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Paradoxical Tensions in Learning Processes : Exploration, Exploitation and Exploitative Learning

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Abstract. Research on organizational paradoxes, notably the learning/performing paradox, have demonstrated the potential value of a detailed analysis of tensions resulting from the need to develop future capabilities, while simultaneously guaranteeing success in the present. But analyzing this paradox exclusively from the perspective of the antagonism between exploration and exploitation masks tensions of a different nature linked to phenomena concerning the transmission, extension and replication of existing capabilities. In this article we apply a concept deriving from the field of project management, namely exploitative learning, which provides a broader appreciation of the diversity of learning processes located in the grey area between exploration and exploitation. Empirically, we will focus on the study of tensions between exploitative learning and performing perceived by the actors in an industrial infrastructure engineering unit simultaneously developing a number of different projects and taking on new recruits. It transpires that learning processes associated with the development of teams for new projects and the training of numerous recruits can, at the macro- and micro-structural levels, run counter to short-term logics of performance, thereby threatening the development of future capabilities. Our study makes it possible to broaden the terms by which the learning/performing paradox is defined. It also enriches our understanding of exploitative learning situations by demonstrating that they require both an allocation in terms of human resources and an investment in terms of time, approaches that are hard to reconcile with short-term goals.

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Organizations must respond to simultaneous and contradictory demands that generate tensions manifested in the form of “paradoxes.” Reacting in an appropriate way to these situations is a pre-condition of survival (Smith & Lewis 2011). But it also pre-supposes identifying and characterizing the nature and origin of those tensions. Recent research has developed a general theory of organizational paradoxes (Lewis, 2000; Lüscher & Lewis, 2008; Perret & Josserand, 2003) and listed the tensions that arise most frequently (Smith & Lewis 2011). This list places a substantial emphasis on tensions linked to a need to “build capabilities for the future, while ensuring success for the present” (384). For Smith and Lewis, this paradox is manifested in the tension between exploitation and exploration identified by March (Levinthal & March 1993; March 1991, 1996), who defined exploration as “the pursuit of new knowledge, of things that might come to be known,” and exploitation as “the use and development of things already known” (Levinthal & March 1993: 105). Governed by different 1rationalities, these registers of action compete for scarce resources, a factor that renders them mutually exclusive.

However, some authors, including Gupta, Smith and Shelley (2006), maintain that the dichotomy between exploitation and exploration is inadequately defined and provides a somewhat vague picture of the range of learning processes available. These authors demonstrate that the dichotomy is based on a distinction between the known and the unknown that fails to take into account the level of organizational analysis considered (units, resources, individuals, etc.). A number of project management studies (Brady & Davies 2004; Davies & Brady 2000; Ruuska & Brady 2011) have responded to Gupta et al.'s wish to broaden the level of analysis to encompass a wider variety of learning processes. Amongst other things, they introduce the notion of "exploitative learning" to describe the transition between exploration and exploitation, differentiating between learning based on creativity and learning based on replication, as well as between the various organizational spheres in which they are produced.

The objective of our article is to combine this perspective developed in the field of project management with elements deriving from the literature on the learning/performing paradox. We demonstrate that when exploitative learning processes, which have been neglected by researchers, are combined with the logic underpinning short-term performance goals, then tensions are generated. Taking these tensions into account provides a deeper understanding of the learning/performing paradox, until now limited to the conflict between exploitation and exploration considered from the point of view of their archetypal forms. With this end in view, we conducted an 18-month study on the tensions perceived by the employees of a complex industrial infrastructure engineering unit. The unit is part of a French group of global standing confronting a transformation in its strategic environment with, in particular, a high growth in demand for infrastructure and a 100% increase in engineering worfkorce. The detailed analysis of this case makes it possible to study the articulation of exploitative learning with other registers of action, and to highlight the tensions that this articulation generates at the macro- and micro-levels.

LEARNING TENSIONS BETWEEN EXPLOITATION AND EXPLORATION

THE DIFFICULT RECONCILIATION BETWEEN EXPLORATION AND EXPLOITATION

Smith and Lewis (2011) highlight the difficulty of reconciling logics of learning designed to "build capabilities for the future" and logics of performance designed to "ensure success for the present" (384). Following Abernathy (1978), March characterizes this tension by distinguishing two registers of organizational action: exploitation and exploration (Levinthal & March 1993; March 1991, 1996). His research shows that these levels, while occurring simultaneously, are heterogeneous in nature, that they obey different rationalities (March 1991: 73-74), and that they are thus, potentially, conflictual in that they dispute the allocation of scarce resources. They therefore represent a reciprocal threat, and combining them generates a series of tensions. Research on organizational ambidexterity focuses on firms' capacity to manage or resolve these tensions (Andriopoulos & Lewis 2008; O'Reilly & Tushman 2004; Schmitt, Probst, & Tushman 2010; Simsek 2009). Such research analyzes ways in which ambidexterity can be developed structurally and contextually (Birkinshaw & Gibson 2004; Duncan 1976), and examines the factors encouraging its emergence, as well as its consequences in terms of performance (Gibson &

Birkinshaw 2004; O'Reilly & Tuhsman 2008; Raisch & Birkinshaw 2008; Raisch, Birkinshaw, Probst, & Tushman 2009).

Research on organizational paradoxes – i.e., situations characterized by the presence of simultaneous, inter-related and contradictory logics that persist over time (Cameron & Quinn 1988; Eisenhardt 2000; Perret & Josserand 2003; Smith & Lewis 2011) – has made it possible to better apprehend the tension between exploitation and exploration. It has been demonstrated that paradoxical situations are typical of changing, ambiguous and pluralistic environments in which resources are scarce (Smith & Lewis, 2011). Such situations generate a proliferation of choices for which traditional decision-making approaches based on dichotomization (either/or dualities) are inadequate, or even dangerous, in that they "trap organizations in paradox" (Josserand & Perret, 2003: 165). Josserand and Perret demonstrate that compromise "leads the organization towards a sometimes uncomfortable intermediary situation," and that hierarchical approaches can prove "disastrous" (Josserand & Perret 2003), exposing the organization to the risk of "spirals" (Eisenhardt 2000) or "vicious circles" (Lewis 2000). Actors are then tempted to react by adopting "psychological defence" behaviours that can take the form of "unreflective commitments" (Vince & Broussine 1996) or, on the contrary, disregard and scepticism, solutions that make the problem worse instead of solving it. It is the self-reproductive character of tensions and the psychological consequences that singularize paradoxical situations and render "paradox management" necessary (Josserand & Perret 2003: 165).

BETWEEN THE EXISTING AND THE NEW: WHAT KIND OF LEARNING?

Managing the paradox between exploitation and exploration pre-supposes a capacity to distinguish between exploitation and exploration activities. But these notions are not clearly defined in the literature and there is no real consensus about them. Some researchers apply the terminology to "fields of knowledge" (March 1991; Vermeulen & Barkema 2001), others to "technological trajectories" (Benner & Tushman 2002), or "product/market domains" (He & Wong 2004). Applied to a variety of situations, the terminology is, therefore, highly generic. This indeterminacy is apparent from the outset in the work of March, who does not provide any rigorous definition of the two notions, instead describing them by means of a succession of synonyms and broad characterizations. Nevertheless, his descriptions and allusions do reveal his views about the difference between the two notions: exploitation and exploration correspond to the distinction between the existing and the new, the already known and the not yet known.

A few authors, including Gupta et al. (2006) have commented on this lack of conceptual precision, observing that there are at least two ways of envisaging the difference between exploitation and exploration. According to the first, the notion of exploration refers to learning activities that generate knowledge, while exploitation designates activities limited to the application of existing knowledge. Meanwhile, according to the second approach, exploitation and exploration both induce learning experiences, but those experiences are different in terms of their scope and characteristics.

Gupta et al. retain the second approach. In so doing, they open a breach in the vision of exploitation and exploration as two heterogeneous, watertight registers in which activities within organizations are supposedly enclosed. In fact, such activities serve as platforms for learning that not only possess a wide range of characteristics, but also vary significantly in their scope. Consequently, defining these activities exclusively in terms of exploitation and exploration is restrictive. In effect, between purely exploratory activities focused on generating radically new knowledge, and activities strictly limited to exploiting existing knowledge that

generate no new learning, there are intermediate learning experiences: "incremental learning" (Miner & Mezias 1996), "exploitation innovation" (Benner & Tushman 2002, 2003) or "exploitative learning" (Brady & Davies 2004). These forms of learning are located in a grey area between the archetypal forms represented by exploration and exploitation, an area that largely escapes the dichotomy between the two. Taking those forms of learning into account provides us a richer, more complex vision of the tension between learning and performing than that offered by March, to which the literature reduces it.

Some research undertaken in the field of project management focusing on actions in this grey area is particularly useful in terms of reappraising existing work on the tension between exploration and exploitation. For example, Brady and Davis (2004) examine how two major technology firms, Ericsson and C&W, managed the transition between exploration and exploitation by studying deep transformations in the activity of the two organizations over the course of the past few years. Their study reveals that the process requires transition learning processes. The authors introduce the notion of "exploitative learning" (ibid.) to describe the way in which firms use capabilities located locally in an exploratory project to attempt to diffuse, replicate and extend such learning to other projects or to the organization as a whole. Their article shows that a transition from local exploration to large-scale exploitation involves specific learning processes aimed at developing capabilities and paving the way for improved future performance, but that those processes are not "exploratory" since they focus on knowledge that has already been generated and mastered locally. Therefore, these learning processes displace, diffuse and extend knowledge that has already been explored, and generate capabilities which are "new" not in terms of their content, but in terms of the human resources involved in them.

Research undertaken in the field of project management thus proposes a more dynamic representation of the exploration/exploitation dichotomy that takes into account knowledge differentials within firms. However, researchers have not fully taken into consideration the temporal dimension of these learning processes and of the time required to absorb those differentials. This is true of the time required to train individuals, whose potentially negative impact on performance has been highlighted by other authors. Van Oorschot, Akkermans, Sengupta and Van Wassenhove (2013) employ the term "assimilation delay" to describe the time during which a new recruit is not "fully productive" and, consequently, has a negative impact on his or her team's productivity (291, 293). Lastly, this research does not envisage the hypothesis according to which exploitative learning could, in turn, be the object or source of tensions of a paradoxical nature in organizations in which it is occurs. It is the objective of our study to fill this lacuna.

CONTEXT, METHODOLOGY AND RESEARCH DATA

CONTEXT AND RESEARCH APPROACH

The data presented here was gathered during a collaborative research lasting a year-and-a-half (November 2010-May 2012) between the authors and the Infrastructure Development Department (IDD, name modified), the complex industrial infrastructure unit of a leading international group. Between 2005 and 2006, the group initiated preparatory studies for a project (referred to as "Project α") implemented in 2007. Designed as a pilot project, the project was introduced with a view to accumulating the experience required to launch, by replicating the pilot scheme, ten new projects by 2010. This expansion triggered the need for more personnel, especially in that, before 2005, the number of staff in the IDD had decreased. Thus, a highly ambitious recruitment policy was implemented,

with the result that the number of personnel almost doubled between 2007 and 2012, with 90% of the new jobs being filled by young graduates.

Our analysis of the data generated by this collaboration led to a process of theoretical development. In effect, thanks to the wealth of material collected and to the access they give to extreme cases (Yin, 1994), mono-case studies (Siggelkow, 2007) make it possible to highlight unusual phenomena (Eisenhardt & Graebner 2007) that had either not been sufficiently theorized or not been noticed at all. This theoretical construction was based on "a continuous process of comparison between empirical data and theory" giving rise to an emerging theoretical construction that gradually "gives meaning to empirical observations" (Charreire & Durieux 1999: 70).

EMPIRICAL DATA AND DATA COLLECTION

Empirical data were collected in three successive phases: an exploratory phase, a methodological phase, and an interview phase.

Exploratory phase

An initial exploratory phase (November-December 2010) enabled us to define our research purpose. This phase began with 6 exploratory interviews (not recorded) with actors tasked by the management of the IDD to implement and steer a joint-project with researchers. These last sent us three documents – two internal memos (7 pages in all) and a slide show (D1, 23 slides). These internal memos summarize the content of two interviews conducted on December 9, 2010 with the HR manager of the IDD (NI1) and the HR manager of the division of the group on which the IDD depends (NI2). The slideshow was aimed at all the members of the IDD. It outlined the new organizational structure and the missions to be carried out by each entity, and explained the philosophy and motivations of the reorganization itself.

Methodological phase

The methodological phase (January-February 2011) consisted in preparing the interviews. We consulted a number of internal documents communicated to us by the IDD management: 11 memos presenting the new organization, the missions and resources of the various projects and sub departments (196 pages; NO1 to NO11); 9 documents on the situation of the unit in terms of human resources and its policy in this regard (71 pages; HR1 to HR9); and 13 documents from the internal social survey (576 pages, global overview and department-by-department; EI1 to EI13). These data enabled us to target a panel of actors and draw up an interview guide. Three coordination meetings, each two hours long, with the actors mentioned above, enabled us to check the relevance of our approach.

Interview phase

The third phase of the collaboration consisted in 49 interviews (conducted between March and May 2011). These interviews were carried out in order to cover all levels of management, including the unit's functions and services, as well as its main sub-contractor (Table 1, below). The interviews each lasted for an average of two hours. Forty-three of them were recorded and transcribed in their entirety (1,458 pages). In the other six, which could not be recorded, notes were taken.

Table 1. Typology of actors interviewed

Type of actor	Number of interviews
Member of the management board (Management Level N+3)	ED1 to ED6
Head of project, Assistant head of project (Management Level N +2	CP1 to CP9
Head of (Management Level N+2)	CM1 to CM5
Team leader (Management Level N+1)	CE1 to CE5
Designer/engineer (Management Level N)	I1 to I14
Support function (Planning, HR)	FS1 to FS4
Sub-contractors	ST1 to ST3
Construction site	CH1 to CH3
Total	49

DATA ANALYSIS

The field data analysis and debriefing phase was conducted between the end of April and May 2011. An initial series of debriefings was carried out at the end of the interview phase in May 2011: two presentations (each lasting two hours) (11/05/2011 and 16/05/2011) were made to steering committees, one small, the other larger, including directors, heads of department, and other HR actors. Another presentation was delivered on 30/05/2011 to all the organization's managers (half day session). Later, four debriefings were delivered, respectively, to the IDD management on 21/10/2011 (two hours); to all the unit's managers on 5/12/2011 (half day session); and to an Assistant Director and to the HR Director on 20/01/2012 and 29/05/2012 (two hours each).

Highlighting tensions

Data analysis started with an examination of the managers' comments concerning the difficulties encountered by the unit. We used the first-hand material constituted by internal memos and the slide show (NI1, NI2, D1). Actors within the organization insisted on the existence of tensions, including difficulties with reconciling certain objectives, conflicts over priorities, and an increase in the number of situations in which delicate choices had to be made at all levels of the unit. All these tensions were focused on learning issues and the challenge of meeting performance objectives.

Detailed analysis issues of approaches to learning and performing in the organization

We carried out an initial analysis of the interviews with a view to defining learning mechanisms and difficulties encountered in attaining performance objectives. With this in mind, we conducted a systematic analysis of the actors' comments on and descriptions of these two subjects. This approach gradually led to the emergence of two categories of problems that the actors regarded as critical. The first category we identified concerned learning processes in projects associated with the transition from a mono-project functioning to a multi-project functioning designed as part of a strategy based on the replication of studies. The second problem revealed by our data analysis was linked to the question of the learning processes of individuals and, in particular, the integration and training of new recruits in the technical departments in the context of a sustained increase in the number of personnel.

We interpreted these problems as two modalities of a specific register of action, namely exploitative learning (Brady & Davies, 2004).

The use of an analytical framework derived from paradox theory

On the basis of these characterizations, we sought to furnish a theoretical interpretation of the tensions isolated on the field by applying an analytical framework based on paradox theory. We used the phenomenology of paradoxes proposed by the literature, which states that a paradox is characterized by the existence of the following elements: conflicts for scarce resources, activities perceived by the actors as mutually exclusive, and the self-reproductive character of paradox, which gives actors a feeling of "claustrophobia" (Lüscher & Lewis 2008; Perret & Josserand 2003; Smith & Lewis 2011).

To study the way in which resources are (re-)allocated within the unit, we first analyzed the discourse of project and technical department heads, since they are the ones who manage the movement of personnel (CP1 to CP9, CM1 to CM5). This analysis highlighted the existence of tensions at the macro-structural level, or, in other words, between departments, in terms of attracting resources. We then studied the way in which actors approached the challenge of combining learning and performance issues by conducting a comparative analysis of the situation and of the comments of team leaders (CE1 to CE5), since these last are responsible for integrating and training new recruits within their teams, and overseeing the production of studies respecting predefined performance levels. Lastly, we analyzed the views of all the actors concerning whether or not tensions would persist. In order to do so, we analyzed the entire corpus of interviews with a view to isolating comments about the future of the unit and the strategy's chances of success. We then bolstered our analysis by comparing those comments with HR data (internal surveys, turnover figures, HR1 to 9, EI1 to 13). From this it transpired that the interviewees felt that tensions may persist, largely due to problems in retaining employees in the unit and in creating a sentiment of belonging, a view confirmed by HR indicators.

RESULTS

THE FORMULATION OF AN UNEASE LINKED TO ISSUES OF LEARNING AND PERFORMING

At the beginning of the collaboration (late 2010), the IDD's management was confronted by a number of problems that, taken together, constituted a kind of unease. In effect, an analysis of the documents revealed the actors' concerns about "the workload issue," "the invasion of personal life by work," and "the perception that we're always chasing after deadlines" (NI1), as well as the need to "develop virtuous routines to avoid crisis situations" in order to compensate for a "lack of efficiency in an organization characterized by too much work and too little productivity" (NI2). In regard to this situation, the management's priorities were to "adapt the organization so that there was more sharing, transparency, efficiency and serenity" and to "modify the process to improve performance and encourage the development of expertise" (D1). In the Director's email accompanying these documents it was pointed out that the most important issue for the unit was "collectively to improve our performance and productivity, and to work more effectively, because it is not acceptable that, with almost a thousand people, employees are overworked today." These comments attest to the difficulties in attaining performance objectives.

An HR Manager highlighted the need for "organizational functioning designed to stabilize collective skills" that might otherwise be "lost." He talked about "problems with training new recruits," due to a "bottleneck at the base of the managerial pyramid" and the fact that the organization had "reached its limit in terms of integration" (NI2). It was also pointed out that some recruits

complained "of a lack of proximity and availability on the part of managers and team leaders (NI1)." One possible "axis of evolution" was to "develop competencies, integrate young graduates and encourage them to remain loyal to the company" (D1). These suggestions attest to difficulties associated in this context with learning.

Cross-checking the content of the interviews revealed problems concerning the implementation of changes required to ensure the successful development of the unit's projects and increase the number of its personnel. Some comments revealed genuine tensions, or in other words, difficulties in reconciling divergent needs. It was pointed out that the organization had to develop "operational functioning and expertise capable of facilitating learning processes, while *at the same time* taking workload into account," and "make more rapid progress, while *at the same time* encouraging productivity in order to ensure that employees are less overworked[1]." Lastly, the claim was made that "the workload [was] growing more quickly than the group's ability to meet it" (N12). These factors seem to point to the existence of a paradoxical tension between learning and performing (Smith & Lewis 2011).

An analysis of the interviews provided a more detailed description of the nature of the learning processes at play. The director of the unit summed up those processes in the following terms:

> *"From an organization that focused on a single project […] we needed to ensure that we changed the organization to a large degree to adapt to a context characterized by a several projects, each one as important as the next in terms of success. They must be successfully concluded at the same time […], while integrating a lot of young engineers […]: [there are] today [twice as many employees] as there were five years ago" (ED1).*

The unit was thus faced with the task of simultaneously managing an increase in the number of staff and implementing a transition to a multi-project functioning designed to deliver an effective replication of studies from project to project:

> *We have to integrate people who are capable of gradually learning [the various aspects of a complex job] and duplicating those skills by applying them to project after project. (ED1).*

The IDD's strategy was designed to extend the organization's capabilities by simultaneously making the transition to a multi-project functioning and increasing the number of staff, an approach of the kind described in the literature as exploitative learning.

TENSION AT THE MACRO-STRUCTURAL LEVEL: THE TRANSITION TO A MULTI-PROJECT FUNCTIONING AND THE REDEPLOYMENT OF RESOURCES

Initially, our analysis revealed the presence of a macro-structural tension, or, in other words, a conflict between teams for the allocation of resources in the context of the development of individual projects and the transition to a multi-project functioning. In effect, while the analysis of interviews with directors (ED1 to ED6), project heads, and technical department managers (CP1 to CP9, CM1 to CM5) revealed a convergence in terms of the aims of the unit's reorganization, it was also clear that there were substantial divergences in terms of how it should be implemented.

Initially, we noted a striking similarity in directors' and department heads'

1. Authors' italics.

descriptions of the objectives of the reorganization. These actors noted that, over the course of the last few years, the unit had been managed by a single project cell (the Projet α Department) in which technical expertise had been centralized within a Technical Department (TDα):

> *"We built a team made up of those best suited to working on Project α" (ED1)*
>
> *"You've got a project unit in which you've placed technical people, and, of course, since it's a 'task force' and resources are scare […] you take the best, the most experienced" (CM4).*
>
> *"We had to raise our game, so the choice was quickly made: a strong project, […] a 'dream team' […] still very strong today, very competent, very experienced" (CP1).*

The heads of department all mentioned the risks inherent in persevering with the unit's current attitude to the multi-project functioning in the context of the implementation of studies on two new projects (Projects β and γ), with further projects in the offing. This evolution was highlighted by the Assistant Director in charge of technical departments:

> *"Last year, we switched to a multi-project functioning […], so we set up two new project units […]. Two new project technical teams would thus solicit the technical sub departments" (ED2).*

The increase in the number of projects rendered the current organization redundant, characterized as it was by a centralization of the most experienced personnel and technical decision-making processes in Project α's Technical Directorate (TDα). The issue at hand was, therefore, to re-equilibrate the organization in favour of the technical sub departments:

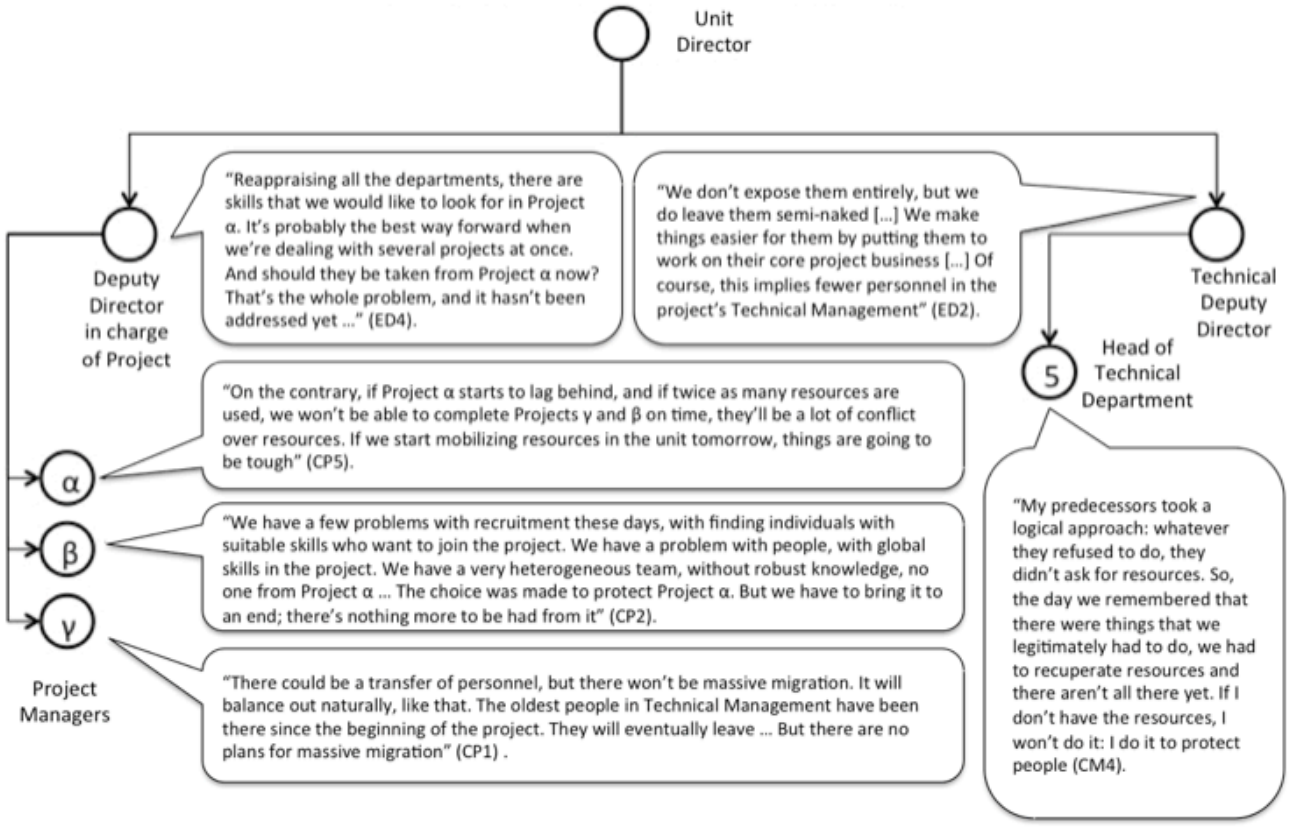
> *"In the multi-project context, we needed to focus on the importance and value of the technical sub departments, giving them more recognition and placing a little more emphasis on their prerogatives […]. Everything can't be decided by the Project anymore because now there are other projects that are going to come after it" (CP1).*
>
> *"We have to give the technical sub departments a certain number of prerogatives now, clearly emphasizing the project unit in their steering mission, and implicitly encouraging it to divest itself of its technical missions and hand them back to the technical sub departments" (CM4).*

In effect, it was the strategy of replicating the pilot project that made it necessary to centralize technical decision-making processes in the technical sub departments, with the Project departments' mission focusing on "steering" (CM4), planning and cost control. Furthermore, the quest for improved performance implied that the new Project departments could benefit rapidly from studies on the progress of Project α. For the actors, the main issue in the reorganization of the unit was, therefore, a displacement of the center of gravity away from the expertise of the Technical Department of Project α (TDα) and towards the technical sub departments, thereby diffusing, via the technical sub departments, knowledge accumulated in Project α to the new projects and to the organization as a whole. It is, in other words, a case of exploitative learning.

Nevertheless, our analysis also highlighted the fact that, beyond this convergence in the opinions of the interviewees, heads of department had widely

varying views on the operational approaches taken to the transition to a multi-project functioning. In effect, the interviews revealed profound differences in the intentions of various unit managers concerning the redeployment of resources, particularly the fragmentation and reallocation of the resources of the Project α "dream team", as shown in Figure 1.

Figure 1. The points of view of department heads on the redeployment of resources associated with the transition to the multi-project functioning



As demonstrated in Figure 1, while the Assistant Director in charge of technical sub departments is positive about the short-term "stripping" (ED2) of the Technical Department of Projet α (TDα), the head of the Project takes a more reserved position. Although he is open to the possibility of a transfer of personnel, he believes that it should be limited, gradual, and operate "naturally" (CP1), without adversely affecting teams currently in place or threatening projects already encountering problems. The Assistant Director of Projects (ED4) is caught between a rock and a hard place: his comments bear witness to the unit's structural hesitation in regard to the transition to a multi-project functioning ("should they be taken off Project α immediately? That's the whole problem" ED4). Meanwhile, technical or project departments looking for resources are becoming impatient. The Head of Project β is relatively resigned to the situation. He admits that his team has a striking lack of experienced personnel, a fact that he associates with a strategy of "sanctuarization" applied to Project α with a view to ensuring its status as a showcase with ambitious objectives: "The choice was made to protect Project α. But we have to bring it to an end; there's nothing more to be had from it" (CP2). The Technical Director of Project γ, which also lacks experienced personnel, describes a "stand-by" situation, his project not having

yet been launched. He is very concerned about the beginning of his project: "we're going to have to fight some big battles over resources" (CP5). Lastly, the head of a technical sub department who is very keen to acquire experienced resources to help his very young staff young goes on the attack, "demanding" resources that do not "arrive" quickly enough, explaining and that, in their absence, he is constrained to extend lead times, or even refuse some of the missions accorded to him. He is keen to tell anyone who will listen that "if I don't have the resources, I won't do the job" (CM4).

In spite of a certain degree of agreement about desirable outcomes, the differences in the comments made by interviewees attest to localized approaches characterized by divergent interests. The battle over resources, identified in the literature on the tension between exploration and exploitation (March 1991) and on paradoxes (Smith & Lewis 2011), can be viewed as symptomatic of a juxtaposition of heterogeneous and contradictory registers of action. The conflict remains, to some degree, latent, but could degenerate as new projects advance, demanding resources and expertise accumulated in Project α, a situation that would prove highly problematic should no solutions be found. Tensions are entirely based on the fact that "stripping" (ED2) the Project could potentially exacerbate already substantial delays, thus prolonging an overlap between projects and creating the preconditions for a "battle" over resources. On the other hand, the desire to continue to "protect" (CP2) Project α, condemned by some interviewees, could undermine the possibility of increasing the productivity of future projects. Project α could thus be brought to a conclusion more rapidly, but only to the detriment of the performance of future projects. This would be, at best, a "Pyrrhic victory".

Thus, in the case of the IDD, the possibility of organizing exploitative learning (or, in other words, sharing skills generated by Project α with the technical sub departments and with new projects) is undermined by the need to meet short-term objectives. If we consider exploitation in the sense of a use of existing capabilities to maximize short-term performance, exploitation and exploitative learning are, here, mutually exclusive. It would seem that one cannot be done without undermining the other, a situation that Josserand and Perret describe as a dichotomic problem (2003).

A MICRO-STRUCTURAL TENSION: INVESTING IN THE EDUCATION OF NEW RECRUITS

Our analysis also reveals a micro-structural tension, or, in other words, a conflict at the individual level over priorities involving activities perceived as mutually exclusive. This conflict concerned the second learning approach identified above, namely the diffusion of skills within the framework of the integration of new recruits as part of a strategy to substantially increase the number of personnel in the unit.

Training new recruits: Issues and conditions

The interviews revealed two factors capable of explaining tensions over the "professionalization" of recruits (NI1, NI2, D1). On the one hand, the sheer number of new employees, especially in the technical sub departments; and, on the other, the time required for new recruits to acquire necessary skills.

Due to the lack of experienced engineers on the job market and to difficulties in attracting them, 90% of recruits in the unit are young graduates. Most of these young engineers head for the technical sub departments, a "port of entry" for new recruits due to a "'historical practice' in the organization" (ED1). This practice gives the technical sub departments particularly young demographics:

> *"We have a large number of people with less than three years experience, most of them in the technical sub departments" (CM2).*

Several experienced engineers expressed doubts about the operational competence of these young engineers:

> *"I see them coming […], young engineers who have absolutely no experience. Consequently, for example, they take an enormous amount of time to draw up calculation support letters takes because they don't have any experience. And since they don't have any experience, they prefer to ask around, to read the thing fifty times, and before taking a decision, they want it to be absolutely nailed down […]. If they were experienced people, they would say, 'that's ok, it's no problem'" (CH1).*

The youth of the teams was perceived by some interviewees as a source of problems for the unit in terms of attaining its objectives. An assistant head of department had this to say:

> *"The IDD has a real challenge to rise to, namely to bring its projects to a successful conclusion, on time, with young employees. It's a real challenge. And in some teams it's really critical, by which I mean that all their employees are beginners" (CP5).*

These comments suggest that exploitative learning marked by the increasing competence of numerous young graduates in the technical sub departments was temporally constrained by the time required by recruits to master their functions, or, in other words, their "assimilation delay" (Van Oorschot et al. 2013). It seems that many young graduates occupied posts for which they did not yet have the necessary skills. Our interviews, particularly those conducted with experienced engineers and team leaders confirm the idea that many years of on the job training are needed before new recruits are genuinely up to scratch:

> *"You need a good deal of time to get things together because there are so many things to learn that, when you first get here, the job seems monstrous" (I8).*

The length of assimilation delay needed by new recruits can be explained by the complexity of the functions they are asked to perform and the inadequacy of the knowledge they acquire at university or engineering school. In spite of the difficulty of estimating the length of this period, several experienced engineers and managers agreed that it amounted to a number of years.

> *"It takes at least a year to eighteen months for them to become effective and be able to do things. And it takes between two and three years for them to become 'autonomous' in the sense of being able to really steer a study from A to Z. They can't be autonomous straight away, on their own" (CM1).*

> *"If you exclude people who develop really quickly, it takes three years to be able to start living your own life. The end of the third and beginning of the fourth year is really, basically when people become useful" (CM4).*

These interviews not only highlight just how long assimilation delay is, but also emphasize that, during the learning phase, new recruits are not yet

genuinely "useful" (CM4), but, instead, represent more of a "burden" than a "resource" for the unit.

Our analysis of the interviews shows that the actors of the IDD perceive that exploitative learning, which consists in the transmission of knowledge to a certain number of new recruits, depends on a temporal variable, an assimilation delay that is difficult to reduce by applying artificial means, during which individuals become genuine resources. But our analysis also reveals that directors and managers were worried about the organization's inability to absorb this assimilation delay and move on from a situation characterized by a lack of resources.

The bottleneck at the level of team leaders: A comparative analysis

The initial question formulated by the unit's managers revealed problems regarding the "professionalization" of new recruits, reflecting concerns about the "integration capacity" of the unit (NI1, NI2). Focusing on the interviews, we analyzed the conditions in which approaches to professionalization and integration were applied. Then, concentrating more closely on the activities of a specific class of actors – team leaders – we were able to interpret those difficulties as symptomatic of a tension at the micro-structural level between exploitative learning and short-term performance objectives manifested in the problems encountered by team leaders in reconciling their various missions.

Many actors emphasized the centrality, in the training of new recruits, of processes of socialization and of interactions with more experienced engineers. Recurrent or even daily informal interactions create feedback loops that enable young engineers gradually to master their activities. But the history of the unit, marked by a decrease in the number of personnel, most of them experienced, followed by a massive recruitment phase, culminated in a situation of pronounced disequilibrium between young graduates and experienced engineers in the technical sub departments. An assistant director points out:

> *"We are now recruiting a large number of engineers […]. The problem is that there are so many young people coming in at the same time that we don't know how to integrate them all" (ED3).*

The consequence of this squeezing of the age pyramid in the technical sub departments, accentuated by problems in attracting experienced engineers and the unwillingness of Project α to free up its resources, was that the task of integrating young graduates fell almost exclusively to base-level managers (the so-called "team leaders") within the technical sub departments. Another Assistant Director highlighted the team leaders' responsibility for training recruits:

> *"I think that the most important role in terms of integrating people is the role of the team leader. […] it's the first level, the team leader, that's where it happens, that's where we must make sure that new people both acquire new skills and learn how we work" (ED4).*

Team leaders are not only those most suited to playing this integrating role, but due to the age pyramid, are, above all, practically the only ones who are able to do so. But the same director also points out that the somewhat idealist scheme of leaving team leaders to train young engineers is not as easy to implement as might be hoped, due to substantial growth in their workload:

> "*Team leaders are overworked. In our organization, team leaders are not 'just' managers, they are also technicians. […] But they also have to put in a real shift as managers, and for some of them it's difficult to do because, spending so much time on technical aspects, and, for example, having to*

check all the reports produced by members of their group, they say that they don't have the time" (ED4).

Thus, team leaders are obliged to take on a wide range of missions, not only technical ("verifying reports," ED4), but also managerial in nature, foremost amongst is which the responsibility for integrating and training new recruits ("integrating people properly," ED4). Our comparative analysis of the situation of five team leaders (one from each of the technical sub departments) confirms this twin-pronged role, at once managerial and technical. All the interviewees insist on the need for team leaders to have a solid technical background guaranteeing "credibility" amongst their subordinates (CE5). This role of "super-technician" (CE3) translates into two responsibilities. On the one hand, responsibility for monitoring technical quality, a task that involves checking the reports produced by young engineers:

"The team leader in our organization is the "technical bulwark". We're the ones who pick up the errors in the documents produced, but if I miss any then I don't see any bulwark other than him" (CE4).

On the other, responsibility for integrating and training young engineers is delivered in the form of "on the job" support (the role of the "referent"):

"When we take on young people or service providers just out of university, we are the only referents. If we don't do that, we're not playing our role properly" (CE3).

Depending on the demographic structure of their teams, these two missions impact the workload in very different ways: the younger the team, the fewer experienced engineers the manager has at his or her disposal in terms of delegating technical support. Consequently, there is more checking to do. Work done by young engineers, less effective due to not yet having completed their assimilation delay, needs to be checked more vigilantly. Indeed, sometimes it has to be done again. This makes the workload associated with the technical supervision of young graduates even heavier.

Four of the five managers interviewed led teams that they considered to be very young. Of those four, three had succeeded in attracting more experienced engineers, "technical referents" to whom they delegated some of their validation and management activities. The manager who did not succeed in attracting experienced engineers was the one who claimed to have the most problems.

Furthermore, all the managers claimed to work under constant pressure to meet deadlines and respect project agendas. They frequently had to turn down jobs, resolve conflicts over priorities, and request extensions:

"I spend my time saying 'no, not now.' […] If it's not accepted, we relinquish the job, or, in other words, we postpone things" (CE3).

"I tell them 'listen, you don't have time, just finish it and don't worry about the schedule!' […] But there are a lot of deadlines that we force ourselves to meet" (CE2).

This "permanent [need to] change and reassign priorities" is, it seems, at the heart of their "work" (CE5). Reflecting the fact that, with the exception of the manager of the team that is significantly more experienced than the others, this pressure to perform and stick to deadlines is translated by an extremely marked commitment to their work, and by the feeling that they are overworked, one of the managers comments:

> *"I often go over the notes at weekends […]. I've worked practically every Sunday and Saturday. It's really been hell" (CE3).*

> *"Systematically living on the threshold of saturation is really tiring. I've been close to burnout for three-and-a-half years now" (CE4).*

These interviews give us a clearer picture of the "bottleneck" mentioned in the initial question (NI2). Although the size of this bottleneck depends on the configuration of specific teams, it nevertheless provides an insight not only into the overwork and stress described by the interviewees, but also into their concerns over the quality of the integration and professionalization of young engineers. Indeed, we observed a high degree of tension amongst these managers in regard, on the one hand, to the need to respect deadlines, and, on the other, to their responsibility to train new recruits. In view of their situation, choosing to meet deadlines come what may necessarily has a negative impact on the quality of support and training that they are required to provide new recruits with. For example, when a study has a tight deadline, a manager can choose to take care of it himself; if, on the other hand, they decide to make a young engineer responsible for it, and the engineer commits a number of mistakes, the manager must, in order to respect the deadline, correct those mistakes without providing any substantial feedback, thus depriving him of a valuable learning opportunity. One of the managers explains that, in order to honour his commitments to planning, he prefers to "do things [him]-self" (CE3), rather than to rely on his team. Nicolas explains how the young recruits depend for their training on the availability of experienced engineers, and the amount of time that the latter are able to dedicate to the former:

> *"In terms of [young recruits] acquiring skills, there is, in effect, at a given moment, a problem of time, of mutual availability. And, here again, it's a question of resources" (CE1).*

These managers often focus on being available to their teams to the detriment of performance objectives. Respecting deadlines serves as an adjustment variable:

> *"I sometimes say no, no to project people, or, in other words, my clients, when they suggest something to me. But I never say no to anyone from my team. If anyone comes to see me and asks me something, it's because there's a real need, and it's not good to tell them that we'll have a look at the problem later" (CE4).*

As we can see, the situation the unit finds itself in means that local managers have constantly to juggle various facets of their missions, balancing preparations for the future via the training of young engineers, with short-term requirements in the shape of deadlines. Consequently, in their day-to-day jobs, their contributions to exploitation (in the sense of respecting short-term performance deadlines) and to exploitative learning are rendered contradictory.

This analysis is confirmed by the comments of new recruits concerning their situation. Internal memos expressed a feeling that there was a "lack of proximity and accessibility on the part of team leaders" (NI1). In their interviews, young engineers stated that their managers were particularly overworked. However, only a few of them claimed that they had been left to fend for themselves, which seems to suggest that managers often made a priority of honouring their commitments to training young engineers and therefore tended to apply a hierarchical approach to problem-solving. Nevertheless, some young graduates

admitted that they would like their managers to be more approachable, even though they understood the kind of pressure they were under:

> *"Sometimes, I would like the manager to be a little bit more accessible and not just to see him for a few minutes to hear a brief explanation of the crux of the problem […]. I kind of had the impression that, sometimes, because we are expanding, we have fewer detailed comments about what we put in the memos. I tell myself that they have so many documents to read, well, I find it hard to believe that they read all the documents thoroughly. There's so many of them!" (I11).*

Our analyses thus show that if a choice is made to sacrifice the integration of young engineers, the process continues at a slower pace, whence the feelings of unhappiness in regard to "professionalization" (NI1, NI2, D1) expressed in the question. This sentiment can be seen as the consequence of an attempt to find a compromise between contradictory requirements which, as Josserand and Perret note, "leads the organization towards a sometimes uncomfortable intermediary situation" (2003: 165).

In terms of the acquisition of skills on the part of new recruits, we find the same structure of paradoxical tension as in the transition to the multi-project functioning. The juxtaposition of short-term exploitation and the development of long-term capabilities generates a tension that renders these registers of action mutually exclusive. In the transition to a multi-project functioning, this tension is manifested at the macro-structural level in a conflict over the allocation of experienced personnel to various departments. Meanwhile, in regard to the integration of young engineers, it is manifested at the micro-structural level in the problems by which managers are faced as they attempt to complete missions rendered all the more problematic in that they lack the resources to do so easily. The solutions applied by managers to these problems are sometimes based on a prioritization, sometimes on compromise.

EXPLOITATIVE LEARNING, MOBILITY AND THE RISK OF THE EMERGENCE OF A VICIOUS CIRCLE

Our analysis focused on evaluating the risk of paradoxical tensions reproducing themselves over time, highlighting a certain number of symptoms which indicate that the risk of the strategy stalling was both genuine and keenly felt by the interviewees. This risk was primarily due to the difficulty of developing feelings of belonging which help to support the process of developing new capabilities, and the resultant (substantial) loss of personnel.

Our HR data study (HR4) showed that the number of engineers leaving the unit had, after years of decline, started to rise again. Between 2009 and 2010, the number of employees leaving increased twice as rapidly as the number of new recruits joining the unit. The unit's policy over the course of the preceding years was to do its utmost to retain engineers in order to capitalize on training investment, and thus "develop skills and encourage the loyalty of talented individuals" (D1). But several engineers mentioned the worrying number of young engineers moving on from the unit at the end of their first post. This means that, as soon as they have completed their assimilation delay, thereby becoming a genuine resource for their team, they leave the organization without really justifying the investment involved in training them.

Several explanations were suggested by the interviewees, including generational factors. Young recruits, of a different generation to their elders,

desire greater mobility and diversity in their careers, both geographically and in terms of fields of expertise:

> *"We're beginning to see a difference of two generations between us and people coming into the unit. […] We ask them to concentrate on certain things for years. We're beginning to see some of them, after four or five months, saying 'ok, I understand that, now I want to do something else.' You feel like telling them 'ok, you think you've understood it? You've only just begun!" (CM1).*

In effect, approaches to developing and stabilizing skills in fields of this kind require long-term commitment. This kind of commitment can be encouraged by high salaries, the intrinsic interest of the activity, or a feeling of belonging, a sentiment of loyalty to the collective. Attempts to ensure that the unit maintains its collective skills thus appear to be incompatible with too high a level of mobility. In the opinion of one department head, a "soldier-monk" (CM4) culture had, for many years, made it possible for the unit to counter this risk by developing a base of loyal engineers who, between them, accumulated decades of experience. But, according to him, engineers belonging to the most recent generation do not share that culture of dedication.

> *"You know, this approach is a throwback to previous generations […]. Globally, we are obliged to think of things in a less directive manner, and the notion of total abnegation cannot be presupposed" (CM4).*

The same manager deduced that it was important to ensure that young graduates experienced "immediate pleasure" (CM4) in their work in order to keep them in the organization. But other interviewees claimed that the unit's operating only rarely makes it possible to achieve this goal. One of them suggested that multiple tensions running through the organization encouraged young engineers to leave the firm early:

> *"I am not sure that [young recruits] want to stay […]. We have a high turnover rate. People stay for three or four years. After three or four years, they are only looking for one thing, a way out […]. The workload is pretty heavy. With all the obligations associated with Project α, things aren't easy […]. People burn out quickly" (I5).*

These factors suggest that the organization ran a genuine risk of becoming trapped in a vicious circle. In effect, the tensions encountered by team leaders, highlighted above, create an uncomfortable situation for young engineers. They could, in effect, find themselves in a situation in which they faced overly complex missions without receiving adequate support, or, indeed, be deprived of training entirely. The uncomfortable nature of such situations could encourage them to leave. In order to replace them, in a situation characterized by a lack of experienced personnel, the organization had to hire new graduates and, once again, deal with an assimilation delay, effectively starting from scratch. There was, therefore, a risk that the juxtaposition between issues of performance and exploitative learning would persist over time.

DISCUSSION

EXPLOITATIVE LEARNING: A CONCEPT THAT TAKES THE LEARNING/PERFORMING PARADOX INTO ACCOUNT

A number of researchers have highlighted the unstable and reductive character of the categories of exploration and exploitation (Gupta et al. 2006), which do not take into account the variety of learning processes at play when organizations attempt to prepare the future and develop their capabilities. The two notions are therefore inadequate to the task of furnishing a broad understanding of the "learning/performing paradox" (Smith & Lewis 2011). The notion of exploitative learning, derived from the project management literature, makes it possible to overcome certain problems and clarify and enrich analytical frameworks that can be applied to tensions linked to learning processes. In effect, it makes it possible to understand certain activities linked to the transmission, maintenance, extension and diffusion, and even transfer of capabilities for which exploration has already taken place. For this reason, such activities cannot be described as exploration, but should neither be qualified as exploitation, to the degree that they are designed, precisely, to prepare the future.

The value of the notion of exploitative learning is that, in conformity with Gupta et al.'s wish, it enables us to make a distinction between different types of learning depending on the level of analysis applied. While the concepts of exploitation and exploration encompass the existing and the new at the level of the organization as a whole, the notion of exploitative learning makes it possible to take into account internal differentials in knowledge and, therefore, analysis tensions associated with absorbing those differentials. This is true both in terms of the transmission of knowledge between projects (macro-structural level) and the transfer of knowledge between experienced personnel and new recruits in training processes dependent on socialization (micro-structural level). Our study shows that the juxtaposition between exploitative learning and a strong demand for short-term performance gives rise to pronounced tensions taking the form of conflicts between departments for the allocation of resources (macro level), as well as to contradictions between the various facets of the activity of managers (micro level), contradictions that make their work more difficult.

We have shown that the contradiction between inter-related, simultaneous, and non-hierarchical registers of action is characterized by a structure of organizational paradox, bringing with it a risk, inherent in that paradox, of the emergence of vicious circles and overwork amongst personnel. Our analyses have demonstrated that the learning/performing paradox not only exists at the level of the organization as a whole (in the form of a hesitation on the part of the management between exploration and exploitation), but can also be broken down into a series of tensions linked to the juxtaposition of local learning processes and short-term goals.

More broadly, the mobilization and detailed analysis of exploitative learning promotes a deeper understanding of tensions between juxtaposed, heterogeneous, temporal logics in organizations. We observed that the question of human resources is central to these phenomena; not only does it shed light on them, but it also plays an instrumental role in their evolution. March had already drawn attention to the relationship between tensions and resources by means of the notion of "conflict for scarce resources," as had Smith & Lewis (2011) with their idea of the latent character of tensions that can be exacerbated by a scarcity of resources. But, up until now, these intuitions had not given rise to specific research on the subject. Research on the micro-foundations of organizational paradoxes involving the detailed analysis of how employees deal with

contradictory demands constitutes a promising avenue of research for this branch of the literature.

A MORE SOLID PERCEPTION OF EXPLOITATIVE LEARNING

Our case study enabled us to deepen our knowledge of the notion of exploitative learning, which, up until now, has been the object of few detailed empirical studies. The literature had shown that these learning processes involved the transfer of knowledge from project to project towards the organization. But, as was demonstrated in the interviews, these knowledge transfers require the redeployment of resources, a process that can prove difficult to implement. It can also be based on the integration of new recruits who must be helped to develop capabilities in order to equip the organization with a greater potential to elaborate projects designed to improve future performance. Our study thus makes possible an analysis of the way in which these learning processes are implemented, and of how they are manifested in the allocation of resources and in investment in terms of time, and, therefore, of potential associated tensions.

By considering exploitative learning in its temporal dimension, we have been able to highlight these tensions, which are manifested, on the one hand, in the links between and juxtaposition of projects, and, on the other, in the time required to integrate and train new recruits, described by means of the notion of the "assimilation delay."

It was the overlap between the culmination of the pilot project and the preparation of future projects that rendered the organization hesitant in regard to the allocating of resources. In effect, the organization hesitated between a logic of exploitation (finishing the pilot project as quickly as possible), and an approach focusing on preparing for the future (providing new projects and technical sub departments with skilled personnel as quickly as possible). Furthermore, taking into account assimilation delays and concrete learning processes through socialization (and involving experienced employees engaged in operational activities) make it possible to envisage exploitative learning as the result of an investment of time and resources. It is precisely this notion of investment which confronts actors facing a lack of resources and pressure to meet deadlines, a situation characterized by unending choices and constant tensions.

LIMITS OF THE STUDY AND POTENTIAL AVENUES OF RESEARCH

The most pronounced tension revealed by the case study concerns the juxtaposition of exploitative learning and short-term performance goals dependent on the same, scarce resources. We have demonstrated that these tensions could be catalyzed by other phenomena linked, for example, to issues focused on a sense of belonging, or otherwise, to the organization, which lead to a relatively high turnover rate which, in turn, further undermines exploitative learning. But it is probable that other factors interact and cause tensions with exploitative learning, notably the exploration of new capabilities, particularly in design activities in which the production of knowledge is absolutely central. Taking those factors into account could pave the way for a more broad-ranging analysis of the learning/performing paradox.

Lastly, we have highlighted the tension between exploitation and exploitative learning in a case which, being extreme, was characterized by a number of highly contingent specificities in regard to the history of the organization and the nature of its activity, including a scarcity of resources exacerbated by a period in which the activity was placed on standby; a need to generate resources internally by training young graduates, rather than hiring experienced personnel, etc. Thus, in our case study, the degree of tension is

strongly determined by a certain number of parameters that can be regarded as highly specific. New research must show whether such tensions can emerge in different forms in other industrial contexts with different characteristics.

CONCLUSION

This article suggests a broader analytical framework in regard to tensions resulting from the juxtaposition, in a corporate context, of a focus on short-term performance goals and a desire to develop capabilities for the long-term. The static character of the categories of exploration and exploitation calls for the introduction of new concepts designed to describe the sheer variety of learning processes in such contexts. In this article, we propose the concept of exploitative learning, which describes learning processes associated with growth strategies based on the replication, extension and diffusion of existing capabilities. The case study of a complex major project engineering unit facing an increase in both the number of projects to be developed and the number of personnel employed demonstrates the fecundity of this concept, which makes it possible to reveal and understand tensions that have not, up until now, been thoroughly described. In effect, an analysis of the tensions running through an organization lacking resources in terms of personnel and subject to a good deal of pressure in to meet short-term objectives highlights the difficulties involved in redeploying personnel between different projects and ensuring that new recruits acquire information from experienced engineers.

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APPENDIX A. COMPARATIVE THEMATIC ANALYSIS OF THE SITUATION OF FIVE TEAM LEADERS OF THE IDD

	NICOLAS (CE1)	BENOIT (CE2)	DIDIER (CE3)	SYLVAIN (CE4)	JEAN-GUY (CE5)
The role of the manager	"The role of the team leader is both technical and a managerial. […] I still do a lot of technical things. I check what is produced by members of the group, we talk about technical matters every day […] – what the group generates are technical products. […] They [young recruits] have technical support. I give them time slots; they know that the door is open."	"It's important that they trust in the overall technical competence of their manager."	"Technical matters aren't incompatible with the job of team leader […], above all, it's about being a super-technician. When we take on young people or service providers just out of university, we are the only referent. If we don't do that, we're not playing our role properly […] And it's true that at the IDD, the personnel is extremely young in terms of skills. You have to be very much on your guard at all times in about technical matters to spot problems, things that haven't really been thought through."	"The team leader in our organization is the technical bulwark. We're the ones who pick up the errors in the documents produced, but if I miss any, then I don't see any bulwark other than him. In our sub departments a good manager is, first and foremost, someone who has a good technical background because we would never be seen as legitimate […], a manager would have a really hard time of it if the person talking to him felt as if he wasn't talking the same language."	"Giving out work, checking work, alerting everyone to the situation when things go wrong." "To be a manager, you need to have a certain degree of competence. To be credible for the team, you have to have a good technical background, otherwise you're not credible."
Technical referents	"A year ago, I introduced the role of assistant referent. There are two referents [now]. These two people leave technical aspects to one side, without my abandoning them, thus enabling me to pre-filter technical problems."	Disposes of an experienced group: no requirements for specific "referents."	"I've got two people, who I was talking about, who aren't really young people – they're between 30 and 35 years old – who really serve as go-betweens for me. That's something that's really helpful to me. When I first took the group on, I was on my own, but we were gradually able to recruit people who were able to deal with this kind of thing."	"If I had a number of experienced people, I'd take a different approach. For me, it would have been ideal if I'd been able to designate an experienced person in my group as a technical referent for a certain number of contracts and let him look after things. As things stand, I can't do that, but in view of my team members, it's not through lack of trying! […] In fact, I'm right in the middle of the age pyramid."	"There are two experienced people who are 50 years old who have become referents. And all the rest are young, recruited in 2010 ;;; "it works because, in the team, there are older referents able to train people. If I IDD didn't have them, if I was on my own, I wouldn't be able to train everybody."
Managerial responsabilities	"In terms of [young recruits] acquiring skills, there is, in effect, at a given moment, a problem of time, of mutual availability. And, here again, it's a question of resources."	Few young people to integrate in comparison to the number of experienced personnel.	"[We are] to some extent, a training school. Without counting suppliers, experienced people cost a lot of money, and they are not necessarily given design jobs. Consequently, my employees are young people just out of university. But I'm not really that bothered because I've got used to training people, and I now pretty much know how to do things; but, still, the average age of the group is very young."	"Sometimes you also have to be a good teacher. […] I have white boards set up in all the offices. And I become a school teacher. […] I've got 6 or 7 young people to manage. It's a colossal work load. Colossal."	"In the beginning, there was an enormous emphasis on training young recruits, giving them enough background information for them to be able to get by. As soon as they could get by, I was able to focus more on my role as a manager. But I have more young people coming in, so I'm continuing my work as a referent."
The issue of deadlines and workload	"From the point of view of time management, it doesn't work […]. People have actually suggested giving up one or two weeks holiday to meet deadlines […] We have an enormous amount to do and all our projects are priorities. […] I'm the one who defines priorities, but it's not easy. […] Project managers don't tell you about what they're going to do, so you have three days to sort things out. It's not possible, not possible …"	"In and of itself, there's no sense to respecting deadlines if we deliver something sub-standard, so we try to strike a balance. I've never pressurized anyone into delivering something on time […]. I tell them "listen, you don't have time, just finish it and don't worry about the schedule!" […] But there are a lot of deadlines that we force ourselves to meet."	"We're kind of caught between a rock and a hard place! We don't have time to do things well. […] I spend my time saying 'no, not now,' if it's not accepted we relinquish the job, or, in other words, we postpone things. And again, I think that I've never refused fundamental jobs, even if I've had to do them myself. That was the crux of the problem: I worked weekends because I knew that there was no point in asking anyone else to do it …"	"Nowadays, I spend my time putting out fires. I come in in the morning with a list of things to do, but I haven't got through a tenth of them by the time I go home. […] I sometimes say no, no to project people, or, in other words, my clients, when they suggest something to me. But I never say no to anyone from my team. If anyone comes to see me and asks me something, it's because there's a real need, and it's not good to tell them that we'll have a look at the problem later."	"In case of conflicts, we prioritize Project α. And then, after that, it's up to the manager, depending on subjects to be dealt with, on the time it takes to deal with them, on knowledge … everyone … everyone has work to do, but sometimes there's a window of opportunity. So we patch things up, make do, change our priorities. That's the manager's job, to shake things up permanently and change priorities."
Quality of life at work	"I start at 9am and don't go home before 5pm … I don't have the time, and I do stuff on the weekend. I don't have time to do it."	IDD not mention problems linked to quality of life at work.	"I often go over the notes at weekends […]. I've worked practically every Sunday and Saturday. It's really been hell, but I was taking on people's work because, in fact, I'd replaced 80% of the staff, since the group was completely falling apart. I had to work really hard. […] I had people who regularly went to company doctor to complain."	"Personally, I got to know all about burn out in this job. I'm knackered. […] We all have a saturation threshold, so reaching saturation from time to time is a source of motivation, but systematically living on the threshold of saturation is really tiring. I've been close to burnout for three-and-a-half years now.	"The grass isn't always greener on the other side of the fence. And our days are very full. So we have to work urgently, think quickly, take decisions rapidly; we finish late in the evening, it's not comfortable."

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