"Process innovation as inquiry in work process: the case of the knowledge managers in a multinational"

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Process innovation as inquiry in work process: the case of the knowledge managers in a multinational

Abstract

This article contributes to the innovation literature by providing a new view about process innovation, which is the employees' or the management's renewal of their own operations in some respect. Relying on the definition of work process as composed of explicit and implicit dimensions and Dewey's notions of experience and inquiry, the article argues that tensions and contradictions between work as officially prescribed and as perceived and performed in practice create potentials for inquiry, in which the individuals seek for new ways of doing their job. Thus, process innovation should be viewed as an everyday process at workplace, in which the individuals engage in inquiry upon the emergence of a problematic situation in the conduct of a task or in the interplay with other people. In support of this argument, the paper presents a case-study, in which the way the knowledge managers in a multinational innovate in their work process is demonstrated based on Dewey's conceptual foundation.

Introduction

A common typology of innovation involves the distinction between product and process innovations (Edquist et al., 2001). In this paper, we address process innovation, which is defined here as the implementation of new or significantly improved production or delivery methods.

The common view in the literature about process innovation is that it is a large-scale organizational change, which involves significant investment and must be carefully planned in a strategic context. However, we argue that process innovation may come out unplanned, emerging from work process of employees. The purpose of this article is to conceptualize this point of view about process innovation based on Dewey's (1938) notions of experience and inquiry. We define work process as 'a set of recurrent actions that are performed with or without the help of tools or machines – to handle a certain task and thus to achieve a certain result' (Ellstrom, 2010). It is composed of two dimensions: explicit and implicit. Explicit dimensions are the written job description and prescription. Implicit ones are the actual performance of a task. They are expressed in the form of improvisations and deviations in relation to the explicit ones (Ellstrom, 2010).

From Dewey's perspective, at workplace, tensions and contradictions between work processes as officially prescribed and as perceived and performed in practice, i.e., between explicit and implicit dimensions, create potentials for inquiry, in which new ways of carrying out the work process are initiated. While process innovation has been seen primarily as a function of investments in R&D and the dissemination of research-based knowledge, we argue that it

should also be viewed as a function of the inquiry process, which stems from the emergence of a problematic situation in the conduct of a task or in the interplay with other people. An important implication of this view is the need to consider the workplace as a site for learning and not only as a production site (Ellstrom, 2010).

Relying on the conceptual foundation of Dewey, we examine a case-study of how the knowledge managers in a multinational do their job. Our case shows that the knowledge managers constantly engage in finding new ways of organizing their work process to cope with the local organizational contingencies and situatedness. Their innovations are embedded in their inquiry and experience of being knowledge managers in a multinational.

This paper is organized as follows. Section 1 presents the dominant view about process innovation in the literature. Section 2 presents a discussion about the concept of work process. Section 3 introduces John Dewey's notions of experience and inquiry and conceptualizes process innovation from his perspective. Section 4 reviews the knowledge management literature to identify the tasks that are commonly prescribed for the knowledge managers. The purpose is to compare those tasks with what the knowledge managers in our case study do to cope with the formal prescriptions of their tasks, which is presented in the case study section. Their process innovations are thereby highlighted in Section 6. The last Section presents our discussion and conclusion.

1. Process innovation: the dominant view

Central to the concept of innovation as defined here is the criterion that an innovation relates to some form of specific change that is new (at least locally) and that leads to what is in some sense a better accomplishment of goals at the system level (the local

unit or the larger organization/system of which it is a part) (Ellstrom, 2010). The goals do not necessarily have to be financial or production-oriented in nature but may relate to other values that we want to achieve by means of certain operations.

There has been a distinction between product and process innovations (Edquist et al., 2001). While product innovation relates to new goods or services, process innovation relates to new ways of producing existing goods and services (Edquist et al., 2001).

Process innovation remains a central element in the main theories of innovation and economic development (Reichstein and Salter, 2006), as it is assumed to bring multiple benefits to an organization and help achieve competitive advantage (Baer and Frese, 2003). It represents a new approach to improving organizational performance. Although it has antecedents primarily in the quality movement, industrial engineering, systems thinking and information engineering, process innovation puts these sources together in a unique way (Davenport, 1993). A number of methods and models have been presented aiming at modeling the entire procedure of innovation or supporting different phases of innovation procedure (Papinniemi, 1999). They include the model of gradually detailing process concept by Jensen and Westcott (1992), the process application of fusion model by Ishii and Ichimura (1992), and the generations of industrial innovation by Sweeting and Davies (1995).

There have been many definitions of process innovation developed in the literature. For example, it is defined as new elements introduced into an organization's production or service operations − input materials, task specifications, work and information flow mechanisms, and equipment used to produce a product or render a service − with the aim of achieving lower costs and/or higher product quality (Reichstein and Salter, 2006). The deliberate and new organizational attempts to change production and service processes, such as Business Process Reengineering (BPR), Total Quality Management (TQM), Lean Production, Simultaneous Engineering, or Just-in-Time Production (JIT) are also considered as process innovations (Baer and Frese, 2003). Process innovation may also mean performing a work activity in a radically new way. It is generally a discrete initiative and implies the use of specific change tools and technology for enterprise engineering and transformation of business processes (Davenport, 1993). In this paper, we adopt the definition of the Oslo Manual (OECD, 2005), in which process innovation is defined as the implementation of new or significantly improved production or delivery methods.

Despite its widely acknowledged economic importance, process innovation has received much less attention than product innovation in the literature. In this respect, process innovation has often been considered a second-order innovative activity, a rather dull and unchallenging cousin of the more glamorous product innovation (Reichstein and Salter, 2006). Compared to product innovation, it appears that firms have less well-developed process innovation strategies (Pisano, 1997). One reason for this lack of organizational attention to process innovation is that the concept itself is extremely diffuse and elastic. It encompasses both improvements in manufacturing operations through the use of new machine tools and other pieces of capital equipment and changes in the processes of production and distribution (Reichstein and Salter, 2006).

A common theme in the literature is that process innovation involves significant investment to materialize. Lager et al. (2010) state that process innovation must integrate the whole organization at an early stage in the development process, using multifunctional teams with a strong customer focus. Davenport (1993), in his famous book on process innovation, argues that process innovation must be undertaken explicitly. It should be focused and planned, and needs to include several key activities such as selecting processes for redesign, identifying and evaluating enablers of innovation, creating a vision, understanding the existing processes and developing detailed designs of the new process and organization. The relationship between IT and process innovation is reciprocal. Radical change can only be achieved using IT, while process approaches are required to harness the cross-functional capabilities of IT. At the same time, the existing infrastructure can impose constraints on innovation where it cannot or will not be changed. Process innovation should occur within a strategic context and be guided by a vision of exactly what the process will look like in the future. This process vision in turn should be closely linked to the organization's strategy. Design and analysis then follow after the strategy and the process vision have been formulated. Without a strategic context for the process vision, the organization will only be able to capture incremental improvement gains. This tight connection between strategy and vision provides a primary mechanism for implementing strategy, which grows in importance as ability to implement strategy becomes an increasingly crucial source of competitive advantage. Consequently process innovation should be treated as large-scale organizational change.

2. Process innovation as inquiry in work process

2.1. Work process. The concept of work process is crucial for the discussion in this paper. We will start by defining process and business process. According to Davenport (1999), a process is a specific ordering of work activities across time and place, with a beginning and an end, and clearly identified inputs

and outputs. A business process is a structured set of activities designed to produce specific outputs for internal or external customers or markets. It implies a strong emphasis on *how* work is done within an organization, in contrast to product that focuses emphasis on *what*. Furthermore business processes have cross-organizational boundaries and they are generally independent of formal organizational structure (Childe et al., 1994). In this definition, an activity is a combination of people, technology, raw materials, methods and environment that produces a given product or service (Papinniemi, 1999).

A work process is then can be defined accordingly. Lager et al. (2010) define it as: 'a set of interrelated work activities that are characterized by a set of specific inputs and value-added tasks that produce a set of specific outputs'. Melan (1992) characterizes four different types of transformations occurring in different types of work processes: physical, locational, transactional and informational. As defined here, it is 'a set of recurrent actions that are performed with or without the help of tools or machines – to handle a certain task and thus to achieve a certain result' (Ellstrom, 2010). This definition is close to the concept of routine as used in organizational theory (e.g., Feldman and Pentland, 2003; Miner, 1991).

Given this definition, two dimensions of a work process can be differentiated: the explicit and the implicit dimension (Ellstrom, 2010). The explicit dimension concerns how the work process is formally codified, prescribed and organized (e.g., in written instructions). The implicit dimension concerns how the work process is perceived by different actors, co-ordinated and performed in practice. Ellstrom (2010) argues that the explicit and the implicit dimension are interwoven and both are necessary to constitute a work process. However, in practice it is common to overestimate the importance and impact of the formally prescribed work process (the explicit dimension), while the actual performance of a task (the implicit dimension) is not made visible and given recognition.

Ellstrom (2010) sees the implicit work process as having a relative autonomy in relation to formal structures and prescribed processes and tasks. This relative autonomy is expressed in the form of improvisations and deviations in relation to the formally prescribed performance of a certain task. Prescribed tasks and processes may be forgotten or are reinterpreted more or less consciously. There is often a considerable variation – between different performers of the same task – but also in the way the task is carried out by the same actor over time. Ellstrom (2010) considers that there is typically a considerable creativity and an ability to improvise when it comes to finding solutions to unexpected problems that arise. However, this creativity mainly occurs unofficially

and implicitly – as a part of what happens "behind the scenes" – and it is therefore not highlighted or paid attention to in official job descriptions.

3. Understanding process innovation from Dewey's perspective

3.1. Dewey's concepts of experience and inquiry. Dewey does not discuss explicitly innovation. His theory has been applied in practice-based studies (Gherardi, 2009; Simpson, 2010), which are concerned about work process and practices. Thus, his concepts of experience and inquiry are an appropriate framework to understand process innovation.

Dewey believes that man is a being reacting and interacting with an environment. Dewey's perspective on the relation between men and the environment is configured by his concept of experience (1958). Our experience includes an undergoing of things which 'happen to us'. It also includes responsive 'taking'. Experiencing is primarily suffering and enjoyment, the feeling of need and the making of effort, while what is experienced is anything which can occur to anyone.

According to Dewey (1938), situation denotes the entire, pervasive, unique character of all conditions under which and within which an individual has experience at a given time. It includes what is done and the way in which it is done, reified objects with which an individual interacts, and importantly, the total social set-up of the situation (Dewey, 1938). The unique pervasive quality of the situation gives it the unity and binds its constituents into a single whole (Dewey, 1938). There is a type of situation, in which there is a smooth on-going routine of activity. Man is in tune with his environment. This type of situation can be called 'determinate'. When this harmony is disrupted, there is a type of situation that ensues. Man is disoriented and confused. The situation now is 'indeterminate'.

When and if the response to an indeterminate situation is not merely emotional and impulsive, if the feeling of confusion gives way to an attitude of doubt, the situation becomes 'problematic' (Dewey, 1938). The problematic of an indeterminate situation initiates inquiry, the cognitive mode of experience. Inquiry is reflective problem-solving which changes the indeterminate situation into a determinate one. The indeterminate situation becomes problematic in the very process of being subjected to inquiry. The way the individual conceives the problem decides which specific suggestions are chosen and which are dismissed, which data are selected and which rejected in inquiry. Finding out what the problems are, which problematic situation presents to be inquired into, is to be well along in inquiry (Dewey, 1938). It is here that the established working methods and routinized actions are questioned

and new ways of dealing with the organizational context are developed. Inquiry consists of the cooperation of two kinds of operations: existential (the actual transformation of the situation) and conceptual (reflection or thinking) (Dewey, 1938). In some phases of the process of inquiry, the emphasis will be on conceptual operations, while in other phases the existential operations will be more prominent. But it is always the cooperation of the two operations and never only one of them (Dewey, 1938). It can be said that thanks to the breakdowns in the environment, the individual, through inquiry, comes up with innovations − new ways in which (s)he copes with the local conditions.

For Dewey, we interact continuously with the world through continuous process of inquiry, which enter into every area of life and into every aspect of every area in an intimate and decisive way (Dewey, 1938). In everyday living, people examine; they turn things over intellectually; they infer and judge as 'naturally' as they reap and sow, produce and exchange commodities. Inquiry does not solve problems by returning to a previous, stable situation, but by means of a transformation of the current situation into a new one. There is no a final settlement, because every settlement introduces the conditions of some degree of a new unsettling (Dewey, 1938).

3.2. Process innovation from Dewey's perspective. Based on our definition of work process, process innovation stems from the conflict between explicit and implicit dimensions. Through the lens of inquiry, process innovation can be seen as embedded in inquiry that emerges upon a disturbance or a problematic situation in the conduct of a task or in the interplay with other people. It can be conceptualized as the result of a search for new ways of dealing with the problematic situation at hand when routinized patterns of thought and action being broken.

A question raised, then, is: what are the driving forces of such problematic situation? Previous research indicates a number of such possible turning points. Examples would include the situations when individuals, groups or organizations are faced with a circumstance that they have never met before (Gersick and Hackman, 1990), when an established working method may lead to a failure in some respect, when there is a demand for change due to rapid technical development, increased quality requirements, or customers and/or management request (e.g., Lundvall and Nielsen, 1999). In general, it is the interface and the interplay between the explicit and implicit dimensions of work is driving forces for inquiry, hence for work process innovation. Tensions and contradictions between work processes as officially prescribed (the explicit dimension) and as perceived and performed in practice (the implicit dimension) challenge the security that follows with well-learned, routinized actions, leading to breaking with the "status quo" (Ellstrom, 2010).

4. Knowledge management

Knowledge management has been a popular management fad in recent years. It has attracted considerable attention from both academics and practitioners. The term has received many different definitions in the literature. One can distinguish the "cognitive-possession" and "social-process" positions (Chiva and Alegre, 2005). The cognitive perspective defines knowledge management as "the explicit control and management of knowledge within an organization aimed at achieving the company's objectives", "the formal management of knowledge for facilitating creation, access, and reuse of knowledge, typically using advanced technology", "the process of creating, capturing, and using knowledge to enhance organizational performance", or "the ability of organizations to manage, store, value, and distribute knowledge" (Vera and Crossan, 2003). The cognitive school, thus, sees knowledge as concrete and transferrable. The social school process of knowledge management believes in the social process view of knowledge where knowledge grows out of social interaction and is to a certain extent malleable and emerging (Hayes and Walsham, 2003). Thus, knowledge management objectives in this school emphasize and promote social networks and the cultivation of trust, norms and shared values amongst employees that constitute "communities of practices" (Bresnen et al., 2003).

Many studies have been devoted to provide guidelines for knowledge managers in doing knowledge management. Holsapple and Joshi (2002), Jarrar (2002), Gore and Gore (1999), DeTienne et al. (2004) and Wiig et al. (1997) provide system approach frameworks, in which major building blocks for effective knowledge management are proposed (Wong and Aspinwall, 2004). The frameworks put forward by McCampbell et al. (1999), Bontis (2002) and Wiig (1999) are process-oriented (Wong and Aspinwall, 2004), outlining two major sequential components of the knowledge managers' activities: achieving an understanding of the knowledge management landscape, which means to obtain an appropriate perspective of the actual organizational situation; and performing knowledge management tasks, which means to translate knowledge managers' understanding of the current state of affairs to knowledge management initiatives. This includes capturing, codifying, storing, and transferring knowledge. Rubenstein-Montano et al. (2001) and Mentzas (2001) opt for a hybrid of system and process-oriented approaches (Wong and Aspinwall, 2004), developing frameworks that contain both essential elements and phases in effective knowledge management for the knowledge managers to follow. These frameworks are summarized in Table 1 in Appendix.

5. The case

5.1. The context. In our case, we study how the knowledge managers at Construction Inc. (a pseudo name) innovate in their work process.

At Construction Inc., the major knowledge management (KM) initiative is the development of a KM Portal, in which knowledge is codified and diffused. The company has set up four regional Technical Centers, which mission is to bring technical assistance to the local plant. The experts, personnel of the Technical Centers, are assigned the responsibility of providing codified knowledge for the KM Portal in addition to their existing tasks. The KM team, composed of two knowledge managers, is responsible for ensuring the exchange of knowledge and know-how via the KM Portal and maintaining the tools by obtaining new knowledge from the experts. The team coordinates a network of five knowledge managers in the Technical Centers, who are in charge of training plants staff to use the Portal and collecting plant contributions.

5.2. Research design. *5.2.1. Data collection.* We argue that studying inquiry can use the narratological approach, as all inquiry is fundamentally interpretive or narrative (Wicks and Freeman, 1998). In narrative-based research, attention has been made primarily to the narratives created by the storytellers to understand different organizational phenomena, such as sensemaking (Brown, 2005), socialization of new employees (Louis, 1980), collective centring (Boyce, 1995), communication, change, power (Rhodes and Brown, 2005), and identity (Currie and Brown, 2003). In this study, we complement the idea that people in organizations are storytellers and that their stories constitute valid empirical materials for research, by recognizing that researchers, too, are storytellers (Rhodes and Brown, 2005).

The KM team and three knowledge managers at the Technical Centers (TC knowledge managers) were interviewed. As repeated interviews over time are essential to interpretive studies (Cohen, Kahn, and Steeves, 2000), each participant was interviewed during two sessions of two hours. Narratives of participants were solicited by incorporating three themes in the interview guide. The first was the use of questions designed to elicit life history. The participants were asked to construct their experience as a story with different chapters (Holstein and Gubrium, 1995). The second theme was that of critical incident technique, which facilitates the investigation of significant occurrences (events, incidents, or processes) identified by the respondents, the way they are managed and the perceived outcomes (Chell, 1999). We adopted this technique by relying on the form of three questions recommended by Cohen et al.

(2000). The first statement was 'tell me the most important thing that has happened to you recently'. The second statement was 'tell me the event that has the opposite emotional valance of the first event'. The third statement aimed at filling in as much detail about daily life as possible. The third theme incorporated in the interview guide was to encourage the participants to reconstruct their experience in light of their organizational situation (Seidman, 2006).

5.2.2. Data analysis. In order to grasp the stories on the knowledge managers' organizing, we paid special attention to language because discourse is 'the very foundation upon which organizational life is built' (Fairhurst & Putnam, 2004, p. 5). We relied on the respondent's own terms and category systems. We interpreted the data by reading and re-reading our transcripts and other data sources, gradually piecing together the different story lines of each knowledge manager for a thematic analysis. We were guided by van Manen (1990) in his suggested process for isolating thematic statements. The analysis started with the holistic reading approach, continued with the selective/highlighting one, and finished with the detailed reading one. The approaches were used in an iterative manner, which means there is a back-and-forth movement between them as the analysis proceeded. We then analyzed each actor's story, comparing it with the other versions, and looking for commonalities and contradictions.

6. Research findings

As discussed above, process innovation emerges when the individual engages in inquiry upon emergence of a problematic situation at workplace. This leads to the explicit dimension of work being broken and the implicit dimension prevailing in a search for ways of dealing with the problematic situation at hand. In this section, we present work process innovation of the knowledge managers by discussing its three components: the problematic situation that leads to inquiry, the identification of the problem that provide the knowledge managers with possible innovative solutions, and the concrete innovations that they adopt for their work process.

6.1. The problematic situation of the knowledge managers: occasion for process innovation through inquiry. This storyline highlights the indeterminate situation, which prompts the knowledge managers at Construction Inc. to engage in inquiry to innovate their work process.

At the beginning, naturally, the knowledge managers were all pleased to be assigned this job. For one, it was the opportunity to turn to a new page in her career (KM team). Another was 'excited like a young graduate' (TC knowledge manager). One was eager to have the chance to apply what he had learned about KM in

real life (KM team). Gradually, the events and circumstances coming up at work made them recognize the indeterminateness of their situation.

When KM was put in place in an attempt to sustain performance and cut down costs, it was considered as one of the organization's priorities. The knowledge managers were supported by the top managers and granted with sufficient resources. However, things had changed. Even the simple task of getting an appointment with the director of the Technical Centers was now difficult. One member of the KM team recalled: 'for our first meeting, he postponed four times. That means next times he will postpone again, or cancel or turn up late. Why so? Why does he not hesitate to postpone our meeting and make me feel disrespected? Why does he not take the risk of showing that he pays attention to what I'm doing?'

In the past, the experts spent time in making contributions to the Portal. Now many of them were not willing to collaborate. In a meeting with them, the KM team saw that 'half of the participants checked their e-mails on their BlackBerry, and the other half fell asleep'. They considered the help provided to the knowledge managers as extra workload.

The knowledge managers also had the difficulty to convince plant staff to use the KM tools. One time a plant engineer even told a TC knowledge manager: 'no one is interested in the KM tools, you are wasting your time'. Plant staff complained about the language problem. Many told the knowledge managers that they did not use it simply because 'they did not understand anything written in there' (KM team). They also used the lack of time as another excuse for not using the KM tools. Sharing knowledge was the last thing they do at work (TC knowledge manager).

6.2. The problem of the knowledge managers' problematic situation: the search for process innovation. This section presents the essential problem the knowledge managers' indeterminate situation. It is worth mentioning because the identification of problem through inquiry provides direction for the knowledge managers to innovate their work process.

As soon as the knowledge managers acknowledged that something needs to be done, the indeterminate situation turned into a problematic situation. It was here that inquiry begins. A TQ knowledge manager admitted: 'four or five years ago, the top managers said: "KM is important, we need to do it", and then everybody followed'. But they 'no longer had that message, things were much more complicated'. It is 'much more difficult to make people involved in KM'. It was not only 'the question of availability but also the problem of unwillingness to collaborate'. They 'were forced to work differently'.

In the process of inquiry, finding out what actually is problematic about the indeterminate situation is a crucial moment. By transacting with the organizational context, the knowledge managers progressively determined the problem of their situation and its possible solution. All the knowledge managers did not create immediately the appropriate innovations for their situation. They made mistakes and suffered the consequences of their actions before being able to identify what is problematic about their situation. It was essentially a learning process. The KM team recalled that: 'at the beginning, it hurts'.

The main problem of the knowledge managers' situation was that the organization had moved to new priorities, KM was not among the current strategic objectives of the organization. This made it difficult for KM and the knowledge managers to be part of the working life of the organization. By attempting to collaborate with the experts, the KM team realized that the experts devote their time and efforts to the existing strategic objectives, not codify knowledge. The knowledge managers explained: 'people focus on what are parts of their objectives, their bonus depends on that, helping us understandably can't be on their to-do list'. If they did not keep reminding the experts of what had to be done and when it had to be done, 'there was no progress' (KM team). By providing training to plant staff, the knowledge managers experienced the insignificant place of KM in the organization. A TC knowledge manager often received refusal from the plants when she offers to come and provide training. The excuse they made is the lack of time and their preoccupation with the 'hot topic of the day', like cost reduction or security improvement. By seeking support from the director of the Technical Centers, The KM team came to understand that KM had been put away from his agenda.

6.3. Process innovations of the knowledge managers. Having identified the problem of their problematic situation, the knowledge managers innovated in their work process to accomplish their mission. Their innovation of work process, which deviated from their official tasks, focused on three different aspects.

First, they dealt with the lack of interest in KM of plant staff and the different accusations they made about the Portal by making the innovation that they called 'marketing'. That means they tried to communicate internally about the Portal, trained and convinced people to use it. Communication activities were conducted on a regular basis to constantly remind people and made KM 'visible throughout the organization' (KM team). Training was provided to plant staff so that they know how to search for a document in the Portal. People heard and saw constantly at work, either in their training, on the internal media, in the e-mails sent by the knowledge managers, or in the poster displayed in their work-

place, that the Portal is useful. Each time a new document related to a given domain was posted, staff in that domain was notified and instruction to get that document was provided (TC knowledge manager).

Second, marketing actions were not sufficient. The knowledge managers strived to make knowledge sharing become part of the existing organizational processes. This innovation was called 'place building' by the knowledge managers. This was to make KM related to the functioning of the organization and using the Portal become part of people's job. The regional or international management meetings, organizational events such as performance day, or network meeting of the experts, became occasions in which people hear about KM from the knowledge managers (TC knowledge manager). Each technical training program included two hours on the Portal. Making at least one contribution had become an obligation for new engineers. The knowledge documents posted in the Portal were relevant to the strategic objectives of the organization, hence meeting the needs and corresponding to the priorities of plant staff (TC knowledge manager).

The experts were inevitable actors for the organizing process of the knowledge managers. They were the 'supplier of knowledge'. The knowledge managers had to rely on the experts, who had direct contact with plants during their training and coaching missions, to promote the Portal. Thus, despite their apathy, the knowledge managers did the best to get help from them. What the knowledge managers did was to 'keep reminding them' by 'emailing them all the time', by 'coming regularly to their meetings', by 'regular appointments' to review the progress, so that things would not be forgotten (KM team). The knowledge managers helped the experts. They prepared two or three slides on KM for the experts to integrate into the training materials presented at plants. A booklet was made to guide the experts how to post the documents they have in the Intranet. Importantly, the knowledge managers had to understand that in the multinational, 'things take time to be done' (KM team). This means they had to 'live with the amount of time the experts willing to give'. Depending on each individual expert, they could get a lot of help or almost nothing but it was life at Construction Inc. (TC knowledge manager).

Third, in order to get help from the experts more easily and make plant staff listen more attentively to their discourse, the knowledge managers turned to the top management for support. They were called 'sponsors' by the knowledge managers. This innovation was called "sponsorship seeking" by the knowledge managers. The knowledge managers noted that if the sponsors said that 'knowledge management is important', their job would be much more facilitated (KM team). However, they were still struggling with this innovation. The top managers had a myriad of preoccupations. Making KM become part of their agenda

was a challenging task. The knowledge managers had been undertaking two main actions. One was to constantly remind the top managers that knowledge sharing was what the company had always believed in. Another was to show the usefulness of KM for the organization by aligning the benefits of sharing knowledge with the organization's goals.

The knowledge managers came up with those innovations through a transactional relationship on a daily basis with the organizational context, which they termed 'trial and error'. It was a period in which they 'sow seeds', they did not know for sure what would come out, but they proceeded by trials and errors, saw what worked and what did not (KM team). Indeed, it was the trivial Portal usage rate of plant staff in her region that caused one TC knowledge manager to look back and think about what she had been doing. She recognized that her training content has to be linked to the existing objectives of the organization. Because KM was not one of the strategic priorities, the only way to attract attention was to relate it to what people were concerned about. The KM team admitted that the biggest error that they made at the beginning was to work without seeking help from the expert and sponsorship from the top managers. By working with the expert in the quality domain, who 'hardly spends a minute to codify knowledge', the KM team understood that it was a constant task to follow up with the experts to make them involved. The process in which the knowledge managers came to realize that they needed these innovations can be best seen in what a member of the KM team told us: 'in this chapter of my experience, I have seen what happened in the previous chapters. I really want to pass to the next chapter, in which I will become more demanding with myself, I will do what can contribute to the objectives of the organization, to what it needs…'

Discussion and conclusion

This paper has discussed process innovation from John Dewey's pragmatism. What we mean by process innovations is new ways of organizing a certain work process based on learning at the workplace within the operations concerned.

Based on Dewey's notions of experience and inquiry, it is argued that an individual always engages in inquiry to make process innovations at work in response to problematic situations, in which formally codified, prescribed and organized working methods encounter breakdowns. Process innovations are function of the individual's transactional relationship with the environment. In this transaction, the individual acts and creates innovation for his/her work process in accordance with the surroundings and local contingencies. As a consequence the changes produced in the environment react upon the individual, his/her activities and future innovations.

As can be seen from our case study, the knowledge managers at Construction Inc. engage in a process of inquiry at work in response to their problematic situation, which is the difficulty of KM to become a part of the organization's working life. The knowledge managers' innovations are implicit, but they are crucial for the performance of the job.

It can be seen from Appendix that all three types of action framework (process-oriented, step-oriented, and hybrid-oriented) propose two main types of activities: achieving an understanding of knowledge management landscape and performing knowledge management tasks. It can be said that these frameworks propose the knowledge managers to try to understand the organizational landscape and then perform appropriate actions. Achieving an understanding of knowledge management landscape means to obtain an appropriate perspective of the actual organizational situation in which the knowledge managers work. This involves activities like analyzing the resources available for knowledge management (Holsapple and Joshi, 2002), making a diagnosis of what have been done in the past (Bontis, 2002; Wiig et al., 1997), or survey and map the knowledge management landscape (Wiig, 1999). Performing knowledge management tasks means to translate the knowledge managers' understanding of the current state of affairs to knowledge management initiatives. This includes activities like capturing, storing and transferring knowledge (Gore and Gore, 1999; Jarrar, 2002) or modelling, acting, revising and transferring (Rubenstein-Montano et al., 2001).

However, compared to these frameworks, the knowledge managers in our case made important process innovations in two ways. First, only some elements of the frameworks are present in the knowledge managers' activities, including obtaining management buy-in (Wiig, 1997), capturing of new explicit knowledge (Gore and Gore, 1999) or identifying and collecting knowledge (McCampbell et al., 1999) or acquiring key knowledge (Wiig, 1999), forming powerful coalition (McCampbell et al., 1999), making KM a requirement for training and evaluation (Bontis, 2002) or training of knowledge workers (McCampbell et al., 1999), and developing knowledge system (Mentzas, 2001). The frameworks can propose only one or two activities relevant to the knowledge managers in our case study. The actions of our knowledge managers are not incorporated in any single framework. Second, the action frameworks assume that knowledge management can be done in a linear manner. Once the knowledge managers have been able to evaluate their organizational context and plan their activities, they just need to go forward. This can be seen most clearly in the model of Mentzas (2001), which advises the knowledge managers to become aware of the organizational context, then plan their knowledge management program, put it in place, ensure its function, monitor its performance, and train people to run the program. Similarly, the process-oriented models of McCampbell et al. (1999), Bontis (2002), and Wiig (1999) are all linear. However, our case study shows that the way the knowledge managers worked is iterative, in which they took actions and learned from their failure.

In conclusion, we argue that our article contributes to process innovation literature by providing a new view about process innovation. The implication is that the organization should invest in identifying unplanned process innovations to make them beneficial to the entire organization.

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Appendix

Table 1. Action frameworks of the knowledge managers

	Authors	Frameworks	
System-oriented	Holsapple and Joshi (2002)	Knowledge resources, KM activities, KM influences	
	Jarrar (2002)	Set a strategic priority for KM; define and understand organizational knowledge; manage knowledge; knowledge environment	
	Gore and Gore (1999)	Exploitation of existing tacit knowledge; capturing of new explicit knowledge; creation of tacit knowledge and its conversion to organizational knowledge	
	DeTienne et. al. (2004)	Organizational leadership; organizational culture; CKOs; technology	
	Wiig et al. (1997)	Review; conceptualize; reflect; act	
Process-oriented	McCampbell et al. (1999)	♦ form powerful coalition ♦ communication vision of knowledge management ♦ establish teams for needs assessment ♦ analyze the needs of knowledge management ♦ identify and collect knowledge ♦ design a technological structure to warehouse knowledge ♦ test the technology	♦ maintenance of the technology ♦ retest the technology ♦ training of knowledge workers ♦ roll out the use of knowledge management practices ♦ track usage ♦ make systems go live ♦ measure quality and productivity, measure the performance of knowledge management practices, conduct a need assessment review
	Bontis (2002)	♦ conduct an initial KM diagnostic ♦ make KM a requirement for training and evaluation ♦ define the role of knowledge ♦ recruit a leader ♦ classify the intellectual portfolio	♦ use document management system ♦ incorporate reward and recognition programs ♦ conduct intellectual capital audits ♦ identify gaps to be filled ♦ prepare and publish organization's knowledge portfolio
	Wiig (1999)	♦ obtain management buy-in ♦ survey and map the knowledge landscape ♦ plan the knowledge strategy ♦ create and define knowledge-related alternatives and potential initiatives ♦ portray benefit expectations for knowledge management initiatives ♦ set knowledge management priorities ♦ determine key knowledge requirements	♦ acquire key knowledge ♦ create integrated knowledge transfer programs ♦ transform, distribute and apply knowledge assets ♦ establish and update knowledge management infrastructure ♦ manage knowledge assets ♦ construct incentive programs ♦ coordinate knowledge management activities and functions enterprise-wide ♦ facilitate knowledge-focused management ♦ monitor knowledge management
Hybrid-oriented	Rubenstein-Montano et al. (2001)	Organizational culture; learning; strategy; types of knowledge; strategy; model; act; revise; transfer	
	Mentzas (2001)	Knowledge assets; knowledge strategy, process, structure, and system; knowledge interaction networks; awareness; plan; develop; operate; measure; training	