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Subsidiaries as Learning Engines: Understanding Middle Managers' Searching for Knowledge as Micro-Foundation

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Abstract

A lot of research on MNC knowledge flows has concentrated on the organizational conditions that promote learning outcomes through a more efficient reuse of existing knowledge (cf. Gupta and Govindarajan 2000). Departing from this predominant research stream and recognising the increasingly important role of middle managers in large, distributed organizations, we investigated how subsidiary middle managers actually search for knowledge when dealing with non-routine problems and evaluated the solution outcomes in terms of generating organizational adaptation. By doing so, we contribute to several calls for more micro-level research of organizational learning processes (Felin and Foss 2005, 2009, Felin and Hesterly 2007, Friedman 2001) and shed light on the black-box of knowledge inflows.

Three interpretative case-studies of ICT subsidiaries, and resulting 33 knowledge search processes were chosen for in-depth analysis. Triangulating data from archival sources, interviews with middle managers and senior managers revealed their actual knowledge searching activities.

We uncovered the constituting activities of the knowledge search process and aggregated these into three phases: *preparing for search, establishing the link,* and *accessing knowledge,* and a fourth set of activities – *modes for accessing knowledge* - that characterised each knowledge source targeted. Further, we link the different knowledge searching activities to the heterogeneity in the level of organizational adaptation generated by the knowledge search processes.

Our study suggests that the activity '*using own experience'* and withdrawal from knowledge searching challenges, reflected in the activities '*accepting longer learning process*' and '*siloed problem-solving*', impede broad searching and integration of different knowledge sources. In contrast, other activities signified more intense and repeated searching despite the challenges imposed by the geographic dispersion of knowledge. While previous research has shown that geographic distance impedes knowledge inflows (Ambos and Ambos 2009, Hansen and Løvås 2004, Monteiro et al. 2008), portraying the subsidiary as an entity that accepts passively geographic dispersion, our findings suggest that individuals' active responses to this challenge can remedy potentially negative effects.

Further, if middle managers searched for knowledge ingredients and mastered the solution development process, then they become solution creators. These searching activities – '*via discussing*' are more flexible to an accessing mode '*via asking*' - because in a bi-directional conversation to search for knowledge, the context of the non-routine problem as well as the context of the knowledge searched remain present. Knowledge is adapted and

dynamically integrated to suit the specific, novel context, often creating new solutions that became part of the organizational memory.

Above all, the findings suggest the contribution that middle managers' knowledge searching activities and solutions developed can make to achieving subsidiary learning. Our results emphasize individuals' searching engagements over MNC structure implications, representing a novel way of studying the black box of subsidiary knowledge inflows.

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Knowledge refers to know-how, expertise or best practice, and - in contrast to information such as financial or operational data - knowledge equates to a skill, a routine or to external market data of strategic value (Gupta and Govindarajan 1991, 2000), which can be tacit or codified (Polanyi 1966). Research on MNC knowledge flows has seen a great level of academic interest, largely driven by the recognition that knowledge is a critical factor in creating competitive success, especially the appreciation that these knowledge-based advantages hinge on the capacity of the MNC to effectively and efficiently reuse and integrate dispersed knowledge sources (Grant 1996, Kogut and Zander 1992).

A lot of research on MNC knowledge flows has concentrated on the organizational conditions that promote learning outcomes through a more efficient reuse of existing knowledge (cf. Gupta and Govindarajan 2000, Szulanski 1996). These studies established, for example, that the motivation of the subsidiary to learn (Björkman et al. 2004, Gupta and Govindarajan 2000), expectation of reciprocated knowledge transfers (Monteiro et al. 2008, Schulz 2003), frequency of inter-unit communication (Monteiro et al. 2008), integration mechanisms (Gupta and Govindarajan 2000, Szulanski 1996, Tsai 2002), the absorptive capacity of the subsidiary (Szulanski 1996) as well as subsidiary age (Monteiro et al. 2008) and subsidiary size (Gupta and Govindarajan 2000, Tsai 2002) affect the level and direction of knowledge flows.

Our study departs from this predominant research stream by investigating the actual activities of knowledge searching. The search for knowledge refers to the activities of *'looking for and identifying'* knowledge (Hansen 1999, p. 83), and is driven by an actual demand for organizational knowledge (Gray and Meister 2004), i.e. we examined how

individuals actually search for MNC-wide knowledge using an explorative multiple-case study research design.

Drawing on the several calls for more understanding of the micro-foundations of organizational learning processes (Felin and Foss 2005, 2009, Felin and Hesterly 2007, Friedman 2001), we argue that dismissing the role played by the actual searching activities by individuals overlooks the micro-foundations of MNC knowledge inflows: how are knowledge inflows initiated and how do they unfold? In addition, we argue that the micro-level knowledge searching activities are an antecedent to achieving learning outcomes – an important mechanism how subsidiaries contribute to MNC knowledge development. Thus, we start opening the black box of subsidiary knowledge inflows.

Specifically, we focused on subsidiaries because their contribution to MNC competence development has been recognised increasingly, meaning that organizational learning is generated not only the corporate centre, but more and more distributed within the network of subsidiaries (Ghoshal and Bartlett 1990). Studies in this vein demonstrate the role of subsidiaries for competence development (Ambos et al. 2006, Schmid and Schurig 2003) and source of innovation (Almeida and Phene 2004).

Further, we chose middle managers as they play a critical role in strategic activities in distributed and large organizations (Wooldridge et al. 2008). While in the field of strategy empirical research has been conducted to further understand the strategic activities of middle managers (Balogun and Johnson 2004, Currie and Procter 2005, Delmestri and Walgenbach 2005, Huy 2001, Huy 2002, Mantere 2008, Pappas and Wooldridge 2007), a similar level of interest cannot yet be reported from organizational learning scholars. This is surprising as recent assessments of organizational learning studies point out that the field lacks empirical work on individuals' micro-activities (Felin and Foss 2005, 2009, Felin and Hesterly 2007,

Friedman 2001), and to our knowledge only the studies by Mom and colleagues provide initial empirical insights into middle managers' knowledge inflows (Mom et al. 2007, 2009).

In summary, the organizational learning, strategy, and international business literatures demonstrate the value of adopting a micro-perspective to subsidiary knowledge inflows. But to date there have been few empirical studies in this area. To address these issues, our research questions were: How do middle managers search for knowledge; and what are the learning outcomes of their searching activities?

In what follows, we introduce the method, present the findings of subsidiary middle managers' knowledge searching activities and level of organizational adaptation achieved, before discussing the findings in light of existing theory.

METHODS

Research design and setting

The exploratory nature of this research was particularly suited to an interpretative case study research design. We used multiple-case studies to obtain more robust findings, because, compared to a single case study research design, the emerging theory is better grounded, more accurate and theoretically transferable (Eisenhardt 1989, 1991, Yin 2003).

The research setting was subsidiaries of three MNCs in the ICT industry. We focused on a single industry in order to reduce extraneous variation. Further, this research setting offered several advantages. The ICT industry was chosen because such a dynamic and knowledge intense industry (Brown and Eisenhardt 1997) is an attractive setting to study the phenomenon under investigation – knowledge search by middle managers.

Having defined the study's population, we then selected three firms by the principle of theoretical variation, for in-depth analysis. Table 1 summarizes the various characteristics of the firms in the sample.

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Insert Table 1 about here

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All subsidiaries were wholly owned by their parent organizations. The selected firms exhibited much variation in their organizational variables. At the corporate level, the companies differed in terms of the number of subsidiaries, as an indicator of the fragmentation of organizational knowledge in general; the size of the focal subsidiary (Gupta and Govindarajan 2000, van Wijk et al. 2008), as an indicator for the stock of knowledge at the focal site; number and nature of mandates at the focal unit, as an indicator for the concentration and scope of knowledge at the focal unit (Gupta and Govindarajan 1991, Hansen and Løvås 2004, van Wijk et al. 2008); and structure of international operations, ranging from pan-regional to global responsibilities with focal units being regional or even global headquarters with higher autonomy as well as units being part of an tightly coupled internal network of operations with less autonomy (Gupta and Govindarajan 2000, Hansen and Løvås 2004).

After securing access to the case organizations, we were able to characterize middle management. We adopted a broad definition of middle managers, including various mid-level professionals that all, based on the scope of their responsibilities and access to top management (Wooldridge et al. 2008). While most middle managers were in line management roles, with people and performance management as their main tasks, their positions also required driving improvements. Besides this similarity, we discovered further variation in terms company tenure of the middle managers as well as typical career path. All these distinct attributes at corporate, subsidiary and middle management level introduced constructive variance to the emerging theory.

Access to the firms was negotiated with the subsidiary senior management. We promised confidentiality to encourage openness of informants and extensive access (Huber and Power

1985, Miller et al. 1997), for example, to archival data.

Data collection and analysis

Data was collected using a range of data collection techniques - study of secondary sources, interviews with middle managers, interviews with senior-level informants, and study of archive materials - to allow for internal triangulation in order to counteract the possibility of investigator, source and respondent bias (Jick 1979). The whole dataset comprised over 2,400 pages.

We conducted 26 semi-structured interviews with subsidiary middle managers who ranged from 45 minutes to 75 minutes and yielded 33 cases of knowledge search processes, our unit of analysis for the micro-level data. The interviews gathered material on the specific aspects directly relating to knowledge search activities for *specific* non-routine problems (Nelson and Winter 1982), situations of high and often uncertain knowledge needs, a measure employed to reduce retrospective bias (Golden 1992, Huber and Power 1985, Miller et al. 1997). All interviews were recorded and transcribed verbatim.

In the five interviews with senior-level managers we explored in more detail subsidiary and MNC strategy, and outcomes of knowledge search processes. Moreover, we had the opportunity to review archival material.

The analysis was conducted in NVivo (Sinkovics et al. 2008, Weitzman 2000), and involved three main steps: micro-level knowledge searching activities, searching outcomes and cross-organizational comparison.

First, to analyse the micro-level knowledge searching activities, we used the middle managers' description of the knowledge search process as the unit of analysis, leaning on practice social theorists (Bourdieu 1990, Giddens 1984). Employing inductive qualitative techniques, we developed 'in vivo' codes, to generate a detailed representation of the data

(Strauss and Corbin 2008), aggregated similar, recurrent codes thematically under broader categories that described particular searching activities, and clustered these activity categories chronologically to reflected different phases of the searching process (Langley 1999).

Second, we used Zollo and Winter (2002)'s definition of dynamic capabilities, categorising the specific learning outcomes of each knowledge search process by the extent to which routines were adapted or newly developed.

Finally, the cross-organization analysis was assisted by compiling tabular information across cases (Eisenhardt and Graebner 2007, Miles and Huberman 1994, Yin 2003), to relate the salience of the searching activities to organizational learning outcomes.

Overall, multiple measures were employed to strengthen the trustworthiness of the qualitative data and analysis (Lincoln and Guba 1985).

FINDINGS

Subsidiary level learning outcomes: Success in achieving organizational adaptation

First, we report our assessment of the ability of the middle managers to generate organizational adaption with the help of their problem-driven knowledge search processes. We based this assessment on two interrelated assessments: (1) the extent to which learning outcomes became part of the organizational memory rather than remaining individual, and (2) if the learning outcomes represented an adaptation or development or routines - Winter and Zollo (2002)'s definition of dynamic capabilities. Table 2 includes illustrative quotes for the adaption and development of routines and the results of this analysis.

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Insert Table 2 about here
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This assessment shows that the subsidiary middle managers were able to varying degrees to generate organizational adaptation. In Gamma, which was most successful, most non-

routines problems stipulated knowledge search processes that led to organizational adaptation. In the other two case organizations, middle managers were less successful in generating organizational adaptation as only about half of the knowledge search engagements led to the adaption or development of routines.

Micro-foundation: Middle managers' knowledge searching activities

This section describes and explains the micro-level activities of how the middle managers actually searched for MNC knowledge. Initiated by a non-routine problem, the middle managers engaged in a searching process that, as our data suggested, consisted of three phases: *preparing for search, establishing the link,* and *accessing knowledge,* and a fourth set of activities – *modes for accessing knowledge* - that characterised each knowledge source targeted. We now present these searching phases chronologically. Table 3 summarises the different knowledge searching activities, providing relevant quotes.

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Insert Table 3 about here

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Preparing for search

Dealing with a non-routine problem, the middle managers often faced uncertainty regarding what kind of knowledge is needed, where to start searching, or who to ask. Thus, middle managers may try to reduce this initial uncertainty by determining the knowledge needs ('*reducing knowledge uncertainty and establishing knowledge needs*'). This was manifested by "*collecting information, is it something that had been previously looked at?" (Gamma, middle manager 5),* aiming to reuse existing knowledge as much as possible. This initial preparation helped middle managers to determine the knowledge gaps as accurate as possible, considering the oftentimes uncertain knowledge needs.

Realizing that the knowledge needs may stretch beyond what an individual manager can possible manage independently, the middle managers sometimes '*set up a team*' to tackle the problem-solving process and related search for knowledge. Assembling expertise selectively around the knowledge needs of the non-routine problem was a step that middle managers took to more precisely determine the knowledge needs and to provide for more targeted knowledge search. This effort may occur informally, loosely connecting people in an informal group-like setting.

Establishing the link

Having prepared for the search for knowledge and being equipped with an intuition where to start searching for knowledge, the middle managers then linked up with potential knowledge sources.

If the middle manager was aware of an already existent knowledge template that was related to the knowledge needs, or the middle manager was quite certain about the domain of the knowledge needed, s/he '*connected to the template owners*': "*I said: look, we have got this problem, have you heard of any good tools at Sigma?" (Sigma, middle manager 10).* In these cases the middle manager was able to develop a good feeling about the knowledge needs and had an idea where to start with the search for knowledge, often because the middle manager has worked with the particular unit or individual previously.

In the case of a greater uncertainty of the knowledge needed, especially because the knowledge domain fell outside of the middle managers' usual work practices, the middle manager had to establish new connections – '*linking up with expertise*'. Here, the middle manager acted based on the intuition that certain experts or expert units may possess knowledge that could be valuable, yet the middle manager connected based on a hunch, usually not having interacted with the particular person or unit previously. Here, the middle

manager developed links to various different units that all seemed to offer a piece of valuable, yet related, knowledge:

> *I am in regular contact with engineering groups, globally. I'm in contact with our legal team, our compliance team, our different operational teams, operational managers … It really, at this point, I think it has touched all of the different departments within Gamma. (Gamma, middle manager 5)*

Searching by linking up with expertise often meant that the middle manager may had a feeling what kind of knowledge was needed, yet could only establish a connection to the knowledge holders via an intermediate step, requiring multiple iterations to connect to the relevant knowledge sources: "*As we spoke to one person, they gave us another name. And that person again gave us another name." (Sigma, middle manager 6).*

Accessing knowledge

After the middle manager established a link to a possible knowledge source, the following activities were concerned with how the knowledge can be accessed. Here, an activity included '*creating co-location*', when the middle manager provided purposefully for geographic proximity of otherwise distantly located knowledge sources. A good example included:

> *We had a person actually coming over and she transferred best practice … But we also have, for example, our management going there, and trying to understand what they are doing there [sister site]. (Gamma, middle manager 7)*

The co-location facilitated an intense knowledge searching over a specified time period because relevant knowledge could be accessed continuously.

Often the nature and complexity of the non-routine problem required the middle manager to engage in an intense searching activity that targeted a number of different possible sources. This activity, '*searching numerous sources*', described the intensity of knowledge searching: *"We worked with a number of different teams"* (Gamma, middle manager 8). When a number of sources were targeted, the searching also became broader in scope: *"Then engaging pretty*

much every department that exists within Gamma" (Gamma middle manager 5), accessing knowledge across the boundaries imposed by hierarchical or departmental lines.

Another activity suggested by our data was that middle managers may also refer to their own experience ('*using own experience*'). Being tenured in the company, sometimes having progressed through the entire internal career path, certain middle managers evoked their experience. An exemplar comment by Epsilon's middle manager who tackled outsourcing challenges included:

> *We all learn from what we did well and badly in the past … I'm learning as well. I mean I have been in that role for two years. (Epsilon, middle manager 8)*

In this activity, 'using own experience', middle managers showed high confidence in the scope and applicability of their own experience. If being certain about the transferability of their previous learnings to the current non-routine problem, middle managers knowledge searching activities in terms of targeting other knowledge sources were usually lower.

Dealing with searching barriers

Caused by the distributed nature of knowledge and the oftentimes uncertain knowledge needs, the searching was not a straightforward process, but laden with searching barriers. Some middle managers had difficulties locating knowledge in that knowledge could not be located in the repository, although the middle managers was initially certain that relevant knowledge was stored centrally: *"Intermittently, I would have gone and searched what would somebody else do, or how is it working for somebody else? But I haven't found it [document]."* (Epsilon, middle manager 4). In other instances the middle managers encountered difficulties in the searching process because the sources which were expected to be knowledgeable in that particular area where actually not:

Sometimes you would have spent some time talking to one person, several times, and then it turned out that this wasn't actually the right person to talk to actually. (Gamma, middle manager 5)

Similarly, geographic remoteness from knowledge centers imposed searching difficulties: *"I often feel, because I am away, I'm missing information. I'm missing the links."* (Epsilon, middle manager 4). Another middle manager echoed the knowledge search barriers created by geographic remoteness from knowledge centers the following way:

Even my manager said that he feels that he is putting me at a disadvantage because he is literally 1,000 miles away… It is much more difficult to actually pick up the phone and say: actually, I have a question, and then to formulate this in such a way that it can be dealt with over the phone instead of strolling into someone's office and saying: do you know what happened to me? (Sigma, middle manager 3)

Our data implied that the middle managers used various activities to deal with these barriers which were of either active or passive character.

An active response by the middle managers was to '*seek regular updates as preventative searching*', communicating regularly with sources to access continuously novel learnings in a timely manner.

In addition to this active response to dealing with searching barriers, middle managers also showed passive behaviours. Here, instead of responding to difficulties with another searching iteration, some middle managers withdrew, which was reflected in our data in the middle managers' '*accepting a longer learning process*' and '*siloed problem-solving*'.

If the middle manager was unable to locate knowledge easily or not at all, this could eventually lead to an '*acceptance of a longer learning process*'. One middle manager expressed:

"It just took us longer to understand. It probably meant that in a few cases we delivered a poor customer experience." (Sigma, middle manager 6)

Further, this caused '*siloed-problem-solving*' when middle managers completely withdrew from (any or further) searching efforts and instead treated the solution finding process as their own responsibility rather than an organizational issue that can be resolved in a collaborative manner. Usually a feeling of being overwhelmed by the searching task or preferring an independent solution finding process caused siloed-problem solving. Here, the middle manager tackled the non-routine problem, although it was often an organization-wide issue, alone: *"I'm pretty much on my own"* (Epsilon, middle manager 3); or: *"It's probably myself more than anything … I thought about it myself"* (Epsilon, middle manager 8). The different findings in relation to dealing with searching barriers, including a cross-organizational comparison, are summarized in table 8.

Activity set: Accessing modes

This analysis focused on the doings by middle managers with the knowledge searched and accessed. Our data suggested two related themes: '*modes of accessing knowledge*' and '*mastering solution development*'.

When accessing knowledge, three modes emerged from our data that describe how the middle managers obtained the relevant knowledge.

The first accessing mode of accessing knowledge was '*via asking*' which meant that the middle manager sought an answer in form of a specific piece of knowledge:

> *The manger said: look, that is how we did it, and that is how we turned it around from something that is something people at the start were quite hesitant about to something that is seen as a success. (Gamma, middle manager 6)*

Here, the middle manager sought a proven solution – or "*established knowledge" (Sigma, middle manager 2),* usually a template that only needed to be implemented. Another middle manager expressed how he obtained the needed knowledge with such a linear search, embracing the solution suggested:

There was an issue that I didn't know technically whether it was important or not - I went with my team lead's [answer]. (Epsilon, middle manager 5)

The purest form of the asking mode occurred in middle managers' repository search where middle managers sought to obtain the answer to the specific search query.

This linear mode of knowledge search differed from the second one, 'via discussing', that was characterized by a reciprocal exchange of ideas between the knowledge seeking middle manager and the knowledge holder. While the middle manager aimed to benefit from the source's knowledge, they discussed possible solutions collaboratively, often co-creating a suitable piece of knowledge especially suited to the particularities of the middle manager's non-routine problem. One middle manager described:

I spent a lot of time just brainstorming with different team members, trying to figure out – do we need to develop a new segmentation model? Do we need to look at customer life-time value? Do we need to find out who are the people we work with? What intelligence is out there? What are we currently doing here at the moment? (Gamma, middle manager 8)

Discussing different ideas helped to refine knowledge: "*We bounce ideas off each other" (Epsilon, middle manager 3)* that became part of developing a solution.

An overview of the findings, comparing the salience of the different searching activities across the three subsidiaries, is provided in table 4.

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DISCUSSION

The objective of this study was to understand how middle managers search for knowledge and the level of organizational adaption generated. Using an activity-perspective to analyse the data, we were able to unravel the actual activities of knowledge searching by middle managers, delineating clearly the different doings that in their combination and interaction constitute the knowledge searching process. By doing so, we examine the black

box of knowledge inflows and respond to recent assessments of the organizational knowledge literature (Felin and Foss 2005, 2009, Friedman 2001) in which the study of micro-activities was highlighted as an important theoretical gap.

In the further discussion below, we outline the implications of the cross-case comparative findings for developing a broader theory of middle managers' searching for knowledge, paying particular attention to subsidiary-level learning outcomes. We link explicitly the observed heterogeneity in the subsidiaries' ability to adapt to middle managers' knowledge searching activities.

Scope of knowledge searching

In the cases of less success in achieving organizational adaptation, middle managers' knowledge search tended to be limited to a small number of sources. If a solution could not be located within the repository or through asking known peers, the middle managers referred to their *'own experience'*, i.e. often withdrew from an active confrontation of knowledge searching challenges, especially the uncertainties of knowledge search. As a result problem-solving and learning outcomes remained fragmented, creating knowledge silos where middle managers individually tackled non-routine problems.

In the case of more success in achieving organizational adaptation, in contrast, the middle managers searched a number of different sources. In this intense and broad searching the middle managers actively confronted and tackled knowledge search uncertainties which was reflected, for example, in their repeated searching efforts if relevant knowledge could not be located immediately. It has been suggested that such behaviour is an important determinant of how effectively issues can be solved because knowledge diversity can introduce dialectical attributes, leading to a more critical evaluation of possible solutions (Nutt 1984, Schweiger et al. 1989, Schwenk 1989).

Dealing with searching challenges

Middle managers in subsidiaries operate under conditions of high knowledge dispersion, creating challenges in the searching for knowledge due to an amplified uncertainly as to where knowledge resides. This challenge operates in addition to the uncertain relevance of new knowledge (Schulz 2001).

The activity-perspective of our study adds to this work by uncovering middle managers' doings in response to these searching challenges. Specifically, we found an active response – '*seeking regular updates as preventative searching*' – and passive response activities – '*accepting longer learning process*' and '*siloed problem-solving*'. The latter activities clearly mean that the middle manager withdraws from dealing with these knowledge search challenges, a behaviour that impeded organizational learning efficacy which demands the continuous integration of different knowledge to realize its benefits (Grant 1996). While previous research has shown that geographic distance impedes knowledge inflows (Ambos and Ambos 2009, Hansen and Løvås 2004, Monteiro et al. 2008), portraying the subsidiary as an entity that accepts passively geographic dispersion, our findings demonstrate that individuals' active responses to this challenge can remedy these negative effects.

Linking uncertainty of knowledge needs and accessing mode

The knowledge accessing mode was *'via asking'*, the search for a proven and solution that can be readily implemented. Given the novelty of non-routine problems, it is questionable to what extent such a straight accessing mode is responsive to the indeterminacy of knowledge needs and possible demands for knowledge creation. Thus, the greater vagueness and indeterminacy of knowledge needs of non-routine problems seemed more conducive for a knowledge accessing mode *'via discussing'* where ingredient or partial

solutions can be exchanged in a dialogue manner – the mode that we observed more in the interpersonal logic. Indeed, the assessment of the learning outcomes below seems to support this contention.

Assessment of organizational learning outcomes

If middle managers searched for knowledge ingredients, they mastered the solution development process – middle managers become solution creators. These searching activities are more flexible because in a bidirectional conversation to search for advice, the context of the non-routine problem as well as the context of the knowledge searched remain present. Knowledge is adapted to the specific, novel context, often creating new solutions. This action of dynamically integrating varied knowledge components has been demonstrated to improve solution results (Okhuysen and Eisenhardt 2002). In fact, as our results suggest, the outcomes of these searching activities more likely lead to organizational adaption.

In contrast, if looking for ready-made solutions, middle managers remain solution applicators. Trying to reuse general, ready-made solutions may under-estimate the specific demands posed by new organizational challenges, overall biasing organizational problem-solving towards exploitative learning activities on expense of innovative solution development. Further, these behaviours undermine the middle managers' potential to become a champion of organizational change (Burgelman 1983a, b).

In the light of recent contentions about the demise of subsidiary's learning potential driven by the advancement of ICT, implying that information becomes more easily transferrable within the MNC, increasing HQ control and reducing subsidiary's scope for learning engagements (Yamin and Sinkovics 2007) the results of our study suggest an extended argument. The modern ICT systems clearly enabled to interpersonal communication needed for geographic distant searching for knowledge, improved the circulation of

knowledge within the MNC – meaning more support for micro-level knowledge searching. Our results seem to suggest that the middle manager play a critical role in generating learning outcomes because of the combination of two factors: IT-enabled support for communication across distance and active and broad searching by middle managers. Thus, our results emphasize the individuals' searching engagements over MNC structure implications.

Limitations and future research

As typical for case study research, questions arises to what extend the findings are transferrable to other contexts. We have employed certain measure to increase transferability. The replication of the study in three case organizations, for example, yielded more robust findings (Eisenhardt 1989, Eisenhardt and Graebner 2007). Second, we studied a phenomenon – knowledge search by middle managers in response to non-routine problems – that, we believe, likewise occurs regularly in other organization in dynamic markets. Further research could establish generalisability to other organizational and industry contexts.

Another area that may warrant further research is examining more closely how the nature of the non-routine problem influences the middle managers' knowledge search. It may be worthwhile to differentiate between non-routine problems based on their degree of novelty: new to the organization or new to industry (Spender 1989). Further, our study investigated the knowledge searching activities when knowledge needs are high (Haas and Hansen 2005, 2007). As a result, we can only provide limited suggestions for knowledge searching activities for 'smaller' problems. Similarly, our results are based on middle management data. It is likely that their knowledge searching activities differ from those of knowledge workers or senior managers in the same subsidiary, for example, because the attributes of the organizational memory take shape differently.

While we adopted a micro-perspective, using the knowledge search process as unit of analysis to uncover the actual searching activities, future research could benefit by analysing individual-level factors of the middle manager, like level of previous experience and education, as possible antecedent of knowledge searching activities.

Finally, our research lifts the black box of subsidiary knowledge inflows. As limited research on micro-foundations of knowledge flows has been conducted to date, exploring the micro-foundations of subsidiary knowledge outflows seems a valuable path for future inquiry.

CONCLUSION

The study reported in this paper was an initial effort towards improving our understanding of micro-foundations of subsidiary learning and subsidiary knowledge inflows. Examining the knowledge searching activities by subsidiary middle managers revealed their critical role in generating organizational adaption through flexible knowledge integration. Middle managers' knowledge searching that actively tackles searching challenges, targets a variety of knowledge sources, and searches for context specific knowledge ingredients rather than ready-made solutions seems more conducive for achieving these learning outcomes. Our results emphasize individuals' searching engagements over MNC structure implications, representing a novel approach to understanding the black box of subsidiary knowledge inflows.

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Table 1. Description of sample firms [a]

	Gamma	Epsilon	Sigma
Characteristics MNC			
Domain	ICT services	ICT solutions and related services	Software solutions and related services
Strategic priorities	Commitment to ongoing innovation and technology leadership Innovation driven growth	Commitment to technology leadership Strive for operational excellence to generate efficiencies	Commitment to innovation Organic and innovation driven growth Strategic acquisitions to add specific technologies and capabilities
Number of global subsidiaries	over 50 subsidiaries around the globe	over 20 subsidiaries around the globe	over 50 subsidiaries around the globe
Characteristics focal subsidiary			
Mandates	Sales	R&D, Services	Sales, Services and Support, R&D
	Two separate units	Two separate units	Over 15 separate units
Size	1,000 employees	1,500 employees	1,000 employees
Unit(s) used for data collection	Sales unit	Product development unit	Sales, Services and Support
Structure of international operations (units of data collection)	Pan-regional responsibilities	Global responsibilities	Pan-regional to global responsibilities
Autonomy	High autonomy	High autonomy	Low autonomy because of tightly integrated operations
Characteristics middle managers			
Role of middle managers	People management, drive sales and operational efficiency	People management, drive process and product development	People management, drive process management and improvement
Company tenure to date	Low	High	Moderate
Career path	Internal promotion and managers hired externally	Dominance of internal promotion	Mostly internal promotion

[a] The specific details of the organizations and subsidiaries are disguised to preserve anonymity, as are the names and details of respondents, organizational units, specific products and services, and geographical origins and locations.

Table 2. Assessment of knowledge search outcomes

Subsidiary	Classification [a]	Relevant quotes	
		Adaptation of routines	**Development of routines**
Gamma	More successful	"We don't replicate [business process] exactly, because obviously the demands may be very different. So we use that, I suppose, as a basic structure." (Gamma, middle manager 3)	"We now kind of expanded it out of the pilot regions into more regions. And we have started to create specialist roles and new role career paths within Gamma to do this type of work." (Gamma, middle manager 8)
Epsilon	Less successful	"We looked at the old model that was there. We looked at where it needs to be improved." (Epsilon, middle manager 8)	"That's where we developed this checklist: is this addressed; have we thought about this; how much will it cost; can we share some of those roles" (Epsilon, middle manager 4)
Sigma	Less successful	"It came down to the last one which wasn't perfect for our purposes, but I was at least able to say: right, that is the nearest, and if we did some development on it, because we have in house development capabilities, we could tweak it to what we need." (Sigma, middle manager 10)	"They said that it was working. We had told all the team leads. That would have been my counterparts in America … We said: look, we have an automated process that will do all of that. So you don't have to do this work anymore." (Sigma, middle manager 2)

[a] We applied two indicators to assess the outcomes of the knowledge search in relation to generating organizational adaptation: outcomes embedded in organizational memory, and outcomes represent an adaptation or development of a routine. Classification relates to the level of success in achieving organizational adaptation.

Table 3. Middle managers' knowledge searching activities

Searching activities		Illustrative quote(s)
Phase 1: Preparing for search		
	Reducing knowledge uncertainty & establishing knowledge needs	"At the early time of the project there was a huge amount of time spent on brainstorming, trying to figure out what we needed to know, who we needed to ask." (Gamma, middle manager 8)
	Setting up a team	"We set up our own group" (Epsilon, middle manager 1)
		"We have a project team that has a representative from each group and a member from the unit." (Gamma, middle manager 6)
Phase 2: Establishing the Link		
↓ Increasing knowledge uncertainty	Connecting to template owners	"I went to HR, to my HR business partner, just to see exactly: what is the procedure, what has been put in place for somebody who is not responding to phone calls?" (Sigma, middle manager 1)
	Linking up with expertise	"These forms are generated in a system … We didn't know how to use it at this time, just saw it there [intranet]. Basically, I reached out to some people, saying: do you know who does this?" (Sigma, middle manager 2)
		"I have my contacts. I can easily put them on cc on an email, and I'd just shout and raise the hand and say: hey guys, does anyone know how it works? And two hours later I'd have it in my inbox: the right contact person." (Gamma, middle manager 1)
Phase 3: Accessing Knowledge		
↓ Increasing knowledge uncertainty	Using own experience	"Because for my previous role, that I dealt 4.5 years with, I deal with much the same issues. It was pretty much the same timeframe, dealing with the same customers." (Epsilon, middle manager 5)
		"It has grown over experience." (Epsilon, middle manager 4)
	Creating co-location	"We needed to make sure that we have got one of the guys who we have got over there [location of expert unit]. One of the best guys … We got him to come over here. We called him on a short term contract." (Epsilon, middle manager 1)
	Searching numerous sources	"There were a lot of people involved in that" (Sigma, middle manager 4)
Activity Set: Dealing with Searching Barriers		
↓ Increasing withdrawal from tackling barrier	**Active response**	
	Seeking regular updates as preventative searching	"I would have set up monthly meetings or calls or VCs [video calls] with the operations manager in Germany… [It is] an update session, and from time to time we would discover something that may be beneficial for the team on either side." (Gamma, middle manager 3)
	Passive response	
	Accepting longer learning process	"And I heard somebody saying that there is a document available, but I haven't seen it." (Epsilon, middle manager 1)
		"Trial and error: you try this area and you realize that it doesn't work. You have to go all the way back to find the fork that was the wrong one, where you took the wrong turn. And a coach could have watched you and said: Actually, this was wrong because… Try to go back to that step and do again, and try this different direction." (Sigma, middle manager 3)
	Siloed problem-solving	"Everyone is trying to sort out the issue as best as they can for their area." (Epsilon, middle manager 1)
Activity Set: Accessing modes		
↓ Increasing knowledge dialogue	Via asking	"I just went and asked other people because they will have had similar issues." (Gamma, middle manager 2)
	Via discussing	"From a management perspective to look: okay, the model is different this year for all of us, for us, and for the [other site] sales. So what will work? What do we think we'll have challenges with? And how can we overcome them?" (Sigma, middle manager 5)

Table 4. Salience of knowledge searching activities and level of organizational adaptation

	Gamma	**Sigma**	**Epsilon**
Achieving organizational adaptation:	More successful	Less successful	Less successful
Knowledge searching activities:			
Phase 1: Preparing for search			
Reducing knowledge uncertainty & establishing knowledge needs	Low	Not present	Not present
Setting up a team	Moderate	Rare	Rare
Phase 2: Establishing the Link			
Connecting to template owners	Not present	Low	Rare
Linking up with expertise	Moderate	Moderate	Not present
Phase 3: Accessing Knowledge			
Using own experience	Not present	Rare	All
Creating co-location	Rare	Not present	Low
Searching numerous sources [b]	High	Moderate	Low
Activity Set: Dealing with Searching Barriers			
Active response			
Seeking regular updates as preventative searching	Low	Rare	Rare
Passive response			
Accepting longer learning process	Rare	Low	Low
Siloed problem-solving	Not present	Rare	High
Activity Set: Accessing modes			
Via asking	Low	Moderate	Moderate
Via discussing	High	Moderate	Low

[a] To rate the use of the knowledge searching activity, we examined in how many of the middle managers' knowledge search processes the particular activity occurred. We assigned each firm a score of "all" if the activity was present in every single knowledge search process, "high" if the activity occurred in more than two thirds of knowledge search processes, "moderate" if the activity occurred in between one and two thirds of knowledge search processes, "low" if the activity occurred in less than one third of knowledge search activities , "rare" if the activity occurred in only one knowledge search process, and "not present" if the activity did not occur within any knowledge search process.

[b] We measured this activity by comparing the organizational average of how many different knowledge sources the middle managers targeted. We assigned "low " if the average was less than 2.5; "high" if the average was greater than 3.5; and "moderate" if the average was in between.