parties.

However, there is relative silence on further empirically exploring this dissensus and maintaining the consensus in knowledge management literature. Thus, to fill this gap and enrich the existing literature, this paper employs a theoretical perspective including both cooperation-based analysis and conflict-based analysis to look at the implementation of knowledge management practices in business organizations by selecting IT professionals' everyday jobs as the research context.

Cooperation-based analytic perspective and conflict-based analytic perspective

The cooperation-based analytic perspective emphasizes that the implementation of knowledge management practices is a process in which individuals and organizations come together, interact and form relationships for mutual benefit. Argyle (1991) defines cooperation-based knowledge activity as acting together, in a coordinated way at work, to pursue shared goals between management and knowledge workers. Smith et al. (1995) view cooperation-based knowledge activity via the shared goal lens, emphasizing working together among employees towards a common goal. Marcus and Le (2013) see cooperation-based knowledge activity as working with others for shared goals, such as sharing information, helping one another create new knowledge, codifying knowledge into an organizational database, and so

on. In this regard, the willingness to cooperate and share is core to knowledge management activity that can eventually foster organizational creativity and competitive advantage (Beersma et al., 2003).

However, unlike the cooperation-based orientation, the conflict-based analytic perspective looks at the experience between or among parties whose goals or interests are incompatible or in opposition (De Dreu & Gelfand, 2008; Korsgaard et al., 2008). Organizational knowledge processes are naturally considered as the 'soil' for producing the struggle between knowledge workers and management, and this struggle is unavoidable in battling the ownership of knowledge (Hales, 1993; Hislop, 2009; Karreman, 2010; Pfeffer, 1992). From this perspective, organizations are groups of people whose interests are contradictory. On the one hand, organizational attempts to manage workers' knowledge are seen as an effort to serve their own managerial interest via possessing all knowledge relevant to the labor process. On the other hand, knowledge workers' attempts to pursue a high degree of autonomy and professional freedom are regarded as an effort to prevent their knowledge from being taken away by the organizations and maintaining their competitiveness (Drucker, 1993). Thus, these two parties are two polarities of conflict and are essentially unwelcoming to reconciliation (Ezzamel et al., 2004).

Despite some scholars bringing the concept of negotiation into the study of management practices and emphasis on compromise and shared value to achieve the common ground between workers and management (Bazerman, et al., 2000; Leede, et al., 2007), the concept of negotiation in the management literature is based on a consensus-based philosophy that essentially believes in a harmonious nature between management and employees. In other words, the prerequisite of negotiation requires both parties to share common ground and beliefs. However, within the context of knowledge workers, they possess the important knowledge to their organization, making them more valuable than other workers. As a result, they may not always share common beliefs with their organization. Instead, to avoid burn-out, they may even twist rules to fight against organizational management practices in certain ways. Thus, the traditional perspective of negotiation towards management practices does not fit the study of knowledge workers' practices and knowledge management activities. An insight integrating both cooperation-based analysis and conflict-based analysis is considered more suitable for exploring the inner mechanism of implementing knowledge management practices within the context of knowledge workers.

Research Methodology

Research design

This paper did not start with any specific hypotheses or existing theories to test. Instead, this paper attempts to take a broader perspective to elicit a rich, detailed, and complex picture of how cooperation and conflict play important roles in understanding organizational knowledge management practices. Based on practitioners' narratives and stories, this paper then looks back at the literature to see whether what these people say bears any relation to the literature. As such, a qualitative approach was considered to be best suited for conducting this study. The qualitative approach allows the author to explore the meanings and contexts behind social phenomena (Bryman, 1989; Bryman & Bell, 2011; Bryman & Burgess, 1999). By probing people's lived experiences, the narratives with which they talk about regarding those experiences, and the context they are embedded in, the author can glean a better understanding

of what people think about certain things and why people think in the ways they do (Patton, 1990).

Sample and data collection

IT professionals who work across a range of organizations were selected as the focus of this research due to the nature of their work, the characteristic of continually updating their knowledge and their role as favoured research targets in the knowledge management literature. Given that the purpose of this research is to give IT professionals an opportunity to freely speak about their ideas regarding knowledge management practices in their organization without worrying about any negative consequences to their jobs, a mixture of sampling techniques, including purposive sampling and snowball sampling, were employed to expand the author's network and trace the research targets who 'hide' in the wider population (Pettigrew & McNulty, 1995; Bryman, 1999). To collect the qualitative data, a total of 36 semi-structured interviews were conducted in English with participants from different countries, such as the UK, China, and Thailand. Each interview lasted 40 minutes to 1 hour, and all the interviews were fully transcribed.

To elaborate, the first couple of IT professionals the author interviewed were contacts referred by a family member. The author interviewed the first respondent twice. According to his answers, the author realized that some of his original questions did not match the actual context of IT professionals' work or IT professionals' language and could not fully elicit the rich and detailed narratives and stories that the author sought. Thus, after the interview, the author reworded some of his interview questions and then interviewed him again at a later stage as more of a formal data-gathering exercise. The first interview was treated as a pilot test and was excluded from the formal data collection.

Next, the author also recruited MBA students because as post-experience students, some of the members of this community are IT professionals. In the introductory email, the author indicated a short outline of the purpose of the research and an indication of how the research findings might be useful to respondents' work in the future. Four MBA students offered to participate in this research. The author also hoped to use snowball sampling to extend these samples, but the respondents did not refer others to join the study. In one case, the participant who was referred was not available.

Finally, the author recruited people from his circle of friends and acquaintances. A snowball sampling technique, therefore, recruited this third group. The author first sent emails or made phone calls to locate potential participants. Eight people were interviewed initially, followed by six, eight, and six in the final three rounds. However, based on the themes, stories, and narratives emerging from the first 31 interviews, the author found that these IT professionals shared similar information. For example, when it came to the question such as why they were reluctant to share knowledge with organizations, responses including time constraints, lack of motivation, egoism, the inability of knowledge to be externalized and remain competitive, iteratively emerged as the factors which block knowledge sharing. It was rare that anything very novel was shared. Therefore, the data were considered saturated once the author had completed the 36th interview, so the author halted data collection. The biographical information of each participant is detailed.

Data analysis

A thematic analysis approach was adopted (Yin, 2014). All data were analyzed by reading the transcripts repeatedly to understand the meaning of the data and then transcribing

and coding them into different themes related to the research question. Then, the author interpreted these data and reorganized them into different categories that seemed to indicate potential conceptual relationships (Rice & Ezzy, 1999). Finally, the author systematically integrated and analyzed the data and made sense of them in order to answer the research question.

To elaborate, this research started with the general question of what kind of knowledge management practices are employed to manage their knowledge work and how they respond to those managerial practices. However the more data the author gathered and the more interviews the author conducted with IT professionals, the more this project revealed itself. Thus, the coding framework was developed based on this outcome and divided into six general themes: "support the establishment of knowledge base", "willing to learn and share knowledge in formal communication mechanisms", "following management demand to conduct the production", "deems it unnecessary to build a knowledge base and record knowledge", "not all knowledge can be shared or externalized" and "essentially ill-disposed to accept control". In this phase, the author generally understood, summarized, and transcribed all IT professionals' responses and categorized them into the six themes above.

Next, the author revisited the data to check the initial categorization. For example, a narrative about "support the establishment of knowledge base" might include contents related to "willing to learn and share knowledge in formal communication mechanisms". However, as this narrative was initially expressed when the author asked IT professionals to talk about their knowledge codification, this content was coded in the thematic group of "support the establishment of knowledge base" in the first step of the coding process. In the second step, the author organized this content into the theme to which it related. After this step, even though the author still had the six thematic groups, the content within these themes was now different. The author had a majority of data that clearly stood for their theme to be interpreted and analyzed based on the themes.

Finally, the author narrowed down these narratives, stories, and words according to related issues which were discussed in the literature. Before interpreting and analyzing the refined data following the emerging conceptual implications.

The thematic analysis showed that thirteen sentences and six concepts were obtained; the six concepts appearing in the coding were then merged with concepts in the same category, and two categories were eventually obtained. Through in-depth analysis of the relationships among the concepts and the categories, significant differences were discovered in the classification; for instance, "support the establishment of a knowledge base", "willing to learn and share knowledge in formal communication mechanisms" and "following management's demand to conduct the production", these three reflected the knowledge management practices based on a cooperation-based orientation. On the contrary, "deems it unnecessary to build the knowledge base and record knowledge", "not all knowledge can be shared or externalized" and "essentially ill-disposed to accept control" reflected the knowledge management practices based on a conflict-based orientation. The results of thematic analysis, in brief, are shown below in Table I.

Table I: Thematic analysis results (in brief)

Typical Evidences	Initial Conceptualization	Categories
'Database is definitely necessary at least for our job. But if the company could organize the database more properly and convenient for searching and reading, it will be helpful even more.' 'We need that, that is why we do even though it makes us feel trouble, boring and (you know) time-consuming. But we do put what we got in the field, such as specific problem-solving solutions, personal experience summaries, programming tips or clarification of design philosophy and so forth, into the database here cos it is necessary. It really do.' 'If time allows, there is some training for newcomers or less experienced IT professionals'.	Support the establishment of knowledge base	Cooperation-based activities
'This weekly meeting gives you an opportunity to resolve problems which you cannot deal with by yourself. It is usually problems related to several people's work. You have to ask for their ideas. Sometimes you may even need to ask them to adjust their part of the work a bit so that you can do yours.' 'This meeting is a good way for us to share our ideas as it holds everybody together.' 'As newcomers, we have basically no clue where we to start and how to make things right. Thus, there is a coach who teaches us, helps us and answers our questions, which is a very good thing.' 'We have coding standards and commenting standards which generally guide us on how to program and write comments.'	Willing to learn and share knowledge in formal communication mechanisms	
'If an IT professional very carefully conducts manual testing for each single component and pays '100%' attention to it, the result of manual testing will be more convincing.' 'Frankly speaking, I have got mortgage loans I need to pay for and I have a family I need to take care of. Here everything is expensive. So, if I can secure the job and also make extra money by finishing work a bit quicker, I definitely follow the rules and regulations. It is good for both the company and me.' 'I get payment for coding, software designing, testing and maintaining, and so on, which directly relates to software development. I do not get payment for offering all my knowledge to the company.'	Following management demand to conduct the production	
'Although there is a general idea of what should be filled out in the report, it is actually not clear at all. Such as, Apart from the general stuff, we have to give something more based on our own experience. Such as, what we learnt from the project, which is usually the difficult part for me because I do not know what I should put in there that sounds about right for them.'	Deems it unnecessary to build knowledge base and record knowledge	Conflict-based activities
'There is some knowledge which cannot be clearly expressed in the oral language. It is gained from many years' experience of accumulation and is a kind of intuition or comprehensive ability of a person to see a big picture in the process of software development.' 'Some knowledge you cannot explain. It needs experience to understand and feel it. That is one of the differences between seniors and juniors.'	Not all knowledge can be shared or externalized	
'Working on the existing one is like working on something whose 'tone' has already been set. There is not too much room left for you to actually use judgment or creativity. But, developing a brand new one is different. You can work from the very beginning and think through every single details which requires a lot of knowledge, energy, patience and creativity. Very challenging and learn a lot.'	Essentially ill-disposed to accept control	

Throughout the data analysis process, the author strove to avoid placing personal beliefs or experiences into data analysis, and constantly made introspections to minimize potential biases and increase the validity of the qualitative data analysis (Alvesson, 2003; Whetten, 2009). The author also kept in close contact with all the respondents and collected their feedback. On which the author refined his analysis results to improve the accuracy of the data and ensure the reliability of the qualitative data analysis. Finally, the author adopted a comprehensive description validation strategy by presenting participants' voices under each theme and providing a detailed analysis of the case to achieve the reliability and increase the validity of the qualitative data analysis (Fereday & Muir-Cochrane, 2006).

Research Findings

Cooperation-based activities

IT professionals are naturally uncomfortable with uncertainty, and they wish that there were management regulations that they could follow to avoid making mistakes. And by following, they do not mean only passively obeying orders but actively 'supporting' and 'cooperating' in a certain sense because keeping in line with management is also beneficial for knowledge workers themselves (Chen, 2015). These 'active', 'cooperation-based' and 'supported' activities embedded in everyday knowledge workers' working practices has been shown in following three aspects.

Support the establishment of a knowledge base

The organization as a knowledge owner likes to set a series of rules and regulations to facilitate the implementation of knowledge work and eliminate the undisciplined exercise of an initiative to increase productivity and avoid mistakes. Systematic codification to build a knowledge base was considered as the main means to achieve this goal and provide references on approaching problems in subsequent tasks. As an IT professional explained:

> *'Well-established knowledge base is regarded as one of the most important knowledge management practices which organizations employed to instruct, facilitate and control knowledge works and knowledge workers.' (Abel)*

Meanwhile, IT professionals also agreed that the knowledge base, including comments, design philosophies, technical frameworks, proposals, and methodologies organized in a way that is easy to access and convenient for reuse, is both necessary and helpful for instructing their future project tasks. Thus, although this knowledge base did not leave too much room for IT professionals to practice their own judgment, IT professionals were still, to a certain extent, willing to spend time to collect and codify knowledge into the database for both organizations and themselves. As an IT professional stated:

> *'A database is necessary for my job. But if the company could be faster in updating the content in the database, it will be even better.' (Carl)*

This idea of a codified knowledge base is in line with the entitative perspective in the knowledge management literature, which emphasizes that knowledge is something people possess and can be captured and externalized through a process of codification (Schultze & Leidner, 2002; Tseng, 2008; Wagner et al., 2006). Building on from this assumption, through the use of information technologies, knowledge can be collected in a central database and then categorized, synthesized, and integrated into the form of solutions, rules, methodologies,

frameworks, and so on, guiding further works (Newell et al., 2009). In this sense, the major task of knowledge management is to free knowledge from the individual and make it widely available as an organizational resource. The knowledge base is considered as one of the best practices preventing important knowledge loss when knowledge workers leave. As Hansen et al. (1999), Teece et al. (1997) and Zollo and Winter (2002) argue, what is learned in the field needs to be processed elsewhere in the organization.

Willing to learn and share knowledge in formal communication mechanisms

Apart from the knowledge base, there were some other formal channels for passing individual expertise around such as training, master-apprentice coaching, kick-offs, weekly meetings, and reflection meetings. These formal mechanisms based on person-to-person exchange resonate with Earl's (2001) claim about the behavioral approach, which emphasizes the need to create processes and mechanisms to facilitate interpersonal sharing of knowledge between people. Often, organizational architectures and the nature of work activities have conspired to keep people apart rather than connect them so as to remove a lot of opportunities for ideas exchange between people (Earl, 2001). Thus, the use of formal communication mechanisms is to encourage 'socialization' (Nonaka & Takeuchi, 1995), stimulate conversations and knowledge exchange, and keep knowledge in the organization. For instance,

> *'If time allows, there is some training for newcomers or less experienced IT professionals.' (Harry)*

> *'Coaching is kind of on-job-training and it facilitates employees study based on real working life context.' (Evan)*

> *'After completing of the project, each member of the project team would provide a short report in the reflection meeting about what they learn, what problems they met, how they sorted them out, what knowledge they gained from this project, and so on.' (Jay)*

Most of IT professionals maintained a very positive attitude regarding these formal knowledge sharing mechanisms. They reflected that formal training offers a general introduction to work, business processes, coding standards, and some frequently used software tools and conveys a sense that they should be able to do their job as long as they keep learning and continue to work hard. This psychological comfort reduced their fear of being in a strange/new working environment and increased their confidence to work there. As an IT professional said:

> *'The most important thing for newcomers is to build confidence. As long as they feel confident, then they can behave confidently. Otherwise, they may end up with very slow improvement, perform poorly, or even quit. Thus, these meetings and training are very important and necessary .' (Iris)*

However, some IT professionals also reflected that these formal communication mechanisms were not always scheduled very well due to tight time with high pressure to move on to the next project. For example, if time was tight, training seminars might be difficult to arrange. Instead, master-apprentice coaching between seniors and newcomers might take place to familiarize newcomers or less experienced IT professionals with their jobs and learn necessary techniques, methods and relevant rules and regulations to conduct their work. This knowledge-sharing channel built a good foundation.

However, coaching by itself was definitely not enough to help cope with the dynamic demand of their job, project-related meetings such as kick-offs, reflection meetings, and weekly meetings were also crucial for IT professionals to learn knowledge, gain experience, and exchange ideas with each other in the beginning, during or after a project. These findings are consistent with Kotnour's (1999) empirical work, which also describes that at the end of a project or when a project has met a particular milestone, there are often some kinds of 'lessons learned' reviews to summarize what members could take from their work and use to inform their futures. In these meetings, members not only develop a better understanding of their work by listening and asking questions. They also share useful insights and recommend solutions to problems which other team members encountered. These meetings, as part of the organization's knowledge management practices provide the opportunity for knowledge workers to learn, share insights, and develop a better understanding to be favored by IT professionals.

Following management demand to conduct the production

In software development, there are three main phases: design sub-components, and coding, integration and implementation, and testing and debugging. In the design phase, the management requires IT professionals to retrieve and reuse well-established frameworks, modules, and algorithms codified in the database to increase effectiveness and efficiency. As an IT professional explained:

> *'My boss always tells me to be smart, boy, do not always develop a new one. If the old one works, then use it. This is a business, not art.' (Calista)*

In the implementation phase, the management set a series of directive rules and instructions to guide IT professionals on how they should do their work to ensure the quality of codes and reduce possible risks. As an IT professional said:

> *'We have coding standards and rules and regulations to guide us, or you also can call as controlling us to program and write comments.' (Bruce)*

Moving to the testing and debugging phase, the management also encouraged us to use manual testing instead of automatic testing to ensure the accuracy and reliability of software applications, even though both manual testing and automatic testing might not be that much different concerning the quality. As an IT professional said:

> *'If someone very carefully conducts manual testing step by step for every single component and pays '100%' attention, the result may be different from automatic testing, but no one actually does it in that way. Usually, the actual effect are same in real life.' (Paul)*

However, these IT professionals' everyday jobs inevitably involve a lot of choices about knowledge application. The choices that they made on the actual method, technique, or framework they adopted and how and to what extent they used this method, technique or framework to implement their project work reflected how they understood knowledge application in their everyday work. Within this discussion, whether to depend on existing technical frameworks, methods, or half-made programs as a basis to achieve the functional implementation of software or to completely develop a new one with a certain degree of help

from existing knowledge had been considered a very important choice employees made in the early stage of the software development process.

Thus, using well-established techniques and practices to deliver the relevant software development jobs has been seen as their daily routine. IT professionals considered that they were more familiar with existing knowledge and could handle it better in different situations to improve work pace. Next, the existing knowledge was considered as more reliable because it has been tested multiple times in previous applications, so it was more likely to be used in practice. Finally, when these IT professionals finish their project early with acceptable quality, they would gain a corresponding financial reward. Thus, IT professionals tended to use existing knowledge rather than develop new knowledge in most situations.

Conflict-based activities

IT professionals also tend to pursue a high degree of autonomy, and thus, they almost become ill in the face of being completely controlled. A certain degree of 'resistance' and 'conflict' to protect their self-knowledge and creativity is seen as inevitable in a real working environment. These 'have to', 'conflict-based', and 'resistant' activities embedded in IT professionals' everyday working practices has been shown in the following three aspects.

Deems it unnecessary to build a knowledge base and record knowledge

Simply doing what is right to comply with management demand is not always aligned with IT professionals' interests. Many IT professionals thought that what they did was 'just a job', and they did not feel that 'giving their knowledge' to the database was a legitimate part of the expectations they thought should be placed upon them in their work. As some IT professionals said:

> *'I get payment for coding, software designing, testing and maintaining, and so on, which directly relates to software development. I do not get paid for offering all my knowledge to the company.' (Tim)*

> *'I do not think that making a high quality report will make me more valuable to the company. What we do is a technical job. Better coding or better software designing, those are what matters, not paperwork.' (Justin)*

In addition, IT professionals mentioned that the nature of their work includes a lot of uncertainty and ambiguity, which makes it very difficult to conceptualize this knowledge fully. As a result, apart from routine steps or basic information, the detailed and context-specific knowledge developed from the problem-solving process was very difficult to comprehend. It depends so much on each individual's experience and understanding of that detail and context for it to be conveyable. Thus, when IT professionals were asked to make reports, they often did not know what they should put in them. Most of the time, it depended on individuals' situated understanding and what they themselves considered as important or valuable to fill in the report. As a result, a huge core of uncertainty was left in the heart of this codification process and the quality of the knowledge base. As an IT professional said:

> *'Although there is a general idea of what should be filled out in the report, it is actually not clear at all. Apart from the general stuff, we have to give something more based on our own experience. Such as, what we learn from the project, which is usually the difficult part for me because I do not know what I should put in there that sounds about right for them.' (Baron)*

As a result, many inadequate information sets and messy documents were produced and stored in organizational databases. It was very difficult for other IT professionals to find the valuable knowledge they wanted there. Furthermore, even if they found the file that they were looking for, they frequently still needed to devote even more time to figure out what it was actually talking about. Thus, this situation further added to the generally negative feelings of IT professionals towards the externalization of knowledge. It increased their belief that some knowledge should stay 'in the mind' and be passed on verbally, which was seen as much easier, clearer and more time saving as a mode of both storage and propagation of at least certain forms of knowledge.

Not all knowledge can be shared or externalized

IT professionals also argued that, not all knowledge could be shared via the formal mechanisms. Much knowledge was deeply embedded in the minds of individuals, acquired by many years of experience and understanding, and was impossible to present comprehensively using any available media. It was the individual's ability to know how to do things better without necessary being capable of fully explaining how and why this is the case. As an IT professional explained:

> *'Some knowledge cannot be clearly expressed in oral language and it is gained from many years of accumulated experience. It is a kind of intuition or the comprehensive ability of a person to see a big picture in the process of software development.' (Will)*

Moreover, in some of those interviews, IT professionals attempted to blur the possibility of externalizing their valuable knowledge through the invocation of notions such as 'you need to feel it' or 'you just know so', in order to protect their own interest and competitiveness. This finding can also be seen in Tsoukas and Vladimirou's (2001) study of call center operators: 'The tacitness of operators' knowledge was manifested when they were asked to describe how and why they tackled a particular problem in a particular way. To such questions, operators were at a loss for words: 'you feel it', 'you know so', 'I just knew it', were some of the most often repeated expressions they used.' What Tsoukas and Vladimirou (2001) understand by phrases like 'you feel it', 'you know so' or 'I just knew it' is that "Such knowledge was difficult to verbalize, let alone codify". They interpret those operators' loss for words as the result of this knowledge being ill-suited to expression by words and thus unamenable to externalization and codification. However, this research in the face of the similar findings such as 'you need to feel it' or 'you just know so' here raises a question: is there any tiny possibility that when respondents answered with something like 'you need to feel it' or 'you just know so' is because they do not want to or cannot be bothered to tell the detailed explanation rather than the result of an outright inability to tell.

Thus, arguably, a great deal of valuable knowledge is context-specific and sometimes ambiguous (Tsoukas, 2005), which is reluctant to be shared or externalized. The sharing of this knowledge requires the context-based methods and a well-established incentive system, rather than a couple of training sessions or meetings can solve.

Essentially ill-disposed to accept control

In our interviews, IT professionals also reflected that they were sometimes tired of tightly managed control and did not want to be a 'salve' but rather a 'freeman' who had significant influence over their own work. In doing so, they develop a better understanding of their work by twisting rules a bit or maintaining a certain degree of autonomy in their job.

Relying heavily on existing knowledge to resolve problems might limit creativity and improvement of individual techniques. As Levitt and March (1988) indicate, it is clear that improvements in competence regarding existing knowledge will make experimentation with others less attractive. Similarly, Bettis and Prahalad (1995) and Crossan et al. (1999) suggest that, if existing knowledge becomes very powerful and dominant, the development of new knowledge may be ignored and inhibited. Even if some of their existing skills were polished, in these cases by repetition, after time, much of what was to learn would have been thoroughly learned and practiced and the improvements would begin to decline (Berman et al., 2002). They would have nothing to add to their knowledge stock for a while. As an IT professional ridiculed:

> *'If you have experienced the design and development of a new framework, technique or codes for a project, you would know how interesting it is as well as how challenging it is. Completely different, it feels like opening a brand-new door for yourselves.' (Derrick)*

Thus, IT professionals never give up the autonomy over how to achieve the functions of a piece of software in their own work. They also emphasized that this autonomy in playing with codes to a certain extent defends their creativity being burned out by a tightly controlled and heavy workload.

Discussion

The objective of this paper was to understand how knowledge management practices are implemented based on a theoretical perspective including both cooperation-based analysis and conflict-based analysis, particularly within the context of IT professionals' everyday jobs. The results show that, these 'active', 'cooperation-based' and 'supported' activities and these 'have to', 'conflict-based' and 'resistant' activities take place iteratively in IT professionals' everyday working practices and simultaneously respond to their management control. For example, firstly, IT professionals defended themselves by developing the ability to read the local context and acting in a way that exceeded and escaped the management's expectations. At the same time, they were also willing to follow certain regulations and guidance to avoid making big mistakes. Secondly, IT professionals claimed they could clarify what they knew in every detail if there was enough incentive. At the same time, they also attempted to blur the possibility of externalizing their valuable knowledge in order to protect their own competitiveness. Thirdly, IT professionals continually twisted the rules and regulations in a slightly different way to ensure the delivery of tasks and continually experimented and improved their knowledge capability. Based on the in-depth analysis, this paper proposed a theoretical model explaining the inner mechanism of implementing knowledge management practices in IT professionals' everyday jobs characterized by both cooperation-based activities and conflict-based activities, as shown in Figure 1.

This model highlights how, in order not to experience a complete loss of creativity as a result of attempting to simply 'do what is right' as well as to maintain a certain degree of compliance with rules and regulations of management, IT professionals continually adjust their behavior to maintain a delicate balance.

Two activities characterize this balance, cooperation-based activities and conflict-based activities, which take place iteratively and simultaneously as they respond to management control. To elaborate, figure 1 illustrates the theoretical model of the inner mechanism of implementing knowledge management practices in everyday IT professionals' jobs characterized by both cooperation-based activities and conflict-based activities.

The lower square bracket represents the willingness of knowledge workers to cooperate with the organization's knowledge management practices. In contrast, the upper square bracket represents the desire of knowledge workers, as the original owners of knowledge, to resist the organization's knowledge management practices. The lower and upper shaded arcs represent knowledge workers' contradictory attitudes and behaviors in responding to management control in their everyday practices.

To elaborate, the lower square bracket represents a cooperation-based attitude to knowledge management. In the case that the organization claims ownership over individuals' knowledge, as indicated through the content in the lower square bracket, knowledge workers follow the rules and regulations to support their organization's knowledge management practices to secure their job. The upper square bracket illustrates a conflict-based attitude to knowledge management. Also, in the case that organization claims ownership over individuals' knowledge, knowledge workers may be reluctant to engage in knowledge management practices to safeguard autonomy and maintain a competitive advantage. Integrating both cooperation-based and conflict-based activities into the study of the implementation of knowledge management practices can promote a better understanding of the inner mechanism of implementing knowledge management practices in everyday IT professionals' jobs and open a new path for understanding how knowledge workers engage with knowledge management practices.

Conflict-based activities

Deem it unnecessary to build knowledge base and record knowledge
Not all knowledge can be shared or externalized
Essentially ill-disposed to accept control

Cooperation-based activities

Support the establishment of knowledge base
Willing to learn and share knowledge in formal communication mechanisms
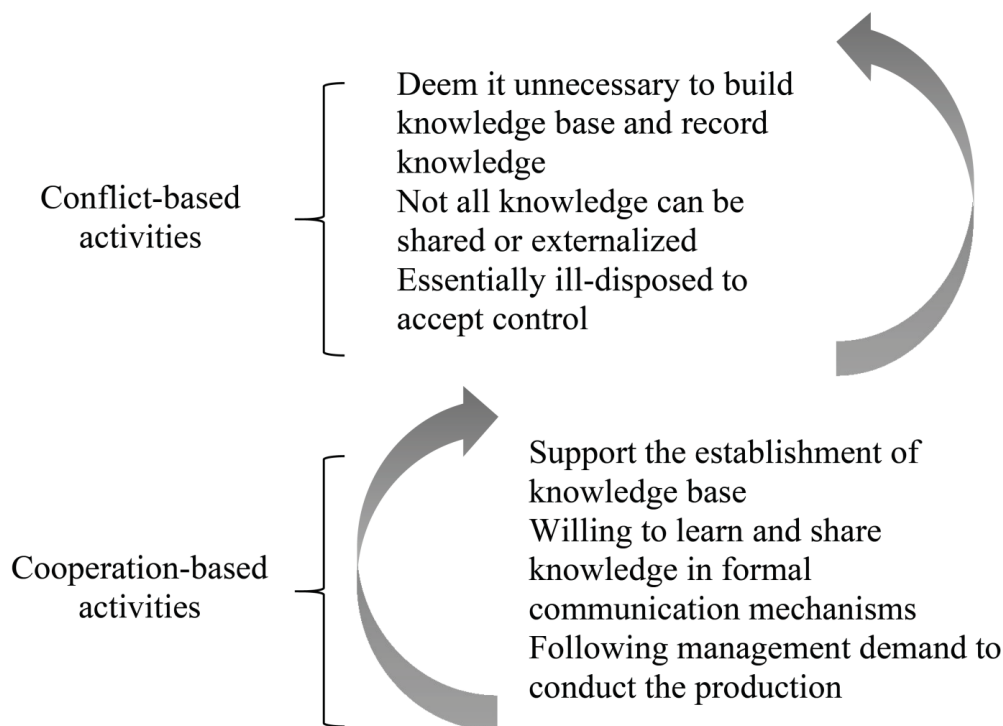Following management demand to conduct the production

Figure 1: A theoretical model explaining the inner mechanism of implementing knowledge management practices in everyday professionals' jobs characterized by both cooperation-based activities and conflict-based activities

Theoretical Implications:

This paper explores how knowledge management practices are implemented in IT professionals' everyday jobs. It reflects that, to avoid experiencing a complete loss of autonomy as a result of perpetual attempts to simply 'do what is right' as well as to keep a certain degree of compliance with management rules and regulations, IT professionals continually adjust their behaviors in work-related knowledge activities to maintain a delicate balance. Despite some statements in previous research about the co-existence of cooperation-based activities and conflict-based activities, such as Marshall and Rollinson's (2004) and Heizmann's (2011) research, who concluded that knowledge workers and managers are likely to have competing interests, and that, when management attempts to control how knowledge workers think and act, knowledge workers, to a certain extent, challenged managerial practices to keep their autonomy and creativity while obeying the management's demand to ensure completion of their work. However, empirical research exploring the inner mechanism of the implementation within the context of IT professionals' everyday jobs is still missing. This study fills this gap by investigating how IT professionals react to their organizations' knowledge management practices. It empirically exposes the process of the co-existence of both cooperation and conflict in the implementation of knowledge management practices and how knowledge workers twist their behaviors, and in what kind of context they twist their behaviors to reach consensus while maintaining dissensus in knowledge works.

The main theoretical contribution of this paper to the existing knowledge management literature is to show that the effective implementation of knowledge management practices is based on maintaining a balance between cooperation and conflict to safeguard the interests of both the management and knowledge workers. However, due to the complex nature of knowledge work and knowledge workers, keeping such a balance is very difficult and requires context-sensitivity. This context-sensitivity determines knowledge workers' reflective behaviors and attitudes towards organizations' knowledge management practices. When knowledge workers face the context of job security, sufficient incentive, and avoiding mistakes, they prefer to follow the rules and regulations and cooperate with organizations' knowledge management practices. On the contrary, they are more willing to keep their autonomy and creativity by twisting the rules a bit or doing something different. This result contributes to the existing literature by explaining the inner mechanism of implementing knowledge management practices and highlighting the impact of the context-sensitivity on how knowledge workers react to their organizations' knowledge management practices.

Practical Implications:

This paper also has several practical contributions. Firstly, this study reminds organizational managers of the dynamic relationship between the management and knowledge workers in implementing knowledge management practices. Managers should take actions to cultivate a proper work context in which knowledge workers are enabled to cooperatively and struggle to exert their creativity (Hirst et al., 2011; Zhu et al., 2018). For example, managers can shape the desired work context by adjusting the degree of control for managing knowledge and reward systems to stimulate knowledge workers' creative behaviors. Secondly, managers should realize that knowledge workers are different from other workers, who are less subordinate to the management and possess more 'bargaining chips' in negotiating how knowledge management practices are implemented and to what extent knowledge management practices are implemented. Thus, wise managers should realize that the balance between the high degree of control for managing knowledge and the lower degree of control required for autonomy is one of the most important ways to ensure the effective implementation of

knowledge management practices in organizations. For example, managers can discuss issues with knowledge workers regarding processes and standards for knowledge codification, sharing, and application. By allowing knowledge workers to participate in the construction of goals and practices of knowledge management, managers can better stimulate the knowledge workers' autonomy as well as ensure knowledge workers meet organizational knowledge management goals. This is because that, such goals are set by both managers and knowledge workers, representing the mutual benefit and the shared interest, which is much more easily accepted and delivered.

Conclusion and Recommendations

In conclusion, this paper selects IT professionals as the research target to investigate the implementation of knowledge management practices in an organization. The results demonstrate that, to avoid experiencing a complete loss of autonomy as well as to keep a certain degree of compliance with management rules, IT professionals continually adjusted their behaviors in work-related knowledge activities to maintain a delicate balance between cooperation-based activities and conflict-based activities in their everyday working practices.

This study is not without limitations. First, the qualitative research design implemented in this study is suboptimal for interpreting causal relationships between variables. Future studies can empirically examine, for example, the causal relationship between the degree of control for managing knowledge and incentive systems and the performance of knowledge management to enrich the existing literature. Secondly, that only IT professionals were selected as the research target in this study is another limitation. Future studies can consider broader samples to provide more rich insight into this area. Finally, because of the diverse background of participants, the issue of cultural differences might arise. Future studies can include cultural factors to enrich the relevant findings.

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Appendix

Table II: Anonymized Biographical Details of Participants

Pseudonym	Gender	Age	Education background	Period of working experience	Job description
Abbott	Male	45	Bachelor of software engineering	22 years	Demand analysis and detail design
Abel	Male	52	MCSE certificate	34 years	Detail analysis and framework design
Ace	Male	26	BSc in computer science	4 years	Coding and self-testing
Adam	Male	28	MSc in software engineering for financial services	3 years	Coding and debugging
Ava	Female	27	BSc in computer science	5 years	Debugging and problem-solving
Baron	Male	32	Bachelor of mathematics in computer science	10 years	Coding manual testing and debugging
Barry	Male	46	IBM certificate	28 years	Detail design
Bella	Female	29	MSc in advanced software engineering	4 years	Detail analysis and framework design
Beverly	Female	34	MSc in advanced computer science	9 years	Designing sub-component's infrastructure
Bruce	Male	23	Bachelor of mathematics in computer science	1 years	Coding
Calista	Female	25	BSc in computer science	3 years	Coding and self-debugging
Carl	Male	55	MCSE certificate	37 years	Detail analysis and framework design
Christ	Male	33	Bachelor of software engineering	11 years	Technical framework design and test
Claire	Female	45	Bachelor of mathematics in computer science	23 years	Designing sub-component's infrastructure
Colin	Male	27	Bachelor of software engineering	5 years	Coding manual testing and debugging
Derrick	Male	36	BSc in computer science	14 years	Detail design
Eli	Male	34	BSc in computer science	12 years	Designing sub-component's infrastructure
Evan	Male	47	IBM certificate	29 years	Detail analysis and framework design
Gavin	Male	41	Bachelor of software engineering	19 years	Client's demand analysis
Harry	Male	26	MSc in software engineering for financial services	1 years	Coding and self-testing
Hunter	Male	28	BSc in computer science	6 years	Coding manual testing and debugging
Iris	Female	31	MSc in advanced computer science	6 years	Coding manual testing and debugging
Jay	Male	29	BSc in computer science	7 years	Coding and debugging
Justin	Male	33	MSc in software engineering for financial services	8 years	Coding and debugging
Leo	Male	34	Bachelor of software engineering	12 years	Debugging and problem-solving
Lou	Male	57	IBM certificate	39 years	Client's demand analysis
Maggie	Female	33	MSc in advanced computer science	8 years	Coding and debugging
Matt	Male	25	Bachelor of mathematics in computer science	3 years	Coding and self-testing
Oliver	Male	24	Bachelor of mathematics in computer science	2 years	Coding and self-testing
Paul	Male	58	IBM certificate	40 years	Detail design
Rachel	Female	50	IBM certificate	32 years	Detail design
Ray	Male	48	MCSE certificate	30 years	Designing sub-component's infrastructure
Simon	Male	40	Bachelor of software engineering	18 years	Designing sub-component's infrastructure
Tim	Male	38	BSc in computer science	16 years	Detail design
Tony	Male	36	MSc in advanced software engineering	11 years	Debugging and problem-solving
Victor	Male	32	MSc in advanced software engineering	7 years	Coding and debugging
Will	Male	37	BSc in computer science	15 years	Client's demand analysis