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Cooperation within Bureaucracies: Are Communities of Practice an Answer?

Emmanuel Josserand

Université Paris-Dauphine
CREPA
eMail: emmanuel.josserand@dauphine.fr

Communities of practice have been presented as the panacea of organizational learning. Building up on three case studies in different organizations characterized by different internal contexts, this article pushes the logic one step further by arguing that communities of practice can also be unique collaboration spaces within bureaucracies. Their main property is the ambiguity of their relationship with organizational control mechanisms and structures. Communities play with the rules, they can be adaptable and as such can build resilience within the organization. But this ambiguity, being the foundation of their capacity to introduce cooperation within organizations, is also difficult to maintain. Cultivating communities of practice thus becomes a delicate task for managers who must be able to adopt complex and contradictory behaviours. Five roles that can be fulfilled by management are analysed: stimulation, facilitation, support, control and recognition. Far from the generic recommendations that can be found in the literature to date, the findings indicate that the degree of intervention from management is highly dependent on the internal organizational context. This article thus provides a contingent framework to the cultivation of communities of practice.

If we live in a world where bureaucratic mechanisms have reached their limit, what is the competitive advantage of organization? Mimicking market mechanisms by introducing profit centres and transfer prices might be marginally useful but is certainly not enough to obtain a specific advantage. Stuck between bureaucratic rigidities and internal competition due to market mechanisms, organizations have had to reinvent their comparative advantage by attempting to introduce or reintroduce some form of cooperation beyond their internal boundaries. Such attempts, with various objectives, included teamwork at management as well as at workshop levels, project management, task forces, working groups and the ultimate form of the community of practice (Wenger and Snyder, 2000). Ultimate, because communities of practice are supposed to provide the Holy Grail, the capacity to cooperate and develop practical knowledge within a reasonably bureaucratic structure. In other words, communities of practice can be seen as interstitial structures (Lave and Wenger, 1991; Wenger, McDermott and Snyder, 2002). By introducing spaces of freedom and exchange within the organization, they allow an informal free flow of knowledge that can be translated into the evolution of practices.

Communities of practice thus play with the organization and its rules but their relationship with formal structures are far more difficult to

maintain and assess than their supporters care to admit. It is especially in their strength—the capacity to escape organizational paradigms—that communities of practice can be threatened as soon as they start to be perceived as productive structures. Despite some early appeals (Lave and Wenger, 1991), power is still absent from the theories of communities of practice (Fox, 2000). Except for some form of normative recommendations on how to "cultivate" communities of practice (Wenger and Snyder, 2000), we don't know much about the actual articulation between the communities and the organization with its control mechanisms.

By contrasting the experience of three organizations—two successful and one less so—in their quest of this quintessential organizational arrangement, my objective is to better understand the ambiguity of the relationship between the organisations and their communities of practice. Understanding the nature of this ambiguity is central to drawing a picture of the contribution of communities of practice to intra-organizational cooperation. The findings show that communities, by playing with the organization and its rules, can become spaces of cooperation that go further than simple knowledge exchanges. But this ambiguity is also at the origin of the risks encountered while trying to encourage the development of communities of practice in a competitive and bureaucratic environment. The second aspect of the findings will provide a contingent approach to the "cultivation" of communities of practice, management's intervention should be crafted very carefully according to the internal organizational context.

LEARNING IN COMMUNITIES, AN INTERSTITIAL ACTIVITY

If communities of practice appear as a stimulating organizational form, it is because they provide a theoretical answer to the hierarchy/learning paradox. It is indeed difficult to encourage the necessary level of cooperation in order to develop knowledge in a work culture of individualism (Trauth, 1999). This question is at the heart of our interrogations about knowledge management and learning; communities of practice seem to be a tempting answer.

The learning and the knowledge management literatures converge to show that it's necessary to go beyond the dominant control logics. Planning, control mechanisms and management by objectives are said to generate defensive mechanisms that remove from individuals their desire to learn (Argyris and Schon, 1978; Fiol and Lyles, 1985; Senge, 1990; Argyris, 1991; Mills and Friesen, 1992; Mintzberg, 1993). They are grounded in a negative image of mankind (Ouchi and Jaeger, 1978), one that encourages opportunistic behaviours rather than cooperative learning ones (Ghoshal and Moran, 1996). Classic bureaucratic control mechanisms have been recurrently described as insufficient in the relatively unstable environment that most organizations have been facing for a few decades now (Pas-

cale, 1990; Daft and Lewin, 1993; Victor and Stephens 1994); strategic planning or input control can be considered as inefficient if it's excessive (Lenz and Lyles, 1985; Mintzberg and Waters, 1985; Huber, 1991; Marx, 1991; Mintzberg, 1993). But decentralization, a possible solution to the excesses of bureaucratization, can also be detrimental to learning. It is indeed often combined with increased internal competition due to the introduction of financial control (Goold and Campbell, 1987). The introduction of internal market-like mechanisms also induces a competition detrimental to cooperative learning. Organizations are thus classically confronted with a tension between their need to learn and develop knowledge and the individualism induced by their control mechanisms (Trauth, 1999).

The challenge of developing cooperative knowledge exchanges is thus to encourage a change of individual behaviours (McDermott, 1999) to a logic of cooperation (Nahapiet and Ghoshal, 1998) that implies commitment (Thomas, Kellogg and Erickson, 2001). The development of organizational knowledge relies on the capacity of the organization to develop its internal social capital (Nahapiet and Ghoshal, 1998), that is to say the horizontal network links between individuals (Burt, 1982; Hernes, 1999). This is only possible with the existence of an autonomy allowing the emergence of some form of creative chaos (Nonaka, 1994), a degree of freedom (Ravasi and Verona, 2001) and empowerment (Gupta and Govindarajan, 2000). The autonomy and cooperation necessary to the generation and diffusion of knowledge thus imply a low degree of hierarchy (Mills and Friesen, 1992; Grima and Josserand, 2000). The remedy to bureaucratic impediments towards cooperative knowledge generation and exchange is thus rather of a radical specie; a change of behaviour can probably be obtained but with the high cost of completely changing the organization while introducing a form of chaos. This is very likely to be the kind of risk few managers would accept.

Communities of practice thus appear as a providential missing link. They can be considered as a unique emerging space where the exchange and development of new knowledge can happen outside the usual organizational constraints (Wenger, 1998). Communities of practice can be defined as «groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on a ongoing basis» (Wenger *et al.,* 2002: 4). Self-organized and self selected communities of practice evolve at the margins of organizations: «communities of practice may well develop interstitially and informally in coercive workplaces» (Lave and Wenger, 1991: 64). They thus constitute unique places where interstitial learning can happen (Lave and Wenger, 1991; Wenger *et al.,* 2002). According to their supporters, communities of practice have the faculty to introduce at the very heart of the organization the chaos necessary for cooperative knowledge exchanges without menacing the pillars of the bureaucratic organization. They allow for a non-threatening change. The concept is of course promising but its presentation can be considered as a bit

naïve especially when it overlooks the interactions between the communities and the rest of the organization.

COMMUNITIES AND THE ORGANIZATION

If interstitial learning is the purpose of communities of practice, it is hard to follow Wenger (1998) when he suggests a representation of the organization as a community of communities of practice. This image only portrays part of what an organization is and, neglecting an in-depth analysis of the articulation between communities and the organization, it only weakens the argument for communities of practice. As argued by Lave and Wenger (1991: 42): «the notion of "community of practice" is left largely as an intuitive notion, which serves a purpose here but which requires a more rigorous treatment. In particular unequal relations of power must be included more systematically in our analyses». In this relatively early work, Lave and Wenger (1991) suggest an analysis in which communities of practice are instrumentalized by the actors; one in which control can thus be a real stake for the members (Fox, 2000). Moreover, if individuals are to share their knowledge, they have to be freed from power games and rivalries between departments (De Long and Seemann, 2000). The instrumentalization of communities of practice and their articulation with the organization they are imbedded in have never been fully investigated. This is the case even though the founders of the concept are conscious of the difficulties encountered in maintaining communities of practice within an organization: «It's not particularly easy to build and sustain communities of practice or to integrate them with the rest of an organization. The organic, spontaneous, and informal nature of communities of practice makes them resistant to supervision and interference» (Wenger and Snyder, 2000: 140). Wenger (1998: 91-92) does recognize the existence of power games within such communities. These include «influence, personal authority, nepotism, rampant discrimination, charisma, trust, friendship, ambition, (…) legislation, policies, institutionally defined authority, expositions, argumentative demonstrations, statistics, contracts, plans, designs». But these power games are artificially isolated from one of their main sources: the interactions between communities of practice and the rest of the organization. We cannot limit our analysis of this matter to normative prescriptions about the role of the pilot of communities or on how to "cultivate" communities of practice without killing them (Wenger and Snyder, 2000). We cannot take for granted the fact that communities of practice can exist without interference from the rest of the organization. In a sense, communities of practice are threatened by the organization of what makes their very distinctive advantage towards other organizational arrangements: their capacity to generate interstitial learning. This paper is thus an attempt to analyze the articulation between communities of practice and the organization they are imbedded in.

METHOD

RESEARCH DESIGN

The research follows a multiple case study design. A case study design was chosen because of the exploratory character of the research (Yin, 1984; Eisenhardt, 1989; Brown and Eisenhardt, 1997). The multiple case study design aims at discovering regularities between cases (Glaser and Strauss, 1967), where each case confirms or rejects emerging concepts (Yin, 1984). Using a multiple case design allows one to collect data in organizations which seem, *a priori,* to address similar issues but do so in different contexts or with different outcomes.

The sampling logics is thus crucial. In order to expose the articulation between the communities of practice and the organization in which they are embedded, it was necessary to select cases with contrasting stories of articulation and evolving in different organizational contexts. To achieve that, the case selection could not be done before a first exploratory research was conducted. I selected the first two cases from a prior research project whose broader objective was to analyze organizational cohesion. The data provided me with both a very good understanding of the organizational context and rich information about the communities of practice in these organizations. I knew these two cases corresponded with my sampling requirements: they had different communities of practice stories and were characterized by different organizational contexts.

The first case study is that of Electrical[1], one of the European leaders in automation and electrical installations. Electrical is characterized by an extremely decentralized and market-oriented organizational structure, in which one could anticipate interesting results as far as individualism was concerned. The story of Electrical is a continuous one, where communities of practice had been launched several years ago and have been encouraged ever since. The second case study is Gas, the world leader in production and distribution of air gases, which is also a decentralized company but to a lesser degree than Electrical. More classic bureaucratic mechanisms also account for its cohesion. Communities of practice were very much encouraged at the beginning of the 90s but emphasis from the top management progressively decreased, thus providing an interesting set-up to study the evolution of communities of practice. In both cases, the first set of data collected led to the conclusion that the intrusions of the organization within the communities of practice was not threatening for their survival.

I thus knew from my previous research that these two cases would provide rich insights into the research questions. But, trying to answer these questions, I also needed to include in the sample a case where the organization was directly threatening the degree of freedom necessary to the survival of the communities. This is the purpose of Comp, the third case study. Comp is an information system consulting firm operating all over France. Comp is organized by business units that gather a group of managers in charge of a team of consultants. These

[1]. Company names have been changed for confidentiality reasons.

managers are the core of the structure, strong pressure is placed on them for the delivery of short-term results. Managers have their own style for managing their team with a point in common, which is a very clear hierarchical delineation between managers and consultants. In order to encourage knowledge exchanges between consultants working in the same sector, four communities of practice were introduced. The limited number of communities offered the possibility of following the development of each one. This provided a micro-social perspective to the study that was not possible for the two other cases. Indeed the preliminary interviews showed that my contact in the company was concerned about the future of these communities of practice; he knew that at least two of them were functioning as working groups rather than as communities of practice. It was thus of special interest to analyze the different paths followed by each of the four communities of practice.

Table 1 provides a summary of the sampling logics. I used Ouchi's (1979; 1980) distinction of three modes of control—the clan, the bureaucracy and the market[2]—in order to underline the differences between the cases in terms of organizational context.

2. The bureaucracy mode of organization was split between output and input control.

DATA COLLECTION

Most of the data were collected through in-depth semi-directive interviews. The interviews lasted from one to four hours. Data collection was conducted as a two-stage process. Nevertheless, as two cases were drawn from a previous and broader research, the strategy of data collection at Electrical and Gas was different from that followed at Comp.

STAGE 1
The study of communities of practice at Electrical and Gas was conducted as part of a broader research project aimed at analyzing the cohesion of these organizations. I interviewed 48 people at different levels in the organizations, from top-level management to production-level workers: 32 for Gas and 16 for Electrical. For each case, the interviews evoked the links between operational units and other organizational units (especially central departments) and between opera-

Table 1. Sampling Logics

Case	Mode of control	Structure	Perspective
Electrical	Market Output control	Small business units by activity	Macro-social, the organization as a whole
Gas	Clan Input and output control to a lesser degree	Small business units by geographical zones	Macro-social, the organization as a whole
Comp	Output control Input control in most teams	Small business units by activity	Macro- and micro-social, specific communities of practice as they develop in time

tional units and external actors. I also collected information about strategic objectives, local competitive environment, and work organization. Open-ended questions were used so that interviewees could freely relate their stories about organizational cohesion. Supplementary sources of evidence, such as documents or presence in the field, were also used. I visited several locations, systematically asking for a guided tour of the premises (office and plant where applicable) during my first visit. This was the opportunity to have a preliminary informal interaction with the personnel. I also attended one or two internal meetings per operational unit. Several short interviews (less than one hour) were also conducted, most of which concerned lower-level employees. In this broad project, communities of practice[3] were one among several organizational mechanisms. They were nevertheless important ones as both companies were putting a strong focus on their development in order to compensate what they perceived as a lack of exchanges between business units[4]. Communities of practice were thus discussed in all the interviews; the time allocated to this subject in the interviews ranged from five minutes to 45 minutes[5].

The protocol was different at Comp as this third case was introduced at a later stage in order to bring in the research design a case where the organization was threatening the development of communities of practice[6]. Phase one was done at the beginning of year 2003. During the interviews, I raised contextual elements such as overall structure, cohesion mechanisms, links between projects and other organizational units and external actors, strategic objectives and work organization. Nevertheless, this was done in relation to the main focus of data collection: the communities of practice. Data were collected about three main themes: the reason for the participation of members, the perception and objectives of the management, the contribution to individual objectives, the contribution to the organization and the control and influence exerted on communities of practice. I interviewed 21 people that occupied different positions within the company: Mission Managers (7), managers (2), consultants (10) and functional (2). They had various activities within the communities—Mission Manager (7), pilot (3), participants (11)—and belonged to the four communities—insurance (4), project management (5), bank-finance (3), CRM (3), CRM and insurance (1), bank-finance and insurance (3) and non-participant (2). Interviews lasted between 45 minutes and three hours.

STAGE 2
Comparative case study research can lead to strong insight provided that the sampling strategy is properly linked to the research question, especially when comparing cases of success and failure (Brown and Eisenhardt, 1997). The first stage of data collection offered this possibility. Nevertheless, the comparison of cases drawn from different organizations is subject to contextual contingencies (Barley, 1990). Diachronic research architecture strengthens the internal coherence of the research by allowing a comparison of the effect of contextual variations on the phenomenon that we are trying to understand (Barley, 1990; Langley, 1999). I accordingly complemented the research archi-

3. In 1996, the concept of community of practice was not familiar to the people I interviewed. At Electrical, they were called "clubs", whereas at Gas, people would refer to them as "networks".
4. Two other companies were included in this former project. They are not included in this article as communities of practice were not identified as one of the foundations of their cohesion.
5. Time has been extrapolated based on a length of the interview transcripts.
6. I would like to thank and acknowledge Bertrand de St Léger for his contribution during stage 1 of the Comp case study. We communicated together the preliminary results at the AIMS conference before he chose to pursue a non-academic career (Josserand and St Léger, 2004).

tecture by introducing a second stage of data collection that took place at the beginning of year 2004. This second series of interviews allowed me to assess the evolutions of the organizations and their impact on communities of practice. I contacted key informants from stage 1 and conducted a series of 16 interviews: seven at Electrical, five at Gas and four at Comp. Each interview was transcribed before the following one so as to orient the questions. The interviews were very focused on the evolution of the organizations and the consequences on communities of practice. I had also conducted brief follow-up interviews between stages 1 and 2 in the three companies. I met the key informants—two informants for Electrical, two for Gas and one for Comp—at least twice a year, generally once informally for a lunch and once for a formal interview. During these follow-up meetings, I took notes that were used to track the important changes of the organizations.

DATA ANALYSIS

Interviews were coded according to two dimensions: chronological and thematic. The chronological coding was aimed at reconstituting the stories of communities of practice in the three companies. The first coding included two aspects: the evolution of the company and the evolution of the communities of practice within these companies. The evolution of the communities of practice was coded with a three-phase perspective: creation, development and evolution. The thematic coding was done using the following broad categories[7]: impact of control mechanisms, connections with the rest of the organization, role of the coordinator, reporting obligations, conditions of creations, objective of the participant, objectives of the community(/ies) and activities of the community(/ies). I then consolidated a chronological basis with interview abstracts and used it in order to write the story presented below. Thematic coding was also consolidated in a thematic basis that was used to elaborate the thematic results.

THREE STORIES OF COMMUNITIES OF PRACTICE

Each of the following sections is a story of communities of practice in their organizational contexts. Electrical and Gas stories offer an interesting contrast: at Electrical the organization continually reinforced its focus on the development of communities of practice while at Gas, the emphasis on communities of practice was progressively reduced. At Comp, the micro-social analysis of the development of four communities of practice illustrates some of the negative impacts of trying to "manage" organizational rules on communities of practice.

THE PROGRESSIVE DEINSTITUTIONALIZATION OF NETWORKS AT GAS

In 1992, the structure of Gas was completely reorganized in order to give more initiative to local units in close contact to the customer,

7. The same categorization was used for the sections of the interviews refering to communities of practice for stage 1 at Gas and Electrical, for the interviews of the personnel of Comp and for the follow-up interviews.

which implied decentralization of the management both between corporate head and the units, and within each unit dedicated to a market, a region, or a field of competencies. In order to organize the sharing of knowledge and expertise, networks were created upon the initiative either of a manager or a unit director. Everybody could, in theory, constitute a network but most of the network concerned the first layer of management and above. There were no reporting obligation but the authorization of the supervisor of the person was necessary (except for unit managers who made their own decisions).

The structure between 1992 and 2001 was characterized by the absence of hierarchy within units: the manager of the unit was the only boss of 30 to 120 persons. Former intermediary managers were now called "experts" and they acted as coordinators with no hierarchical power. This implies a very large decentralization within the unit. In this context, networks were presented as a very useful means to obtain knowledge sharing between units. A strong emphasis was put on their development and, at the group level, a sponsor was responsible for keeping trace of their development and stimulating the creation of new networks. The development of networks was very fast and most experts were involved in one network, sometimes several.

As autonomy was established in units, practices and procedures progressively diverged within the group; operational unit personnel felt a need for coherence and guidance. Progressively, the strength of the rhetoric of the new organization weakened, resulting in 2001 in the reintroduction of a layer of middle management in the operational unit. During this period, the emphasis on networks faded progressively. Networks continued to exist and to develop but not as systematically. The sponsor—and memory—of networks retired at the same period and nobody was appointed to replace him.

The increasing connections between subsidiaries of international customers rendered necessary the introduction of even more convergence in the offerings of the group. Moreover, the decentralized organization allowed for the introduction of numerous local innovations but had a cost in terms of productivity. A vast reorganization was launched in 2003 in order to rationalize the offerings and concentrate resources; small units were consolidated in larger ones (15 in France). Numerous reappointments and the hiring of external managers accompanied the reorganization. This changed the relational structure within the group and numerous networks disappeared.

Interestingly enough, what could have been the cause of the death of the networks was in fact the cause of a new meaning for network development. Indeed, the reorganization was led at a fast pace and central units had difficulties in providing timely answers to the concrete problems that were emerging. Quite naturally, the old figure of the network resurfaced during this period. Networks helped at various levels to implement and interpret the new guidelines, thus producing knowledge that was often centrally adopted afterwards. In other cases, networks stimulated the creation of formal working groups to solve a tougher problem. At the end of stage 2, the reorganization was under better control, networks were less active but new groups were still cre-

ated punctually when a problem arose . Moreover, the links generated during the reorganization were still active, at least informally on a dyadic basis. Thanks to the surge of networks, the reorganization was not synonymous with de-socialization and these links could be reactivated when necessary to solve new problems.

THE INSTITUTIONALIZATION OF CLUBS AT ELECTRICAL

Electrical is a company that resulted from the merger of three companies present in different geographical areas. From its creation, the group chose a management style that granted a large autonomy to small entities (700 in 2004, with a personnel ranging from 20 to 120 people) called "companies". The only functional central structures are financial, marketing for only some specific activities and an innovation cell that mostly ensures technical environment scanning. As far as line management is concerned, Regional Directors are responsible for the coordination of a large cluster of companies. Considering the light structures of the group, central interventions are reduced to a minimum. A strategic plan is defined for each company and formally translated into financial objectives. These objectives are followed formally. Interventions of the Regional Directors are non-directive, each company manager is responsible for his/her decisions. In such a decentralized context, the group sought some ways to reintroduce crosscutting links between companies in order to exchange resources and knowledge. These endeavours included formal working groups, crosscutting innovation projects and the constitution of "clubs".

"Club" was the word used at Electrical to designate crosscutting groups of individuals who share common questions or issues within the firm. The proposition to create a club generally emanated from one of the Regional Directors but could also be launched by Company Managers or Project Managers. The club then had to be approved by the Strategic Orientation Committee, the central governing committee; this approval was generally a straightforward process. Clubs could regroup representatives of companies that had common customers, work<u>ed</u> on the same field, or wish<u>ed</u> to develop their expertise on a precise function or question (for instance logistics, purchases, etc). Membership and attendance varie<u>d</u> from small communities of five people to bigger ones of up to 30 people. Clubs had no pre-determined duration, they could be temporary or permanent. No formal reporting was expected but they could produce a final report if they thought it appropriate.

The story of the clubs of Electrical is that of a continuous building up over the eight years of this study. When I started the study in 1996, the question of crosscutting exchanges was a recent one following the extreme decentralization policy adopted by the head of the group. The clubs quickly emerged as a very useful tool for managers to develop links between companies while respecting the principle of decentralization of the group. By the end of 1997, the group counted about 40 active clubs that were binding together the 250 companies on various themes. At this stage, there was no specific support of the organization to the clubs even though attempts to create cross-cutting links was

one of the four criteria used in the assessment of each company manager. Some clubs included a Director as others were composed only of Project Managers and company managers.

In 2000, after a reorganization of the holding company, Electrical incorporated the electrical activities of another group. Even though Electrical was smaller than the other group, the management style that was adopted for the newly integrated entities was that of Electrical; thus the other group was reorganized in small autonomous companies. From 250 companies, the group thus jumped to 700 and consolidated its position in Europe. The decentralization principle was not put into question and thus the need for crosscutting links was even more crucial. This first reorganization was followed by a rationalization of the divisions of the activities at the beginning of year 2003 in order to introduce a common brand name for all the entities.

The transformation of the group resulted in a systematization of the creation of clubs so as to exploit common knowledge and synergies within the group. If the rules for the functioning of clubs had not changed, the practices evolved progressively. An Internet portal was introduced where clubs could be registered, minutes of meeting when taken were stored, member lists displayed and various documents shared. The major change was the quasi-generalization of the presence of a Regional Director at the meetings; this was the case for the majority of clubs even though some exceptions remained. This Director was not directly responsible for the co-ordination of the club, the choice of the topics or the membership; nobody was forced to attend a club meeting. Nevertheless Directors had a specific status in the clubs as they could ask members to stop their activities if they judged that no progress was being made. They also helped to focus the debates, especially by proposing some themes when the clubs were launched. As discussed below in the thematic analysis, this is to be put into perspective with the decentralization of the group and with the fact that Directors are not the hierarchical supervisors of most of the members of the clubs they coordinate.

THE INSTITUTIONAL
AND DISSIDENT COMMUNITIES OF COMP

Comp is characterized by an important decentralization at the manager level while hierarchy is more important at the consultant level. Projects in the business units could have common points that were not exploited because of the decentralization of the company. It was decided in 2001 to launch communities of practice called "excellence centres". Six such centres were initially created on the following themes: Internet, telecommunication networks, project management, bank-finance and insurance. The first two centres—Internet and telecommunication networks—only lasted a few months and fell apart rapidly because of the lack of interest of the consultants. The four others are still active, even if to a variable degree.

Participants were initially a mix of about ten experienced and less experienced consultants in each centre that had chosen freely to get

involved. Each centre was facilitated by a pilot, a co-pilot and a few experts. A Mission Manager was nominated by the management of the company to follow the development of each centre. In the initial organization, the Mission Manager did not participate in all the meetings; the pilot reported to him on the activities of the club, he could be called in to help and arbitrate a delicate matter or help obtain some resources for the centre. Centres met at least once a month and had to organize so that the knowledge they produced was made available to the rest of the organization. On these common grounds, the four centres followed very different paths.

In fact, only the CRM centre's manager respected the organization as initially defined. The pilot was the actual facilitator of the centre and the Mission Manager did not get involved. Topics to be put on the agenda were discussed between members and everybody could contribute. The Mission Manager acted only as a link with the top management but insisted on his informal role and not on influencing the decisions taken within the centre. He did not exert control on the centre; the centre was thus very active and was a real community of practice that contributed to knowledge exchanges and helped members to deal with complex clients proposals.

The project management centre was gradually organized by the Mission Manager as a project team. The vocabulary used was that of project management with deliverables, deadlines and objectives, what the Mission Manager called "framed voluntary work". The Mission Manager was thus more involved, he proposed the themes and the members chose which topic they wanted to contribute to; they then agreed to do a specific task for a specific deadline. In order to orient the activity of the centre, the Mission Manager often participated in the meetings. He used his own experts to help determine the appropriate subjects. The group no longer worked as a community of practice, and thus did not offer the same opportunities in terms of knowledge sharing. Nevertheless, it had become a project group that produced deliverable useful for the organization.

In the two other centres, the role of the Mission Manager—the same person for both centres—was even more prominent. The Mission Manager progressively acted on behalf of the pilot and took their places in the centres. She restricted the subjects to be studied and gradually became the manager of the centre. Some of the themes that had been chosen at the beginning by the members were replaced by others unilaterally judged as priorities. She also controled the activity and got directly involved in the elaboration of the deliverables, building on the work done in subgroups by the members. The functioning of both centres was perceived as hierarchical as the mission director is a representative of the head of the company. Fewer and fewer consultants were interested in doing extra work without having the opportunity to enter exchanges on subjects that really interested them: the passion was gone.

The bank-finance and insurance centres thus both progressively faded away. Nevertheless the outcome was not completely negative. On the one hand, managers within the company had identified, thanks to the

two centres' activities, key consultants whose expertise could be used on projects. They started interacting with them directly as the two centres were perceived as too bureaucratic. On the other hand, consultants were asking for a structure where they could exchange their knowledge and this structure was still to be created. Thanks to the centre, they learnt to know one another and this resulted in the emergence of a completely informal and deinstitutionalized community. Three consultants took the initiative to organize monthly lunches with colleagues who worked in the field of bank and finance. These lunches, which started at the beginning with a small group of less than ten persons, became very successful and a very active community of 70 consultants later constituted the mailing list, with an average of 30 coming to the lunches. At these lunches, the unofficial pilot very briefly raised a subject and launched a debate that participants were free to develop or not at their end of the table. These lunches were followed by active exchanges of files, documents and the formation of small working groups to address subjects of interest. Groups on subjects other than banking or finance formed as consultant realized that they had common technical preoccupations. Interestingly, the excessive formalization of the centres resulted in a very active, informal and non-institutional community.

THE COMMUNITIES AND THE ORGANIZATION: DISCUSSION OF THEMATIC RESULTS

The contrasting experiences and organizational contexts of the three cases studied offer rich insight into the potential contribution of communities of practice to intra-organizational cooperation. First, the results show that communities of practice can fill organizational gaps, build resilience within the organization and thus develop a rich form of interstitial cooperation. Second, the analysis of the connections between communities of practice and the organization results in identifying five key roles managers can play to contribute to community development, depending on the organizational context.

TOWARDS INTERSTITIAL COOPERATION

Communities of practice can contribute to filling organizational gaps in various contexts. As elastic forms, they adapt to the organizational environment. The longitudinal design of the research allows for the analysis of how they resurface when organizational actors need them. Their resilience is based on underlying networks that sometimes crystallize themselves into a community; this property is crucial in order to build resilience in the organization by allowing cooperation to take place when and where needed. Such cooperation goes far beyond simple knowledge exchanges and can lead to very concrete realizations. Communities achieve this result when they can create a balance between the self-interest of their members and a polymorphic altruism.

FILLING ORGANIZATIONAL GAPS

If communities of practice are interstitial organizational forms, it does not mean that their contribution to the organization is marginal. If they are acclaimed by the managerial world, it is because the interstices can be wide: communities of practice can fill organizational gaps. What is remarkable is the wide spectrum of their contribution. In decentralized environments they can constitute precious links between entities, help individuals in the decentralization process and contribute to breaking the internal individualist and competitive logic of output control or market incentives. In a more centralized environment, they can help to interpret or implement the rule as well as to generate dissident behaviours sometimes necessary to escape the rule.

The first generic situation is that of decentralized organizations. This was the situation of Electrical, Gas (in phase 1) and Comp (at the managers' level). Decentralization has a first effect of dispersion of competencies within the organization: people who could exchange knowledge and exploit their competencies and resources tend to focus on their own business and miss opportunities of joint developments. This effect of decentralization is very straightforward: «The problem is that as we are organized with dispersed companies, people don't meet necessarily very often; [the club] is a means we found so that people who have common preoccupations could exchange» (Project Manager, Electrical). The situation is the same at Comp for the informal community that emerged after the failure of the competency centres: «we tried to put people together because they worked in the same field or because they had the possibility to work in the same field» (Consultant, Comp). The importance of this aspect of the role of communities of practice tends to be amplified «as organizations grow in size, geographical scope, and complexity» (Lesser and Storck, 2001: 831). This is exactly the situation Electrical faced after merging its activities, with an increase in size from 250 to 700 companies. The clubs proved very useful as they helped in the integration of the new companies in the group; the clubs progressively integrated the new comers on relevant subjects: «At the beginning, as I told you, it was mainly people from the old perimeter, we are now very happy as it integrates people from the whole group, even beyond the electrical activities» (Club Facilitator, Electrical).

More generally, the communities of practice can help individuals in the process of decentralization. Indeed, decentralization means that actors must redefine their roles and bear a situation of increased responsibility and pressure; in such circumstances, communities of practice offer a social context in which to cope with this situation. This was specifically experienced at Gas during the initial decentralization of 1992: «for me, the networks were very useful for the reorganization, for exchanging best practices, to look for possible new tracks. It was a reassuring factor for people that had not necessarily a hierarchy to help them on a number of topics» (Region Manager, Gas). The contribution of communities of practice in a changing organization is both reinventing the content and identity of the role and providing actors with the opportunity to reorient their informal networks, one of the key elements constitutive of role transition (Ashforth and Saks, 1995).

Finally, decentralization can create a situation where dialog between units is made difficult. These difficulties result in the first place from the differentiation of the structures (Lawrence and Lorsh, 1967). Also, decentralized structures are often associated with the introduction of financial control mechanisms (Goold and Campbell, 1987); output control in such situation is associated with a competition that can result in individualist attitudes detrimental to the cooperation between the units. This was exactly the situation encountered at Electrical, where both differentiation and financial incentives resulted in difficulties to recreate a cooperative link. People hesitated to give away strategic information: «In general, people give little information about their customers, everyone looks out for his own interests» (Sales Manager, Electrical). For instance in the buyers club, it took time for people to feel confident enough to start talking about providers: «In this club, at the beginning, people really had to get used to trusting one another, to talking with one another and telling one another what their providers were telling them. (…) Then, during the two or three first meetings, it was to get used progressively to saying things that they didn't dare to say» (Club Facilitator, Electrical). Communities of practice thus helped actors to overcome the individualism resulting from financial incentives and to enter into a more authentic relationship of cooperation.

The reorganization of Gas and the evolution of the bank-finance excellence centre of Comp were two opportunities to observe the positioning of community members in a situation where new and more restrictive rules and procedures were introduced. Communities of practice in both companies were useful in this situation. In the case of Gas, the introduction of new rules and procedures was not necessarily perceived as an intrusion. Many actors felt some rationalization had to take place in order to face strategic challenges such as the internationalization of customers. It was not a case of complete recentralization and thus, the rules left some margin for interpretation: «Networks are very productive in the period we are engaging in, because we move back towards a situation more centralized, much more centralized. This means the national policies are much more precise and demanding. Thus, the modalities of implementation must be discussed between those who are in position to see how to adapt efficiently to these national objectives efficiently» (Region Manager, Gas). In such a situation the communities of practice thus helped to interpret and implement the new policies.

But communities of practice can also be used in order to escape some form of intrusion, in which case they become clandestine. This is what happened at Comp when the Mission Manager attempted to take over the activity of the bank-finance centre, thus transforming a community of practice into a bureaucratic structure. Consultants started to meet informally outside of the excellence centre: «As the Mission Manager imposed things on us, we started to see each another outside and we figured out we could exchange (…) that's how we progressively disregarded the Mission Manager» (Consultant, Comp). Project managers looking for a specific competency would then start asking directly to the informal community members: «The first request came directly

from a manager alone, directly, I didn't ask for it. He had understood that there were some competencies and he didn't want to bother with formal procedures, so he called the person who had the knowledge» (Consultant, Comp). The informal community thus offers a real alternative to the formal structure, it was perceived as a useful way of bypassing the formal structure. This is in line with Lave and Wenger's (1991: 64) suggestion that «communities of practice may well develop interstitially and informally in coercive workplaces». Even if Comp had not become all of a sudden a coercive workplace, the pressure put on the excellence centre by the Mission Manager was perceived as too coercive and was leading to a bureaucratic functioning. This drift of the community is also to be linked with the difficulties top management has to actually capture the essence of the practices undertaken within the organization. This results in a tendency to underestimate or misinterpret the actual skills deployed within the organization and thus in the deployment of clandestine exchanges: «The corporate tendency to down-skill can often lead to non-canonical practice and communities being driven further underground so that the insights gained through work are more hidden from the organization as a whole» (Brown, 1998: 232). But as illustrated by the situation of Gas, communities of practice can also contribute to integrating actual practices within the formal or "canonical" practices; by acknowledging the importance of the negotiation of sense by those who are to implement the organizational procedures, central management can avoid a situation of disconnection between espoused canonical practices and actual practices (Brown, 1998).

Communities of practice thus maintain an ambiguous connection with the rules and procedures that is to be understood as a mixture of approved interpretation and dissident transgression. The actors can instrumentalize them in order to negotiate meaning, either to interpret the rule or to create linkage in less structured organizational settings; in that sense communities of practice play with the context. They can also be a place to escape the organization, a place where the rules are no longer applied and cooperation takes place despite individualism. Management can tinker with these different facets of communities of practice, they can try and build around them but in the acknowledgement that communities have a life of their own and that tinkering too much is likely to make them cross the border towards clandestine behaviour. A longitudinal analysis of the evolution of the communities in the three cases help us to better understand the unique way communities of practice connect the informal to the formal and the institutional to the clandestine. In the next section, we adopt the concept of resilience to shed light on these questions.

RESILIENCE, COMMUNITIES AND INFORMAL NETWORKS
One of the insights that can be drawn from the Gas and Comp case studies is the capacity of communities of practice to reappear when they are no longer expected. They may change, become more or less formal and benefit from a stronger or a weaker institutionalization, they seem to resurface when the actors of the organization need them. If

previous life cycle theories about communities of practice fail to capture this resilience, it is mainly because they stop the observation when the community escapes its definition; but communities are one of various possible states for their underlying social ties. As such they can't be understood if we don't follow what becomes of these social ties when the community disappears. This gives us an understanding of the resilience of communities of practice but also of their contribution to the resilience of the rest of the organization.

Communities at Gas resurfaced when they were needed for the implementation of a new and more centralized organization. This was in an organizational context where the communities had become less essential as management tools; communities still existed but were not as actively encouraged as they had been following the first reorganization in 1992: «It represents less than before for the people of the company. It is diffuse and less… it is no longer encouraged, it is more spontaneous but it no longer has this character of a wanted institution that we made sure would endure and be prosperous at the beginning of the [1999] reorganization» (Region Manager, Gas). Despite these unfavourable conditions, communities emerged naturally in order to interpret the new rules and procedures: «We see with satisfaction that they start to function again or to reconstitute themselves while changing a bit their objectives. For them, it is to share their know-how in mastering new tools, or to put together the preparatory works for the implementation of the new tools. And this works very well. To a point, it is enough to let do.» (Region Manager, Gas). Communities (networks in the company's argot) can thus be considered to some degree as an organizational reflex, an acquired property of the organization: «It is a great asset because I think that ten years ago we wouldn't even have thought about it» (Technical Manager, Gas).

Another occurrence of the capacity of communities of practice to resurface in a new and unexpected configuration was observed at Comp when the bank-finance excellence centre was perceived as inappropriately bureaucratic. The functioning there was completely outside of the institution and not formal at all; the starting point was the organization of a monthly lunch by three of the frustrated consultants: «It was completely informal. People would come with folders and files, input, exchange in electronic format, mostly electronic. It was the opportunity for numerous electronic exchanges afterwards» (Consultant, Comp). This gave birth to a wide community of 70 people but also to various working groups on very concrete priorities of the consultants: «For instance, on the new accountancy rules, after one of the lunches, three people from the group worked together on an offering on the new norms. They met at the head-office and worked on a presentation of the norms to the company and for a specific customer. They communicated it to the rest of the group» (Consultant, Comp). Interestingly enough, the scope of the new emerging community starts to expand below the initial thematic. Sub-groups form on other themes: «There were people from finance, but in the telecom industry. Some of them had worked on new communication means like PDA, BlackBerry and this kind of things. They also got together on geo-location things that

had nothing to do with the starting subject. (…) It might well be that several groups will form» (Consultant, Comp). This thematic deviation illustrates very well how powerful the informal communities can be.

The reappearance of communities can't be interpreted without taking into account a broader picture of the organization. Communities have an ambivalent relationship with pre-existing informal networks. First, they often build on pre-existing informal networks; this is one of the more consensual results of research on communities to date (McDermott, 2000; Wenger and Snyder, 2000; Gongla and Rizzuto, 2001; Wenger *et al.,* 2002). This was of course observed in the different case studies, for instance at Gas: «When I was transfered to Orléans, I wasn't part of this South network but I was called and told "I would like you to participate because there are things on which you have made progress and we would like to share and exchange on these subjects". And this is how I integrated this South network» (Technical Manager, Gas).

Nevertheless, this is not necessarily the way networks were formed at the beginning. Managers often play a role in the emergence of a network by suggesting and pushing their collaborators to form a community or to get involved in an existing community; this was especially obvious at Gas and Electrical. This does not imply a pre-existing informal network between participants. In such circumstances, the community will be the origin of the informal network and people will start to know each other because of their participation in the community. This explains why a community may not completely disappear when an external observer might think of them as terminated. They continue to survive in a lethargic state that can explain their resurgence. For instance at Comp, the excellence centre gave birth to both the clandestine community and to informal networks of expertise: «Even though it [the bank-finance excellence centre] collapsed, there is still an informal group that is still appealed to on questions of bank-finance» (Consultant, Comp). Institutional communities give birth to informal networks, which, in turn, can be the source of new communities.

Communities can also lead to and be derived from a much more formalized form, that of the working group. Communities do not always dispose of the necessary resources and competencies to achieve certain objectives. In such cases, community members may think it appropriate to create a working group: «That is to say, if in a network a certain number of people decide that there is a subject to be more deeply gone into, we can start a work group system» (HR Corporate Manager, Gas). This does not mean that the community is over or will not revive from the social ties consolidated into the working group. Wenger *et al.* (2002) captured the idea of this evolution of communities of practice by using the term "transformation", but contrary to their view, transformation is not the end of a community but the evolution towards a different form of social links that can result in the rebirth of the community.

In fact, the life cycle approach to community development (McDermott, 2000; Wenger *et al.,* 2002) fails to accurately capture the evolution of communities of practice (Gongla and Rizzuto, 2001). This is probably

the case because it does not consider the community in its context, that of the organization. If communities have this capacity to reappear in a different form when they are needed, it is mainly because of their recursive connection with informal networks but also with other more formalized forms such as work groups and probably former and current work teams or project teams for instance. Communities thus appear as the crystallization at one moment in time of social relationships within the organization. They belong to a wider continuum of organizational forms from the very fluid form of informal networks to more structured work groups or teams. They are built on other forms and build other forms.

These results echo Granovetter's (1978) conception of social embed-dedness that appeals to an understanding of organization as a combi-nation of strong and weak ties. The strength of the ties is subject to some elasticity as weak ties «serve as communication channels and may at all times be transformed into strong ties» (Biemans, 1990: 533). It is only within this broad perspective that we can understand the cycles of disappearances and reappearances of communities of prac-tice. One could say that communities hibernate in the form of informal network and than reappear when issues or problems are to be solved within the organization. As argued by one of the Region Managers of Gas: «Communities are still functioning and not only because of the acquired speed but also because of the permanence of subjects to be addressed». In this sense, by introducing some form of redundancy in organizations, communities of practice reinforce their capacity to recover from important changes or perturbations. Indeed, even though redundancy is costly (Burt, 1982), it increases information-gathering capacity (Tichy, 1981). Beunza and Stark (2003: 136-137) showed the recovery of trading activities after the events of September 11: «orga-nizational responsiveness rested less on contingency plans and hier-archical command structures than on heterarchical structures of self-organization and lateral coordination». In the same vein, Leca and Naccache (2004) associated al-Qaida's resilience capacity to its spe-cific network structure. Redundancy in the organization is one of the important drivers of adaptability to small changes, recovery and resur-gence. As they offer alternative ways of doing things, communities of practice introduce within the organization some generative redundan-cy in the sense of Beunza and Stark (2003).

Communities of practice thus appear as resilient forms; building on informal networks they fade when the organizational context is not favourable and reappear when their contribution is needed. One could say that they survive because they are interstitial; they fill the gaps left by other organizational forms. Their resilience is also a contribution to resilience at other levels of structures. Communities of practice, as a reticular form (Josserand, 2004), directly contribute to organizational resilience; as communities reconfigure themselves from being more or less formal and more or less institutionalized, they can contribute to solve various organizational issues and thus reinforce organizational resilience. By creating spaces of exchange between individuals, they also contribute to individual resilience.

INTERSTITIAL COOPERATION,
FROM LEARNING TO DOING TOGETHER

One of the explanations for the resilience of communities of practice is their capacity to adapt their shape to the organizational context and thus to answer to various expectations from organizational actors. Any specific community must answer the same expectation of concrete contribution to individual practices. To achieve this, communities have to evolve from learning to doing; the community members I observed were not merely meeting to exchange knowledge, they were active and working together. They were engaged in common activities that helped them to transcend their everyday practices, giving them the passion to meet and to develop the community, a level of contribution that is possible only if the community becomes a place of free exchange in which "true" cooperation can take place. This form of cooperation results from a finely tuned balance between the pursuit of self-interest and the development of a polymorphic altruism.

Interestingly, members were able to articulate the achievement of networks as a two-fold activity. They first underlined the importance of information and knowledge exchanges. Some actors even spontaneously used the phrase "network of knowledge" to underline the role classically attributed by the literature to communities of practice. But they also insisted on the importance of more concrete activities if the community was to survive: «Very quickly, there must be common objectives» (Regional Manager, Electrical); «The purchase community worked out, it still works because they gave themselves concrete objectives (…); clubs that do not give themselves concrete objectives do not work well» (Club Facilitator, Electrical). The objectives were varied but they often implied the creation of common elements like rules, procedures, tools, a brand or prospecting for common customers. Communities were meant to take decisions together: «The way we function, it is not that connections between people that have decisions to make or things to do together would have to go through a pyramid. We want it to be horizontal connections» (Regional Director, Electrical); «For new functions, as that of Quality Manager or Work Planner, it came naturally with a strong need of course because they are in the process of creating their profession in a way» (Technical Manager, Gas). Members also clearly articulated the knowledge and more operational aspects of the activities of the communities: «Our action was more to make proposals for the customers. We gathered in small groups to do that and we worked. The stakes were to settle some problems to acquire new competencies for their carriers but also to form our networks of knowledge. Knowing that one can rely on somebody when one has a problem» (Consultant, Comp); «There is a network to work and after, there is a knowledge network as well, that is to say that it is important to know who does what in the company and to know were to get the good information. (…) in "networks" there are two aspects» (Region Manager, Gas). In their interstitial activities, community members do more than exchanging and developing knowledge, they also engage in concrete cooperative actions that are essential to the survival of the community.

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The importance of concrete activities within the community gives an interesting perspective on Wenger's (1998) participation/reification duality. Indeed, as argued by Brown (1998), for community members, learning is a matter of practice, not a theoretical thing, it is all about becoming a practitioner. Communities' activities and more generally cooperation have to be grounded on concrete and practical realizations (Dameron, 2004; Dameron and Josserand, 2004), something that is essential in order to stimulate the involvement of members. Concrete realizations partially satisfy the need for reification while allowing for a common engagement in participation where resources and competences are complementary. The achievement of this form of cooperation contributes to building-up the legitimacy of the community towards its members and towards the organization; in that sense it is absolutely necessary. Still, the connection between community and practice is ambivalent. The community transcends the practice of each member but only if it has a grip on these practices, only if it imposes its mark in concrete common realizations. Members' participation in the community is not enough if the community does not participate into the everyday practice of members. Sharing a practice means learning but it also means doing concrete things together, cooperating in the etymological sense of the term in order to adjust to the needs and objectives of each member and of the organization as a whole.

Achieving such a level of cooperation is not straightforward, it implies a finely tuned balance between interest—the satisfaction of instrumental objective stressed above—and a polymorphic altruism. Instrumental objective can be captured by a give and take logic: «There is a necessary condition for a club to work, people that belong to it must want to give, to receive (…) it is really a place of exchange» (Region Director, Electrical). But the instrumental objective does not seem sufficient to ensure the success of a community. Many participants underline the necessity of some form of conviviality that goes beyond mere interest: «It is due to the ambience, the desire, obviously, this ambience is a factor that will make a club live, die or flounder» (Project Manager, Electrical). This necessity to create convivial links between individuals is often translated into the nature and location of the meeting: a lunch, visiting a customer or a technical realization, a meeting room outside of the company… In fact, true cooperation will only happen when the group comes together naturally: «When people have worked together on a subject, further activities come naturally» (Region Director, Electrical). As described by Wenger (1998), this led to a common passion: «about the notion of club, I would like to add the importance of "voluntary passion", that is important» (Commercial Manager, Electrical). As the community emerges, strong affective ties can appear: «It takes several years before they are fluent but after a while, they call each others for everything. They become friends» (Regional Manager, Electrical); «To me, there must be, let's say, an affective relationship between people» (Project Manager, Gas).The give-and-take logic is thus not the only explanation for the survival of a community. The construction of a common identity associated with

affective links allows for the surpassing of self-interest towards some form of altruism.

The quality of cooperation within communities of practice thus clearly appears as dependent on a balance between interest and altruism (Grima and Josserand, 2000). Ambivalence in the interpretation of such cooperative relationships can be traced back to Chester Barnard (Dameron, 2002). Interest in an instrumental perspective is essential but a community is viable only if both affective and identity links are present (Dameron and Josserand, 2004). Nevertheless, the instrumental dimension is essential if the community is to find its legitimacy within the organization and results in a new perception of participation where members participate in the activities of the community but where the community also infiltrates daily practices of the members.

ORGANIZATION, MANAGER AND COMMUNITY: A CONTINGENT APPROACH TO A COMPLEX TASK

I have proposed previously that communities of practice were characterized by a high level of resilience. Nevertheless, the concept of resilience, whether used in physics or social sciences, also intrinsically includes the existence of a breaking point, a point after which the system can't recover. Accordingly, the resilience of communities of practice is not absolute and much could be lost because some communities and their underlying networks are pushed beyond their breaking points. Management can contribute greatly to strengthening the role of communities within an organization. They can avoid rupture and encourage the consolidation of networks into communities, they can also encourage participation. If the management of communities of practice is a key question, it is because there is much to gain for the organization, but also much to lose if management intrudes and destroys the space of free exchange that communities represent. The results of this research show that managing communities of practice is a very demanding task for managers: they have to develop a form of behavioural complexity in order to manage the unmanageable. Beyond the very general advice given in the literature on communities of practice, "cultivating" communities of practice can only be understood within a contingent framework where the degree of tolerable intervention varies a lot depending on the organizational context.

Communities of practice and their underlying networks are exposed to both organizational changes and pressure. In some circumstances, their resilient property is not enough to ensure their continuation or at least some opportunities of interesting exchanges can be lost because informal networks disappear. This result was especially explicit at Gas where the number and level of activity of communities decreased progressively between the two major organizational changes. When people were transferred, they were supposed to introduce their successor, but communities did not always come first: «When you change position there is an overlap period and this is the moment to introduce the colleague. But we don't do it systematically because sometimes the

period is too short» (Commercial Manager, Gas). It is of course even more obvious in the case of major changes. The second reorganization of Gas broke inter-individual ties: «Most networks disappeared as we changed the structure, we changed most managers, we transferred them or assigned them to different functions, it takes time for all this to come together again» (Region Manager, Gas). The pressure of operational tasks within the organization can also be an impediment: «If business is slow, troubles here and there and people don't take the time to come anymore» (Project Manager, Electrical). Changes in the organization can thus be very detrimental to the community, which is especially the case if the emergent "pilot" or "facilitator" or "leader" of the community is affected. Indeed, interviewees at Gas and Comp[8] systematically underlined the importance of actors who would take charge of the development of the network: «The problem is the pilot, if you don't have a pilot and if it is not always the same person, it will fade away with time» (Technical Manager, Gas); «I think that for a network to work well, it requires one or two people who have some charisma or facilitating capabilities that structure the network, make sure there is a meeting agenda, some form of discipline… I think that often, the termination of a network corresponds to the fact that at a certain moment in time in the group, this or these person/s are not here any more and the others don't know how to get organized» (Region Manager, Gas); «Now the centre has collapsed, it was linked to one person who had strong relational capabilities and who has a very tough mission now, so he doesn't organize the centre anymore and nobody really took the lead» (Consultant, Comp). The hazards of transfers or more fundamental reorganizations are thus a major threat to the survival of communities of practice. This is the case because informal networks underlying communities can be destroyed but also because, if management does not pay enough attention to the issue, useful communities can disappear because their pilot or leader has been transferred. This echoes an early appeal by Brown (1998: 232) for more attention to the ecology of communities of practice: «More generally, changes or reorganizations, whether or not intended to down-skill, often disrupt what they do not notice (…) an organization needs to re-conceive itself as an ecology of communities of practice, acknowledging in the process the many non-canonical practices in its midst». The role of management is thus important if opportunities for community development are not to be lost or existing communities are not to disappear as the organization evolves.

The question of the role of management in the development of communities of practice is of course a very sensitive one as communities partly derive their contribution from their interstitiallity, from the fact that they escape management. The three cases studied can help us to draft the possible scope of managerial intervention and shed light on the managerial complexity of this issue. Five main roles to be played by the management emerge from the research, each of them generating a certain level of risk for the communities; these risks associated with the four roles are more or less salient, depending on the organizational context (**Table 2**).

8. The issue was addressed differently at Electrical, see below for more information about the role of Region Managers in maintaining the activity of the communities.

STIMULATION

Establishing the connections between individuals is the first role that management can fulfil. In the three cases, with the exception of the dissident community of Comp, managers played a major role in the formation of communities or simply in the fact that an individual joined a community. In fact, they often suggested to their subordinate to create a community: «For what I know, it is rather at my initiative [that communities were created]. I see a collaborator who experiences difficulties, who is not able to properly collect the know-how wherever it is. I tell him, lets look together for the three or four persons in France that could be more advanced in this area… Then we connect them to each other and that's it» (Region Director, Gas). A recurring point is that the capacity of management to establish a connection must not drift towards forcing people to participate: «We suggest to them that they ought to do that, we tell them it is a good way to make progress, but this kind of system can only be based on willingness» (Region Manager, Electrical). Forcing people to participate only results in a disinterest for the community and can be detrimental for the implication of members who joined with enthusiasm: «If it is informal, it is not hierarchical, you can't bring somebody to a club with a gun in his back. Either they come freely, they exchange and it works out well or they don't come anymore and obviously the community dies» (Region Director, Electrical). It thus appears as every manager's job to contribute to the development of the communities within the organization while paying attention to preserving a freedom to participate that is essential to maintain the dynamics of the community. This echoed what I called the risk of systematization observed in the case of a collegial insurance company (Josserand, 2004). Trying to build on a successful informal community, the company tried to generalize and impose on all members the participation in think-groups; as might have been expected, the outcome was not successful and the groups did not last very long. Wenger and Snyder (2000) emphasize the key role of managers in identifying the communities but do not underline the corresponding risks. They even suggest that managers can use the help of a consultant to interview potential community members. It seems that in many cases, the difficulty is rather to find the right passionate people who are willing to contribute rather than to select with authority the appropriate members. It is nevertheless important to underline that the need of intervention by management depends on how well institutionalized

Table 2. Roles of Management

Roles	Stimulation	Facilitation	Support	Control	Recognition
Objective	Connection	Purpose	Resources	Deviance	Reward and appreciation
Risk	Obligation	Imposed topic	Expected return	Threat on affect	Expected deliverables
Organizational contingence	Institutionalization	Decentralization	Resource decentralization	Productivity orientation	Degree of short-termism

communities of practice are within the organization. The evolution of Gas is very explicit on that matter. After the first reorganization, communities were identified as intrinsic to the new organization; individuals would thus naturally propose the creation of a new community. During the second reorganization, on the contrary, communities were not actively encouraged; managers thus had a key role in stimulating their revival. Managers have thus to be more active in their connection role if the facilitation and valorisation roles do not result in a sufficient institutionalization of communities of practice within the organization.

FACILITATION

A second role can be played by management, that of facilitation. At Gas, management did not take part in the actual functioning of the community, but the cases of Comp and Electrical offer the contrasting perspective of a failure and a success of such managerial implication. At Comp, each community was assigned a Mission Director, initially for facilitating and reporting purposes. As described previously, this experiment was not successful for two out of four communities because the Mission Director took over the activities of the community, as summarized by a consultant: «The centre became a tightly managed working group» (Consultant, Comp). This resulted in the creation of the informal financial community: «Even if we did not say it officially, it allowed us to by-pass the management» (Consultant, Comp). At Electrical, the starting point is more constraining than at Comp. In fact, a Region Manager is assigned to most of the communities. This is not a formal rule but it is applied in most cases. Because of their knowledge of the group, Region Managers are perceived as helping members to build their own objectives on a strategic perspective, in practice their role is described as «to bring ideas and themes, sometimes to propose the organization of meetings with external persons» (Project Manager, Electrical); «I see to it that there is an agenda, that it does not drift in every direction… When it goes into hare-brained subjects it is important to refocus the debate. But about the content, it is up to them. In principle, I do not facilitate. In order for it to remain operational, it is good that one of the member organizes the meeting» (Region Manager, Electrical). Management is thus present at most general meetings of the communities but interestingly, this is less detrimental to community development at Electrical than it was at Comp. The explanation can of course be found in the differences between organizational contexts. If both companies use financial objectives, Electrical is very decentralized whereas in Comp, input control is the rule in most teams. This means that for the Region Managers of Electrical, accepting the existence of a zone of autonomy has become natural, whereas management at Comp is used to the controlled production of deliverables to the customers. Actors at Electrical explicitly link their capacity to contribute to the community facilitation with the more general organizational context: «A manager that would be bossy, that would want to rule over everything, of course he blocks everything. The spirit is to give a space of exchange without constraints. If people feel they are spied, watched over, for sure they won't say anything. But this is not

the functioning at Electrical» (Project Manager, Electrical). Two minor points can also be underlined about the interventions of the Region Managers. First, they only supervise a few members of the communities they participate in, which makes it harder for them to behave with too much authority. Second, between general meetings, members interact, work in small groups, advance on subjects and projects and the Region Manager does not take part into this. The result is thus a situation where management can help the community to develop its full potential in the spirit described by Wenger *et al.* (2002: 73): «because communities evolve toward their potential, rather than define it up front, developing them involves imagining possibilities their members have not yet considered». Smith and McKeen (2002) have also identified a role for management in shaping the community's intent. These advice are of course relevant in some contexts but the study of Comp shows that we are playing with the intrinsic paradox of community management, that of their unmanageability. Such intervention from management should only be considered in very decentralized environments, where input control is extremely reduced.

SUPPORT
A third role is that of supporting the communities' activity, mainly by giving access to the resources needed by the communities and helping them to lift organizational barriers. This role is dealt with in a very different manner in the three organizations. At Comp, this was the key initial attribute of the Mission Director. I have already showed in detail how this non-intervening role led to short term results expectations and subsequent interference in the communities' activities. Both Electrical and Gas have in common a decentralization of resources at the operational unit level. This meant that in both companies, if community members needed some resources they would have to negotiate these resources with their unit managers. In principle, this decentralization of resources would be enough to ensure that appropriate resources were available. Nevertheless, in both cases some complementary mechanisms were at play. At Electrical, the fact that most communities had a Region Manager among the members was important for credibility and thus for resource allocation: «The fact that we were here was important. It ensured that resources were used wisely» (Region Manager, Electrical). Gas addressed the question of facilitation more directly. During the first reorganization, a national sponsor for the communities was appointed, his only role was to facilitate the development of communities; this role was depicted as extremely useful: «As long as we have had people like [Name] who was very convinced about the communities and who worked for it, it worked out well, but for a few years, the momentum has slowed down» (HR Central Manager, Gas). Directly or through the national sponsor, communities could also gain access to resources from the functional departments of the company. This question was not relevant to Electrical as functional departments were reduced to a minimum. Support has already been identified as a key role in the literature (Wenger and Snyder, 2000; Smith and McKeen, 2002). I did find evidence of its importance but it was never expressed

as a primary concern for the actors. As shown in the case of Comp, it can also lead to higher expectations and undesired intrusion from management within the communities. Even though facilitation appears as a necessity in organizations with no decentralization of resources at the operational unit level, its implementation must once again very carefully take into account the organizational context.

CONTROL

The fourth role of management is that of control. Gas and Electrical offer the most interesting perspectives on that matter. In both companies, many actors expressed the fact that a community could become a place of social encounter with no real work or achievement. For instance a unit manager at Gas stated: «If it is to go out for a big lunch together but that generally there has been no production during the community meeting, I notice it and I don't necessarily want them to go on with it». The fact that no formal report is asked for does not imply that no control is involved. In fact, most of the time the control is very informal: «I asked all the people who participate in networks in my unit to keep me informed about their meetings. Some give me written reports, others oral ones, to some extent, I don't care. My aim is not to intervene in the conclusions or in what was said in the networks but to measure what is the value and volume of this exchange» (Region Manager, Gas). At Electrical, the control is more direct as Region Managers are present and are there «to check if the club evolves in a constructive climate or not, and then have the power to stop the club» (Region Manager, Electrical). Nevertheless, in both cases, actors insist on the fact that control should not undermine the affective dimension of the community. The same manager who emphasized the risk of deviance also underlined that: «One knows that one takes advantage of it to have a little lunch together so that there is a moment of conviviality». The affective dimension has to be preserved: «The weight of a manager mustn't interfere with the overall functioning. If it were the case, it means we have a concern, that the geniality is not there» (Project Manager, Electrical). These modes of control were possible at Gas and Electrical because the organizational context was tolerant and even demanding of a form of cooperation that was not yielding immediate results. This was not the case of Comp, where the productivity orientation directly threatened the expression of the affective dimension. The risk of deviance of communities of practice has already been identified as «too much of a good thing» (Wenger *et al.,* 2002: 145); it appears as an important concern for the managers in the three companies. But before introducing control mechanisms, a clear assessment of the risk encountered on the affective dimension of the community has to be conducted. Sometimes, recognition of the community activities can be more beneficial than tight controls.

RECOGNITION

The fifth role of management is precisely that of the recognition of the activities of the community. This involves both rewarding and appreciating members' contributions but also leveraging communities' activi-

ties within the organization. At Gas, the recognition of communities'
activities is now reduced to a minimum. Nothing is included in the eval-
uation criteria; in fact, the common understanding is that members will
attend if they find an interest in the community's activity. If it helps them
to better do their job, then the reward will come in their everyday activ-
ity. Electrical has a more voluntary approach to reward and apprecia-
tion. Contribution to crosscutting relationships between operational
units is one of the criteria of evaluation, which includes getting involved
in communities: «The fact of participating or animating a community,
this is a point that can be set as a precise objective» (Region Manag-
er, Electrical). The presence of a Region Manager to the meetings is
also an important factor for recognition. It first contributes to the diffu-
sion of the community's outcome: by its position the Region Manager
can leverage it through the organization. It is also important for the
recognition of the community, thanks to the presence of the Region
Manager: «People were happy that it was an action that was validat-
ed, that was made official by the fact a Region Manager care about it»
(Region Manager, Electrical). This was also one of the only positive
feelings associated with the presence of a Mission Manager at Comp:
«If there is a Mission Director, it means that the management is really
involved» (Consultant, Comp). But on the other hand these manage-
ment implications led to a situation where deliverables were systemat-
ically asked of the communities: «If they get involved, they will ask us
to do things. If they ask us to do things, either they control, and this
does not work, or it is extra work» (Consultant, Comp). This is a man-
ifestation of the hiatus between the expectations of the members who
wanted to share their knowledge and that of the Mission Managers
who tried to impose the short-term production of materials for the rest
of the organization. One of the main differences between Comp and
Electrical and Gas is the difference in recognition of the importance of
time in building a community of practice. Communities have to be
places of exchanges protected from the overwhelming time pressures
that exist in most organizations. This echoes the finding by Wenger *et
al.* (2002: 152) that «when an organization lacks a compelling vision of
what communities can accomplish in relation to strategic priorities,
communities are forced to focus on achievements that can easily be
included in formal evaluations, such as technology or documentation,
even if members do not believe that these are the most important pri-
orities». This doesn't mean that the unique competences of their mem-
bers cannot be used by the organization. For instance at Comp, man-
agers would ask the informal community members for help and sup-
port for difficult projects: «They were not really involved but they would
call me to know who they could call. They told me "on this subject, do
you know who is sharp because we have a need"» (Consultant,
Comp). This is an interesting answer to the use of non-traditional mea-
sures to assess the contribution of communities to the organization. In
fact, the results show that recognition of communities activities goes
far beyond simple ideas such as «listening to member's stories» as
suggested by Wenger and Snyder (2000: 145). It requires equilibrium
between some form of involvement of management and the necessity

to protect communities from short-term expectation that can distract them from their more fundamental purpose.

The first steps towards managing the unmanageable communities of practice have to be taken with caution. As underlined by Wenger and Snyder (2000: 140), «It's not particularly easy to build and sustain communities of practice or to integrate them with the rest of an organization. The organic, spontaneous, and informal nature of communities of practice makes them resistant to supervision and interference». The Comp case study indeed shows that «organizations can seriously hinder community development as well. (…) Their design is often focused on accountability for short-term, local, or individual results and is not well suited for communities» (Wenger *et al.,* 2002: 154-155). It is precisely the reason why advice on how to cultivate communities of practice can hardly be given in general. I identified five key roles that management can play in order to contribute to the development of communities of practice but these five roles cannot be artificially separated from the risks they are associated with. In fact there are probably very few organizations in which these five roles can be fulfilled without threats to the nature of the communities of practice. These would be organizations where communities have been recognized and institutionalized, management admits decentralization of decision and resources and productivity short-term orientation is not the only concern. In such organizations, managers may have learnt to deal with the ambiguity of combining coercive control mechanisms with the freedom necessary for the development of communities of practice. In order to do that they have to accept that their control of the community will be partial. Moreover, they have to accept a zone of irrationality and uncertainty; an attitude that would be perceived as a real challenge to their sovereignty by many managers in most organizations, something that involves asking a lot from managers. Indeed, it requires them to develop what Denison, Hooijberg and Quinn (1995) called behavioural complexity: they have to be able to combine contrary and opposed behaviours so as to adapt to the requirements of the organization and to those of the communities of practice. It is not enough for them to read the prescriptions on how to cultivate communities; they have to deeply integrate the rationale of communities of practice in their actions and to combine them with contradictory expectations from the rest of the organization. The formal mechanisms conceived in order to manage communities of practice can thus only be designed if we take into account the capacity of managers to separate business as usual from the exigencies of communities of practice. Paradoxically, it is in organizations where the context is less favourable for the development of such behaviours that communities can bring their most valuable contribution. In that case, the role of management should probably be reduced to its minimum. In such circumstances, institutionalization is important, so that managers can stimulate the connection between members. Bringing support will also be important but through an independent sponsoring structure directly related to the top management. Recognition can be organized at a general level but should probably not be linked to individual or to a specific community contribution. It is

only by crafting a context specific design for the interactions between the communities and the rest of the organization that a balance can be reached between developing communities of practice to their full potential and reducing the risk of managerial take over of the communities.

CONCLUSION

In this research I aimed to assess the potential contribution of communities of practice to cross-sectional cooperation within the organization. The results show that communities of practice can become real places of cooperation far beyond simple knowledge exchanges. They constitute a very flexible organizational form that allows actors to adapt to changing environment and organizational contexts. In centralized environments, they can contribute to interpreting or even to escaping the rule when necessary. In decentralized environments, when there is a lack of rules, they create social linkage between individuals who have difficulties in defining their practices; they can also contribute to escaping the pressure of competition. This elasticity of the purpose of communities of practice partially explains their capacity to resist internal or external disruptions. Nevertheless, a full understanding of their resilience is only possible if we put communities of practice into the broader perspective of their organizational context. They are resilient because they build on networks and resurface when they are necessary for members to redefine their practices; this resurfacing can be formal and institutional but it can also happen informally and clandestinely. By their capacity to contribute to various organizational challenges, communities of practice build resilience within the organization: they introduce some network flexibility within bureaucratic arrangements. The more developed communities contribute to concrete realizations, they evolve from learning to doing, they engage in very concrete activities that can lead to business development for the members. This form of cooperation is only possible if the actors' self-interest and short-term perspective is transcended by a form of altruism, the quest for a common purpose and common objectives. The current trend to classify communities of practice in the knowledge management category is certainly adopting a limited view of their possibilities, unless we think that prospecting together for a common client is knowledge management. To address their full potential in terms of filling organizational gaps and building resilience, we must acknowledge the potential contribution of communities of practice to a wide scope of interstitial cooperative realizations.

Contemplating the potential of communities of practice, one can only understand why their manageability is an important question. Indeed, communities are resilient but they are also fragile and if some communities reappear within the organization, others will disappear because their pilot has been transferred or because of other organizational changes. If the form is resilient, specific communities and their potential for cooperation can easily be lost in the recurring reorganiza-

tions that seem to characterize the current business world. Management can contribute to develop more communities and to further develop existing ones. Nevertheless, helping communities to realize their full potential is a delicate challenge and management interventions need to be crafted very carefully according to the organizational context lest these interventions be counterproductive. I identified five major roles that managers can play in order to contribute to the development of communities—stimulation, facilitation, support, control and recognition—but specific risks are associated with each of these roles. Moreover, these risks are mitigated by organizational context. The organizational context has a direct impact on the capacity of managers to endorse the behavioural complexity that is necessary to accept communities of practice as zones of exception within the organizational framework. The results indicate that, unless we are confident that the organizational context is favourable, management implication should be limited to stimulation and indirect facilitation and recognition. This research thus represents a first contribution to what can become a complete contingent framework for the cultivation of communities of practice.

Emmanuel Josserand is Assistant Professor at Paris-Dauphine University and researcher at the CREPA research center. He recently published *The Network Organi - zation: The Experience of Leading French Multinationals* (Edward Elgar).

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