Solicitation of experts in an undetermined environment: the case of a polar exploration

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Abstract

Purpose – *The purpose of this paper is to understand the solicitation of outside experts in the upstream phase of innovation projects, which fall within the scope of the exploration and which take place within a context of radical uncertainty: how are these experts identified, selected and mobilised? While companies are compelled to manage exploration projects, the processes underlying the expansion of knowledge in these projects are not well known.*

Design/methodology/approach – *Based on the literature, this paper first presents a conceptual view of the notion of expert. Then, the research question is analyzed by means of a case study of a polar expedition. The project leader seeks a knowledgeable person who has never been identified as an expert, but whose knowledge is essential.*

Findings – *The expert appears both in his cognitive and social dimensions. Moreover, he emerges out of the situation, on the basis of neither strong nor weak signals. The rationality of expert solicitation falls within a pragmatic logic where the acquired knowledge must reduce the uncertainty so that the project can progress. The learning process enables to increase gradually the knowledge of the actor but also to build the legitimacy required in order to have access to the expert.*

Practical implications – *Findings can be translated in more general situations. Indeed, polar expeditions projects and exploratory innovation projects (Garel and Lièvre, 2010) possess some common characteristics: lack of knowledge concerning, timing issues, need to implement a pragmatic, enquiry-based learning. These projects strongly rely on external expert knowledge. This case study suggests that, while it may be useful, planning should not strictly define the course of action. A central competence of the project leader is to manage the duality between planning and adaptation. This implies the ability to adapt, to detect and to assess human resources and knowledge flows rapidly, as well as to weave social links inside and outside the organisation.*

Originality/value – *The existing literature offers a comprehensive view of experts in an organisation. However, the questions of expert selection and identification remain open. This paper fills a gap in the literature concerning the way experts are identified and selected. The case study shows that identifying experts does not solely depend on weak signals (reputation) or on strong signals (the expert's social status). Rather, the expert emerges in the situation, in an unexpected way. The expert's social dimension is not sufficient and one must look to the cognitive roots of the expertise. On the other hand, the fact is emphasised that the expert is a social construct which emerges from the solicitation process.*

Keywords *Project management, Knowledge, Uncertainty management, Case studies, Experts, Learning*

Paper type *Research paper*

1. Introduction

In a knowledge-based economy (Amin and Cohendet, 2004; Foray, 2009), the ability to innovate by using both external and internal knowledge has become the foundation of corporate strategy. Innovation becomes more and more intensive (Eisenhardt and Brown, 1998; Hatchuel and Weil, 1992) and managing breakthrough innovations becomes essential (Ben Mahmoud-Jouini and Charue-Duboc, 2008; Henderson and Clark, 1990; Le Masson *et al.*, 2006). According to March, exploration is "the search for new ideas, new markets, and new contacts". It "includes things understood in terms such as research,

variation, risk-taking, experimentation, game, flexibility, discovery, innovation". (March, 1991). In a knowledge-based economy, a particular strategy for exploration is to seek expertise outside the boundary of the project team.

Our article specifically addresses the question of expert solicitation outside the boundaries of an organization, in the upstream phase of radical uncertainty innovation projects. Solicitations of experts include a set of tasks such as identification, selection and mobilization of the expert. Radical uncertainty means that the probability of occurrence of an event cannot be calculated, and that new events may appear during the project (Callon *et al.*, 2001), which constitutes a real challenge for decision making.

At this stage, it can be noticed that projects can imply different levels of uncertainty (Garel, 2011): low uncertainty projects mostly rely on the existing knowledge, and can be viewed as "exploitation projects". On the other hand, high uncertainty projects or "exploration projects" require the acquisition of new knowledge. Our research obviously deals with this second category.

We have chosen to narrow our investigation to a specific context in which we possess valuable data, namely, the design phase for an Arctic expedition. According to Garel and Lièvre (2010), the study of expedition project in extreme environments such a polar expedition, may be clarifying to understand the design and achievement of innovations. Projects in extreme environments and exploratory innovation projects have points in common with regard to temporality, incertitude and factors (cost, risk, etc.), which are constraints in the learning process inherent in exploratory innovation (Gupta *et al.*, 2006). According to Garel (2011), innovative projects compel the project teams to mobilise experts increasingly outside their close environments. Moreover Lenfle and Gautier (2004) have shown the importance of the upstream phase where the project is designed for the project's overall performance.

The research question we propose to answer in this article is: how does the expedition leader operate the identification and selection of experts in the upstream phase of the project, in a context of radical uncertainty? More specifically, we seek to answer questions such as: what is exactly an expert? How are experts identified? What types of signals does the expedition leader use to mobilise experts? Which type of rationality does the expedition leader use to make his choice?

We first present the analytical framework concerning the notion of expert. The second section is devoted to a presentation of our case. Finally, in Section 3, we propose an analysis of this case with regard to our research questions.

2. The concept of expert

Experts can be defined by opposition to specialists (Bootz and Schenk, 2009): due to the depth of their experience related knowledge, they possess a status of "knowledge reference" and they are able to solve complex problems which are out of reach of specialists. With respect to the DIKW (data-information-knowledge-wisdom) chain, experts are considered to possess the "wisdom" and therefore stand at a higher level than specialists. Borrowing from the literature and from previous work (Bootz and Schenk, 2009, 2014), we consider that an expert is a person who has deep knowledge in a given field (the cognitive dimension) and who will appear legitimate at a particular point by a third party (the social dimension) in a context of high uncertainty. Therefore, our starting point is to view the notion of expert along two intertwined dimensions: the cognitive dimension and the social one.

2.1 The cognitive dimension of the expert

A distinction can be made between scientific knowledge and experience-based knowledge. According to Foray (2009) or Amin and Cohendet (2004), these two types of knowledge are equally important for organisations. Recognising that both types of knowledge have the same value is the principle of the knowledge's symmetry as developed in Callon's sociology of translation (Callon, 1986).

2.1.1 The expert's scientific knowledge. The status of scientific knowledge has long been debated in the field of Science Philosophy but the most relevant discussions concerning scientific experts were brought by sociologists (Ancori, 2009). Over three centuries, Science has emerged by opposition of common sense (Bachelard). Science takes the form of written reasoning, produced according to precise methodological rules the purpose of which is to explain phenomena. According to Le Moigne (1995), three authors constitute the pillars of this view:

1. René Descartes for the analysis.
2. Claude Bernard for the experimental method and the counterfactual situation.
3. Liebniz for the use of formal logic to express what is real.

According to Popper, it is admitted that science does not tell the truth. It produces a near truth which may be corrected. Knowledge is said to be scientific if it can be refuted. As pointed out by Henri Poincaré, the purpose of knowledge is knowledge itself and not action.

For instance, fluid mechanics equations cannot be used to build a protective wall against wind-blown snow, for a tent in a polar expedition. However, on the basis of Navier-Stokes differential equations, engineers were able to build a wind tunnel which enabled to solve the specific problem (Naaim-Bouvet and Naaim, 2009). Scientific knowledge by definition is accessible since it is written and therefore may be stored. It may be consulted in data banks. Today, anyone may access all research work directly on the Internet.

2.1.2 The expert's experiential knowledge. There is a long tradition in psychology dealing with the distinction between the expert and the novice (De Groot, 1965; Chase and Simon, 1973; Sebillotte, 1988). Expertise in a general sense can be defined as a high level of skill or knowledge in a given domain (Salas *et al.*, 2010).

Cognitive expertise has been first studied in the case of the chess game (De Groot, 1965; Chase and Simon, 1973; Reingold *et al.*, 2001). What differentiates the expert from the novice is the ability to notice areas of the chessboard and to operate relevant moves very quickly, much more than the ability to calculate the numerous forward moves (Didierjean *et al.*, 2004). It is mainly the ability to organise information into larger entities which distinguishes the expert from the non-expert. With experience, experts acquire the ability to group details into a more comprehensive sets, also called a "chunk" (Feltovich *et al.*, 2006).

The Natural Decision Making approach (Klein *et al.*, 1993; Klein, 2008) analyses the question of expertise in complex natural situations. Globally, this approach underlines that experts do not take decisions according to the classic analytic model. Klein (1989, 2008) stresses that experts base their decisions on their ability to match the representation they have of the situation with the specific patterns contained in the memory describing prototypical situations (Hutton and Klein, 1999). The expert is then characterised by his ability to quickly generate the right option and to avoid a laborious repetitive process (Klein *et al.*, 1993). Hutton and Klein (1999) synthesise the expert's cognitive characteristics as follows:

- expertise is domain specific;
- experts perceive patterns;
- experts are faster and make fewer errors;
- experts have superior memory in their domain;
- experts see and represent a problem at a deeper level;
- experts spend more time trying to understand the problem;
- experts have strong self-monitoring skills; and
- experts have refined perceptual abilities.

Socio-cognitive approaches enrich this psychological analysis centred on individual cognitive processes, by considering that the expertise cannot be studied without looking at the social context. Interest then lies on the conditions for developing expertise (Evetts *et al.*, 2006) and the unit of analysis becomes *the expert-in-context* (Feltovich *et al.*, 1997; Clancey, 2006). Starting from the work of Winograd and Flores (1986), De Fornel (1990) considers that the expert's knowledge is basically embodied and based on a direct relation between the agent and his material and social environment. In this context, the cognitive dimension is considered as socially contingent by taking the practical into account. These approaches open the way for a sociological approach of experts.

2.2 The social dimension of the expert

The sociological approach is based on the relative dimension of expertise according to performance criteria in a particular context (Evetts *et al.*, 2006; Mieg, 2006). This view is radically different from the cognitive approaches, in the sense that every person – under certain circumstances – may act as an expert towards another:

> The particular gain from using an expert is the relatively fast utilization of the expert's compressed experience *any* reasonable person could make if she or he had enough time to do so (Mieg, 2006, pp. 748-749).

The expertise is therefore considered as a social construction where the status of expert is determined in relation to the expertise seekers (Huber, 1999; Mieg, 2001). The use of the expertise then implies that a person is approached if he or she agrees to respond to this request (Roqueplo, 1997). One cannot call him/herself an expert. The social view raises the question of legitimacy and trust. In previous works (Bootz and Schenk, 2009, 2014), we emphasised that legitimacy may rest on a formal institutional structure (a professional body, a labelling system) or on a self-organised social phenomenon. In this way, the expert's legitimacy may be linked to the institutions which grant the expert status. It then has an *external* character, insofar as it is codified, it may be assessed from outside the institution attributing the status of expert. Expert identification can therefore be based on strong signals (holding a title or label). On the other hand, the expert's self-organised legitimacy is determined outside any formal context. It refers to the tacit dimensions of expertise and will be difficult to assess outside the reference group. Expert identification is then based on weak signals (reputation, image).

Furthermore, an individual will only be approached as an expert if the expertise seeker trusts him (Mieg, 2001, 2006). Trust expresses the anticipation that a partner will not behave opportunistically even when faced with short-term incentives (Chiles and McMackin, 1996). It enables the social uncertainty to be reduced and may be considered as a function equal to power (Luhmann, 1979; Fukuyama, 1995). Nooteboom (2002) suggests a distinction between c*ompetence trust* and *intentional trust*. The need of intentional trust explains why expert's neutrality is usually required. Competence trust reveals a paradox (Giddens, 1990): how can one assess skills that one does not have oneself? Competence trust is constrained by the cognitive distance[1] (Nooteboom, 2000) between the expert and the expertise seeker. This distance can be explained by the scientific knowing of experts, but above all by the tacit dimension of experts' knowledge (Polanyi, 1966; Von Hippel, 1998).

According to the SECI model of organizational learning (Nonaka and Takeuchi, 1995), there are two ways to reduce this cognitive distance. Socialisation involves exchanges of tacit knowledge within the reference group defining the expert, while codification enables the expertise validation criteria to be externalised outside this group. Hence, in the case where the expertise seeker and the expert are in the same social group (e.g. community of practice), the relationship of trust may be built through interactions according to the methods specific to the social group (Cohendet *et al.*, 2004, 2006). Conversely, when the seeker is in a position outside the group encouraging the emergence of the expertise,

building trust in the expert is based on the strong signals issued by the expert or by his reference group.

There is no doubt that the design of exploratory expedition projects requires the mobilisation of experts. However the solicitation process itself is still considered as a black box: Does the expedition leader use an *ad hoc* list of potential experts or does he use a sequential method in order to identify and approach the experts? How is the legitimacy of experts constructed? In the remainder, we propose a case study in order to answer these questions.

3. The case study

3.1 Methodology

The case study method as developed by Yin (2009) aims at an in-depth understanding of complex phenomena where numerous factors come into play. A case study is an empirical enquiry concerning a contemporary phenomenon where the limits between the phenomenon and its context are not obvious and where a large amount of information is used. We consider a unique case of an extreme character where the player's logics are pushed to their limits. This allows the phenomena to be more readable for the researcher (Pettigrew, 1990). Our aim is both intrinsic and instrumental (Stake, 1995). Indeed, we seek to learn from the case independently of any body of literature, as well as to enrich the theoretical framework on the social and cognitive nature of the expertise.

Knowledge of the case and access to the data was made possible by the fact that one co-author has a long time experience in polar expeditions research (Lièvre, 1999; Garel and Lièvre, 2010). Being part of the polar expeditioners community, he had knowledge of the project and his likeages with our research topic. The case concerns the upstream phase of an exploratory project aimed to gather information for a future, larger expedition. Our research is based on various materials: informal interviews, logbooks, e-mails exchanged, *ex post* interview Data collected are:

- interview of the project leader after a PowerPoint/photo presentation of the expedition;
- logbook of the project leader (20 pages);
- documents used by the project leader (scientific book, map with notes);
- E-mails between project members (approximately six e-mails per week during four months) and with individuals outside the project team (five e-mails). E-mails between the project leader and the park guard (three e-mails); and
- meeting with a member of the expedition in order to gather missing information.

The case is kept anonymous for the sake of confidentiality. It is described in accordance with the aim of our research, as close as possible to the players' points of view. The expedition leader's logbook served as a guideline. All data gathered were validated through cross-comparison according to principles of Yin (2009) and the case presentation was validated by the project leader.

3.2 The case study: an expedition to Spitsbergen

3.2.1 Elements of the context. Pierre is an experienced expeditioner who knows Spitsbergen well. He already made five expeditions on this island, located in northern Norway. His goal was to attempt an original kayak expedition in Spitsbergen in summer. This required him at one point to cross a glacier by ski, with the kayak be used as a sled. As the glaciers in part melt in summer, this meant finding a path between the cracks, the temporary lakes and the areas where the water flows. This is technically difficult. Pierre had never crossed these glaciers in summer. During the preparation phase which we are considering, his goal was to acquire knowledge on the way in which one could move around this type of glacier and find a specific path for the final expedition. He went on a reconnaissance trip with one of his future fellow team members.

3.2.2 Approaching experts. Pierre already knows two specialized agencies which could potentially provide him accurate information. A generalist agency specialized in polar expeditions with which he was in contact but which was not sufficiently professional in his opinion. And an agency specialized in sea kayaks but for which the project did not make much sense, as it involved various sports disciplines (kayak, ski).

The manager of this agency, Simon, was one of the rare "foreign" guides to be accredited by the local authorities. But Pierre preferred to wait until he had made more progress with his project before contacting him. On the other hand, on several occasions he met Paul, one of Simon's assistant managers, who is a member of a Kayak club near Pierre's house. He is a sport kayak specialist but who has no significant experience in this type of expeditions. Pierre sent him an e-mail before his departure but he did not receive any reply. He decided not to contact him again. Pierre also consulted a book by a geographer who had worked on the Spitsbergen glaciers. Thereby, he learnt a lot about the specific features of this type of glacier. Even though Pierre knew this geographer, he did not contact her. On his arrival on site, Pierre had discussions with the guides and explorers at the campsite.

In summer, about 50 guides and expeditioners gather here every day. However, the first discussions with the expeditioners did not go very far as none of them had ever been on these glaciers in summer. They knew the icecap in winter, but they did not know it at all in summer. Consequently, Pierre obtained very little information on the path to take and on the difficult passages on these glaciers in summer.

As a result, when Pierre went to see the national park guard to obtain the expedition permit, he still did not know the path he would take. However, he knew that he could not admit his ignorance and even less ask the national park guard for the path to be taken without compromising his chances of being given the authorization. Pierre showed the guard the equipment required to obtain the permit (gun, beacon, distress flare, satellite telephone, etc.) and signed the administrative papers. When the park guard asked about the route, Pierre put the maps on the table and indicated a route he had identified with the information he had gathered. The guard very rapidly showed him the places where he should not go. Pierre gave the park guard a pencil so he could show the position of all this very important information. Without any hesitation, the guard made crosses to indicate passages with cracks which must be avoided. He also described the various ways Pierre could reach the sea. In turn, it is this guard who, as the person in charge of rescues in the area and who issues the expedition authorization, had the extremely detailed knowledge of the passages on the crevassed area of the glacier that Pierre needed. He gave Pierre this very relevant information which him to identify a practicable path.

After the preparatory expedition, on his return to France, Pierre sent the park guard an e-mail with substantial details regarding the cracks observed on the glaciers. At the end of the e-mail, Pierre indicated that he intended to explore another glacier the following year to terminate the preparation of his expedition. Pierre asked him for his opinion. Two days later, the reply from the park guard left him in no doubt: he had to go by the glacier on the left bank where no there was no problem with crevasses. In just a few lines, Pierre obtained the essential information which meant he did not have to make an additional preparatory expedition.

4. Discussion and analysis

4.1 On the dual conception of the expert

Despite his experience as a result of the many expeditions to Spitsbergen, the project leader sought external expertise. He was faced with a major uncertainty on the possibility of crossing this glacier in summer and identifying an exact route on skis, pulling a kayak. He sought to overcome his lack of experience knowledge by contacting people who had already crossed this glacier in summer. He did not know if it was possible to do it. He decided to alternate the reconnaissance processes relying on strong and weak signals,

and also the two, calling on both institutional and informal experts. He also sought experience and scientific information.

In his search, the project leader initially used strong signals to obtain experience and scientific information. In this way, he first intended to contact two agencies because they were specialised in this type of expedition (strong signal), believing that they would possess the experience knowledge but he abandoned the search in both cases. He did not call on the first one because he considered, from past experience, that it was insufficiently professional. It was therefore the lack of confidence in the skills that made him abandon it. In the case of the second agency, he decided not to contact the manager who was a real Spitsbergen specialist but who was, above all, a kayaker who was likely not to understand the peculiarities of multisports expeditions. He contacted his assistant manager by e-mail but he did not get a reply. Obviously, experts do not always respond to outside solicitations. The project leader then tried to gather scientific knowledge on the topic. He knew a geographer, who had a considerable reputation on the Spitsbergen glaciers and read a chapter from her book. However, the information obtained was not sufficient and the search had to go on. The strong signals were not sufficient to obtain information without calling on the expert in person.

Conversely, with regard to the guides and the explorers in the campsite when he arrived at the expedition site, the reconnaissance and judgement processes were based on totally informal elements or weak signals. The guides formed a community of practice (trading war stories, sharing experience, socialisation) in which the seeker participated. The cognitive distance is extremely reduced here; in this way, he is able to make rapid judgements on each one's levels and field of expertise by relying on weak signals stemming from past or immediate interactions. This led him to reject certain local guides in favour of others and to listen to the advice of other expeditioners. This search process enabled Pierre to gather useful information. However the knowledge acquired was not sufficient to reduce the undetermination concerning the route to be taken.

4.2 The double-sided legitimacy

Due to his position, the guard is likely to have a substantial knowledge of the geographic area. His knowledge stems from a quasi-exhaustive review of the expeditions and a memory of the features, successes and difficulties encountered. Moreover, his status gives him a high trustworthiness in the area. On this basis, the guard can be viewed as a key figure for the expeditioners in the region.

However, this status of expert remains theoretical. Above all, the guard represents the actor responsible of administrative authorizations for the area. Even though he knew that the guard was a "knowledge collector", Pierre could not ask the guard for information, thereby admitting his own ignorance. Hence, *de facto*, Pierre did not view the guard as an expert but as the administrative authority.

To benefit from the guard's knowledge without compromising the chances of being given the authorization, Pierre needed to acquire some knowledge prior to his encounter with the guard. Pierre first acquired useful information through his readings and encounters with other expeditioners. While this information was not sufficient to reduce the undetermination concerning the route, it was essential, as they enabled Pierre to be seen as legitimate in his discussion with the park guard. Our argument is that the expedition leader has to possess some knowledge to gain a "right to access" expert knowledge. There appears a form of *two-sided legitimacy*: on the one hand, the expert needs to be legitimate for the expertise seeker. On the other hand, the expertise seeker needs to prove legitimate for the expert. This two-sided legitimacy is an important finding concerning the expert solicitation process.

Finally, we can view the park guard as an *expert in context*:

- Due to the novelty of the project, it was not a priori obvious that the guard would possess the required knowledge. More generally, the *locus* of information is not known by the knowledge seeker, which must enter a search process.

- To benefit from the guard's knowledge without compromising the chances of being given the authorization, the expedition leader needed to acquire some knowledge prior to his encounter with the guard. Not only does prior knowledge increase the absorptive capacity (Cohen and Levinthal, 1990) of external knowledge but it also conditions the access to external knowledge: "experts are more keen to respond to knowledgeable persons".

The case illustrates a situation where the expertise emerges in the situation, without being the result of a classic search process. It suggests that the social dimension of expertise relies on a two-sided legitimacy. The expert legitimacy does not build upon strong or weak signals, but it emerges *ex post* through the demonstration that the right knowledge is possessed. The project leader legitimacy is the outcome of the search process prior to his encounter with the expert.

4.3 Solicitation made in a hurry

In the information search process, some choices are guided by the situation characteristics (urgency, geographic proximity, temporal nature of the project, reduced cognitive distance). For example, initially, the seeker does not contact the manager of the second agency even though he has the characteristics of an expert (experience and legitimacy). At the time, the seeker feels that his project has not yet progressed enough to call on him. This seems to show that the recognition of the expert's legitimacy and skill is not translated into an automatic solicitation and involves avoiding solicitations at inappropriate times, as these are kept for the key phases in the project.

In any case, the temporal nature or the synchronicity between the solicitation and the project's phases seems to be a non-negligible factor. Through this search, it is also seen that certain choices depend on perfectly rational decisions (lack of trust arising from strong or weak signals, insufficient skills) as well as others depending on less logical elements. For example, why did he not meet the geographer when there was no doubt but that he had useful expertise? Was this due to the cognitive distance? To the urgency of the situation? The same applies to the agency assistant manager. Why did he not contact him against when there was no reply to an e-mail? The timing issue seems in any case to constitute a structuring element in the solicitation.

4.4 Mobilising weak ties

In his search process, Pierre essentially relied on weak ties (Granovetter, 1973). He did not seek knowledge among his friends, but rather among further relations: the two agencies, the geographer and the local guides he met on the spot. This converges with Granovetter's view concerning the strength of the weak ties. The weak ties enabled him to obtain new information. Furthermore, these weak ties enabled him to make a better assessment of the information gathered during the search. This is consistent with findings of Lecoutre and Lièvre (2010), which show that relying on weak ties in the upstream phase of projects is essential for obtaining critical information. According to them, it would be paradoxical if a weak tie would systematically respond. Indeed, in our case, the assistant manager of the second agency did not respond to Pierre's solicitation. Lecoutre and Lièvre (2010) suggest solutions to this dilemma, starting with agreed cooperation which may be either of an identity type (they resemble each other) or the instrumental type (they need each other) (Dameron, 2004). Such a tie may be very rapidly established during a simple encounter. What seems to have been established with park guard showed an instrumental type of co-operation. The park guard gave Pierre precise and reliable information. Finally, the last exchanges of e-mails between Pierre and the park guard illustrate this cooperation: Pierre sent precise information on the crevasses noted on the spot; in return the park guide showed him the route across another glacier.

4.5 Rationality of the expert solicitation

Far from being entirely planned and optimised, the solicitation of an expert in this case results from a poorly structured process (Belleval *et al.*, 2010).

While the aim of the project leader was to gather relevant information while maintaining options, in a context of bounded rationality (Simon, 1957), his behaviour cannot be accounted for with the sequential search model using satisficing rules (Stigler, 1962). The project leader did not increase his level knowledge by combining satisficing bricks of knowledge gathered sequentially. The project leader's approach was not logical from a formal standpoint. We have to return to the specific context where an expert is solicited for an exploration. How can one look for something if one doesn't know what it is? This is the famous Menon paradox according to Plato:

> Man cannot look for something that he knows, or that he doesn't know; as he will not look for what he knows because he knows it and there is no need to look for it, nor what he does not know, for the reason what he doesn't know what he should be looking for.

This aporia highlights that one cannot approach this question from the point of view of formal logic.

If the process of calling on experts in an exploration situation cannot be taken as a sequential logical process, how can it be planned? The rationality of the project leader can be viewed as a procedural rationality (Simon, 1957). We observe a form of endogenous rationality which is the product of a singular coupling of the player and his environment (Suchman, 1987, 2007). In this context, the planning does not define the course of action but is a resource (among others) for the action to take place. For this reason, we view the quest of expert knowledge as an enquiry-based learning (Dewey, 1967) relying on an abductive reasoning. This learning implies pragmatic investigation logic and enables to reduce the undetermination. The actor builds a model which enables him to progress and the expert solicitation can be viewed as a knowledge expansion process which makes it possible to move gradually from an undeterminate situation to less undeterminate situations.

Moreover, the case analysis stresses a specific point. The enquiry-based learning enables to increase gradually the knowledge of the actor, but also to build the legitimacy required to have access to the expert. Therefore, the learning has a direct impact of knowledge acquisition and an indirect impact of legitimacy construction. Our case reveals a situation where "we need to prove knowledgeable to access expert knowledge".

5. Conclusion

The aim of our research was to understand how experts are mobilized in radical uncertainty environments. The case fits with our view of the expert as a person who, in a situation, responds to solicitation from a third party, enabling him/her to reduce the undeterminate nature of the situation. It was shown that the expert identification does not solely depend on weak signals (reputation) or on strong signals (formal status). The expert emerges out of the situation, in a way that was not entirely predictable. Rather than to follow a sequential search process to mobilize the expert, an adaptive learning must be developed. The enquiry-learning process is highly pragmatic since it must take into account a continuous flow of unpredictable elements.

Even though it did not provide the expedition leader with sufficient information for the project, the information search process prior to the encounter with the guard enabled him to gather enough knowledge to be viewed as a legitimate. Indeed for obvious reasons, the expedition leader could not show the guard his ignorance concerning the terrain. Our argument is that the expedition leader has to possess some knowledge to be eligible for knowledge transfer by the expert. There appears a two-sided legitimacy:

1. the expert needs to be legitimate for the expertise seeker; and
2. the expertise seeker needs to prove legitimate for the expert.

Our findings can be translated in more general situations. Indeed, polar expeditions projects and exploratory innovation projects (Garel and Lièvre, 2010) possess some common characteristics: lack of knowledge concerning, timing issues, need to implement a pragmatic and enquiry-based learning. These projects strongly rely on external expert knowledge.

Our case study suggests that, while it may be useful, planning should not strictly define the course of action. Rather, a project plan is to be considered as a resource (among others) for the action to take place. This is in line with Edgar Morin's view of complexity: "Complexity calls for strategy. Only strategy enables to progress under uncertainty. [. . .] (it) is the art of using information that appear in the course of the action [. . .]." (Morin, 1990, p. 178).

A central competence of the project leader is then to manage the duality between planning and adaptation. This implies the ability to adapt, to detect and to assess human resources and knowledge flows rapidly, as well as to weave social links inside and outside the organisation.

Note

1. According to Nooteboom (2000), people have developed along different paths and environments, and therefore, they interpret, understand and evaluate the world differently. This leads to the notion of cognitive distance between individuals.

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