

'Communities of Practice' and the Social Process of Knowledge Creation: Towards a New Vocabulary for Making Sense of Organizational Learning

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Abstract

The idea of knowledge as the source of competitive advantage has been celebrated in the management literature for some time. However, our understanding of how knowledge emerges and develops in the actual work practices is still relatively limited. The argument of this paper is that an approach called 'communities of practice' offers a relatively coherent view of the *social processes* of knowledge creation. The paper introduces the 'communities of practice' approach as a general scientific perspective for making sense of and planning organizational knowledge management programs in a more effective and contextually sensitive way. However, at the same time it is noted that the move to a socio-cultural inquiry of knowledge creation processes is associated with a broader shift in thinking about organizations and organizing and that a full awareness of the practical complexities and contradictions inherent in the ideas around 'communities' and 'practices' needs to accompany the application of this new vocabulary of managing and learning.

Key words: knowledge creation, communities of practice, organizational learning, social dynamics.

Introduction

The idea of knowledge as the source of competitive advantage has been celebrated in the management literature for some time (e.g. Nonaka & Takeuchi, 1995; Pfeffer & Sutton, 1999; Prusak & Davenport, 1998). However, our understanding of how knowledge emerges and develops in the actual work practices is still relatively limited. Most of the mainstream knowledge management technologies attempt to capture existing knowledge within formal systems, such as databases. Yet systematically addressing the kind of dynamic "knowing" that makes a difference in practice requires the participation of people who are fully engaged in the process of creating, refining, communicating, and using knowledge. Even when people work for large organizations, they learn through their participation in more specific communities made up of people with whom they interact on a regular basis.

This paper discusses organizational knowledge creation and learning as a process of 'communities of practice'. Communities of practice (COP) has been coined as a concept that integrates a number of social science approaches to learning and knowledge creation. Our intention in this paper is, firstly, to locate the COP perspective within the existing theoretical approaches to organizational knowledge creation. Secondly, we want to introduce the main assumptions and concepts of COP so as to pave the way for the future studies and debates in the organizational analyses of knowledge management. Thirdly, we want to make some critical notes about the applicability of COP as a managerial tool for organizational management, emphasizing the fact that for COP, participation of the individuals in the knowledge creating collectivities is a contested process that can neither be controlled nor predicted in the same fashion as in the more conventional organizational behavior paradigms. The move to the 'social' inquiry of knowledge creation and learning brings its own 'can of worms' that needs to be addressed before the emerging approach can be translated into managerial ideas and intervention techniques.

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However, we will start with a more basic look at the main principles and themes of the knowledge management discourse. This is followed by a section that outlines the similarities and differences between the knowledge creation approach and the organizational learning debate. The fourth section elaborates the implications of moving from the individual based views to organizational theories of the 'social' dynamics of knowledge creation and learning. The 'communities of practice' approach is introduced next both as a theoretical perspective on social construction of work practices as well as a management technique that draws upon a number of 'collaborative techniques'. The sixth section discusses the implications of the COP perspective against some of the more classical organization theories investigating people and organization, while the final part concludes by summarizing the perspective developed in the paper on the social process of knowledge creation.

The Knowledge Creation Approach to Organizational Management

Although there has been a long debate on professional service firms and knowledge intensive organizations, the organizational solution of these companies has been mainly understood as one contingent form among others (Mintzberg, 1983; Nurmi, 1998; Alvesson, 1993). That is, managing organization is in the views of the many of the contributions related primarily to strategy implementation while strategy formulation and competitive success are seen to draw upon firm's external market position and environmental scenarios.

The inferior position of internal knowledge in relation to market activities is reversed in the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991). Unlike the classical strategy frames, which emphasize market position and strategic choice, the resource-based view argues that competitive advantage is derived from unique capabilities and know-how. Following the resource-based view, organizational knowledge and competencies are said to have become the prime source of business success in the post-industrial economy (e.g. Teece, 1998). The quest for identifying, developing and nurturing individual and organizational capabilities emerges as the key focus for any firm, not just for those considered 'expert organizations'. It is in this context that the notion of 'knowledge management' has appeared and gained widespread popularity among managers.

The discussion on knowledge management can be identified as sharing a number of core definitions and components. Firstly, the concept of knowledge is distinguished from more technical views. For example Davenport and Prusak (1998) make a distinction between data, information and knowledge, arguing that 'data' is information in its nascent state while 'information' contains some ideas about the use of data. 'Knowledge', in turn, refers to an understanding of information codes that includes guidelines of how to use information in practice. In a more academic context, Gherardi (2000) stresses that discussion on organizational knowledge needs to avoid the simplistic notions of knowledge. She proposes that the analysis has emphasized either mentalist image, arguing that knowledge is in people's heads, on one hand, or the objectivist image, emphasizing knowledge as something that can be stored, distributed and sold on to the other.

Other classifications have been presented from the management point of view. For example Bonache & Brewster (2001) discuss several categories of knowledge in the context of international corporations. Knowledge can be classified as context specific or context generalizable, it can be held by individuals or by a collective. Besides that, Bonache & Brewster (2001) also mention the dimensions of present versus future orientated as well as higher versus lower level knowledge. The most well known conception of different forms of knowledge is, however, (Nonaka's 1991, 1994; Nonaka & Takeuchi, 1995) distinction into tacit and explicit knowledge. Nonaka, following Polanyi (1966), argues that a major bulk of know-how in organization is tacit, that is, embedded in what Giddens (1984) calls actors' practical consciousness, and not necessarily articulated into language or other social code. The conversion from tacit to explicit is a key technique in knowledge creation, involving a process of articulating the experiences and habitual patterns into explicit, codified knowledge (Dunford, 2000; Bird, 1994). Yet, despite the importance of the tacit-explicit conversion, Nonaka (1991) is keen to emphasize also other dynamics such as explicit-explicit and explicit-tacit translations because of the fact that they perform different functions, all of which are needed for comprehensive knowledge management.

Nonaka (1991) extends his approach by discussing the implications of knowledge dynamics on different managerial levels. On the organizational level, the idea is to use organizational structure to shape the overall system of connections and communication by intervening into the division of labor and control and power mechanisms. On the group level, the focus is on more concrete social behavior, where the search for new ideas takes place through dialogue and interpersonal dynamics. On the individual level, Nonaka (1991) stresses, in turn, empowerment of employees with the aim of being better able to reflect on their work and its meaning. Bird (1994) proposes, based on this distinction into levels of analysis, a list of management tasks for each level. The top management shapes the overall values and framework for knowledge creation whereas the middle management acts as a combiner of top management visions and operative realities). The lower managers, in turn, are those, who mainly work within the concrete, everyday aspects of knowledge. This is accomplished through an active participation in teamwork, where individual managers draw upon their knowledge-in-use in the dialogical process.

Knowledge Creation and Learning Organization

Despite its apparent novelty and radicalism, knowledge management shares a number of similarities with other organizational approaches, such as corporate culture and quality management. However, the most obvious overlap and crossbreeding can be found in the relation of KC to the learning organization (LO) debate. But what does learning organization mean? The definitions and perspectives on learning are vast and fragmented, although some key texts are frequently referred to (e.g. Senge, 1990; March, 1991; Argyris & Schön, 1978). Easterby-Smith (1997) argues in a review paper that 'learning organization' is the prescriptive approach whereas 'organizational learning' has come to refer to academic theories and analyses. However, as Easterby-Smith (1997) and others tend to see it, both discourses agree on a shared object of interest, which is the process of learning, defined usually as acquisition and development of new knowledge and new ways of acting.

The LO approach thus touches the process of knowledge creation from the perspective of learning and change. Yet it is useful to note that some of its ideas about organization and management differ from those of KC. For example the focus of LO is not so much on the dynamics of knowledge but on the effect of knowledge creation on organizational change and sense-making. From this emphasis the tendency of LO is also to stress more the informal, subjective aspects of knowledge creation and organizing at the same time as KC focuses on information systems and the structural design of organization. LO is also more attuned to the relation organization has with its environment and for this reason, LO includes more managerial tools aimed at customer sensitivity and adaptation to the environment. KC, instead, has tended to reify environment so that it is understood as a set of external forces rather than a latent pool of ideas and opportunities. On the other hand, KC has also viewed environment and extra-organizational experiences as a prominent source of tacit knowledge. Overall, the emphasis of the LO literature is more on the informal processes and subjective sense-making while KC is slightly more interested in the management of knowledge creation from the objective systems perspective.

However, despite these differences, similarities between the two approaches are considerable (Easterby-Smith & Burgoyne, 2000). Both for example subscribe to the resource-based view where competitive advantage is seen as stemming from the unique capabilities. In order to achieve and sustain capabilities, organizations need to develop organic structures that enable dialogue and boundary crossing (Virkkunen & Kuutti, 2000). Both also emphasize the importance of creating enabling conditions for group and individual level knowledge creation, mainly through rewarding experimentation and allowing for a greater degree of autonomy than in bureaucracy. In addition to that, KC & LO foster the idea that the existing skills and habits can be utilized through the unleashing of the potential embedded in the tacit views of employees. In this way, both regard learning and knowledge creation largely as natural, emergent processes of sense-making and interaction rather than phenomena that would require external governance. Both also agree on the idea that integration of autonomous subjects is best achieved through the articulation and diffusion of common values and visions. However, the learning organization literature leans on the traditions of the study on organizational and managerial learning. Organizational learning has long history of

dealing with the critical conceptual and theoretical issues around organizational information processing, and it is worth looking at how the learning discourse has reacted to the problematic issue of the individual versus the organization in the dynamics of knowledge creation.

Moving From Individual Level Views to Social Analyses of Organizational Knowledge Creation and Learning

The literature on organizational learning has a long tradition in management and organization studies that goes back to the classical writings of authors like Simon & March (1958), Simon (1990) or Wiener (1949). While most of the early work was done within individual level approaches, the more recent developments have contributed to our understanding of learning as a social phenomenon in the context of organization level processes and mechanisms. The move away from the individual is part of the wider trend in which the individual has become less central in the field of organizational psychology and behavior and also to some extent in psychology proper (Jackson & Carter, 2000).

The disappearance of the individual is paradoxical since the discipline of organization studies was based on the psychological discourses about the human at work and many pioneers from Mayo through McGregor to Schein have been psychologists by scientific training. The developments from the late 1970's onwards, however, have shifted the attention from the individual attributes such as personality, attitudes or motivation to the contextual properties of the situations in which organizational behavior takes place. This change is documented in a study by Nord and Fox on the material published in (organizational) psychology journals over the period of 1975-1995 (Nord & Fox, 1996). Their analysis of the contents of the publications indicates that the interest on the stable, essential traits of the individuals has given room to a more social scientific understanding of human behavior as emerging from the interaction between the person and the situation.

Similarly, the debates on learning have witnessed a move from the traditional cognitive theories towards organizational level concepts and explanations. Palmer & Hardy (2000, p. 224) argue that organizational learning can be approached from three distinct perspectives that illustrate the attempts to move from individual to organizational analysis of learning and knowledge creation, which they label 'individual components', 'organizational hardware' and 'organizational software'.

Table 1

Approaches to organizational learning (adapted from Palmer & Hardy, p. 224)

Focus	Individual components	Organizational hardware	Organizational software
Status of organizational learning	'Organizational' learning is really individual learning	'Organizational' learning is really individual learning applied to organizations	Organizational 'learning' is a process quite different to individual learning
Learning process	Individuals learn; they think and act	Organizations learn; they think and act	Organizations are sums of the collective actions and meanings
Developing learning	Ensure that individuals learn more effectively by improving their cognitive processes	Ensure that organizations learn more effectively by improving structural and cultural processes	Ensure that organizations learn more effectively by improving meaning creation processes

In the analyses following a predominantly individualistic view, the main focus is on the nature of personal learning, conceptualized as various cognitive processes and organizational mechanisms affecting those processes. Organizational aspects of learning are often reduced to psychological questions about the 'essence' of the mind, with less weight put on the social dimensions of knowing and acting. This approach is evident in much of the current knowledge management literature, which tends to argue that organizational level knowledge creation is not possible with-

out the prior individual level learning. For example Nonaka and Takeuchi (1995, p. 13) note that 'although we use the term 'organizational' knowledge creation, the organization cannot create knowledge on its own without the initiative of the individual and the interaction that takes place within the group'.

In contrast, the organizational 'hardware' approach takes a meso level view on the knowledge process, arguing that it is organization that learns, not the individual. Thus, organizational behavior is not to be seen as the sum of the individual actions and intentions, but more as a phenomenon driven by the structural properties of the social system. This perspective looks at the emergence and 'engineering' of knowledge as it happens within the complex information processing 'pipelines' and 'feedback mechanisms' of organization.

However, the systemic perspective is still rooted in the idea that although social in character, organizational learning and knowledge become understandable as we locate these concepts within the image of organizations as an information processing brain that operates according to the principles of neurological or cybernetic systems. In contrast to this, the organizational 'software' approach argues that organizations are fragile effects of the actions and interpretations of their members and that knowledge is constructed in social practices that are diverse and ambivalent in nature. The perspective is distinct from the individual level cognitive theories as well as from the structural approaches that treat learning and knowledge creation as a property of a system. One of the most elaborated theories that has emerged within the interactionist perspective is the discourse that looks at how learning and knowledge creation takes place in 'communities of practice'.

'Communities of Practice' as an Organizational Theory of Knowledge Creation and Learning

The term 'communities of practice' was first coined by Etienne Wenger and Jean Lave (1991). Academicians, technologists, and management professionals have discussed about knowledge and communities over ten years, both from theoretical and practical perspective. The concept of "communities of practice" can be defined as referring to informal social structures that have long traditions, all the way from tribes to today's informal groups. According to Wenger (1998), members of a community are informally bound by what they do together – from engaging in lunchtime discussions to solving difficult problems – and by what they have learned through their mutual engagement in these activities. A community of practice is thus different from a community of interest or a geographical community, neither of which implies a shared practice. A community of practice defines itself along three dimensions:

- **What it is about** – its *joint enterprise* as understood and continually renegotiated by its members.
- **How it functions** – *mutual engagement* that bind members together into a social entity.
- **What capability it has produced** – the *shared repertoire* of communal resources (routines, sensibilities, artifacts, vocabulary, styles, etc.) that members have developed over time.

Communities of practice develop around things that matter to people. As a result, their practices reflect the members' own understanding of what is important. Obviously, outside constraints or directives can influence this understanding, but even then, members develop practices that are their own response to these external influences. Even when a community's actions conform to an external mandate, it is the community – not the mandate – that produces the practice. In this sense, communities of practice are fundamentally self-organizing systems.

Communities can be seen composed of three elements: people, places and things (Lesser et al., 2000). *People* are the primary ingredient in any community effort. A community is composed of people who interact on a regular basis around a common set of issues, interests, or needs. In these communities, individuals participate through sharing experiences, pooling resources, representing the interests of larger groups, and building relationships with other like-minded individuals.

Secondly, communities need *places* for their members to gather. In conventional community environments, the place is often a physical space where members meet and exchange ideas and insights. But, in today's electronic world, meeting places do not necessarily have to be physical spaces. The development of the Internet has provided a virtual medium where individuals can effectively interact across boundaries of time and space.

Etienne Wenger (2000) talks about a critical activity performed within communities: the management of "boundary objects" or *things*. In the workplace, these objects are the rules, norms, procedures, tools, and other artifacts that communities use to accomplish their tasks. Individuals use these things as mechanisms for documenting and sharing what they know and how the work they perform should be accomplished.

Communities of practice are everywhere. We all belong to a number of them – at work, at school, at home, in our hobbies. Some have a name, some don't. We are core members of some and we belong to others more peripherally. You may be a member of a band, or you may just come to rehearsals to hang around with the group. You may lead a group of consultants who specialize in telecommunication strategies, or you may just stay in touch to keep informed about developments in the field. Or you may have just joined a community and are still trying to find your place in it. Whatever form our participation takes, most of us are familiar with the experience of belonging to a community of practice.

Communities of Practice in Organizations

Communities of practice exist in any organization. Because membership is based on participation rather than on official status, these communities are not bound by organizational affiliations; they can span institutional structures and hierarchies. According to Wenger (1998) they can be found:

- *Within businesses:* Communities of practice arise as people address recurring sets of problems together. So claims processors within an office form communities of practice to deal with the constant flow of information they need to process. By participating in such a communal memory, they can do the job without having to remember everything themselves.
- *Across business units:* Important knowledge is often distributed in different business units. People who work in cross-functional teams thus form communities of practice to keep in touch with their peers in various parts of the company and maintain their expertise. When communities of practice cut across business units, they can develop strategic perspectives that transcend the fragmentation of product lines. For instance, a community of practice may propose a plan for equipment purchase that no one business unit could have come up with on its own.
- *Across company boundaries:* In some cases, communities of practice become useful by crossing organizational boundaries. For instance, in fast-moving industries, engineers who work for suppliers and buyers may form a community of practice to keep up with constant technological changes.

Communities of practice are not a new kind of organizational unit; rather, they are a different *cut* on the organization's structure – one that emphasizes the learning that people have done together rather than the unit they report to, the project they are working on, or the people they know. Communities of practice differ from other kinds of groups found in organizations in the way they define their enterprise, exist over time, and set their boundaries.

- A community of practice is different from a *business or functional unit* in that it defines itself in the doing, as members develop among themselves their own understanding of what their practice is about. This living process results in a much richer definition than a mere institutional charter. As a consequence, the boundaries of a community of practice are more flexible than those of an organizational unit. The membership involves whoever participates in and contributes to the practice. People can participate in different ways and to different degrees. This permeable periphery creates many opportunities for learning, as outsiders and newcomers learn the prac-

tice in concrete terms, and core members gain new insights from contacts with less-engaged participants.

- A community of practice is different from a *team* in that the shared learning and interest of its members are what keep it together. It is defined by knowledge rather than by task, and exists because participation has value to its members. A community of practice's life cycle is determined by the value it provides to its members, not by an institutional schedule. It does not appear the minute a project is started and does not disappear with the end of a task. It takes a while to come into being and may live long after a project is completed or an official team has disbanded.
- A community of practice is different from a *network* in the sense that it is "about" something; it is not just a set of relationships. It has an identity as a community, and thus shapes the identities of its members. A community of practice exists because it produces a shared practice as members engage in a collective process of learning.

People belong to communities of practice at the same time as they belong to other organizational structures. In their business units, they shape the organization. In their teams, they take care of projects. In their networks, they form relationships. And in their communities of practice, they develop the knowledge that lets them do these other tasks. This informal fabric of communities and shared practices makes the official organization effective and, indeed, possible.

The importance of Communities to Organizations

Communities of practice are important to the functioning of any organization, but they become crucial to those that recognize knowledge as a key asset. From this perspective, an effective organization comprises a constellation of interconnected communities of practice, each dealing with specific aspects of the company's competency – from the peculiarities of a long-standing client, to manufacturing safety, to esoteric technical inventions.

Communities of practice fulfill a number of functions with respect to the creation, accumulation, and diffusion of knowledge in an organization (Wenger, 1998):

- They are nodes for the *exchange and interpretation of information*. Because members have a shared understanding, they know what is relevant to communicate and how to present information in useful ways. As a consequence, a community of practice that spreads throughout an organization is an ideal channel for moving information, such as best practices, tips, or feedback, across organizational boundaries.
- They can *retain knowledge* in "living" ways, unlike a database or a manual. Even when they routinize certain tasks and processes, they can do so in a manner that responds to local circumstances and thus is useful to practitioners. Communities of practice preserve the tacit aspects of knowledge that formal systems cannot capture. For this reason, they are ideal for initiating newcomers into a practice.
- They can *steward competencies* to keep the organization at the cutting edge. Members of these groups discuss novel ideas, work together on problems, and keep up with developments inside and outside a firm. When a community commits to being on the forefront of a field, members distribute responsibility for keeping up with or pushing new developments. This collaborative inquiry makes membership valuable, because people invest their professional identities in being part of a dynamic, forward-looking community.
- They provide *homes for identities*. They are not as temporary as teams, and unlike business units, they are organized around what matters to their members. Identity is important because, in a sea of information, it helps us sort out what we pay attention to, what we participate in, and what we stay away from. Having a sense of identity is a crucial aspect of learning in organizations. If companies want to benefit from people's creativity, they must support communities as a way to help them develop their identities.

Fluid communities of practice (Brown and Duguid, 1991) enable organizational members to have a legitimate status on the periphery, where they can watch each others and develop know-how. Learning is fostered by expanding access to these communities of practice, not by explicating of individual practice or by setting up formal teams. According to Dougherty (1995, p. 115), com-

petencies 'do not exist apart from the people' who develop them, 'nor from the social processes of interpretation and construction through which people make their experiences meaningful'. If, as organizational theorists C. K. Prahalad and Gary Hamel (1990) suggest, an organization is defined in terms of its "core competencies", then the constellations of communities of practice that embody these competencies are what gives an organization its identity in terms of what it knows how to do as an organization (Snyder, 1996).

Different members of an organization can take actions in their own domains to support communities of practice and maximize the benefits they can provide (Wenger, 1998). First, line managers must make sure that people are able to participate in the right communities of practice so they sustain the expertise they need to contribute to projects. Knowledge managers must go beyond creating informational repositories that take knowledge to be a "thing," toward supporting the whole social and technical ecology in which knowledge is retained and created. Training departments must move the focus from training initiatives that extract knowledge out of practice to learning initiatives that leverage the learning potential inherent in practice. Strategists must find ways to create two-way connections between communities of practice and organizational strategies, and change managers must help build new practices and communities to bring about changes that will make a constructive difference. Also accountants have a role, they must learn to recognize the capital generated when communities of practice increase an organization's learning potential. Facilities managers must understand the ways in which their designs support or hinder the development of communities of practice, and finally, work process designers must devise process improvement systems that thrive on, rather than substitute for, engaged communities of practice.

Managing with communities of practice

According to Pór (2003), as knowledge and technologies keep differentiating, so do markets and customers who ask for integrated solutions. Not only that, but we prefer to deal with one provider of such solutions rather than to incur the additional cost of having to deal with many. That's why organizations that want to stay competitive, feel the pressure to "grow in size, geographical scope, and complexity." Doing so, they may get a better chance to respond to increasingly complex market demands, and the technological and organizational conditions required to meet them.

From a technical perspective, the Community of Practice in context is quite simply a mechanism for collecting, storing, sharing, and using information around a given domain (Dillman, 2002). The purpose of which is, of course, to facilitate a more collaborative, productive, effective, and efficient result. It can be said, that the communities of practice is more than a set of roles in an organization; it's an integrated set of functions within the community defined by needs of the community and controlled by technical implementations of these functions. More to the point, these functions are predominately implemented through information technology within and across organizations.

Experience has shown over and over that what makes for a successful community of practice has to do primarily with social, cultural, and organizational issues, and secondarily only with technological features. It is more important, therefore, to address these social, cultural, and organizational issues than to seek endlessly for the perfect technological platform. Still, an increasing number of communities of practice today are geographically distributed and must rely on some kind of technology for keeping in touch. And even those that are co-located often need to keep in touch between meetings and to create a repository for their documents. So technological issues are relevant and it is worth asking what technology can do: what are the areas where technology can be expected to help?

The Role of Technology in Communities of Practice

When we try to understand the role of technology, we must consider what are the characteristics of communities of practice that lend themselves to support by technology. Technology platforms are often described in terms of features, and there can be found several such factors with examples of how a technology platform can affect the success of a community in each area. Wenger (2001) has listed the success factors of communities of practice that can be affected by

technology. These include presence and visibility, rhythm, variety of interactions, efficiency of involvement and connection to the world. There are also some issues to consider if organization wants to adopt a systemic community-based approach (Sharp, 1997). First, what are you trying to accomplish with technology? You need to decide which community success factors you are trying to prop up and then evaluate your choices of technologies accordingly. Secondly, do you want technology to modify behavior? You also need to decide what the system says about the place and role of communities in the organization. An aspect of this question is how much behavior modification you want to promote. All technologies to some extent influence behavior by placing emphasis on or facilitating certain processes, but some companies also take intentional steps to make their technologies reflect some principles or processes and influence behavior accordingly.

Some systems are designed as general utilities and some are designed to encourage certain behaviors. Some are meant to blend seamlessly into the way people behave already, for instance by using e-mail a lot. Others are meant to encourage specific behaviors, such as logging on to a distinct community space or reflecting on a model of how a community behaves.

Collaborative Technology and Communities of Practice

A collaborative technology is the use of a technology to support the construction of communal ways of seeing, acting and knowing (Roschelle, 1995). Collaboration allows a community of communicators to reconstruct a shared experience continually in order to produce greater meaning and greater potential for successful future action. A community of practice has collaborated to generate a common, shared understanding of events and an action orientation for dealing with such events the next time they arise.

A collaborative technology is one publicly used "in a shared perceptual space" to develop shared resolutions to problematic experience. The technology becomes an instrument of mutual knowledge construction for a group of people. The goal of a collaborative technology: the construction of communal ways of seeing, acting and knowing. A collaborative technology is a tool that enables individuals to jointly engage in active production of shared knowledge. For example, a storyboard is a tool that can enable script writers, set designers, and directors to construct a shared understanding of the film they aim to produce.

"Good collaborative technologies function by becoming a highly visible part of shared experience. By publicly acting on a problematic situation with a collaborative technology, a community collectively reconstructs its experience; this necessarily involves gesturing, pointing to, talking about, and in general juxtaposing the technology and the problematic situation."

To sum it up, communities of practice are important to the functioning of any organization, but they become crucial to those that recognize knowledge as a key asset. From this perspective, an effective organization comprises a constellation of interconnected communities of practice, each of which are dealing with specific aspects of the company's competency – from the peculiarities of a long-standing client, to manufacturing safety, to esoteric technical inventions. Knowledge is created, shared, organized, revised, and passed on within and among these communities. In a deep sense, it is by these communities that knowledge is "owned" in practice.

To develop the capacity to create and retain knowledge, organizations must understand the processes by which these learning communities evolve and interact. We need to build organizational and technological infrastructures that do not dismiss or impede these processes, but rather recognize, support, and leverage them. Communities of practice have functioned in organizations long before technologists and managers tried to provide specific facilities for them. The basic communication technologies that most organizations already have can be enough for some communities. Well-designed and implemented communities of practice can drive both the community and business forward in achieving valuable results.

Conclusions

In this paper we have proposed a new way of approaching organizational knowledge creation and learning, 'communities of practice'. We have looked at the discourse on knowledge management, identified its links with the organizational learning literature and discussed the various

meanings of 'knowledge creation', 'learning' and 'organization' that are present in the organizational studies of knowledge management. Our main task was to explore the key themes, concepts and managerial challenges in one particular perspective that the researchers in this area have named as the 'communities of practice' approach. It is our belief that the communities of practice perspective allows the theorizing and development of knowledge creation to focus on the social dimension of learning in a fashion that is largely missing or lacking in most of the existing management writings on the subject. More specifically, the COP approach can avoid the problems inherent in the individualistic cognitive theories as well as in the structural systems approaches to knowledge and learning.

The 'communities of practice' perspective emphasizes interaction, interpretation and the ongoing process of sense-making, storytelling and representation of those who participate in the work processes. With these qualities, it departs from the rationalistic views, which tend to highlight the objective aspects of social organization and the analogy between the features of a structured system and the orderliness and controllability of a work organization (Barley & Kunda, 1992). The ideology has its roots in Taylorism and Fordism (Morgan, 1997), but as Kilduff (1993) has noted, even the seemingly post-rationalist behavioral theory of organizations and decision-making (Simon & March, 1958) tends to assume a machine like system that has the capability to adapt and learn from experiences. Although the focus has shifted from physical to cognitive labor, there is a persistent habit in the organizational theorizing to render work manageable by suggesting that individual efforts can only contribute to the organization if they are assigned a role in the larger whole (Townley, 1994).

What is interesting for the debates on learning and knowledge creation is the observation about the pervasiveness of the systems thinking as the necessary element of a truly 'organizational' view (e.g. Senge, 1990), and the implications this has for the humanization (or the lack of it) of knowledge management. It seems that the main bulk of the knowledge creation writings, as well as the more popular writings in the learning organization debate, tend to reproduce the image of organizations as hierarchically structured systems. There is an assumption that in order to be effective, organization needs 'structure' to give its creativity some order and predictability, often in the form of bureaucratic structures and practices known to organizational scholars from the ideal type description of Weber (Morgan, 1997).

The communities of practice approach makes assumptions about the nature of organizational life that are different from the emphasis to be found from the mainstream knowledge creation writings and that draw more from the Human Relations legacy of the organizational theorizing and thinking than from the classical and scientific management paradigms. The Human Relations School (e.g. Roethlisberger & Dickson, 1939) was the one of the first movements to challenge the mechanistic and hierarchical paradigms, and the contemporary approaches like culture, quality or empowerment can be seen as continuations of the history of humanistic and communitarian approaches to management and organization (Barley & Kunda, 1992). The current discourse on learning in communities of practice shares many important insights with the human relations philosophy into the working of the organization, including a focus on informal rather than formal organization and the interest on the communal modes of social belonging that are needed to balance the mechanistic forms of industrial collectivity. As Styhrne (2003) notes, the human relations or human resource management perspective is in many respects close to the general spirit of the knowledge management literature which pays a lot of attention to the question of how to unleash the individual knowledge and competence of the workers in a way that benefits the whole work community and organizational performance. We have argued in this paper that such correspondence between human resource theories and knowledge creation theories can be found from the discourse of 'communities of practice'.

However, there are also considerable discontinuities between the early Human Relations developments and the contemporary theory of communities and practices at work. The first of them concerns the darker side of the community. While communities can be an important source of social integration and unity, they can also divide and exclude, a point made recently by Bauman (2000). The hierarchical segregation of people according to their gender, ethnicity, class or other social category can emerge as a result of the incapability of the communities to respond to the

challenges of diversity and difference. As Reynolds (2000) has noted, this is a challenge also in the modern learning organization discourse, where the humanistic intentions have not yet been complemented with a corresponding sensitivity to the plurality of the sub communities each drawing upon a more established societal or cultural collectivity. This might be a problem insofar as the intervention method enacts the principle of equality and is however informed by a limited vision of community as unity and consensus.

Another vexed question concerns the relationship between the individual and the context (Gherardi 2000; Fox, 1997). If learning and knowing are embedded in practice, knowledge creation needs to be understood primarily as situated engagement with the social and material elements of work. In the COP view, the individuals of the participants to a practice are shaped and finalized as the situations develop and the relations between the individuals, the context and the technologies become more patterned. There may be problems if the ideas from the debates about learning-in-practice are translated into a language that highlights the duality of agency and structure. Equally complicating may be an underlining idea that individual subjects are autonomous and self-contained entities whose knowledge creation can be understood as isolated reflection and mindset stretching in the confines of the reserved spaces of management development and corporate training.

The human relations legacy is an integral part of the COP approach to knowledge and learning, but equally important is the move towards processual thinking in social theory, and the implications this has for our analysis of peoples' everyday work practices in organizational situations. The introduction of the new theoretical views directs the attention to the unfolding of the concrete work processes as they are practically accomplished by the knowledgeable actors in the local contexts of technology, business and culture. 'Social' dimensions of learning and knowledge creation become visible as we think of organizations as heterogeneous associations of people, ideas and technologies that are continuously in a process of 'becoming' but without a stable 'bed-rock' to hold the fleeting networks of practice in place (e.g. Fox, 2000). People are already inscribed to these forms of sociality and unlike in the human resource management theory, it is not so much a question of how to motivate them to do what they know but how to make them aware of the knowledge they already use as competent actors of the prevailing practice.

Discussion

The concepts of 'communities' and 'practice' make us think of a world which is messy and constantly evolving and where professional work can be characterized as situational sense-making and practical adjustment in the varied organizational and technological contexts. The main difference to the dominant articulations of knowledge management is that the theory of practice approaches knowledge from a performative perspective (Latour, 1986), which basically assumes that whatever form of knowing or comprehension is used to generate socially and pragmatically meaningful action, this can be seen as a form of 'working knowledge' in that particular context. An ostensive understanding of knowledge, instead, starts from the idea that in order to make sense of what is the role of knowledge in organizations, one needs to define it so that it can be separated and analyzed in detail.

While the ostensive definition of knowledge distinguishes in beforehand what is 'knowledge' and who can be trusted to scan, validate and manage it, communities of practice theory has no presuppositions with regard to what kind of information or idea can be used to accomplish a practical task. Instead, knowledge can only be discussed as it is used in conjunction with a particular practice, often only in retrospect. There are no absolute guides as to where to look for the 'new' knowledge that has not yet been unplugged for organizational development. Instead, knowledge is whatever makes a heterogeneous network of people, beliefs and technologies to form a functioning whole around a practice. It can be 'read' from the stories the technicians are telling to each other about the pragmatics of a machine (Orr, 1996). Or it can be fully non-discursive and non-reflective like in a routine skill such as the competence to hammer a nail (Gherardi, 2000). Or alternatively knowledge can be seen as referring to the tacit skill of a senior academic to intuitively distinguish a 'good' piece of research from works, which are more or less intermediate.

When a performative definition of knowledge as something that is used to generate practice in a work community is employed, learning can be expected to emerge from scrutinizing and analyzing procedures and tasks that are normally seen as not containing competencies that could feed into knowledge generation. For example Styhrne (2003) describes a case study in a pharmaceutical company where the performative analysis of knowledge-in-practice suggested that the professionals were not aware of the learning potential of the clinical testing phase of the new drug development as the site for knowledge sharing. As in the knowledge management literature in general (e.g. Nonaka & Takeuchi, 1995), the main focus in the knowledge creation initiatives in the company had been on the research and product development activities. Yet also the clinical testing phase involved complex material and administrative arrangements that require advanced practical skills. However, these competencies were never discussed due to the perception that the knowledge-intensive tasks are located in the early phases of the new drug development process that follows the more traditional scientific model of discovery and innovation. Management initiated a series of knowledge sharing practices such as tutoring and informal seminars, which enabled the clinical researchers to feel more comfortable in their roles, to appreciate the 'knowledge' they already possessed as participants in the testing practice as well as to use their pragmatic sense of the working of the systems to improve the effectiveness of the operations.

Knowledge management is still led by technologists and economists, both of whom tend to see knowledge as something that can be codified, processed and managed. The debates in the field of organizational learning are closer to the spirit of Human Relations approaches, and they pay closer attention to the dynamics of the work communities and individual actors. The perspective provided by organizational learning makes an important contribution to the field of knowledge management by scrutinizing the knowledge creation potential of the ongoing social activities and arrangements around professional work tasks in modern organizations. Communities of practice can be seen as one of the most prominent approaches within the recent organizational learning discourse concentrating especially on the social and cultural dimensions of workplace innovations and knowledge creation. However, as has been argued, the full social theory implications of the introduction of the concepts of 'community' and 'practice' need to be systematically analyzed before they can be considered as constituting a working theory of organizational knowledge creation and learning in the modern business enterprises.

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