The Role of the HRM in the Construction of KM for the Innovation in Technological SMEs

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Abstract: The purpose of this research is to show the link between "human resources management" and the knowledge management in practice, within technological SMEs. We show that the HRM processes set up by the entrepreneur and his experts' collaborators in fact reveal more implicit KM practices that are deliberately integrated into the rganisation through community of practices. The community of practices offers a new opportunity to assist entrepreneur in decision making to innovate by the knowledge management. The centrality of the entrepreneur is reduced for the benefit of the members of the community of practices. We used a methodology known as PAR (Participatory Action Research) strongly mobilized in the study context regarding knowledge transmission, training and recruiting. This methodology allows to both meet the organization's expectations in terms of management and knowledge transfer, and data production based on a scientific method.

Keywords: Knowledge Management, HRM, communities of practices, Expert, Hightec SMEs

1. Introduction

In France, the industrial policy of encouraging technological innovation is supported by HRM services such as the formalized management of competences, recruitment and training. These kinds of services are influenced by the HRM norms (Pichault and Nizet, 2001) and strategy of large companies or bureaucratized organizations (Mintzberg, 1987). The aim is to identify and make explicit the required competences in specific jobs and providing the associated recruitment and training in accordance with the strategy (Pichault, 2007). If knowledge is considered as the competitive advantage of SMEs (Sparrow, 2001), this orientation of the Human Ressources to technological SMEs then raises the question of their articulation with Knowledge Management (KM) in practice and in theory. KM is defined here as a strategy for managing organizational knowledge, supporting decision-making, building up competitiveness and improving creative and innovative capacities (Zyngier et al., 2004). Whereas in large companies the HRM process and the design of its tools are separated from the KM process (Sparrow, 2001; Mac pherson, 2005), this is not generally the case in SMEs where the entrepreneur integrates these two functions in practice (De Souza and Awazu, 2006). It is still less the case in technological SMEs (Gourlay, 2001). Under the influence of his own technological knowledge acquired through experience and learning, the entrepreneur develops the HRM practice in an implicit KM (Hutchinson and Quintas, 2008; Macpherson and Holt, 2007). This approach implies to consider the role of HRM processes in KM (Sveitlik and Costea, 2007) in technological SMEs.

By focusing on specificities of KM in technological SMEs, we thus consider two questions in this research 1/ How does the entrepreneur use HRM process to create KM flows in order to innovate in technological SMEs? 2/ In the practice, how does the implementation of the link between RH and KM take shape?

The data collection methodology is that of Participatory Action Research (PAR) (Kindon, Pain and Kesby, 2010), conducted over a three-year period in an optics and photonics cluster. Our job is to combine a Research and Development approach with operational function to offering HRM services to support innovation in young SMEs (less than ten years old, where the founder is still in place). With the PAR, we collected data by scientific initiatives (interviews, observations) integrated into the operational practice. We processed the data via the software Nvivo which allowed us to analyze according to codes previously established.

After presenting and establishing the theoretical framework of the approach based on specific link between KM and HR in technological SMEs, we shall set out the PAR methodology and then the results of this study. The originality of this paper is to show that beyond the strategic dimension, the practices of human resources and Knowledge Management are deliberately created and linked by the entrepreneur to assist him in decision-making to innovate. Doing so, his objective is to develop the knowledge for the innovation in SME.

2. Theoretical approach to KM in SMEs

In technological SMEs, the organizational arrangements orchestrated by the entrepreneur play a fundamental role in innovation (Sparrow, 2001); they are at the heart of the productive activity (Atherton, 2003) and structure the knowledge flows (Tsoukas, 1996). While for some authors the design of the knowledge-flow organizing processes is

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centralized and personalized by the entrepreneur (Evangelista et al., 2010), other authors stress the combination of knowledge between the entrepreneur's expertise and that of his co-workers (Tsoukas, 1996). In technological SMEs, as in communities of practice (According to Wenger (1998), a community of practice defines itself along three dimensions: its joint enterprise, a mutual engagement, the shared repertoire of communal resources) (Lave and Wenger, 1991; Brown and Duguid, 1991), knowledge is said to be constantly produced and negotiated, dynamic and provisional (Gherardi and Nicolini, 2000). However, in technological SMEs, these knowledge flows appear inseparable from the central role and intentionality of the entrepreneur, practising a KM based on his own technological knowledge incorporated into the strategy of innovation. This type of KM, which some authors call informal (Hutchinson and Quintas, 2008) and others implicit (Nunes et al., 2006), questions the pertinence not only of KM tools but also of HRM centred on formalization of knowledge (Gourlay, 2001) and orienting recruitment and training.

In young technological SMEs, the entepreneur's expertise seems to combine with the knowledge flows in the community of practice to which he belongs, for an integrated conception of HRM and KM processes (Gourlay, 2001). The centralization of the management can be discussed for the benefit of a more shared approach particularly in the management of the innovation.

2.1 Personalization of KM and HRM through the expertise of SME's enterpreneur

Both HRM and KM have been shown to be powerful factors in the success of organizations and more particularly in SMEs (Jorgensen and Keller, 2008; Clancey and Sierhuis, 1997).

Comparison of the KM cycle with HRM practices reveals many activities shared by these two approaches (Sveitlik and Costea, 2007). Knowledge acquisition is found, for example, through external recruitment of individuals who will support learning and growth as individuals and professionals (Sveitlik and Costea, 2007). Similarly, in SME studies, Wong and Aspinwall (2005) argue that training activity is a source of KM implementation.

Contrary to large companies (Scarbrough, 2003), informal KM integrated with HRM processes based on socialization is regarded as a lever effect that makes it possible to achieve the strategic aims efficiently and effectively in SMEs in various sectors (Desouza and Awazu, 2006). The work of Sparrow (2001) and Scarbrough (2003) show that innovation processes in SMEs are facilitated by cohesion between KM and HRM. The functional distinction between KM and HRM is rare in SMEs, because of the centrality of the manager in the organization of activity at ground level and his role in strategic decision-making (Sparrow, 2001).

In the case of technological SMEs, this centrality is based on the technical and scientific expertise more than managerial expertise (Starbuck, 1992). This expertise is at the origin of the innovation (Carter et al., 2003) and comes from the experience of highly qualified entrepreneur (engineer, researcher). In the definition of the expert, Tynjälä, (1999) shows that the nature of the expert is to mobilize all these knowledge to identify, acquire, manage and develop these knowledge (Tynjälä, 1999). This natural characteristic of the expert is called metacognitive activity (Tynjälä, 1999). In fact, the entrepreneur does not centralize the management but he throws practices and process from these mental models (Jonhson and Laird, 1983) for the innovation in technological SME. This argument would explain KM strategies centred on personalization rather than codification (Zanjani and al., 2009) in technological SMEs, beyond the pursuit of efficiency. To Zanjani and al. (2009), "personalization is a strategy to manage the knowledge that is produced by human interaction".

So the socialization of Desouza and Awazu (2006) is not the only way to the KM technological SMEs and the embedding of KM flows is achieved through the metacognitive (Metacognition is an activity of reflection on one's own knowledge and sharing) activity of the entrepreneur who develops his own approach (Norris and Krueger, 2007) of knowledge management. Indeed, Sparrow (2001) suggests that SMEs develop their own understanding of KM. He thus concurs with other authors whose results show that even if they do not have an explicit KM strategy, technological SMEs have implicit strategies and guidelines for KM issues (Nunes et al., 2006). KM integrates procedures and management with work organization in the company (Nunes et al., 2006) such as HRM process. KM is based on informal way to renewal constantly the technological and even scientific knowledge that is the source of innovations (Nunes et al., 2006).

Atherton (2003) even argues that successful development of an SME depends on its ability to work in and with learning, which converges with the expert entreperneur's metacognition through the KM cycle (Nonaka and Takeuchi, 1995) (acquisition, creation, transfer). Acquisition corresponds to the search for knowledge and information from different sources, knowledge creation corresponds to the development and expansion of the base of new knowledge, transfer corresponds to distribution and sharing (Svetlik and Costea, 2007, p. 200-201).

The structuring of knowledge creation (Von Krogh, 1998) within technological SMEs is different from other organisations (Quintas et al., 1997) and it would seem that the functioning of this type of company would then be very close to that of an intentionally created community of practice (Ackerman et al., 2008).

2.2 KM in decision-making to innovate, the role of community of practice

Argyris and Schon (1996) presented "communities of practice" (CoPs) as the intermediary that makes possible individual learning based on a collective validation of knowledge. Communities of practice have been found to support knowledge creation by knowledge sharing among experts in firms (Wolf et al., 2011). They are ''groups of people informally bound together by shared experience and passion for a joint enterprise'' (Wenger and Snyder, 2000, p. 139). Knowledge sharing then takes place in a situated dimension (Lave and Wenger, 1991; Clancey and Sierhuis, 1997) of the everyday life of the "community" or work collective (Brown and Duguid, 1991). A CoP brings stable collective references into individuals' identity and cognitive construction, and enables them and the group to learn knowledge sharing processes (Lave and Wenger, 1991) and represent a favourable context (Nonaka and Konno, 1998) to create opportunities for innovation (Cook and Brown, 1999).

When these communities are supported and remain oriented by the task for which they were created, they facilitate knowledge use, development, management and storage (Snowden, 1997) and knowledge transfer (Macpherson and Holt, 2007). Gourlay (2001) even argues that knowledge is "better" managed in this type of group than by a formal KM and HRM processes devised outside the community. Nicolini et Gherardi (2000) also argue in this direction when they explain the rules of work inculcated in training programmes offered by management are not appropriated by the members of a CoP: this is governed by its own working rules which are constitutive of individual identity and social membership of a group. HRM processes that consist in identifying and making explicit the skills in jobs so as to be able to plan the recruitment and training would present a problem in the presence of a work collective close to communities (Legge, 1989; Pichault 2007).

These approaches converge on analyses of the role of organization in the structuring of technological SMEs (Quintas et al., 1997; Von Krogh, 1998).

In their analysis of innovative SMEs in clusters, McAdam and Keogh (2004) approach CoPs in SMEs as a form of structural innovation to support innovation. They mediate the strategy and support processes of innovation and creativity by making employees feel responsible and committed. Sparrow (2001) shows that the adoption of consultative processes and "learning by doing" approaches are indeed developed within SME communities of practice. McAdam and Koegh (2004), stress the strategic role of the ability of employees belonging to CoPs in SMEs. It is then clear why individualization rather than institutionalization of KM is predominant in technological SMEs as a KM tactic (Zanjani et al., 2009). Indeed, according to Zanjani et al. (2009), whereas institutionalization is based on the formal aspect validated and recognized by the collective in socialization, (For example, giving a young recruit a collectively validated information and introduction guide is a form of institutionalization) individualization emphasizes the informal aspect in small groups supporting knowledge sharing at the individual level:

> *"Individualized tactics allow knowledge sharing to take place using an informal and decentralized approach so in small organizations, individual tactics may serve the knowledge sharing needs of the organization adequately as employees frequently meet each other in the hallways" (Zanjani et al., 2009, p. 372).*

We then assume that this perception of KM reinforces the positioning of the CoP within knowledge acquisition, creation and transfer processes.

The question of the SME entrepreneur role was not addressed in this approach. Nevertheless the traditional literature (Torres, 2004; Evangelista et al., 2010) highlights the centrality of management by the entrepreneur in SME more prescriptive. The entrepreneur creates an *"egofirm"* (Torres, 2004) and seems to be alone in the decision-making process. In technological SME, the concept of community of practice allows to discuss this centrality. Clancey and Sierhus (1997) explain that communities of practices are created by legitimated people. In technological SME, we saw entrepreneur is an expert and he creates a community of practice with experts to share the knowledge and secure the "best"decision. Since the nature of an expert is to discuss his knowledge with his peers, we suggest that the centrality of the entrepreneur role can be reduced for the benefit of a scientific collective process of knowledge validation: Communities of Practice

2.3 The entrepreneur connects KM and HRM to innovate

In large companies, the question of the governance of the CoP brings out the complexity of therelationship between the hierarchical authority of the entrepreneur in his management and the authority of the CoP (Pattinson and Preece, 2013). Clancey and Sierhuis, (1997) show that CoPs in the case of SMEs are produced by the permission of individuals legitimate within the organization. In technological SMEs, technological knowledge of the entrepreneur and his expert's position support his authority in the community (Métailler, 2015).

Jorgensen and Keller (2008), argue that the condition for the creation of knowledge within the CoP comes from the alignment of such KM with the practices of management and the activities of the firm. HRM practices would be then directly involved in the knowledge cycle.

The entrepreneur does indeed occupy a hybrid position, as one among peers within CoP and in a position of authority through the employment contract, which implies a position of subordination in the organization and performance of work. The expertise of the entrepreneur in the choice of HR processes materializing the knowledge stemming from his expertise is re-configured by the knowledge of the CoP, which has an authority of its own.

We then suggest that, in the presence of a CoP, the entrepreneur of a technological SME has no choice but make his expert knowledge dialogue with that of the other experts in his community to organize the KM flows in the HRM processes.

The notion of "distributed expertise" (Hatchuel; 1996) in technological and scientific knowledge then makes it possible to relativize the idea of centralization of the strategic decisions orienting the knowledge flows in this type of SME. This notion suggests a consultative role (Sparrow 2001) of CoPs though an organizational design drawn up in discussion with them (Jørgensen and Keller, 2008). The knowledge flows are thus constructed individually and collectively at the heart of a work organization by different socially recognized and encouraged practices (Nicolini and Gherardi, 1991).

The intentionality of the entrepreneur in the construction of KM flows in the SME then consists in setting up mechanisms to encourage individuals to practise behaviours of knowledge sharing and selection of this knowledge from the environment (Grant, 1996; Macpherson and Holt, 2007) such as CoP. This prescription is based on the entrepreneur's past experience (Musyck, 2003) and his perception of the environment (Nicholls-Nixon et al., 2000); it represents a tactical solution to the quest for alternative sources of knowledge lacking in the company (Deakins et al., 2000).

Recruitment in technological SMEs would therefore follow rules close to those of the CoP. Thus, whether it is formal or not, a CoP is self-organized and its members are recruited by co-option (Wenger and Snyder, 2000). These authors stress the importance of the structuring of the community by itself and the central role of the knowledge specific to the activity in the organization of knowledge flows through recruitment.

Pattinson and Preece (2014) show that in innovative technological SMEs, everyday problem-solving with client partners favours the acquisition of individual knowledge. They then demonstrate the importance of individual learning in innovation and show how in SMEs built on scientific and technological knowledge, the CoPs, made up of experts, favour and support knowledge transfer by performing "on the job training" and development functions. CoPs thus constitute a favourable context for the transfer of tacit and informal knowledge among experts and between experts and novices (Anderson et al., 2001). By recourse to HRM processes on which he is the final arbiter, the entrepreneur is then the monitor of the KM flows in the community that he has initiated by HRM process. HRM processes create KM flows and CoP. This one allows to guide the entrepreneur through his decision-making

3. Data and methodology

In December 2010, a CIFRE (Conventions Industrielles de Formation par la Recherche: a scheme under which a company is subsidized to hire a doctoral student with a view to collaboration with a public research laboratory.) Agreement was drawn up between the OPTITEC competitiveness cluster and the research laboratory specialized in labour economy and human resource management. Established in two regions, (Region of Provence-Alpes-Côte d'Azur and Region of Languedoc-Roussillon) this cluster represents the optics and photonics sector of southern France. It consists of a population of 115 industrial companies, 85% of which are SMEs created in the 2000s, occupying market niches in optic and photonic technologies for the environment, health and defence/security/aerospace industries.

3.1 Méthodology

The objective of this agreement was to analyse the HRM process and KM practices in SMEs to support innovation. The collection of research data presented here resulted from an activity as an employee with a dual – complementary and dependent – function in the operational team of a competitiveness cluster which was negotiated and decided with the governance of cluster at the signature of the agreement:

- A function as a strategic workforce planning officer within the cluster;
- An R&D function in a public research body.

In this study, we mobilized a methodology called Participatory Action Research (PAR) (Kindon, Pain and Kesby, 2010) which assimilates this dual posture. This methodology makes it possible to respond both to the expectations of the organization in terms of knowledge management and transfer and to the production of data in accordance with a scientific method. PAR is defined as a collaborative process of research, education and action (Hall, 1981) explicitly oriented around a social transformation. The researcher and the participants identify and examine a situation of change or a research object in order to improve it (Wadsworth, 1998). Research operations are then initiated in order to highlight the possibilities, capacities and evaluations of the action concerned on the basis of research work and materials derived from practice. This methodology coordinates the bodies in charge of the creation and development of knowledge and those who use this knowledge in the framework of action on industrial or social development. It legitimates our positioning within the cluster as an actor in the creation of knowledge, in interaction with the bodies and institutions in charge of what is commonly called competence management. It also enables us to enrich the scientific work by the collection of original materials directly derived from the operational function, such as documents, and observations from the implementation of the strategic workforce planning mechanism for the businesses in the cluster.

3.2 Data collected &data analysis

The PAR methodology thus makes it possible to include on the same footing the traditional methods of research in management science such as semi-structured interviews and focus groups of the collective action, and also visual and performative methods derived from action in a scientific perspective (Kindon, Pain and Kesby, 2010).

We make use in this study of two types of complementary resources that stem from a dual positioning:

We draw on ten interviews carried out in SMEs (To target the SME population concerned here, we used the definition of the GREPME (*Groupe de Recherche en Economie et Gestion des Petites et Moyennes Organisations et de leur Environnement*) (1994), which approaches SMEs by five characteristic features (smallness, centralized management, low specialization, simple or relatively non-unorganized internal and external information systems, and an intuitive or relatively non-formalized strategy). numbered 1 to 10 in the labelling of the transcripts, in the framework of the research work of the laboratory. Positioned as a researcher and as an external member of the cluster, we carried out interviews with an average length of two hours thirty minutes, always on the premises of the business itself. The interviewees were always the entrepreneurs of SMEs, all trained as engineers and aged between forty and fifty-five. In this exploratory phase, we opted for semi-structured interviews so as to give the managers the opportunity to express themselves freely and exhaustively, in order to understand how they approached the topic. We did not concentrate exclusively on HRM and competence management processes but approached the topic in a way that was more integrated with company strategy and organization. The interview guide was thus constructed around the following axes:

- The company
- Technology, strategy and organization: developments in technologies and associated knowledge
- HRM and KM: knowledge management processes.

Using the possibilities of PAR we mobilize a second resource resulting from a different posture. We analyse a collective action of competence management carried out within the cluster for five SMEs numbered 11 to 16 in the labelling of the transcripts, which we set up and co-constructed with our partners in the framework of our operational function. We here played a role in the participatory research as a participating actor and observer. This action was initially designed to support five to ten SMEs belonging to the cluster in their competence management and in integrating strategic workforce planning tools. In our case we carried out the action with five companies. We have implemented an intervention that diagnoses the revelance of practices to innovate in each company during 5 days and 3 collective times to favour the experiences feedbacks between entrepreneurs.

By our expertise developed in the cluster, we have reoriented the diagnostic towards topics concerning the following KM processes of the SMEs to support innovation:

- Work organization,
- KM and specificities of SME management

These five companies are alos represented by their five entrepreneurs during 3 working sessions of 4 hours to discuss about the feedback of the interventions. The working sessions are co-animated with institutional partners and the subjects are "KM practices to improve innovation process".

We shall analyse the following material: the discussions around the diagnoses, the exchanges in the focus groups involving the entrepreneurs, the summary document and debriefings carried out by the institutional partners, the content of the training identified by the partners and validated by the companies, and the various research notes made the context of the participant observation.

The data presented are coded with Nvivo in three main dimensions, present in the main question of the interview and the follow-up questions.

These 3 dimensions are the following:

- Recruitment in an innovative environment:
- Training in a context of expertise
- Work organization in an expert community

In the framework of the exploitation of the transcripts and for each dimension of analysis, the data are not exhaustively integrated. The extracts chosen are intended to sensitize the reader to the reasoning of the actors studied and their language, while bringing to light the social categories of their practices.

4. Results

In this part, we study the perception of the formal HRM mechanisms with the specificities of the management of persons and knowledge in SMEs. These results are aimed at understanding what KM processes are mobilized in SMEs and why the expert and technical managers of SMEs have integrated these processes into their everyday activity.

4.1 Recruitment, a decision-making shared and based on KM process

When SME entrepreneur are asked about recourse to recruitment institutions, 12 about of 15 SME entrepreneurs do not see "the interest of such a procedure" (Company 3), which they may find too complex and too time-consuming in relation to performance.

"No, we don't work with the recruitment partners, it's too complex" (Company 1)

It can thus be understood why the recruitment assistance services offered by the employment partners do not represent a solution in themselves.

"… first and foremost we do it through our connections [connaissances] because they perform well from the start and meet our needs rapidly" (Company 2).

The question of the knowledge [*connaissance*] of the novice can be seen as an element in its own right in consolidating a company strategy. Recruiting constitutes a considerable "risk" for the SME entrepreneur inasmuch as he has to acquire knowledge and integrate a "satisfactory" and "reassuring" competence.

"We only do it through the network… it's reliable and meets our needs" (Company 3).

With the phrase "*our* needs," used spontaneously and recurrently, the entrepreneur does not separate himself from the community in the activity of recruitment and acquisition of knowledge by HRM through the collective validation of the need.

The phrasing used in Company 2 and 3 enables us to explore further the role of the knowledge and the social network of the CoP in the recruitment process. The community asserts itself as guarantor of a new scientific contribution (initial value).

> "We are all experts in our fields so we know how to identify the people who may interest us in terms of our needs and requirements. And then, when one of us knows someone, he already knows what that person will

> bring us [as regards knowledge]. Then he talks to us about it, but except in extreme cases… well, in general, when one of us validates, the others agree. It's not democratic, it's just that we and think things the same way." (Company 12)

In this except, the recruitment processes observed (network recruitment) within the SME then seem to correspond to a practice of consulting the CoP. The use of "we" ("our requirements," "we are experts," "our knowledge") in the remarks quoted shows the involvement of the CoP in identifying the scientific and technical knowledge lacking in the company and its collective validation by the community. This approach reveals the importance of the consultative aspect of the CoP in knowledge acquisition and its involvement in the processes of KM by HRM.

> *"Well, to start with, when we have a need, generally it's because we have long-term projects, and then we recruit. The new recruit starts his job, and contributes his added value directly, but then as time goes on he transmits [his knowledge] to his colleagues, informally, but he transmits it all the same, that's the aim…We all have our specialities but we are still all technical experts, so we understand one another" (Company 11).*

The novice contributes directly in a first stage to the conception of the product or service.In a second stage, he supplies the CoP with his knowledge identified and validated by the community, and makes transfer of knowledge to the experts.

So when the entrepreneur consults community to recruit a new expert, he tries to validate scientifically the knowledge of the novice to reduce the risk of his decision-making. By the recruitment, the entrepreneur with CoP create KM flows wich assist him in decision making. This approach relativizes the central position of the entrepreneur in the knowledge acquisition process. For while he remains alone in the decision-making, the consultative aspect of the CoP in the analysis of needs seems preponderant. As regards knowledge, the entrepreneur seems to share expertise with the community to ensure the acquisition and transfer of knowledge in technological SME.

4.2 Self-training, an implicit KM process to develop technical knowledge

The absence of formalized process does not imply an absence of strategy. Asked about the modes of training and the development of knowledge, the SME entrepreneurs almost unanimously (13 about of 15) answered: in-house training. The analysis of similar transcripts enables us to understand why the SMEs' training is done intra-organizationally within the cognitive space of the company in accordance with the specific mode of recruitment previously observed.

> *"We only train ourselves in-house, there's no training plan. Management training and so on is of no interest to us. Because we can't find anything in technical training, we train ourselves here…" (Company 10).*
>
> *"For everything technical we train ourselves in-house" (Company 5).*

As in the case of recruitment, the entrepreneur shows his sense of belonging to the community of experts by regular use of "we". The community seems here to have validated the technical gaps in training that correspond to its needs. By the discourses analysis, we can even suggest that, from a technical point of view, the entrepreneur involves the community to manage knowledge by identifying the gaps but also the opportunities, through projects, problem solving…

> *"We provide training in-house by technology watch, through projects, in a word, everything that makes up the environment of our activity…" (Company 2).*
>
> *"Here, at the technical level, we train ourselves. There's our technology watch of the sector, the company projects, collaborative projects, national and international trade fairs, everything you can find around the activity" (Company 7).*

From the entrepreneur's representation, the CoP tends to preserve its competitiveness and its expertise. The community seeks to create knowledge by mobilizing, within the activity, all the resources for development of informal knowledge available to it.

The identity of the community experts including their metacognitive activity can then be seen as one of the levers for development of knowledge in the SME community. The idea of co-constructed and shared expertise thus intervenes to expand the notions of work organization centred on the manager.

As one of our interviewees neatly phrased it, in-house training is seen as:

> *"…a regular system that allows more reactivity and meets our requirements by mobilizing our resources" (Company 8).*

In a first stage we can consider the implications of this material. It is relevant here to note that we only interviewed SME enptrepreneurs. While the enptrepreneur remains the sole decision-maker, “meets our requirements” confirms the responsibility given to the expert members of the CoP in the decision-making process.

> *“We do a lot of in-house training because it is more effective in terms of the needs of the company, since we directly target what the person concerned has to work on” (Company 10).*
>
> *“In general we have one expert per domain in the company, who is the reference and trains himself in his area and then passes on the information to the others” (Company 4).*

This organization of work through domain experts is intended to enable the performance both of productive work in its own right and work of diffusing information that can be assimilated to a transmission. This configuration allows a coordination of experts and mutual adjustments of knowledge. The specific HRM processes are embedded in the organisation. They consist in organizing knowledge through the metacognitive activity of the experts in the community.

The knowledge of the experts acquired through recruitment and training are put into practice in the activity and the organisation of technological development. CoP involves to support and structure knowledge through transfer. In the same time, reflexive analysis of knowledge in the CoP leads to a structuring of HRM processes (recruitment, technology watch, on-the-job training), bringing to light the needs of knowledge.

The SMEs observed prefer more informal RH processes, functionally, organizationally integrated within knowledge flows into the activity and the organisation such as CoP.

> *“When one of us is working on a project he gives a technical explanation to the others, and, look around, it’s a small open space, so that we can all see, discuss and ask one another for help” (Company 1).*

This extract brings to light the concept of knowledge transfer within the community. The entrepreneurs perform in one and create a “cognitive” distribution of work based on “everyone’s specialities,” putting together. This organizational configuration is deliberately designed for knowledge sharing and on the job training.

> *“Here we exchange a lot, it’s easy in a space like this… among ourselves” (Company 4).*
>
> *“…as we only have experts, everyone is training himself on a daily basis and through our contacts with one another…” (Company 10).*

These transcripts show clearly the ambiguous place of the manager, who sees himself both in the community (“we”) and at the same time as the prescriber of work organization in the physical space.

> *“For us, training happens every day, we are constantly on the look-out, we all talk to one another, and since we only have domain specialists, everyone is training himself all the time” (Company 3).*
>
> *“Our closeness means that we are constantly training one another through our daily contact” (Company 7).*

This organizational arrangement then appears as a dynamic process of knowledge transfer from the CoP to the entrepreneur. KM cycle is set in a continuum in which the practices of training between experts and above all a mode de recruitment structuring the acquisition of knowledge reinforce the common knowledge base but also enrich the knowledge flows.

All in all, SMEs show specific recruitment processes because they offer the opportunity to acquire new knowledge quickly to the CoP; CoP structure knowledge transfer and creation through implicit training. To assist the entrepreneur in the decision-making, technical expertise in community then appears as distributed. This approach relativizes the centrality of the entrepreneur in the management of SMEs and legitimates the consultative role of CoP. The distributed expertise in CoP appears like a condition to manage innovation by scientific validation of the knowledge in decision-making for the technological SME.

5. Conclusion and discussion

Knowledge management is at the heart of technological SMEs. We have tried here to understand KM processes in technological SMEs from a practical point of view. We have then observed the articulation of HRM and KM in a dynamics of identification, acquisition, creation and use of knowledge in technological SMEs focusing on recruitment and training.

The aim of this research was twofold: to understand 1/ how the entrepreneur uses HRM process (recruitment and training) to create KM flows in order to innovate 2/ how the implementation of the link between RH and KM takes shape in the practice. Analysis through a participative longitudinal methodology (PAR) then makes it possible to propose an articulation of implicit et informal KM through HRM practices that are non-formalized, integrated into the everyday activity and organisation of the company. HRM thus appears as a means of directly integrating the KM flows stemming from expert knowledge necessary for the internal construction of innovation processes (Grant, 1996).These results go beyond the consultative aspect of Community of Practice (Sparrow, 2001) to involve cognitively the experts of the SMEs in the decision-making to innovate. This approach does not reduce the revelance of the entrepreneur in the management of the SME but shows that it bases on a scientific validation of knowledge for the decision-making to minimize the risk. Our results also bring to light the role of distributed expertise within the CoP, which supports the entrepreneur in decision-making. This approach tends to put in perspective the centrality of the entrepreneurs for the benefit of a shared approach based on knowledge, that are specific to tehcnological SMEs.

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