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Exploring the “black box” of ACAP from the perspective of individuals’ micro-practices: the case of a collaborative project

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1. Introduction

Absorptive Capacity (ACAP) is recognised as a set of capabilities (identification, assimilation, transformation, exploitation) to explain and foster innovation (Cohen & Levinthral, 1990). However, there is yet no clear understanding on what ACAP is made of, and the roles of individuals’ ACAP to develop it in their companies.

This question is crucial both from a theoretical and empirical perspective. Even though literature on ACAP has continued to develop in the last twenty years, the concept that is not yet stabilised (Roberts et al., 2012) and can be described as a puzzle where the scattered pieces do not yet provide an holistic representation. We know that organisational ACAP relies on individual ACAP, previous firm’s knowledge base and organisational routines (Matusik & Heeley, 2005). In addition, it seems that emerging micro-practices are anchored within and renew pre-existing organisational routines, without specifying how this transition occurs (Di Stefano et al., 2014). Finally, ACAP relies on organisational absorptive routines (Cohen & Levinthal, 1990; Zahra & George, 2002) but there are no details concerning the functioning of those routines. If ACAP is mainly understood as an organisational concept, a better understanding of the skills and micro-practices of individuals are crucial to open the ACAP black box. From an empirical perspective, this is crucial for SMEs in Europe for whom innovation has become vital for survival.

The literature on absorptive capacities firstly shows that key actors and competencies are mobilised to constitute an individual ACAP without clearly specifying the micro-practices that are associated to it. We wish to tackle these gaps with the following research question: what are the micro-practices of individuals that contribute to the organisational ACAP?

The aim of this paper is to accentuate the roles of individuals by a better understanding of their role in the development of capabilities that progressively generate micro-practices. We adopt a practice-based view (Whittington, 1996) and introduce the description of micro-practices as observable actions that are progressively emerging in the context of collaborative innovation projects. We assume that these micro practices act as the cement of specific routines that lead to the constitution of organisational ACAP, in the context of collaborative innovation projects consisting of several SMEs. The main aim of this research is to explore how absorptive micro-practices are developed at the individual and inter-individual levels.
2. Literature review

2.1. ACAP to better understand innovation within SMEs working in collaborative networks

ACAP is a set of capabilities that structure routines and allow a firm to develop new outputs (innovation, products, services) and thus stimulate firm dynamism (Todorova & Durisin, 2007). It fosters a willingness to adopt new ideas and adapt to change, and stimulate commitment to creating an environment that encourages new ideas (Zacharia et al., 2011).

Performant firms develop dedicated integrative capabilities such as innovation capability (Lawson & Samson, 2001) and largely rely on the concept of a firm’s absorptive capacity (Cohen & Levinthal, 1990). Despite Cohen & Levinthal’s argument that ACAP relies on the absorptive capacities of individual members within an organisation, we notice that much research focuses on ACAP at the organisational level and few studies deal with it at the individual level (Ter Wal et al., 2011). Yet Liao et al. (2007: 354) explicitly underline the role of individuals in the knowledge absorption process. This level of analysis is however important firstly because ACAP is considered as a capability where individuals play a key role (Helfat & Peteraf, 2009). Secondly, ACAP is a prerequisite for the evolution of routines. Therefore, individuals’ actions underpin ACAP at both the individual and organisational level, and then, they impact the enactment of organisational routines. We argue that the concept of micro-practices may be the missing link between individual ACAP and organisational routines, and in this study will use the concept of micro-practices to link individual ACAP and organisational routines.

2.2. What are the appropriate methodologies and related theoretical backgrounds used to enter into the ACAP black box?

There are two main approaches to describe organisational capacities: routines and the practice-based view.

Two different approaches of organisational dynamic capabilities foundations can be underlined within the literature (dealing with two levels of analysis) (Peteraf et al., 2013). The first focuses on their micro-foundations at the individual level, in terms of latent actions and a firm’s ability (Teece et al, 1997) to renew its competences that are based on individuals’ skills (in particular managers skills) and built during daily activities through the implementation of individual “micro-practices” in interaction with other actors (Fauré & Rouleau, 2011;
Rouleau, 2005). The second considers dynamic capabilities at an organisational level, and defines them in terms of constituent elements (in a process, routine, or pattern) where they are “the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die” (Eisenhardt & Martin, 2000:1107).

We adopt Di Stefano et al.’s (2014) view and consider that these approaches should be reconciled in a unique model that unifies an understanding of the foundations of dynamic capabilities. Micro-practices developed by individual and at the inter-individual level progressively cultivate organisational routines.

2.2.1. Exploring Routines

Organisational routines can be defined as “generative systems that produce recognisable, repetitive patterns of interdependent actions, carried out by multiple actors” (Feldman & Pentland, 2003) within a pre-existing social context. They consist of rules, heuristics, and norms that are operationalized at different levels of organization activities and processes, and although managerial practices may be seen as routines, the two concepts are not equivalent because not all routines become standard operating practices (Lewin et al., 2011: 84).

The concepts of routines and capabilities are closely intertwined. Routines constitute the building blocks of organization capabilities and evolve over time as a result of problemistic search, organizational learning and past selection and retention processes (Gavetti & Levinthal, 2000). New superior routines, capabilities and new knowledge emerge through a dynamic interaction of internal and external variation, selection and replication processes involving knowledge creation and change over time (Lewin et al., 2011: 84).

Innovating is a complex process for firms because novelties and innovation introduces perturbation within the established system (Carroll & Teo, 1996), which challenge its current activities. Mastering the innovation process therefore implies a need to stimulate innovation through destabilisation of routines and to integrate innovation by adapting or developing and restabilising new routines (Lawson & Samson, 2001). Feldman & Pentland (2003) suggest the concept of ostensive and performative routines to describe this evolution. Ostensive routines are those that may be codified as a standard operating procedure and potentially includes artefacts (Feldman & Pentland, 2003: 101). Performative routines will progressively contribute to the evolution of absorptive organizational routines by acting simultaneously and
reflexively on “performative” and “ostensive” dimensions of routines (Feldman & Pentland, 2003) stabilizing some best emergent practices at the organizational level.

The literature considers different characteristics of organization that are successful with their ACAP; we classify them according to their structures, managerial modes and managerial structures. Different organizational structures are considered to facilitate ACAP such as, the type of power relationships, the size, socialization and organizational capabilities (Todorova & Durisin, 2007), the diversity of the background of human resources, the type of R&D resources, the cross-functional communication (Noblet et al., 2011), the knowledgebase (Carlile & Lakhani, 2011), digital capabilities (Roberts et al., 2012) and the strategic positioning within networks (Giuliani, 2005). Second, certain types of managerial modes are known to boost ACAP such as incentives, community leaders, the level of formalization of routines, the balance of efforts on the several ACAP dimensions and the level of centralization (e.g. management decision-making and ease of communication) (De Araújo Burcharth et al., 2015). Third, some organizational culture encourages ACAP such as a climate of tolerance for failure, the “willingness to cannibalize” (accept to take away current sales from existing products), external openness, a collective spirit aimed at challenging their own way of thinking or acting (Park et al., 2007).

Based on an extended literature review that has crossed the absorptive capacity with organisational routines, Lewin et al. (2011) propose a taxonomy of internal and external meta-routines, with examples of absorptive capacity routines. Two of them, managing adaptive tension and transforming knowledge back to the organization, are in-between internal and external meta-routines. We summarise these meta-routines in table 1.

Table 1: Taxonomy of internal and external absorptive capacity meta-routines (Lewin et al., 2011: 87-89)

<table>
<thead>
<tr>
<th>Components</th>
<th>Meta Routines</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal AC Meta-Routines</td>
<td>Facilitating variation</td>
<td>Facilitate the emergence and exploration of new ideas at different levels of the organization (p.87)</td>
</tr>
<tr>
<td></td>
<td>Internal selection regimes</td>
<td>Firm’s processes put in place to select the various projects and activities to invest in and to determine how to allocate resources among them (p.88)</td>
</tr>
<tr>
<td></td>
<td>Sharing knowledge and superior practices across the organization</td>
<td>Ways by which organizations transmit and share information (p.88)</td>
</tr>
<tr>
<td>Components</td>
<td>Meta Routines</td>
<td>Descriptions</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Reflection, updating and replication</td>
<td>In contrast to bottom-up, random, or informal learning processes, reflection routines are intended to formally update their capabilities at specified intervals or an integral step as a process (p.88)</td>
<td></td>
</tr>
</tbody>
</table>

| In-between AC Meta-Routines | Managing adaptive tension | By selecting an external comparison group and placing some weight on the value of external information; or by imposing stretch goals (p.89) |
| Transforming knowledge back to the organization | Linking external knowledge with firms’ in-house capacities is a central element of absorptive capacity that should foster innovation in firms (p.90) |

| External AC Meta-Routines | Identifying and recognizing value of externally generated knowledge | Companies have formal gatekeepers of boundary spanners who serve at the interface between an organization and its external environment (…) particular importance when the external information is not directly related to the core activities of the organization and requires contextual interpretation to be considered useful by other members of the organization (p.89) |
| Learning from and with partners, suppliers, customers, competitors and consultants | Companies have been increasingly interacting with outside organizations to learn from them or cogenerate knowledge (…) facilitated by developing stable patterns of collaboration between the two partners (p.90) |

### 2.2.2. A practice-based approach

Much attention has been given to the practice-based approach to better understand organizations. It is rooted in an understanding of “what people do in everyday lives as an object of research and as an explanatory category in social sciences (…) Practice is both our production of the world and the result of this process. It is always the product of specific historical conditions resulting from previous practice and transformed into present practice” (Nicolini et al., 2003: 8). These authors defend the practice-based approach as the most relevant approach to capturing knowing and learning in organizations. They consider knowledge as a “social activity that requires some form of participation and that is continually reproduced and negotiated, that is always dynamic and provisional” (ibid: 3).

Gherardi (2006: 34) defines a practice as a “mode, relatively stable in time and socially recognized, of ordering heterogeneous items into a coherent set.” In her view, practice has two important implications: (i) social action and social knowledge must be regarded as activities inseparably woven together, (ii) knowledge cannot be viewed as a conscious activity
involving meaningful acts (...) There are three types of relations established between practice and knowledge:

- “A relation of containment, in the sense that knowledge is a process that takes place within situated practices;
- A relation of mutual constitution, in the sense that the activities of knowing and practising are not two distinct and separate phenomena; instead, they interact and produce each other;
- A relation of equivalence, in the sense that practising is knowing-in-practice, whether the subject is aware of it or not” (ibid: 38);

Practices are carried out by individuals and are thus dependent on individual abilities and skills where implementing ‘simple rules’ are straightforward. (Eisenhardt & Martin, 2000). While focusing on practices that facilitate the coordination of experts in a large firm, Kotlarsky et al. (2014) highlight the types of knowledge that intervene and differentiate between structured and unstructured coordination modes. The practice-based approach raises key questions in terms of methodology (Gherardi, 2013). When researchers do not have the possibility to observe actors in a longitudinal period, for instance in a research action frame, other methods are usually used such as narratives of practices, discursive analysis, ethnography presented in the format of “vignettes” (a set of activities described by individuals via selected verbatims) or focus groups. These methods always question the way narratives are interpreted to reach a better understanding of work in action. Rouleau & Balogun (2011: 957) stress the fact that the use of an interactive discussions group, crossed with interviews conducted with individuals, “encourage deeper reflection from each other around activities individuals are engaged in”. In the methodological part of this paper, we propose a new focus group based methodology to better capture individual micro-practices.

2.3. A call to conceptualise the firm’s individual ACAP in SMEs

Referring back to the seminal work of Cohen & Levinthal (1990: 131) who stated that “the task of bringing in, processing and utilizing external knowledge in organizations falls to individuals”. Volberda et al. (2010: 944) added, that if the “absorptive capacity is a firm level construct; it has a foundation rooted in an understanding of individual”.

Yet there remains a dearth of research defining what an individual ACAP, as a concept, could be. Park et al. (2007: 301) define individual ACAP as the “individuals’ idiosyncratic
capability that would help improve individual performance and eventually increase organizational competency” (…) the capacity of individuals to “reinvent their use of ERP to fit to their task environment and thus that such reinvention would be tightly related to users’ ability to learn to use ERP systems effectively”. Ter Wal et al. (2011: 4) define individual-level absorptive capacity as the “level of effort that individuals undertake to identify external knowledge, assimilate it and utilize it to commercial ends”. Although they acknowledge that organizational antecedents play a crucial role in determining absorptive capacity at the firm level, individual efforts constitute important building blocks of organizational absorptive capacity that have to date received limited scholarly attention (Foss et al., 2010; Volberda et al., 2010).

However, certain authors provide insights on the personal characteristics, skills or capacities of individuals that are developing an ACAP in their companies or describing what their behaviours are. Following Wright et al. (2001: 704), we define skills as “human talent” and behaviours as “individuals as cognitive and emotional beings who possess free will” and represent skills that are activated via social interactions. (ibid: 705)”. Teece et al. (1997: 515) define dynamic capabilities at an organizational level. They are the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments. Hence the term ‘capability’ enhances the key role of strategic management in appropriately adapting, integrating and reconfiguring internal and external organizational skills, resources and functional competences to match the requirements of a changing environment. Capabilities can be then defined as macro-competences and related skills (Retour et al., 2009).

From a human resource approach, the links between individual and collective competences are complex. Dynamic capabilities can then be considered as macro-competences and related skills that enable firms to reconfigure human resources to adapt to new market conditions (Retour et al., 2009: 42). In addition, the KSA theory (knowledge, skill and ability requirements for teamwork) developed by Morgeson et al. (2005) highlights that going from an individual capacity to a collective one implies taking into account not only practices but also social skills (e.g. solving conflicts…) and organizational (e.g. coordination, establishing common objectives…) (Retour et al., 2009: 81). Thus, in this study we consider that the individual “dynamic capabilities” concept can be split into both a high level of skills and behaviours that exhibit productive behaviour. The main skills and behaviours of individuals developing an ACAP are summarised in Table 2.
### Table 2: Review of the literature on the individual ACAP capabilities

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Differentiation</th>
<th>References</th>
</tr>
</thead>
</table>
| Characteristic skills | • Knowledge capability and learning:  
  o Mobilise the knowledge infrastructure/repository of the company  
  o Reframing problems and solutions  
  o Speed of learning; Manage different ways of thinking  
  • Level of education and academic qualifications  
  • Openness and Alertness to opportunities  
  • Risk tolerance  
  • Creativity  
  • Bricolage  
  • Communication | Seo et al. (2015)  
  De Araújo Burcharth et al. (2015)  
  Noblet et al. (2011)  
  Ter Wal et al. (2011)  
  Noblet et al. (2011)  
  Zahra & George (2002)  
  Park et al. (2007)  
  Cohen & Levinthal (1990) |
| Behaviour | • Social interactions  
  • Relational learning  
  • Leadership (notably the CEO)  
  • Aggressively and persuasively pushed external knowledge internally  
  • Manage constructive conflicts  
  • Each actor need to learn how to play multiple roles in the process  
  • Motivation to learn and innovate | Hotho et al. (2012)  
  Leal-Rodríguez et al. (2014)  
  Leal-Rodríguez et al. (2014)  
  Flatten et al. (2014)  
  Jansen et al. (2005)  
  Ter Wal et al. (2011) |

The specific skills that provide a good breeding-ground to foster ACAP micro-practices have not yet been identified. Even though we are convinced that fostering specific micro-practices in SMEs could be a good managerial approach to foster ACAP and related capabilities, we do not have a clear vision about what these practices are. Thus, a better understanding of these practices could also contribute to the discussion on the transition from ostensive to performative routines (Feldman & Pentland, 2003) in the context of collaborative innovation projects consisting of SMEs and also within collaborative networks. Finally, by exploring the set of routines in more depth, these could lead and reconfigure what constitutes organizational ACAP in this context.

From this literature review, we propose an heuristic model (Figure 4) that highlights the main gaps identified. First, we defend the need to conceptualise the firm’s individual ACAP. This can be done by, firstly, better highlighting the links between individuals (described through their skills and behaviours) and individual and inter-individual ACAP micro-practices (lower
part of Figure 4). Secondly, the literature shows a lack of in-depth understanding of the interconnection between organisational routines and ACAP routines (upper part of Figure 4). Thirdly and finally, there is a final black box in what Di Stefano et al. (2014) name the “co-development” that is to say the passage from the individual stage to the organisational one. How do individuals contribute to cultivate organisational ACAP? There are certainly specific conditions, in certain contexts that favour the transformation of ACAP (inter-)individual practices to ACAP routines. The conceptual heuristic model developed here (and represented in figure 4) illustrates the interactions between individual and organisational ACAP and is the foundation on which we can base our further research. However, for this paper, we will focus on the initial stage to explore how we can better understand and articulate these interactions in the first instance.

3. Case study

Qualitative data rely on a process study approach (Langley et al., 2013). An innovation project, which was the basis of this case study, was composed of fifteen members, among which three partners worked together on a specific package that aimed to identify how silicone could be embedded in textile thread and knitted according to the requirements of specified applications (aeronautic, automobile, medical, etc.).

Firstly, we conducted thirteen interviews among different participants working within the same collaborative innovation project (profiles of case participants are summarised in table 3). Secondly, we conducted a focus group based on the ISEA method (Santorum et al., 2013), where we modelled the innovation process within Omega company to capture both the individual and inter-individual practices linked to each activity and knowledge exchange (represented in Figures 2 & 3). We also interviewed the cluster’s coordination unit team as they were the originators of the idea for the innovation project.
Table 3: Profiles of Case Participants

<table>
<thead>
<tr>
<th>Cluster’s Coordination Unit</th>
<th>Alpha Firm</th>
<th>Gamma Firm</th>
<th>Omega Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing Director (2 times)</td>
<td>R&amp;D Director</td>
<td>CEO</td>
<td>R&amp;D Manager</td>
</tr>
<tr>
<td>Project Manager 1 (2 times)</td>
<td>Innovative Project Manager</td>
<td>R&amp;D Manager (Interview + Focus Group)</td>
<td>Innovative Project Manager (Interview + Focus Group)</td>
</tr>
<tr>
<td>Project Manager 2</td>
<td>Innovative Project Manager</td>
<td>Project Manager (Focus group)</td>
<td>Technician (Focus Group)</td>
</tr>
<tr>
<td>Working Group Manager</td>
<td></td>
<td>Commercial Manager (Focus Group)</td>
<td></td>
</tr>
</tbody>
</table>

To conduct our investigations, we based our methodology on the ISEA method. This is an innovative methodology oriented toward the modelling of processes and developed by the computer laboratory at the University of Grenoble (Santorum et al., 2013). It adopts a collaborative approach based on a serious game to orchestrate the modelling phase of the process. The principle is as follows: after the identification of the process to be modelled (that can be done throughout several interviews with actors involved within the process), a collective simulation phase is introduced. This phase of simulation gathers all actors of the process identified during the first identification phase. The role-playing game helps them structure a numerical representation of the process. All participants re-enact the precise role they played and intervene where necessary (by following the temporal progress the process followed) to describe the activities of which they were in charge, along with the documents they initiated, received, transferred or delivered to other actors for their own activities.

This approach enabled us firstly to produce collectively a representation of the collaborative R&D project and all the activities that Gamma organization had undertaken during the entire project lifecycle. In a second phase, based on the process the actors described and modelled, we initiated an exploration phase of the absorptive capacity practices the actors developed. To that effect, we asked the actors to repeat the process but this time focusing their attention on individual and inter-individual practices they developed in order to:

- Identify and capture the external knowledge that was necessary for their activities during their interactions with external actors such as the project partners or customers;
• Assimilate the external knowledge acquired, transmitted, shared with internal actors of the process, or yet again transformed by combining them with knowledge the organization already had internally;

• Exploit the external knowledge integrated to act (for example to produce a document, to realize the machine set-ups, or to realize knitting tests) or to decide (for example to validate the project, to validate the thread quality, to validate the textile mock-up that was presenter so it could be further developed and commercialized on the market).

We were also able to identify, in line with what the actors mentioned and described, the main activities that took place during the project and where acquisition, assimilation/transformation, or exploitation practices are implemented. During each stage of this serious game, actors were requested by facilitators to identify potential artefacts (shared documents, material supports such as sample) that the practice necessitated.

4. Results

Specifically, we are studying the micro-practices of knowledge absorption that are generated by key actors included within an innovation process. To do that, we notably operationalise the SECI (Socialisation, Externalisation, Combination, Internalisation) model developed by Nonaka & Takeuchi (1995) on all phases of the ACAP model. We developed a taxonomy of micro-practices (Table 4) produced from individuals assuming different roles.

Based on the interviews we conducted and the modelling of the process with firm Omega, we identified four phases the project followed, which are represented in Figure 1. This section of the paper will only focus on the two first phases (project initialization and mock-up development) since phase three and four are just a repetition of phase two.

Figure 1: Project's phases
4.1. Identification of intensive ACAP phases

Within the innovation project, we identified two main phases during which the ACAP of individuals played an increased role. We call these two phases “ACAP-intensive momentum”.

In Figure 3, the first ACAP-intensive momentum, represented in red, illustrates the intensive phase where the new thread was developed. This phase consisted of detailed technical specifications with partners about the quality of the thread, tests regarding this quality as well as tests oriented towards the knitting of this new siliconed thread. Alpha was the first actor that had to intervene in this phase. As a silicone expert, the firm was in charge of developing a silicone formula that would have the properties necessary to be fixed on the textile thread. Once the formula was developed, it was sent to Gamma who coated the thread with this formula. If tests were not successful, Alpha worked on the formula again until Gamma could provide a satisfactory thread to Omega. Knitting this new thread then required interactions between Omega and Alpha (if the silicone formula affected the knitting of the thread) or with Gamma (appropriate thickness of the thread for knitting). These steps were repeated until the developed thread was suitable.

The second ACAP-intensive momentum, represented in green, lies around the design of the manufacturing mock-up. It included testing of the mock-up by customers in order to check if it fulfilled the business requirements related to the final use of the textile, which might have been in different sectors (such as medical, building, aeronautical). If the initial tests were inconclusive, the innovation manager proposed new technical specifications, which led to another manufacturing step. This process ended with the validation of the mock-up by the customer to then build a prototype, which ended up as a manufacturing process.

These ACAP-intensive momentums were characterized by a high frequency of exchanges, both among internal and external actors, that combined externally acquired knowledge and internal knowledge leading to a new exploitation of knowledge. These were extremely interesting to observe in order to better understand ACAP practices and notably the role of individuals.

Within our case study, we identified that (i) being an active member within a cluster (which provides innovation oriented workshops), (ii) developing collaborations with universities during the project set-up, and (iii) collaborating with other SMEs that share the same innovation culture, are conditions favouring the institutionalisation of the knowledge
absorptive routine. This in turn, will become an organisational ACAP routine based on the three micro-practices observed in our case.

4.2. A classification of individual ACAP micro practices and related skills

Analysis of our case study allowed us to define four types of knowledge that individuals develop during the most intense phases of the innovation process previously highlighted. These types of knowledge are acquired by specific individuals and allow them to develop particular practices that will be developed during the project lifecycle at certain key moments. We observed four types of knowledge that were used during the project, and which led to twelve different practices that we present in Table 4 according to a specific ACAP phase.

Technical knowledge related to the product or service are directly linked to the project and the project partners will need to acquire and integrate these into their already existing organizational practices so that they can reuse them at the end of the project.

Customers’ knowledge needs: where the actors have to identify the final customers’ needs and develop the ability to continuously adapt the product they are developing to ensure it fits in with what they are expecting. This knowledge is highly linked to the functionalities the customers want the product to have. It is thus highly recommended to include the customers in all of the development phases so they can provide useful insights concerning their requirements.

Knowledge based on opportunities arising from the project that are related to the in-depth knowledge of the market and how the organization can make the best out of the project in order to benefit from its outcomes.

Project engineering oriented knowledge that are occurring throughout the project’s lifetime. Within this case study, two of the SMEs we interviewed were experiencing collaborative projects for the first time. Thus, they had to learn new ways of collaborating in an environment where power relationships may not be exactly the same as they had experienced in previous projects.

Table 4 below presents the different practices that are related to the four knowledge types and the three dimensions of ACAP. We divided each knowledge type into four major elements: (1) actors that are involved in (2) innovation process activities, which led to the development of (3) practices and (4) artefacts (such as laboratory notebook, common glossary, etc.). The
underlying idea behind this table is to provide precise examples of the implemented practices, that is to say where, when, how they occur, who is involved in them, who is interacting with whom, and what tools or boundary objects are created to facilitate the absorptive capacities of the overall organisation.
### Table 4: Taxonomy of individual ACAP practices in an innovative project

<table>
<thead>
<tr>
<th>ACAP Dimension</th>
<th>Content</th>
<th>ACQUISITION (A.) Knowledge acquisition from outside the organisation’s boundaries (identified and captured)</th>
<th>TRANSFORMATION (T.) Knowledge assimilation / transformation (stored, shared, transferred, combined)</th>
<th>EXPLOITATION (E.) (used to make decisions or to act)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Technical knowledge related to the product or service</strong></td>
<td>Actor</td>
<td>Project manager (interacting with industrial partners)</td>
<td>Project manager Innovative project manager Technician</td>
<td>Technician</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Thread technical specificities definition</td>
<td>Thread quality test Knitting test</td>
<td>Mock-up, prototype or industrial trial proposal</td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td>Set up collaborative meetings with project partners</td>
<td>Realise test iteratively (trial/error approach)</td>
<td>Realise machine set-ups Develop the textile mock-up with an ongoing approach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set up of shared learning sessions at the same location with project partners</td>
<td>Interact with actors in order to refine technical specifications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Artefact</td>
<td>Thread technical requirement specifications</td>
<td>Thread technical requirement specifications</td>
<td>Thread technical requirement specifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common glossary</td>
<td>Laboratory notebook to capitalize on realised tests</td>
<td>Textile mock-up</td>
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<tr>
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<td></td>
<td></td>
<td>Silicone-thread sample</td>
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</tr>
<tr>
<td></td>
<td>Actor</td>
<td>Sales Manager (interacting with the customer)</td>
<td>Sales manager Innovation manager</td>
<td>Technician</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Customer experimentation</td>
<td>New mock-up specifications</td>
<td>New textile mock-up proposal</td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td>Present the mock-up (or prototype, or industrial trial)</td>
<td>Interact with other actors Inform about customer’s reactions to adjust the mock-up or the prototype</td>
<td>Realise machine set-ups Develop the textile mock-up with an ongoing approach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identify customer’s needs</td>
<td></td>
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<tr>
<td></td>
<td>Artefact</td>
<td>Textile mock-up (or prototype)</td>
<td>Textile mock-up (or prototype)</td>
<td>Textile mock-up (or prototype)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer’s specification requirements</td>
<td>Customer’s specification requirements</td>
<td>Customer’s specification requirements</td>
</tr>
<tr>
<td><strong>2. Customers’ needs knowledge</strong></td>
<td>Actor</td>
<td>Project manager (interacting with industrial partners)</td>
<td>Project manager CEO</td>
<td>CEO</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Define the project’s objectives</td>
<td>Project validation</td>
<td>Project validation</td>
</tr>
<tr>
<td><strong>3. Knowledge based on the resources required by the</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACAP Dimension</td>
<td>Type of knowledge</td>
<td>Content</td>
<td>ACQUISITION (A.) Knowledge acquisition from outside the organisation’s boundaries (identified and captured)</td>
<td>TRANSFORMATION (T.) Knowledge assimilation / transformation (stored, shared, transferred, combined)</td>
</tr>
<tr>
<td>----------------</td>
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</tr>
<tr>
<td>project</td>
<td>Practice</td>
<td>Realise collaborative meetings with project partners</td>
<td>Share knowledge about project initiation, market opportunities, project’s funding possibilities and organisation’s own strategy Combine internal knowledge possessed by the CEO with newly acquired external knowledge by the project manager</td>
<td>Evaluation the opportunities Evaluation project feasibility (technical feasibility and resources allocation) Decision making</td>
</tr>
<tr>
<td></td>
<td>Artefact</td>
<td>Project report and financial annex</td>
<td>Project report submitted to the funding institutions</td>
<td></td>
</tr>
<tr>
<td>4. Project engineering oriented knowledge</td>
<td>Actor</td>
<td>Project manager (interacting with the coordination unit of the cluster and the university)</td>
<td>Project Manager</td>
<td>Project Manager</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Project building file production</td>
<td>Project document writing</td>
<td>Writing of the project</td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td>Interact with the university to write the file</td>
<td>Formulate the project file iteratively and progressively Combine knowledge already known about project building and newly acquired knowledge from the cluster and university</td>
<td>Produce the document that will send to the funding institutions</td>
</tr>
<tr>
<td></td>
<td>Artefact</td>
<td>Framework of project file (document not provided by funding institution), project file and financial annex</td>
<td>Framework of project file (document not provided by funding institution), project file and financial annex</td>
<td>Project file</td>
</tr>
</tbody>
</table>
Figure 2: Initialization phase of the collaborative process at Omega (Knitting Company)
Figure 3: The Mock Up Process in Omega Firm (Knitting company)
5. Discussion & conclusion

The literature review has highlighted the necessity to have a better understanding of the individual ACAP mechanisms. To do so, there is a need to first better understand who are the individuals that develop the ACAP dimensions through their characteristics and behaviours. Second, we need to further describe the individual and inter-individual micro-practices of these individuals.

Considering skills and behaviours, presented in Table 2, we now need to see how the individuals that are participating in an innovation project develop similar or new types of skills and behaviours. In addition, it would be interesting to be able to highlight the skills and behaviours that have the most impact on each dimension of ACAP. To do so, we need further empirical data.

Concerning the description of the individual and inter-individual micro-practices of ACAP, we have been able to identify that, in an innovation project, there are specific steps, called ACAP intensive momentums, during which the frequency of exchanges and richness of the knowledge exchanged are higher. This will lead us to develop further focus groups concentrating on these specific momentums with the ISEA method. Second, we have started to characterise the individual micro-practices according to four elements that underpin it. These elements are: (1) the actor that is in charge of (2) a specific activity, (3) the practices that are related to this activity and (4) the artefacts that materialize that ACAP’s output. Our results exemplify empirically the relationship between individuals’ actions and organisational ACAP. More precisely, it helps understand the bilateral relations between individual ACAP (the way individuals actually acquire, assimilate, transform or exploit external knowledge) and micro-practices (concrete actions) (Figure 4). To go further, we need to be able to categorise these practices, for instance by defining them as structured or unstructured (Kotlarsky et al., 2014), non-structured practices have the potential to become ACAP routines. We assume that a co-development phase as suggested by Di Stefano et al. (2014) may explain the shift from isolated unstructured micro-practices to organizational routines, precisely as micro-practices become more structured.

By comparing results of the three companies that were collaborating within this case study, we will be able to better characterise the practices that serve the ACAP. A final stage of this
research will be to discuss the meta-routines described by Lewin et al. (2011): see how far these are similar to those encountered in our case study and complete them.

Finally, this research has allowed us to apply the ISEA methodology to explore individual ACAP, and complete data collected via semi-structured interviews. It offers actors the possibility to replay their role in a 2-hour format, enabling them to have a reflexive view on their practices, and understand how they can improve them.

This research is exploratory and as such, it has some limitations common to exploratory and case based studies. One of the main ones is that this study is based on only one case, albeit in depth, and thus cannot be and is not intended to be generalisable.

Recommendations for future research are to investigate all the stages of conceptual model developed in figure 4, and to be able to fully describe practices related to both individual and organisational ACAP. By focusing on ACAP-intensive momentums within innovation projects this will lead to a more informed understanding of individual and organisational ACAP and their inter-relationship. We aim to improve the detail of the individual interactions by being able to capture even more “zooming in” (Nicolini, 2009) interactions among actors in order to enrich the description of practices through the three dimensions of ACAP and the type of knowledge mobilised within innovation projects. In doing so, we wish to be able to capture a taxonomy of practices within each ACAP dimension that could fit with different contexts and steps of the innovation project. By doing so, we would be able to answer questions such as: does assimilation and transformation develop similar practices within all phases of the innovation project? Or within different contexts (size of companies, number of companies collaborating in an innovation project, type of industry, type of culture among companies). This will lead to managerial implications where profiling individuals that can make a valuable contribution to this process could be much more transparent for recruitment. Furthermore guidelines would be developed for fostering best managerial practices throughout the innovation project.

Finally, we could explore these phenomena in other countries and contexts – the role of clusters might indeed be unique to France and in other contexts, the role of individual ACAP could be even more instrumental in the actual initiation of the innovation ideation process.
6. References


