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## Factors Facilitating and Hindering the Implementation of Communities of Practice in Smes: An Exploratory Study

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*In recent years, interest in “Communities of practice” (CoPs) as a tool for knowledge management and employee participation has increased in international management literature. However, their potentialities for small and medium-sized enterprises remain largely unexplored.*

*This research makes a contribution in this respect analyzing the implementation of “Communities of practice” in nine Spanish small-scale organizations. The information collected for the analysis comes from a questionnaire administered to participants in the learning communities at two different points (the beginning and official end of the project) and from semi-structured in-depth interviews with the coordinators and consultants intervening in the experience.*

*Small and Medium Enterprises can also successfully implement CoPs. Specific advantages are on their side, although they need to overcome significant barriers.*

**Keywords:** *CoP, small, firm, knowledge management, factors, implementation.*

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## Introduction

Organizations and firms in particular, are faced with a need to adapt to the increasingly changing conditions of the environment. The knowledge they require –and, to some degree, possess- in order to tackle the challenges they are set, remains trapped and compartmentalized by structures, processes and cultures that are low on flexibility, transversally and permeability. One of the possible answers that firms can develop to get over this handicap are learning communities (CoP). Indeed, authors such as Guptill (2005) suggest that the establishment of such work groups represents the most effective method for building Knowledge Management (KM).

Communities of Practice are work groups whose purpose is to generate, share and maintain knowledge, especially that which is the most tacit or hard to capture or articulate (Hildreth and Kimble, 2002). Thanks to the quality they possess for developing connections, relations and a common context among those who seek information and sources, CoPs can become a tool that reduces barriers to knowledge exchange within organizations (Lesser and Fontaine, 2004), thereby facilitating the generation of solutions to some business problems.

Since the current of Knowledge Management (KM) came into being at the end of the 1980s, experiences of that kind have been developed with growing interest, mainly in large firms, and, as a result, the scientific literature began to refer to CoPs, and to analyze different features of their functioning. Notwithstanding, there is insufficient literature on the organizational processes that lead to the creation of these structures (Anand, Gardner, and Morris, 2007; Harvey, Cohendet, Simon, and Dubois, 2013).

Du Plessis (2008, p. 66) suggests that CoPs can stand as the introductory tool for KM in SMEs. The empirical literature analyzed, however, reveals an absence of documented experiences of implementation of CoPs in SMEs, and very little attention has been paid to this area. It is a well-established fact that, because of the specificities of SMEs, their management follows different parameters from those of the big firms and the implementation of CoPs might, in consequence, be expected to be conditioned by different factors (Roberts, 2006). In addition, it is hard to identify SMEs where such practices occur, because management experiences

in companies of this kind do not usually get reported due to their low relational capital.

Another of the deficiencies observed in many of the studies carried out to date is that they offer a static view of the communities, in that the registers utilized do not provide knowledge of their development over time.

This investigation, therefore, will focus on making a contribution to these aspects that have been less developed in research terms. The main questions this work seeks to address are: can CoPs function in SMEs?; what results do they yield?; and, what are the keys to implementing them? To this end, an analysis is performed of the creation and implementation, between October 2012 and July 2013, of CoPs in nine small-scale organizations in the Basque Country (Spain).

The paper begins (section 2) with a brief review of the literature on CoPs in order to define their principal characteristics and features of functioning. The third section goes on to set out the experience we have analyzed, along with the information sources employed. In section 4, we refer to the results obtained, whilst the fifth analyses the factors that facilitated the good functioning of CoPs, as well as the barriers that have been perceived in the development of the works undertaken. The study comes to a close, in the sixth section, with the conclusions.

## **Learning communities**

Synthesizing the characteristics alluded to in the main segment of the seminal literature on CoPs (Lave and Wenger, 1991; Brown and Duguid, 1991, 2001; Wenger, 1998; Wenger and Snyder, 2001; Lesser and Fontaine, 2004), we may say that CoPs are groups of people that have the following characteristics:

- They organize themselves autonomously around a problem, topic or area of action, where participation is voluntary;
- The people they are composed of are grouped around a shared interest and also, generally, have shared experience and enthusiasm. Wenger (1998) and Hislop (2004) stress that they share some values or, at least, a view of or perspective on their environment;
- This common interest frequently has its origins in the actual members of the CoPs (they are informal groups), unlike other organizational structures created through external work methods or

pressures (such as a formal structure, for instance). Nevertheless, a growing number of firms are facilitating the creation of CoPs in order to promote knowledge exchange mechanisms among their members;

- They regularly interact sharing knowledge and learning in terms of their common interests and/or the work methods they use;
- The relations developed between members of the CoPs are a key factor for the creation of trust between members, and of collective identity, feeling of belonging and of roles between members. Trust diminishes individual resistance to sharing knowledge;
- They represent a shared project that is permanently subject to the decisions that its members adopt concerning it via consensus.

In their seminal work on CoPs, Lave and Wenger (1991) show that knowledge and processes to manage it (creation, codification, storage, transfer, absorption, etc.) are social processes. Learning is a process of social participation (Wenger, 1998). The literature on KM has made clear that good social relations are a pre-requisite for knowledge exchange to take place between people.

Lave and Wenger (1991) place the development of CoPs within what is known as situated learning. Justesen (2004, p. 82) goes further and states that they might be described as “the context of situational learning”. Such learning is rooted in work practices and, accordingly, starts out from and is directed toward real problems in the participants’ environment (in this case, labor problems), founded on trust, a feeling of belonging, and experientially. The participants seek a variety of solutions for the problems analyzed, using their experiences and their knowledge, and relying on the support tools furnished by ICT for acquisition, storage, codification and interaction. The purpose is to carry out a situational change in the development of their thinking and in their learning capacity.

Through participation, the members of a CoP collectively interpret and construct tools, procedures, rituals, languages, meanings, solutions and so forth that are associated with their daily practice, in line with their professional experience and shared knowledge. This makes CoPs a good platform for knowledge exchange at an organizational level, although knowledge exchange between the different groups and units of an organization is a more complex business than intra-group knowledge exchange within the CoP itself (Hislop, 2004).

The general starting hypothesis of those who have committed themselves to these experiences is that the setting up of CoPs increases knowledge flow within the organization (Fontaine and Millen, 2004; Lesser and Fontaine, 2004). A CoP is understood to be successful when its members exchange knowledge, experiences and practices in a way that enables them to develop specific know-how applicable to a particular field of activity in the organization (McDermott, 2004). However, it proves difficult, to say the least, to quantify the degree of knowledge exchange produced within an organization (Davenport, De Long and Beers, 1998; Fontaine and Millen, 2004; Kim, Hong, and Suh, 2012).

Managers of firms, when contemplating whether or not to decide to support the emergence of these parallel structures –which cannot but seem anomalous, as they have their own sources of legitimacy and hierarchy, based on knowledge of a problem and on roles performed within the group (Hildreth and Kimble, 2004, p. xii)-, need to possess information about the most quantifiable costs and results of these practices. Likewise, as the importance of CoP activities grows, accompanied by a consequent increase in the resources devoted to this issue, organizations try to align these activities with their strategic objectives (Davenport et al., 1998), even though CoPs were initially conceived as work groups that spontaneously arose under self-management (Brown and Duguid, 1991; Lave and Wenger, 1991). This circumstance has led to some controversy in the literature (Probst and Borzillo, 2008). It is widely recognized that company managers should not openly control and intervene with regard to developments brought about by CoPs (Anand et al., 2007).

Over recent years, basing their approach on the experiences analyzed in large firms, different empirical studies have proposed guides, models and/or factors of success –and, to a much lesser degree, of failure– with a view to facilitating the development of CoPs. Some consensus has been reached regarding some of the elements analyzed.

Different investigations (Frost and Schoen, 2004; Probst and Borzillo, 2008; Iaquinto, Ison, and Faggian, 2011; Kirkman, Mathieu, Cordery, Rosen, and Kukenberger, 2011) stress the importance of the objectives of CoPs, invoking their relevance, both for the organization (top management) and for the participants, and the nexus that should exist between them and company strategy.

The governance mechanisms of CoPs are widely discussed (Bishop, Bouchlaghem, Glass, and Matsumoto, 2008; Probst and Borzillo, 2008; Scarso, Bolisani and Salvador, 2009) owing to the need to vertically and horizontally coordinate activities of the communities in large companies (subject to analysis in all the studies reviewed), and to establish mechanisms for making the results visible, assigning resources and providing incentives for community activities.

Other works (Frost and Schoen, 2004; Bishop et al., 2008; Probst and Borzillo, 2008; Scarso et al., 2009; Hemmasi and Csanda, 2009) highlight the importance of having a core group to drive the other community members, as well as people equipped with the competences required for managing the communities and contributing to achievement of their goals (Garavan, Carbery and Murphy, 2007; Bishop et al., 2008; Corso, Giacobbe and Martini, 2009; Iaquinto et al., 2011; Backer-Eveleth, Chung, Eveleth and O'Neil, 2011; Kirkman et al., 2011; Nesheim, Olsen and Tobiassen, 2011): having a vision of how the process must unfold; providing experience in the field; motivating, assisting, interacting and recognizing members; managing conflicts and reaching consensus; encouraging members to participate; generating an atmosphere favorable to shared learning and the contribution of ideas, etc.

The social aspects of CoPs (such as the roles performed by their members; values, routines, language and other group productions; mechanisms for developing contacts, relations and trust; members' social and psychological motivations, the dominant culture, etc.) are reflected as central in a good number of the empirical works analyzed (Frost and Schoen, 2004; Ardichvilli, Maurer, Li, Wentling and Stuedemann, 2006; Schenkel and Teigland, 2008; Scarso et al., 2009; Hemmasi and Csanda, 2009; Jeon, Kim and Koh, 2011; Nesheim et al., 2011; Harvey et al., 2012).

Some studies point to the importance of other factors including: the inter-relation, interactivity and commitment of those involved in the communities (Hemmasi and Csanda, 2009; Iaquinto et al., 2011); the communication and interchange produced between members of the community, and people and groups from outside it, which makes it possible to attract information, experiences and knowledge that favor the development of knowledge activities in the CoPs (Frost and Schoen, 2004; Probst and Borzillo, 2008); factors connected with the design and use of technology platforms for knowledge management (Scarso et al., 2009); the

use of social networks that were in existence before CoPs were set up, in order to build effective groups (Iaquinto et al., 2011; Harvey et al., 2012).

Meanwhile, some of the factors that stand out most as obstacles to the success of CoPs are the following: the lack of relevance, visibility, practicality and applicability of the topics, knowledge and experiences shared between group members (Dube, Bourhis and Real, 2005; Probst and Borzillo, 2008), or the reluctance to apply knowledge provided by others (Probst and Borzillo, 2008); top-down implementation, instrumental use of the communities and the reproduction of existing power frameworks in the formal organization (Raz, 2007; Harvey et al., 2012); the absence of a core group to promote CoP activities, the lack of identification of CoP members, and the low level of face-to-face interactions (Probst and Borzillo, 2008).

## **Experience analyzed and data collection**

### **The experience analyzed**

This study collects the results of the experience of nine learning communities (see table 1) created in small and medium-sized firms and organizations. These enterprises joined a CoP implementation project presented by a consultancy with strong roots among industrial SMEs in the district of the river Deba in Gipuzkoa (Basque Country, Spain) and which is funded, with regard to the participants' training work, consultancy and facilitation of the CoPs, by the regional government.

The group implementation project commenced in the autumn of 2012 (between October and December, depending on the specific case) and officially concluded in July 2013. It unfolded following a learning methodology based on Kolb's "experiential pedagogy". Within this common methodology, each group established its own work rhythm, as well as the periodicity and intensity of the face-to-face activities. In table 1 the profile of the CoPs under analysis can be observed.

**Table 1:** CoPs participating in the project

Firm	Activity	Workforce	Problem undertaken by the CoP	No. part.	Periodicity / Length of meetings	Type of participation
<b>A</b>	Machine Tool	160	Reliability when setting up and installing the machine/Planning	8	Weekly 2 hours	Mgmt.-promoted
<b>B</b>	Industrial Tool	55	Need to launch product engineering	6	Fortnightly 1 hour + occasional meetings	Mgmt.-promoted
<b>C</b>	Dpt. of Quality, Environment, Prevention and Training	4	Resistance to change in the training sphere	4	Monthly 3 hours	Mgmt.-promoted
<b>D</b>	Consultancy	6	Improvement of the visual attraction of communication	4	Two-monthly 2.5 hours	Mgmt.-promoted
<b>E</b>	Professional Training and Consultancy	100	Self-motivation of student body / Need to attract women to industrial studies	5	Two-monthly 2.5 hours	Voluntary
<b>F</b>	Taps and valves	13	Development of product specifications	8	Two-monthly 1 hour	Mgmt.-promoted
<b>G</b>	Municipal center for women's equality	12	Image of the center/ participation of women	8	Monthly 2 hours	Voluntary
<b>H</b>	Sale and maintenance of vending machines	25	Improvement of customer satisfaction(measuring and detecting needs)	6	Monthly 2 hours	Mgmt.-promoted
<b>I</b>	Pre-series engineering and manufact.	60	Use of artificial vision in quality control systems	5	No fixed periodicity 2 hours	Mgmt.-promoted

Given that the project is proposed by the consultancy firm to the Management bodies of SMEs with which it has previously worked, the groups that commence their activity are legitimized or supported by official organizations (Wegner, McDermott and Snyder, 2002, p. 28). The CoPs were constituted by a collective of between 4 and 8 people. In most of the cases, the groups were made up of people belonging to the management staff or, at least, technical and/or skilled personnel. One of the participating

organizations (G) was dissolved during the process without reaching the results stage.

The process developed in the CoPs ran in five stages. In the first (introductory) stage training was offered concerning the concept and methodology of work in the CoPs, and also regarding the collaborative tools to apply in the community (for this purpose, the participants were trained in the use of the Evernote application). This stage concluded identifying and specifying the object of concern/analysis shared by the CoP members.

Afterwards comes the experiences and observation stage. The experience, “feeling” and emotions associated with the concern/object of analysis are brought to the surface. The intention thereby is to share sensations and identify their consequences, in relation both to people and to the organization. A second point in this stage consists of observing and analyzing why the problem/object of concern is occurring. In this phase the learning objectives are established and work begins to search for and exchange information, prioritizing collaborative IT tools. It is considered very important as a source of learning in the methodology applied to pool the information available on the web. Value is also given to identifying the existence of external groups interested in the same subject and getting in touch with them.

All this having been done, the reflection-theorization phase starts. Using all the elements collected and exchanged in the previous stage, the knowledge acquired is formalized and integrated, conclusions are drawn and possible solutions proposed. In this stage the search and exchange of information initiated in the previous phase is maintained, but the orientation now is toward possible solutions. The reading of documents, exchange of information and of good practices, as well as the formulation of possible solutions guide this stage.

The CoP is now prepared to move to the experimentation phase. The experimentation objectives are defined and the systematized knowledge or solution defined for the problem identified is applied in the context which constituted the point of departure. Plans are made for applying the solution (actions to be carried out, resources and elements to be taken into account, time, responsibilities, etc.). The last step here is to measure the results of the experimentation.

The fifth phase dealt with is the transfer stage. The objective is the extension and transfer of the knowledge acquired/developed/generated.

Thought is given as to how to share what has been learnt, and how to make other people and different bodies take part in learning about the subject analyzed.

## Data collection

Two different channels were used to collect the information that is going to be analyzed over the following pages:

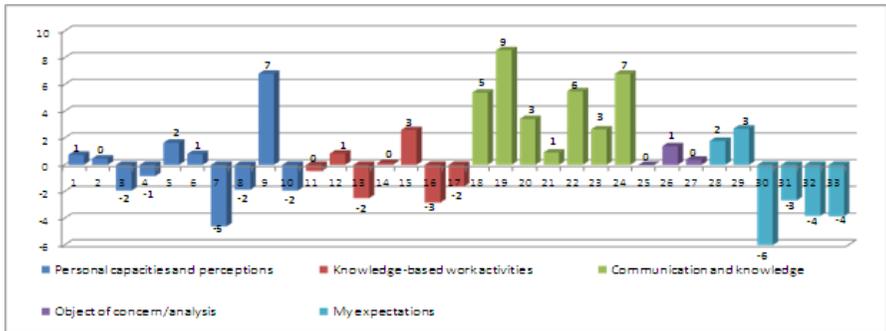
- a) Questionnaire for measuring the evolution of the capacities, perceptions and expectations of the people who have formed part of the CoPs (See Appendix 1). This questionnaire, based on the tools proposed by Fontaine and Millen (2004), is composed of thirty three items that are assembled in five groups: Capacities and personal perceptions –items 1 to 10-; Knowledge-based work activities –items 12 to 18-; Communication and knowledge –items 20 to 26-; Object of concern and analysis–items 28-30-; and, Participants’ expectations – items 32 al 37-). The questionnaire was given to the CoP participants at two points (start and conclusion of the project). Forty-three answers were obtained from the members of eight CoPs in the first step (October-December 2012) and thirty answers were received from the members of seven CoPs in the second (July 2013).
- b) Semi-structured in-depth interviews held with the coordinators of each of the nine work groups and the three consultants who took part in the experience. In these interviews, the evolution of the CoPs (both facilitating and limiting factors) and the results obtained were the fundamental subject of analysis. These interviews took place in the participating firms and organizations during June and July 2013.

## Results

This section provides an account of the results identified in this experience. Based on the survey held with those who took part, the first step (section 4.1.) refers to the evolution of their perceptions concerning the items proposed. As a second step (section 4.2.), we focus on the main global results obtained by the communities, considering the interpretation of the interviews carried out with the coordinators and consultants.

### Evolution of the participants’ perceptions

In the following figure (figure 1) the items in the questionnaire are represented (Appendix 1), and the variation in the participants’ perceptions between the time when they began the CoP implementation project (October-December 2012) and the point when the project officially ended (July 2013) is shown. As may be observed, the items considered have undergone an uneven development, although more items show a positive evolution than those that do so negatively. The intensity of the variations in the perceptions is greater in the items that evolve favorably than in those that do so unfavorably. Similarly, it must be noted that the participants’ perception, taken overall, is positive, since the final scores (July 2013) range between 6.52 (1-10 scale) (My linguistic competency), the lowest value, and 7.77 (Importance I assign to the problem), the highest. And 23 out of 33 items are assessed at over 7.



**Figure 1:** Evolution of participants’ perceptions (percentage points)

The aggregated results clearly reveal that the principal achievement of these work groups (a gain of 9 and 7 percentage points –pp– between the start and formal conclusion of the project) is an improvement in knowledge exchange, both in the organizational sphere and within the CoP itself. There is room to argue, therefore, that this project has fulfilled the main thrust of its objectives: improving the flow of knowledge between the people comprising the organization. In the same connection, internal communication also benefitted owing to the implementation of CoPs (6 pp in the work groups and 5 pp at the organizational level).

The setting in motion of experiences of this kind, opening up participation from the workers, has resulted in a clear improvement in job satisfaction (7 percentage points), and also, although to a lesser degree (3 pp), a favorable evolution can be detected in the capacity to adopt decisions, in the work atmosphere in the firm, in collaboration between the CoP members, and in expectations that the solutions proposed by the CoPs will be applied.

Other items that revealed a slightly positive trend (1 or 2 pp) are: my capacity for team working; my capacity for handling IT tools; my linguistic competency; my capacity for evaluating and processing knowledge; trust in people in the CoP; the importance I give to the problem, and expectations of finding solutions to the problem.

On the other side of the scale, the aggregated results show that the regressions in perceptions are concentrated to a substantial degree within the area of expectations (items 34 to 37): changes in work (6pp); changes in organization (3pp); generation of innovations (3pp); and improvements in knowledge and capacities (3pp). The possibility of participating in a novel experience that involves new ways of doing and understanding work, probably aroused expectations of change in participants that, globally, were not satisfied.

Meanwhile, there was some regression (5 and 3 pp, respectively) in the capacity for innovation itself, and in the capacity for leading and developing knowledge activities (coordinating, training, and managing). Where innovation activities are concerned, we presume that the concept of innovation held by the people who took part in the survey was associated with innovation of a technological kind, an issue that has only been taken up in CoPs (F and I). As for the fall in self-perception of the capacity to manage work-related knowledge, this may be to do with the growing awareness throughout the project of the difficulties that surround such a task, and of the lack of training to carry it out.

Other items that saw a somewhat negative trend (1 or 2 pp) are: my learning capacity; my entrepreneurial capacity; my productivity; my feeling of belonging to the firm/organization; my knowledge-sharing capacity; my capacity for coordinating, training and managing.

## General results from the CoPs

We have classified the results obtained by the CoPs in three groups: a) Results at the individual level are those obtained by each individual as a product of participation in the initiative (modification of knowledge, capacities, attitudes, levels of satisfaction, etc.); b) Results of a socio-organizational kind, associated with improvements that collective participation sets off in others –and in the organization. Among these, for instance, results in terms of knowledge, collaboration, trust between members, communication, work atmosphere, establishment of consensus and resolution of problems, etc., should be mentioned; and, c) Results of organizational effectiveness, which are connected with the firm's outputs with a direct or potential impact on its operational activities: customer service, the achievement of operational objectives, effectiveness /efficiency, reduction in costs, improvement in service and attention to the public, innovations, patents, etc.

In the light of the evidence gathered in the interviews held with CoP coordinators and consultants, what stands out is that the results obtained by the different CoPs differ markedly from one to another (see table 2). In section 5, the keys that have most clearly affected the CoP results are subjected to analysis and discussion.

We remarked above that the purpose of the CoPs is to produce or develop specific know-how applicable to a particular field of activity. We could say that, from the business point of view, they complete their journey when, through individual and socio-organizational results, they manage to obtain applied results (effectiveness). This being the case, at one extreme, we can observe three CoPs (A, B and G) that, although they attempted to do so, were not successful in achieving any kind of experimentation or results that were effective during this time (one of them abandoned the program when it had only just begun and another is close to obtaining the first results in this area); they did improve, however, in terms of individual and socio-organizational results. It can also be observed, at the other extreme, that three CoPs (F, H and I) attained notable results in terms of effectiveness. In these CoPs, the intensification of individual and socio-organizational results was clearly greater than in all the others. In the remaining cases (C, D and E), the CoPs achieved results at the three levels,

although we might consider them to be more discrete than those just mentioned.

## **Factors that have most facilitated and limited the experience in SMEs**

This section presents the facilitating and limiting factors that, in the light of the evidence gathered, most influenced the experience of implementing CoPs in SMEs. Since this is an exploratory work, association of these factors with the success or failure of the CoPs is more of a hypothetical than of a probatory nature.

### **Facilitating factors**

- a) **Management Involvement.** In most of the cases analyzed (except C and E), members of the Management of the organizations committed themselves to the experience or followed the development of the works very closely, taking an interest in advances made, making contributions, or even driving the CoP at specific moments. In our view the exemplarity of Management – through participation in the project or direct support of it- was one of the main elements that helped to bring the work of the CoPs in the SMEs analyzed to a satisfactory conclusion. The involvement of Management made it possible to provide time (a resource that is more scarce in an SME) for this activity and to align the objects of concern with market needs or strategic company targets. Strategic alignment is crucial when choosing projects to invest in (Lesser and Prusak, 1999) and guarantees a link to economic performance or industry value. Management support proves decisive if these experiences are to expand or perpetuate over time in the firms analyzed. Nevertheless, management did not expressly influence the dynamic or the decisions adopted by the CoPs in the cases studied.
- b) **Having back-up via the involvement of an outside firm.** The support received from the consulting firm was assessed to be very good in all the CoPs, even in those that have a greater degree of maturity and tradition in project management (engineering firms). It is widely known that one of the main drawbacks of SMEs is their lack of

management tools and capacities. In consequence, the presence of the consultancy helped the CoPs to reduce this limitation, by: Making available to the SMEs an effective work methodology; Generating a systematic for gathering, classifying and treating information; Providing an external (and, at times, critical) perspective on the decisions and actions of the organization; Dynamising work meetings; Introducing pressure -in addition to their own internal demands- because of having to present activities they were engaged in to an external agent; Contributing suggestions concerning the problems dealt with, etc. Except for case I, which was already running prior to the project, this was a critical element for the development of the CoP.

**Table 2:** Main achievements of CoPs

CoP	Main individual achievements	Main socio-organizational achievements	Main achievements in efficiency
A	Changes in attitude to problems Involving people in search for solutions	Improvement in communication between CoP and Organization Improvement in CoP knowledge exchange Incorporation of new points of view/approaches	
B	Improvement in IT capacities Involving people in search for solutions	Improvement in communication between CoP and Organization Improvement in collaboration Improvement in knowledge exchange between CoP and Organization Improvement in work atmosphere Improvement in trust	Establishment of launch systems/procedures for new product (innovation and technological supervision plan) under way and awaiting presentation to group.
C	Improvement in IT capacities Improvement in knowledge management capacities Changes in attitude to problems	Improvement of Communication in CoP Improvement of knowledge exchange in CoP Incorporation of new points of view/approaches Increase in knowledge level	Knowledge systematization (new manuals and training methodologies) Experimentation of solutions
D	Changes in attitude to problems Improvement in	Improvement in Communication between CoP and Organization	Knowledge systematization (new criteria and productions for data)

	capacity for analysis Improvement in decision-making capacity	Improvement of Knowledge exchange in CoP Incorporation of new points of view/approaches	“viewing”) Experimentation of solutions (application of new approaches to commercial activities) Own development of free software for personalized data viewing (under way)
<b>E</b>	Capacity for reaching consensus Capacity for analysis Decision-making capacity Linguistic competency	Improvement in Communication between CoP and Organization Improvement in knowledge exchange between CoP and Organization Incorporation of new points of view/approaches Improvement in knowledge of problem Generation of knowledge networks	Experimentation of solutions (image-based learning methodologies)
<b>F</b>	Involving people in search for solutions Incorporating new points of view/approaches	Improvement of communication in CoP Improvement knowledge exchange in CoP and Organization Implementation of team work Workforce awareness of challenges Generation of knowledge networks	Knowledge systematization (development of technical product specifications) Obtaining of patents Approvals with big customers
<b>G</b>			
<b>H</b>	Improvement in IT, linguistic and knowledge management capacities Changes in attitude to problems Involving people in search for solutions	Improvement communication CoP and Organization Improvement collaboration Improvement knowledge exchange in CoP and Organization Improvement work atmosphere Incorporation of new points of view/approaches Awareness in workforce of challenges facing Organization Increase in level of knowledge	New systems/procedures (creation of complaints and suggestions system) Experimentation of solutions (internal and external application. Improvement in customer service processes) New approaches to commercial activities (customer orientation organization)
<b>I</b>	Improvement in IT, linguistic and knowledge and innovation management capacities Increase in motivation	Improvement in Communication between CoP and Organization Improvement of Knowledge exchange in CoP Improvement in collaboration	Knowledge systematization (scheduling algorithms) Experimentation solutions (creation of software and control machinery through artificial vision) Acquisition of Patent Creation of technology spin-

	Feeling of fulfilment Changes in attitude to problems	Improvement of work atmosphere Generation of knowledge networks Radical increase in knowledge level in CoP Integration of multidisciplinary knowledge	off base Establishment of strategic alliances
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- c) Interface with people outside the CoP or organization. Some of the groups have been supported by people not in the organization during particular stages of the work or, even (in two of the cases, D and I), structurally, as permanent members. In some cases they report that they have generated active knowledge networks with actors from outside the firm (customers, suppliers, universities, technology centers, etc.) in the CoP's spheres of specialization (E, H and I) or, in others, have sought to generate contacts and exchanges between members of the CoPs and customers, suppliers, organizations in the same sector, employed in the same organization, etc.. (C and F). The possibility of communicating the initiative to other similar organizations has aroused much interest and opportunities for enlarging the size of the CoP, its geographical reach, the quality of the contributions and interactivity. Consequently, sharing relations and knowledge with people at a remove from the CoP is assessed very positively in the case of SMEs because it involves a greater degree of knowledge exchange and a supplementary contribution of information and comparison for the group. Other groups, in contrast, developed their activity with only the consultancy firm as an interface.
- d) Small size of the organization. While the small size of the participating organizations (SMEs) generates limitations (time, resources, management tools, technology, relational capital, etc.), it is also a factor that favors knowledge between people, communication, the existence of more informal close relations, less rigid structures and greater trust. In consequence, SMEs can benefit from their size, because the interaction between CoP members is more intense and on a face-to-face basis. In the same way, the

diffusion and transfer of knowledge at an intra-organizational level can be simpler in these organizations.

- e) Permanent fluid interaction among CoP members. The constant exchange of communications, information and knowledge between significant numbers of CoP members has sparked off great dynamism and value in the CoP results. Nevertheless, as will be indicated in the following section, this factor is limited by the small dimensions of the CoPs.
- f) Commitment and work of the people taking part, both those who were in charge of the coordination of the CoPs and the rest of the participants. The results of this research reveal that, in general, most of the people involved in the CoPs attended the meetings called, were punctual, and performed the individual jobs they committed themselves to. Likewise, they showed a good attitude toward knowledge exchange.

Moreover, it is clear that the constancy, commitment and generosity in the efforts made by members proves essential for CoPs to work well. Lack of commitment and of work was the main reason that caused the disappearance of CoP G, which did not finish the program.

“The subject interested us but we didn’t want to work. So, if you don’t work, you don’t get anywhere. (...). The consultancy firm behaved brilliantly the whole time. If we had asked them to help us in any way, they would’ve been there... because their attitude couldn’t have been better”. (Interview with Co-ord. CoP G)

Indicative evidence collected in this regard is the quantity and quality of the contributions uploaded by the participants to the reservoirs of information. The most active CoPs had people who made more contributions to the group than others. It can be affirmed, as the literature indicates, that the interest aroused and shared in the CoP had an impact on the performance (enthusiasm, commitment and contribution) of the participants.

Organizational culture. In some of the cases analyzed (D, F, H and I), the organizational culture (dynamic firms, very close to customer needs, that actively seek new innovative business opportunities, etc.) has been detected to encourage the development of individual activities by CoP members and, subsequently, affects the results of the CoPs. In a sample that included, among others, some small technology-based firms, Davenport, De

Long, and Beers (1998), in the same connection, found evidence that a suitable culture stimulates a positive orientation toward knowledge.

- g) Leadership. As is pointed out in the general literature on CoPs, another critical element for the success of a CoP is leadership capacity. Finding a catalyst and the hard core of the community, in particular the coordinator and main components, is one of the principal challenges these CoPs have had to confront. It is necessary to count on the services of coordinators and drivers able to perform their role effectively, dedicating time to the dynamization process and with a capacity to encourage people to give up established collective routines in order to steer the group toward the development of its potentialities. The most active and important CoPs in this sample (H and I) could rely on people who exercised effective leadership.

### **Limiting factors**

- a) Lack of time. In all the cases analyzed lack of time was shown to be the main factor putting a brake on the activity of CoPs in SMEs. Small and Medium Enterprises are known to stand out for being more flexible than large firms, having more lithe structures, providing more personalized customer service and possessing less negotiating power. This, along with a lack of structure and advanced planning and management tools, means that they get bogged down in works that “should have been done yesterday”, without space to allocate time for strategic reflection or to set projects in motion such as our present subject of study. As a result, severe difficulties were seen to exist in harmonizing the schedules of CoP members, and tasks that were taken on were dealt with, in the main, outside working hours. Lack of time unquestionably has a negative effect on the development of CoPs in SMEs, and on knowledge management processes. However, it must be said that the CoPs very positively evaluate having had to make they put time aside for this project, because the day to day consumes all their energy.
- b) Difficulties in estimating the cost/benefit relation of this activity. The workers, faced with the opportunity of joining the CoPs –which, in essence, represented for them a novel project in which, a priori, it

was not clear what purpose was being pursued or how much effort was going to be required-, found it hard to estimate the relation between the effort that had to be put in –the costs- and the benefits that would accrue. This circumstance led to some of the participants withdrawing from their involvement, or taking part only cautiously. In addition, the lack of vocational commitment, and the skepticism (at the start, above all, until the results began to arrive and attitudes changed little by little) of some of the participants, especially when the CoP was set up in a top-down direction, meant that the cost estimate was higher than that of the benefits, producing an unfavorable relation for the participants.

“The interest people feel is very different from when we began. It was hard to fall into place. At the beginning, two or three of us grasped it... and now, I think each participant in the group is clear that this has been important”. (Co-ord. CoP A)

As remarked in the previous section, constancy, commitment and generosity prove to be decisive in bringing the work of the CoP to a satisfactory conclusion, and the perception of a negative cost/benefit relation does not foster the development of these attitudes. This result is consistent with the findings of Wolf, Späth, and Haefliger (2011), where they suggest that there is interdependence between perception of cost/benefit and collaboration.

- c) Small size of the CoP and lack of sufficient interaction. In general, we are dealing with very small CoPs (4-8 people) and, in comparison with experiences analyzed in the literature, they are far smaller than those that exist in big companies. In the communities in our sample, interactivity tended to be much less and more dependent on the driving role of the coordinators and/or active members than on the actual group dynamic. While the small dimensions of the organization have advantages for the CoPs, the lack of a critical mass of participants can represent a barrier that is hard to overcome when the members are not very involved in group tasks. To get round this problem, CoPs in SMEs should make a special effort to relate to other actors in the business milieu who can contribute to providing feedback and endow the group with resources and knowledge. The small size factor contributed, in this regard, to the

fact that the CoPs kept their unity of structure and action (without geographical subdivisions or subtopics being created).

- d) Insufficient capacities and/or heterogeneity of the participants' knowledge. The activities undertaken by the CoPs demonstrated that there are gaps between the participants when it comes to their capacities for developing collective activities, such as: the capacity to manage meetings, work as a team, systematization of reflection, leadership, etc. People who work in SMEs are individuals of action, with little time to think/analyze, and they are accustomed to make fast decisions. This experience has confirmed the difficulty most participants have had in respecting collective mental processes, such as in the maturation of an idea which was initially supported by little evidence, or processes of analysis prior to the generalization/proposal of solutions.

Even the most basic individual capacities, such as the handling of IT tools or of languages, have shown themselves to be things that hinder the work of the CoPs, especially in the smallest firms where workers' training levels are lower. Against this background, the insufficient or uneven level of knowledge possessed by some of the CoP members regarding the object of analysis has also been identified as a limiting element. This influences the capacity to develop, transfer and absorb knowledge within the group.

- e) Cultural problems. In some of these organizations, organizational culture was a clear barrier for the development of CoP activities (take case (F), for example, a family business characterized by working under immovable routines over many years, broadly consolidated within a hierarchized atmosphere; and (E), an educational organization grounded in the public administration, with very little flexibility, where there is no commitment to the objectives of the organization; or (G), an association of women at the municipal level, used to having a campaigning approach in representation of its members vis-à-vis the town council, highly dependent on charismatic leaders, but with no tradition of team work). In the first of these cases, the implementation of mechanisms for participation, as the CoPs might be in this circumstance, runs into difficulties because the staff are not accustomed to team work, to contributing, deciding, committing themselves, and certainly not in an environment where their

colleagues are their traditional bosses or subordinates. In the other two instances, organizations where participation in the CoPs was strictly voluntary, a conformist attitude can be detected among the staff and, probably, a poorly digested idea that the process is voluntary. Participation was, indeed, voluntary, but was not accompanied by an active and constant contribution and by commitment from the participants.

## Conclusions

This exploratory work presents an analysis of the experience of implementing Communities of Practice, an innovative management tool in SMEs, within nine organizations. In line with the international literature, the foremost potentiality of this instrument –increasing communication and the flow of knowledge in the organization- has been very clearly shown in the SMEs that comprise the sample analyzed.

The processes of participation that are at the heart of CoP and were triggered throughout this experience had positive organizational effects in the enterprises studied. That is to say, interpersonal communication, collaboration and internal knowledge exchange in the CoPs brought about improvements in communication and knowledge exchange at an organizational level, accompanied by a better work atmosphere in these firms. Likewise, most of the firms analyzed managed to secure results – which, in some cases, were more than outstanding - in terms of operational effectiveness.

With regard to individual results concerning expectations of personal development and achievement, the effects registered are lower than those documented in successful experiences at an international level and developed in big companies. From the data collected in this experience the indications suggest that, while there is satisfaction with the process at an organizational level, the participants in this project do not, individually, seem to have attained the results or changes they had expected in their work. The people who took part seem to be expressing the idea that, although they recognize the results achieved with the implementation of the CoP, there is still a long way for SMEs to go for there to be greater participation by workers in the organization and for there to be a deepening of participatory culture and social learning.

The notion of the CoP is a wide one (and can be applied to any kind of problem and in any organization), but its principles of interactive social learning are hard for SMEs to implement, hemmed in as they are by inertias stemming from structures, organizational practices and contexts with a limited culture of participation. The main implications that stem from this work for SME managers who are assessing the implementation of CoPs are several:

First, that CoPs can represent a good platform for becoming involved in knowledge management, since we have verified in this study that knowledge flows and is shared among the members of an organization to a greater degree following the establishment of the groups;

Second: Implementation of CoPs is not reserved exclusively for big firms, with more structures and resources. SMEs, as we have seen, can also make use of the benefits they offer and, furthermore, have advantages of their own that have contributed to the results of these experiences, such as their small size, which facilitates the generation of less formalized relations, more fluid communications among members of the organization and more facilities for the establishment of trust between the participants, which is a critical aspect when sharing knowledge;

Third: there must be commitment and active support for the project from management, as otherwise the undertaking will rapidly taper off due to the fact that the pressure of the day to day tends to paralyze any kind of initiative that is not deemed to be directly related with the firm's current operations. Participation in CoPs by members of Management lubricates the inclusion of a CoP's objectives within the company's strategic goals, and this contributes to these initiatives having continuity over time;

Fourth: Support from Management is again essential so that the firm can allocate time for the project. Lack of time is clearly the main limiting factor for such experiences in SMEs, because they are immersed in an environment that runs in accordance with day-to-day priorities.

Fifth: it is helpful to be able to count on the collaboration of an agent with expertise in the implementation of CoPs, since this person contributes resources and capacities which SMEs usually lack, such as methodology and experience, an external perspective (contrast), support for meeting the formal aspects of the project (stages, deadlines, deliverables, etc.), mediation in cases where there are opposing points of view among participants, and an image of seriousness (toward the project). All the

foregoing makes it easier to overcome resistance (arising, in particular, in the initial stages of the project) from staff to implementation of innovative experiences of this kind in the SME field. Similarly, CoP coordinators find in these figures the professional support necessary for performing their job.

Six: The role carried out by those who coordinate the work of the CoPs is vital for maintaining and encouraging these communities. On them depend the interaction and development of resources that bolster the socio-affective atmosphere of the community. In short, as we have argued, in SMEs CoP coordinators need backup from Management and technical support from consultants.

Seventh: The public authorities dedicated to economic promotion in the regional and local sphere should support these initiatives among SMEs. They provide institutional backing, visibility and resources so that these firms have the confidence to implement innovative experiences such as CoPs within their milieu. Without this support, SMEs are very unlikely, on their own initiative, to set out on this road.

We conclude with the observation that the results contributed in this exploratory work, while bringing us closer to comprehending the implementation of CoPs in SMEs, must be treated with a degree of caution and are not generalizable. We also consider that the time elapsed between the start and the conclusion of the project is too short to be able to properly ascertain the reach of the changes that have taken place in the SMEs.

It is necessary to continue investigating the use of these techniques in SMEs, given the scant research that has been carried out about these firms. Consequently, it would be advisable to: identify the extent of their effective penetration within the world of the SMEs and the reasons why; confirm whether the critical (facilitating and limiting) factors in the firms as set out by this study are common to other firms and regions; proceed with the longitudinal analysis of the evolution of CoPs to ascertain which results and elements have had most impact on their survival; and improve the systems for measuring results.

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## Appendix 1: Questionnaire employed (values from 1 to 10)

<b>Capacities and perceptions</b>
1.- My capacity for team working
2.- My capacity for self-motivation
3.- My learning capacity
4.- My entrepreneurial capacity (initiative)
5.- My capacity for handling IT tools
6.- My linguistic competency (Basque, Spanish, English, others)
7.- My innovative capacity
8.- My productivity
9.- My satisfaction with the firm/organization
10.- My feeling of belonging to the firm/organization (pride/prestige)
<b>Knowledge-based work activities</b>
11.- My information-seeking capacity
12.- My capacity for evaluating and processing (analysis and synthesis) information
13.- My knowledge sharing capacity
14.- My capacity for reaching consensus and resolving problems
15.- My decision-making capacity
16.- My capacity for coordinating, training and managing
17.- My capacity for relation/interaction/communication
<b>Communication and knowledge</b>
18.- Communication in our firm/organization
19.- Knowledge exchange in our firm/organization
20.- Work/social atmosphere in our firm/organization
21.- Trust in the people in the CoP
22.- Communication between people in the CoP
23.- Collaboration between the people who make up the CoP
24.- Knowledge exchange between people in the CoP
<b>Object of concern and analysis</b>
25.- My knowledge about the concern under analysis
26.- Importance I give to the problem
27.- Importance the organization gives to the problem
<b>Participants' expectations</b>
28.- Expectations of finding solutions to the problem
29.- Expectations that the solutions will be applied
30.- Expectations that the CoP will bring about changes in my work
31.- Expectations that the CoP will bring about changes in the organization
32.- Expectations that the CoP will bring innovations
33.- Expectations of improving my knowledge and personal capacities