HOW DO FIRMS REALLY LEARN: EXPLORING THE ELEMENTS OF ABSORPTIVE CAPACITY

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ABSTRACT

Increasingly dynamic business environment encourages companies to maximize the trade-offs offered by externally available information and internal ideas, balancing between the two. Company's ability to capture external knowledge and to use it for own benefits is shaped by organizational absorptive capacity. Known for over two decades, the phenomenon is still ambiguous. A new model of absorptive capacity was recently suggested, describing the phenomenon as a set of success factors rather than a process. By using a multiple-case study approach and utilizing interview data obtained from 62 interviews with 61 companies, the current paper explores this recent model, providing in-depth study on the elements and patterns building up the phenomenon. The analysis conducted demonstrates that companies value external information, sourcing it and making their strategic choices based on the competitive situation. While providing support for the model of absorptive capacity, the results also unravel common elements of its subsets: process-driven innovation, reliance on competitors and clients, importance of employees.

Keywords: Absorptive capacity

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Abstract

Increasingly dynamic business environment encourages companies to maximize the trade-offs offered by externally available information and internal ideas, balancing between the two. Company's ability to capture external knowledge and to use it for own benefits is shaped by organizational absorptive capacity. Known for over two decades, the phenomenon is still ambiguous. A new model of absorptive capacity was recently suggested, describing the phenomenon as a set of success factors rather than a process. By using a multiple-case study approach and utilizing interview data obtained from 62 interviews with 61 companies, the current paper explores this recent model, providing in-depth study on the elements and patterns building up the phenomenon. The analysis conducted demonstrates that companies value external information, sourcing it and making their strategic choices based on the competitive situation. While providing support for the model of absorptive capacity, the results also unravel common elements of its subsets: process-driven innovation, reliance on competitors and clients, importance of employees.

Keywords — Absorptive capacity; knowledge management; organizational learning; dynamic capabilities

1. INTRODUCTION

Constantly changing business environment challenges companies on many different levels: the product development cycle is shorter than ever (Mowery *et al.* 1996), revolution is continuous (Brown and Eisenhardt, 1997; Bettis and Hitt, 1995); new technologies are being regularly introduced (Bettis and Hitt, 1995); competition is intensifying while the complexity level is rising, leading to great uncertainty (Emden *et al.* 2006; Leonard-Barton 1992).

Those environmental pressures require companies to be agile, constantly re-shaping their core competences in order to address changing environment (Teece *et al.* 1997). This places the learning ability of a firm into a center of its development, allowing it to refine its competencies and to adjust its position, adapting to the challenges of the continuously changing environment (Mowery *et al.* 1996). The ability to capture those influences and to benefit from external developments is determined by absorptive capacity of an organization, i.e. its ability to source the trends and knowledge created by others and to utilize them for own benefit.

Absorptive capacity can be defined as "the ability of an organization to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal 1990: 128) or as "the organization's relative ability to develop a set of organizational routines and strategic processes through which it acquires, assimilates, transforms and exploits knowledge acquired from outside the organization in order to create value" (Jimenez-Barrionuevo *et al.* 2011). It is most often seen as a dynamic capability (Zahra and George, 2002; Wang and Ahmed, 2007), helping companies sustain competitive advantage in light of external changes (Winter 2003). The dynamic capabilities' framework addresses the rigidity of the business terrain, signifying ability of firms to learn and to refine

their competences (George 2005). However, the phenomenon has also strong links to other organizational theories, such organizational learning, innovation, knowledge-based view, co-evolution theories (Volberda *et al.* 2010), resource-based view (Barney 1991) and network theory (Baum *et al.* 2000).

The aim of the current paper is to explore the mechanism of absorptive capacity, discovering the elements of the phenomenon and unlocking the processes and factors determining the ability to commercially apply externally sourced information. The research question of this paper is as follows:

RQ: What are the elements and details of organizational absorptive capacity?

The research uses the model proposed by Stulova and Rungi (under review) and performs a multiple-case study analysis of in-depth interviews with 61 companies (62 interviews in total). This model was selected as a basis for the study due to its novelty and empirical formulation. The earlier models of absorptive capacity have not received full empirical validation (Todorova and Durisin, 2007). This study uses interview data collected in Estonia, a small innovative country in Northern Europe. Estonia ranked 31st globally in Bloomberg's Global Innovation Index, with R&D intensity rating 26th (Bloomberg Rankings 2013) as well as is considered as a European alternative to Silicon Valley due to its digital excellence and innovation (Giang 2014), making it an excellent target for innovation-related studies. As an example, Estonia is homeland for numerous famous start-ups, such as Skype, TransferWise, Fortumo and GrabCAD.

The paper contributes to the existing body of research on absorptive capacity in several ways. First, it provides an empirical verification to a new, success factor based rather than procedural model of absorptive capacity. Next, it identifies the links between the facets of the absorptive capacity mechanism, demonstrates relative importance of various subsets as

well as places absorptive capacity in the context of general environmental turbulence. Third, it provides a solid insight into the role of external knowledge sourcing for companies.

2. LITERATURE REVIEW

Defined as "the ability of an organization to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990: 128), absorptive capacity helps organizations address the demands of the changing environment. It is a firm-specific capability (Zahra and George, 2002; Wang and Ahmed, 2007), which helps companies re-shape its competences and re-apply resources to address changing environments (Teece *et al.* 1997).

Absorptive capacity was introduced by Cohen and Levinthal (1989, 1990), who suggested a three-pillar construct that is "not resident in any single individual but depends on the links across a mosaic of individual capabilities" (1990: 133). They argued that knowledge absorption is a step-wise process consisting of recognizing the value of external knowledge, its assimilation to the existing know-how of the organization and application of a newly combined knowledge to achieve commercial goals.

The next considerable advancement to the model was proposed by Zahra and George (2002), who proposed that absorptive capacity exists at two levels – potential and realized absorptive capacity, reflecting the distinction between what could potentially be absorbed and what is actually absorbed. They further split this higher abstraction level into four steps of absorptive capacity process: acquisition of external knowledge and its assimilation to the know-how of organization jointly shaping potential absorptive capacity; and transformation of a combined knowledge and exploitation of the final valuable knowledge created as the building blocks of realized absorptive capacity.

Also, Lichtenthaler (2009) tried to develop a new model, incorporating an addition to the absorptive capacity that was introduced already in 1994 by Garud and Nayyar. They argued that absorptive capacity by itself is not sufficient to achieve competitive advantage and that it should be accompanied by transformative capability (Garud and Nayyar, 1994). The model proposed by Lichtenthaler consisted of six elements: recognizing the value of external knowledge, assimilation of it to the organizational knowledge base, its transmutation to make a new blended know-how, application of a newly created knowledge, its further maintenance and reactivation at any given time later – representing a four-pillar model by Zahra and George (2002) enhanced by transformative capability of Garud and Nayyar (1994). However, his model did not receive any empirical validation. His endeavours were disproved at a later point and the paper has been retracted, no subsequent studies have attempted to provide verification of it.

Generally, the framework proposed by Zahra and George (2002) was welcomed by scholars and has received sufficient empirical validation (e.g. Flatten *et al.* 2011; Fosfuri and Tribo, 2008). However, it has also been criticized. Such, Todorova and Durisin (2007) propose that the interpretation of the concept should go back to the model suggested by Cohen and Levinthal (1990). Drawing on empirical research, they offer several additions to the original model of the phenomenon (such as feedback loops between stages), but their main argument is that a three-pillar structure explains the behaviour of the concept better than the division of it to potential and realized capacity proposed by Zahra and George (2002).

Other studies have examined the structure of the absorptive capacity as well, yet with less significant outcome and with less subsequent support. Such, Lane *et al.* (2001) investigated the dimensions proposed by Cohen and Levinthal (1990) in a context of international joint ventures and concluded that the model could encompass only two dimensions as they found that acquisition and assimilation stages are independent and

different from the third stage, ability to apply, whilst are correlated between one another. Similarly, Heeley (1997) argued that exploitation of the external knowledge depends on firm's technological capabilities and cannot be considered a separate step of absorptive capacity, leaving the absorptive capacity concept with only two stages.

Another alteration to the model was proposed by Stulova and Rungi (under review). An empirical study revealed a new, success-factor rather than procedural model of absorptive capacity. The substance of the phenomenon, but the elements form new combinations – suggesting that in the new dynamically changing environment absorptive capacity is a set of success factors rather than a process. Absorptive capacity is built-up by four elements (Figure 1): the continuing development or a company's orientation on persistent development of its technology, offering, processes, resources; the bottom-up innovation or idea sourcing at all levels of hierarchy; the trust-based internal cooperation or working and reliable cooperation within a firm; and the deferred knowledge use or proper codification and working mechanism for reactivation of earlier knowledge (Stulova and Rungi, under review).

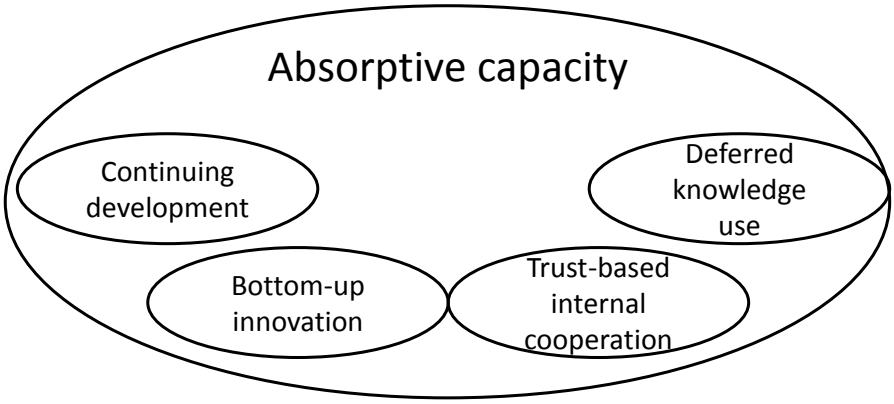

Figure 1: The model of absorptive capacity based on Stulova and Rungi (under review)

The *continuing development* subset of the absorptive capacity phenomenon signifies the importance of a firm's willingness to develop at all levels (e.g. development of employees,

technology, products/services). This dimension relates to other organizational capabilities such as "adaptive capability" and "innovative capability" (Wang and Ahmed, 2007) or "sensing business opportunities" and "product development" (Kolk and Rungi, 2012). The employee-related subset of the dimension once again bridges absorptive capacity to the organizational learning theory, which praises conscious learning at individual level and puts it in the cornerstone of the learning organization metaphor (Pedler *et al.* 1991). Continuing development also relates to ambidexterity, which requires balancing of exploration and exploitation endeavours (Gupta *et al.* 2006).

Increasing flattering of the organizations and transformational management, which motivates and empowers employees by personal example and goal setting rather than instructions through the top-down command line, has been demonstrated to be most beneficial for creation of new knowledge (Bryant 2003). The direct interactions between the people within the organization and the environment surrounding it suggest that employees have a better understanding of the actual situation and know better where to direct endeavours, triggering the evolvement of the knowledge-based view (Spender 1996). Also here, the new model suggests that the *bottom-up innovatio*n, or the ideas offered by people from other than top management, is an integral part of absorptive capacity.

Linked to the bottom-up innovation, is another subset of absorptive capacity, *trust-based internal cooperation* between employees. Earlier research has revealed that most effective knowledge transfer both internally as well as between unrelated parties is achieved in a collaborative setting (Zhao and Anand, 2009). Including a part on trust between cooperation partners, *trust-based internal cooperation* emphasizes the voluntary nature of such collaboration, which is considered to be most beneficial (Smid *et al.* 2005). A combination of *trust-based internal cooperation* and *bottom-up innovation* is most favourable for knowledge-intensive works, which supports the notion of knowledge worker (Drucker

1967). This combination is also closely aligned to the idea of the communities of practice that encourages sharing of information and collective learning (Hemmasi and Csanda, 2009). Such communities facilitate information sharing as well as they allow for further idea development by means of discussion and knowledge spreading. Those discussions should also help retain the knowledge over time (Nonaka 1994), linking the interplay of those two dimensions to the *deferred knowledge use* subset of absorptive capacity as well.

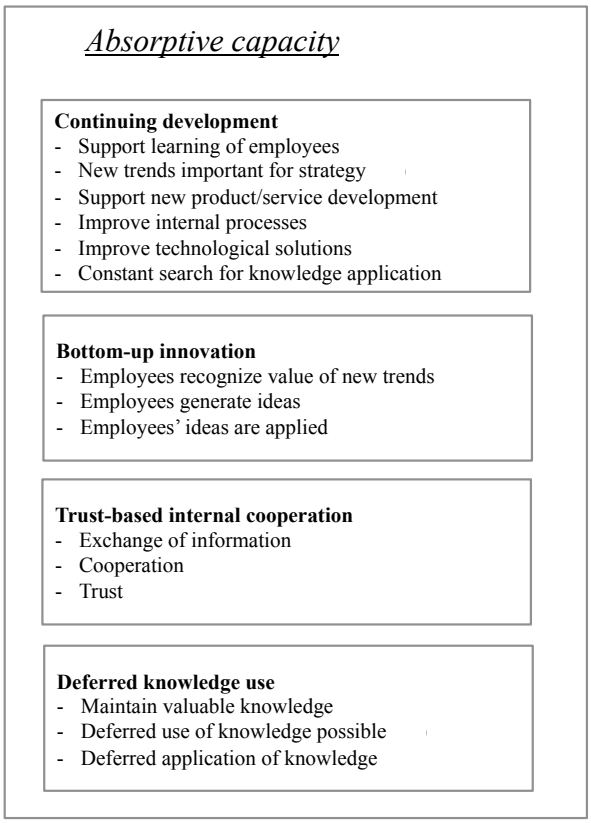

Figure 2: The model of absorptive capacity based on Stulova and Rungi (under review)

Deferred knowledge use subset is to a certain extent inversely related to the *continuing development* dimension. Learning is cumulative and path-dependent (Kim and Inkpen, 2005; Bierly *et al.* 2009), symbolizing that past knowledge has certain importance. But given the level of environmental turbulence, the companies have to be focused on growth and development, sourcing new knowledge all the time – as the products and the technologies are changing fast (Bettis and Hitt, 1995; Menon *et al.* 2002), making old knowledge lose its value

(Hedberg 1981), and suggesting that memory might be in fact constraining new knowledge accumulation (Starbuck and Hedberg, 1977). This, coupled with an understanding that organizations have their own memory (Daft and Weick, 1984), drove a whole new direction of research on organizational forgetting (Holan and Phillips, 2004).

The goal of the current study is to provide further empirical investigation of this model, gaining additional knowledge on what are the elements of absorptive capacity and how they relate to one another.

3. METHODOLOGY

To gain solid and practical information that would allow achieving the research objective, a series of case study interviews were carried out. Semi-structured in-depth interviews, followed by a multiple-case study analysis allow to see behind the facade of general statements and descriptions that are common for strategic management and, especially, for intangible topics of organizational learning.

While the single case-study approach permits deep insight of the phenomenon (Eisenhardt 1989), multiple-case study analysis provides other benefits, improving the validity of results (Meredith 1998). Even though it is possible to generalise already from a single case (Flyvbjerg 2006: 219, 221), the experiment-like structure of multiple-case study is repeating and replicating cases as experiments (Eisenhardt and Graebner, 2007: 25). Contrasting quantitative and qualitative research methods, it is important to differentiate that while quantitative research aims to achieve statistical generalizability, then multiple-case study focuses on analytical generalizability (Eisenhardt 1989; Dubois and Gadde, 2002). For this purpose, Eisenhardt (1989) recommends analysing 4-11 cases. In extreme cases, multiple-case study can reach up to 62 firms (Wang *et al.* 2004: 169). This paper operates at the edge

of this, with the number of participating companies reaching 61, although some companies participated in the study anonymously.

In current research, neither theoretical (Eisenhardt 1989: 537, 545) nor similar purposive sampling (Denzin and Lincoln, 2000: 370) were used. The cases were randomly selected by members of the research team from the universe of the profit-seeking companies registered in Estonia, as a result most of the cases belong to be representative/typical and few extreme ones (Yin 2003: 40-42). This approach is believed to be satisfactory as former improves analytical generalizability through providing "similar results" and latter challenges and contrasts the average results with extreme cases, accounting for deviations (Yin 2003: 47).

Table 1: Sample overview, breakdown by industry

Industry	**Nr of companies**	**% of total**
Services	17	27.4%
Manufacturing	13	21.0%
Trade	10	16.1%
ICT	7	11.3%
Finance	6	9.7%
Other	9	14.5%
Total	**62**	**100%**

Slightly above 50% of the sample (54%) were formed by the companies controlled by local Estonian shareholders. The remaining part of the sample was represented by local subsidiaries of foreign companies. The division of the sample by size by the number of employees is balanced: microfirms 7 (13%), small 14 (26%), medium 19 (35%), large 14 (26%). The average number of employees stands at 198.

Semi-structured interview frame was prepared and extensively tested (Yin 2003: 57) by research team, consisting of undergraduate students in supervision of authors of this paper. The interviews were conducted in Estonian, English and Russian. The interviews lasted between 0.5-1.5 hours, the difference in time is explained by the semi-structured nature and open-ended questions of the interview. The interview frame was followed loosely, allowing the participants of the study to develop their line of reasoning and bring in as much information as possible. All the interviews were transcribed in accordance with best practices (e.g. Silverman 2000), unfortunately, not always within a 24-hour timeframe (Eisenhardt 1989).

In analytical part of the research all the interviews were thoroughly read, coded and categorized, and thereafter content analysis was performed. The codes used were partly theory-driven and partly *in vivo* (data-driven) (Piekkari and Welch, 2008). Next, a frequency analysis was run to support text data analysis. NVivo software was used for carrying out the text analysis.

Unexpected findings triggered a need to revert to theory, comparing and contrasting the earlier research with results of this paper. Recurring consultancy with literature is quite common for qualitative analysis, since prior theory does not have the same role as in quantitative research (Yin 2003: 28). Also, contradicting findings help to increase internal validity of the study (Yin 2003; Silverman 2000). External validity is increased by the multiple-case study setting deployed herein, with permission for analytical generalizability (Yin 2003).

4. RESULTS AND DISCUSSION

The extensive data collected for the multiple-case study analysis (62 interviews with 62 separate companies) allows extending the knowledge on the processes and elements

behind the organizational absorptive capacity concept, revealing extensive and detailed information on the nature of its building blocks as well as on the interconnections between them.

As expected, the elements are highly related. Conventional wisdom would have suggested that *continuing development* acts as an umbrella for other elements of absorptive capacity because of its overwhelming nature, which to a certain extend holds true. However, other direct and indirect links are observed between the elements as well. Also, some new elements are revealed and the results demonstrate the importance of environmental turbulence for the knowledge articulation in a company.

Generally, the companies have positive attitude towards external information. The firms follow the trends set by others (including direct and indirect competitors), they constantly source information from outside, benchmark themselves against peers and try to catch-up as soon as possible if any gaps are observed. Some authors (DiMaggio and Powell, 1983; Lieberman and Asaba, 2006) attribute this behaviour to companies that feel uncertain and therefore follow the best. Imitation is widespread and happens incredibly fast. However, not everything can be imitated – companies develop inimitable resources in order to achieve competitive advantage (Barney 1991) as well as certain path-dependency and idiosyncratic nature of resources (Teece *et al*. 1997; Eisenhardt and Martin 2000) limits the possibilities for imitation. Observing and following trends is not the same as learning from clients, recommended by learning organization paradigm (Marsick and Watkins 1994) and it doesn't match with imitating, described earlier.

It is interesting to note that Estonian companies studied benchmark themselves mostly against global peers, even if they do not operate in the same markets. They also use intensive co-creation with clients, seeing clients as another vital source of external information.

Continuing development

The companies participating in the survey demonstrated positive developments in recent years. A considerable share of the companies suffered a decline during economic crisis of 2008-2009, but managed to recover and improve its position during 2011-2014.

The major building blocks of the *continuing development* dimension of absorptive capacity generally follow the data-driven detailization proposed by Stulova and Rungi (under review), uniting support of new product development, continuous development of internal processes, support for learning of employees, investments into technologies, importance of new trends for strategy and search for knowledge application possibilities. However, those elements are not of equal importance. This study reveals considerable differences across elements and allows drawing conclusions on priorities of firms.

The companies studied seem to be largely focusing on internal processes in order to facilitate development. They invest into new technologies that optimize operations as well as improve internal efficiency. The content analysis of interviews revealed that the companies strive towards ambidexterity, working on both internal and external aspects. However, internal processes have been leading the developments, somewhat exceeding product-related endeavours.

The competitive situation is seen as the main driver of the recent as well as current developments and also the main goal of short to medium-term strategy of companies. Also, the developments are heavily client-driven: instead of proposing revolutionary products and services, the companies try to address existing client demands and create output that would be demanded from the beginning.

The client-reliance of the new product/service development could be a result of the relative importance of service-oriented companies for the sample as well as for the Estonian economy in general; this should also be the main reason for product innovation lagging

behind process innovation in general. Service companies mainly introduce new services once they see demand for those services. However, the same tendency was demonstrated also by manufacturing and trade companies – instead of trying to offer products that would re-shape client preferences, they derive new products based on observed client behaviour.

A special situation of product/service development can be observed the multinational companies, i.e. where the owner of the Estonian company is a foreign firm. The results demonstrate that those Estonian manufacturing companies, who are part of a multinational corporation, do close to no product/service development at all, with innovation coming from the parent company, following their analyses, R&D and testing that they perform in other markets.

The analysis revealed that the firms acknowledge the importance of employees for corporate development, although the development and learning of employees is mainly achieved through training programs. Some companies have formal rules on training quotas, some decide on an *ad hoc* basis, but in almost any situation the employee has to select the trainings as well as substantiate his/her choices, i.e. the actual support for employee learning is a combination of welcoming attitude of employer and persuasion of employee.

Despite the general wish to develop business, improve performance and grow, the daily challenges of increasingly dynamic environment reduce the capacity of the companies to search for new opportunities. The companies invest a lot of effort in unravelling changes in client/customer preferences and in following the moves of competitors, placing new initiatives and new ways to apply existing knowledge behind those goals. The growth realized seems to be more a favourable outcome of external developments that the companies were able to capture and utilize rather than a result of hard work and internal search for ideas.

Bottom-up innovation

The *bottom-up innovation* occurs in the companies differently than it has been described for technological giants such as Intel (Burgelman 1983) or Google (Scott 2008). The analysis reveals that innovation achieved from within the company is mainly process-oriented. The employees take active role in developing alternative solutions to the existing processes (e.g. manufacturing, warehousing, property management), with product innovation significantly lagging behind.

Employees are most often not rewarded extra for the ideas, but process-related ideas result in improved efficiency of their workplaces, offering non-financial incentives for the employees, without additional involvement and stimulation from the company side.

With respect to the products and services, the employees are mainly expected to pass on information from the clients (e.g. client feedback, new requests, attitudes towards products and services). Employees are seen as a source of vital knowledge, an input for further product/service development. However, the decisions with respect to the product/service development as well as realization of other ideas aimed at corporate advancement are made by the top management or even owners of the organizations. High involvement of owners is a country peculiarity: most of the companies in sample are small to medium sized and for such companies in Estonia the owners are generally actively involved in daily operations of the companies, often as managers. The decision-making is heavily centralized and a considerable amount of new developments is coming from the top management.

None of the companies said that they do not encourage bottom-up innovation or that they are not interested in ideas of employees. However, a lot of them complained that employees do not assume responsibility and do not offer any ideas. Still, given that the decision-making is centralized, the actual opportunities that idea generation would offer employees, are limited, discouraging effort.

The product/service development part of bottom-up innovation matches with the one described for the continuing development subset. Most of the development is client or environment driven, with employees conveying important knowledge in order to support new product development, making little to no attempts to revolutionize the industry.

Trust-based internal collaboration

As expected, *trust-based internal collaboration* is about people and collaboration. The results demonstrate that this collaboration is mainly achieved by participation in meetings as well as by informal communication between employees, i.e. talking.

Most of the companies in the sample, as well as most of the companies in Estonia have very flat organizational structures, facilitating easy exchange of ideas and information. The data revealed that cooperation between employees within department as well as across departments is a vital part of business, i.e. the provision of service or quality of the final product depends on several people/departments and collaboration between them. Communication as well as joint actions take place on a daily basis, implying that for successful outcome the employees have to trust one another. Another important element emphasized by the respondents was a two-way direction of communication and cooperation, signifying that participation in collaboration is in the best interest of every employee. This voluntary nature of the cooperation is the most beneficial structure for firms to consider (Eisenhardt and Martin, 2010: 278).

Even though the results demonstrate a working pattern of cooperation as well as ease and regularity of information flows, there are still problems arising with respect to the relations between people. The problems, however, are mainly emotion-driven and sometimes are not even related to situations within a working environment. Still, since people can be vulnerable to emotions, those emotions have a capacity to exercise negative influence on

cooperation as such. The cases analysed did not demonstrate any situation where emotions would deteriorate the cooperation performance within the company, although it still remains a theoretical risk source.

Feedback surveys and feedback sessions are widely used to gather feedback from employees, aiming to achieve constant improvements in internal environment. The surveys are mostly anonymous and employees can pass their ideas and complains forward, what presumably adds to trust development within an organization.

The companies with more active information exchange and cooperation between people demonstrated better results in bottom-up dimension as well, supporting the overall role of people for corporate development and growth as well as demonstrating the interrelations between different elements of absorptive capacity.

Deferred knowledge use

Deferred knowledge use is heavily related to internal processes within the companies, since archiving of knowledge as well as its further re-appraisal are parts of internal procedures.

There are considerable differences with respect to the information stored. While in general R&D and product development repository activities are beneficial for absorptive capacity (Spithoven *et al.* 2011), a considerable amount of respondents interprets deferred use in the narrowest way, referring to the data maintenance as prescribed by laws (e.g. accounting documents, contracts). Also, manufacturing companies tend to preserve materials on product quality, to minimize the risks of reclamations in the future. In addition, organizations tend to store business analytics and performance indicators. Those are the materials mostly referred to with respect to deferred used and those can be accessed and used at a later stage as well, for performance appraisal and forecasting.

Even though some organizations have IT platforms for idea preservation and monitoring of the pending ideas and projects, it still seems that most of the know-how

remains in peoples' heads, i.e. the knowledge of individuals is not being codified into the shared know-how of the organization. Some of the companies have a practice of knowledge sharing, whereby an employee who has attended training would present the information to his/her colleagues as well. However, this is more in line with the ideology of communities of practice (Hemmasi and Csanda, 2009). In case of a working community of practice, the individual knowledge could be conveyed to the organizational level, helping to retain valuable knowledge over time (Nonaka 1994).

The possibilities for delayed use of ideas have not been demonstrated by the cases examined. None of the firms investigated have a routine procedure for re-appraisal of earlier knowledge. Thus, unless the people in the company are always there, the real opportunities for use of previously generated knowledge are minimal, especially given the general psychological tendency for undervaluing the benefits of older ideas, as came out from several interviews. Perhaps the relative inability for reactivation of earlier knowledge is determined by the speed of environmental change. Several companies have identified that older ideas cannot be of real value due to the dynamics of the environment. It could also be an influence of the channels of new ideas – since the main strategy of the companies is to keep up with the competitive situation, with internal idea generation and product development being somewhat disregarded.

Environmental turbulence

Majority of the companies have evaluated the business terrain as highly dynamic, implying a constant need for development of the company in order to be in line with the market. Some part of the dynamism can be a sources of opportunity (Song *et al.* 2005), but some part of it introduces threats (Leonard-Barton 1992). The analysis reveals that the environment is occasionally too fast, undermining the ability of firms to think of new opportunities for business expansion as they have to constantly deal with maintaining what has already been

achieved. Disregarding the last one, the companies seem to be handling environment turbulence rather well, seeing it mostly as an opportunity to take their business to new highs. Culturally, this contradicts the assumption of the prevailing desire for uncertainty avoidance common for Estonia (Hofstede 2015). Business-wise it is rather a result of openness of the Estonian economy, high degree of exports and global mindset of business leaders.

The analysis conducted reveals that industry dynamism is linked to all the elements of absorptive capacity. Also, the results demonstrate that the business terrain is not developing homogenously, with varying degree of turbulence affecting businesses. Such, among the elements introducing most challenges are clients and their preferences, process and product development and competition.

As suggested by the analysis of the subsets of absorptive capacity, the development of the companies has been relatively little more driven by process improvements rather than by product advancements. Still, the industry dynamism makes companies re-evaluate their products and services regularly. The product/service development, in its turn, is considerably influenced by clients – i.e. the companies want to capture the client expectations, in line with the earlier theories – the turbulence makes companies compete fiercely, introducing new products at regular and short time intervals (Bettis and Hitt, 1995; Menon *et al.* 2002). Contemporary globalized world encourages clients to seek for the best possible service and product, making companies put the priorities of the client first.

Of a similarly high magnitude of contribution to the industry dynamism, is the necessity to follow the trends set by competitors. The companies want to catch up with others, also shifting from own new product development to imitating others (Lieberman and Asaba, 2006). Organizations thoroughly follow what their competitors are doing, copying their developments to a considerable extent. Some observe direct and indirect competitors for inspiration, taking in ideas for new product development. Some, on the contrary, use pure

imitation to minimize the first-mover advantage potential. In any case market screening and identification of trends is a cornerstone for contemporary business.

Interestingly, the challenges offered by technological advancements and suppliers' offer development do not introduce considerable turbulence.

Table 2: Summary of the results

Continuing development	**Bottom-up innovation**
• Information is sourced globally, rather than regionally • Ambidexterity – internal and external sourcing of information is equally high • External sourcing mainly by following trends, not on the basis of cooperation • Confirm wish to support advancement of employees, with training seen as the main source of learning • Developments are client-driven • Focus on existing situation and imitating/catching up others, not on future-oriented own initiatives • Short-term strategic planning • Commitment to improvements of processes • Limited technological endeavours	• Rather top-down – initiatives and decisions from top management • Decision-making process is manager-centric • The employees are seen as a valuable source information, not so much as a source to get new innovative ideas • Bottom-up ideas are welcomed, though formal incentive system is missing • Information mediated by the employees is mainly client-driven • Process-orientation of employees' ideas instead of new product development, with processes mainly focusing on daily operations
Trust-based internal cooperation	**Deferred knowledge use**
• Both formal meetings and informal communication • Flat organizations, ease of information exchange • Cooperation is an integral part of business • Two-way relationships in cooperation • Importance and involvement of emotional aspects leads to occasional problems	• Biased interpretation – conservation of documentation prescribed by laws, where both paper and digital archiving is in use • Additional preservation of client data and performance indicators, reused for forecasting and analytics • Warehousing of ideas and knowledge limited • Very little working solutions for idea storage, a lot still remains in peoples' heads • High pace of changes reduces value of older information
Environmental turbulence	
• Generally high-paced environment, emphasis on continuity of changes • Main sources of turbulence are competitors and clients • Products are mainly developed by imitating others	

This focus on competitors also pushes companies to search for unique offering, investigating the opportunities to get into a niche segment meant to ensure competitive edge and minimize the threats stemming from the general industry dynamism. Some of the companies studied believe that they have a unique offering that distinguishes them from competitors.

Employees play a considerable role in addressing the industry dynamism. As organisation cannot act without people, the mere action of information sourcing comes from the people involved in operations and should be interpreted in conjunction with bottom-up innovation and trust-based internal cooperation facets described above.

In general, it has been pointed out that the business environment is highly encouraging in Estonia, with favourable taxes and transparent procedures. On the negative side, the companies tend to sense the limitations of a small regional market, but this holds only for the companies that are oriented to the internal market. Another important aspect pointed out is the regulatory framework, its changes are a considerable source of volatility for the companies.

Key findings of this multiple-case study cover many known and some peculiar findings in absorbing information. First of all, there are indications that sample companies use mainly three information sources for innovation: its clients, headquarters and following the moves of competitors. Client-orientation is the most peculiar in its controversy, somehow logical in its nature at a first glance, it is simultaneously known that companies may fail while following client opinion "too carefully" (Christensen and Bower, 1996: 197-205). Clients usually tend to provide evolutionary approaches – extensions and modifications of existing products and services – not revolutionary approaches. Perhaps most famous citations for this and illustrate the area are from Duell (head of US patent office in 1899) "everything that can be invented has been invented" (Wright 2010: 435) and from Henry Ford (founder and head of Ford Motor Company) "if I had asked people what they wanted, they would have said

faster horses" (Dumitrescu *et al.* 2011: 24). It has also been demonstrated in more modern days, Tushman and Anderson (1986) noted that existing companies tend to be more inclined towards evolution rather then revolution.

Second source of new developments is headquarters; valid for those companies studied that are subsidiaries to multinational corporations. Often subsidiaries are used as resellers of product without having resources for knowledge-intensive developments, what holds true for the sample studied. In those situations new knowledge, sourced from the parent company, is absorbed as it is, without any additional transformation.

Third used approach – imitation – has been widely known for a while. Initial reasons come from mature countries where industries are getting homogenized due to innovation followers copying the best innovators (DiMaggio and Powell, 1983), but this cannot be the case for the sample studied due to the relatively short history of capitalism and considerable growth rates posted in Estonia. At the same time, high environmental turbulence is known to reduce imitation, not allowing making clear conclusions on what should be the best strategy for Estonian companies. Many companies have emphasized differentiation – in case the product or the service offered is not a commodity, then the companies try to make their offering unique, thereby reducing competitive pressures.

For all of the dimensions of absorptive capacity, organizational antecedents matter to a great extent. Such, flat organizational structures facilitate information exchange and collaboration, promoting new idea development and, thus, innovation. At the same time, they encourage knowledge sharing and distribution, creating suitable environment for a deferred use of particular knowledge. Knowledge aspects clearly add to the continuing development subset; as well as it also benefits from flat organizational structures as such – smaller companies with little hierarchy are more flexible, adapting to changes and re-shaping to address the challenges of the environment.

Environmental turbulence is an important feature for absorptive capacity as well, influencing all subsets. It mainly targets the continuing development subset as it introduces a number of challenges to tackle. However, it also is important for trust-based internal cooperation and bottom-up innovation as it equips employees (especially the ones who liaison with clients, suppliers, partners) with opportunities to source new external knowledge and to convey it to the decision-makers within the organization. The only subset that has an inverse relation with dynamism is the deferred knowledge use. Fast changes makes information obsolete fast, thus, discouraging coming back to old ideas (Hedberg 1981).

The results unlock new categories within the absorptive capacity concept that are common for all the success factors and that have not been part of the model proposed by Stulova and Rungi (under review) (Figure 3). Such, one of them is people – organizations pool together people and those people are valuable assets, irrespective of whether the company is service or product oriented and whether or not it allows its employees being innovative. However, the role of employees is limited. They are mainly seen as deliverers of valuable information, such as client requests and feedback to a service received. The people are not empowered to take risks and to make own decisions with respect to innovative ideas. The same with supporting the growth of people – trainings are provided, but the goal of those is mainly nominal. The employees are expected to justify an application for training and some employers might have strict rules with respect to what to develop in a person and what is not priority.

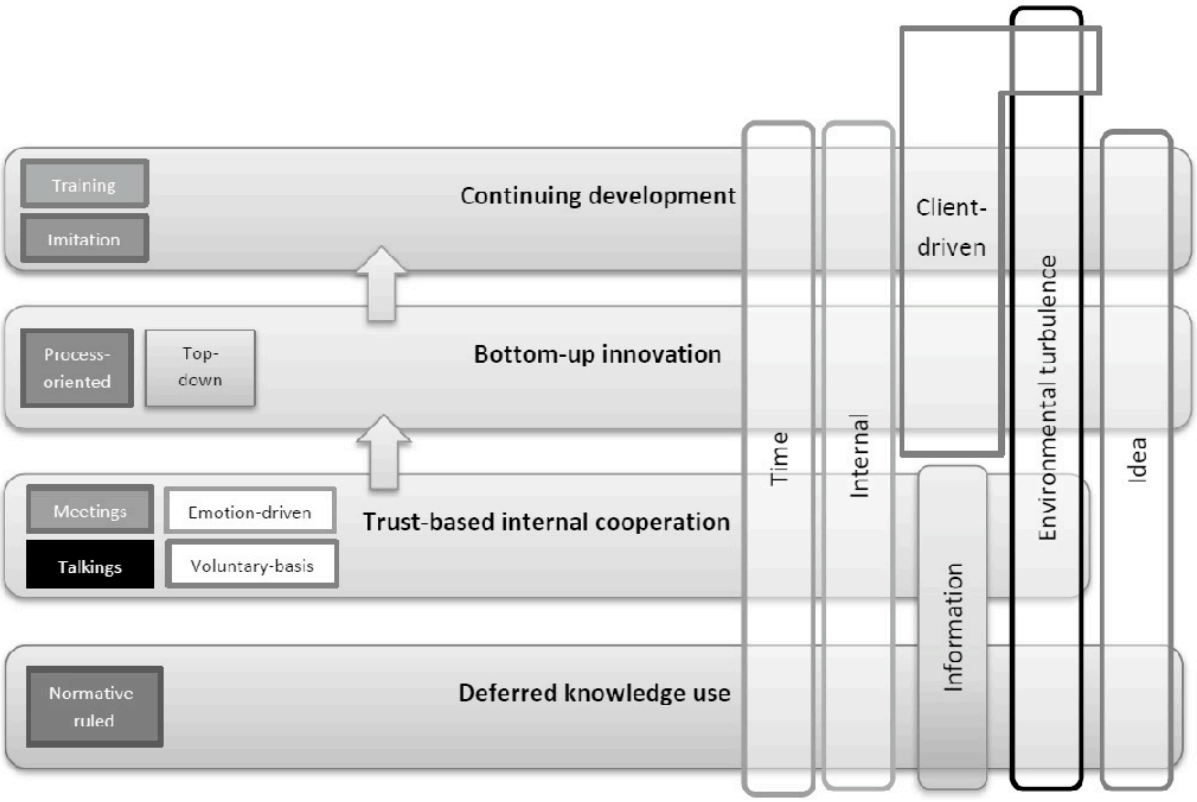

Figure 3: The interplay between the elements of absorptive capacity

Another category is client. The changes and developments of a firm and its products/services as well as its internal processes are to a considerable amount client-driven. Co-creation of new solutions allows firms to have extra certainty with respect to the post-investment demand, reducing business risks and granting excellent access to external knowledge.

Also, all of the dimensions are very process-centric. In addition to working on how the company is positioned, the firms focus on their internal environment and efficiency of operations. Considerable investments are being made to automate internal processes as well as employees' initiatives on improving the working processes is welcomed and enforced.

It is surprising that changes in technology do not offer many growth opportunities for the companies. Advancements to the technology have mostly created opportunities for

improvements in internal processes and have not been used as a source of revolutionary product development.

5. CONCLUSION

The results of the current study unlock valuable knowledge on the building blocks of absorptive capacity. The results provide support to the model proposed by Stulova and Rungi (under review), extend the knowledge on the linkages between the facets of the phenomenon as well as demonstrate the different roles of the components of absorptive capacity.

The analysis conducted demonstrates that companies favour external information, sourcing it and make their strategic choices based on the competitive situation.

While the model at its higher level of abstraction receives empirical support, the results also reveal new interdependencies and unveil priorities among the factors. The results of this study demonstrate shared elements of success factors, such as process-driven innovation, reliance on competitors and clients, importance of employees. Initial assumption predicted these elements to exist mainly in single factor not across them. The study also demonstrates that industry dynamism is an important antecedent of the absorptive capacity, influencing all of its business blocks.

The results are value-adding in several ways. First, they provide empirical validation of the model of absorptive capacity as suggested by Stulova and Rungi (under review). Second, the results demonstrate the elements of absorptive capacity at a satisfactory level of detail, allowing to see the interconnections between the elements as well as to differentiate those based on the level of their relative importance. Third, they confirm that environmental turbulence is shaping the behaviour of firms, affecting all the subsets of absorptive capacity. Lastly, the results demonstrate that external information is of critical importance for the companies, shaping their strategic choices.

REFERENCES

Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, **17**, 99-120.

Baum J.A.C., Calabrese T. and Silverman B.S. 2000. Don't go it alone: Alliance networks and startup performance in Canadian biotechnology. *Strategic Management Journal,* **21**(3): 267–294.

Bettis R. and Hitt M. 1995. The new competitive landscape. *Strategic Management Journal,* **16**(S1): 7–19.

Bierly P.E.III, Damanpour F. and Santoro M.D. 2009. The application of external knowledge: Organizational conditions for exploration and exploitation. *Journal of Management Studies,* **46**(3): 481–509.

Bloomberg Rankings. 2013. 50 most innovative countries: Innovation index revealed – *Bloomberg*. Available from http://www.bloomberg.com/slideshow/2013-02-01/50-most-innovative-countries.html#slide21 (accessed 5 May 2014).

Brown S. and Eisenhardt K.M. 1997. The art of continuous change: Linking complexity theory and time paced evolution in relentlessly shifting organizations. *Academy of Science Quarterly.* **42**: 1–34.

Bryant S. 2003. The role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. *Journal of Leadership & Organizational Studies,* **9**(4): 32–44.

Burgelman, R.A. 1983. A Process Model of Internal Corporate Venturing in the Diversified Major Firm. *Administrative Science Quarterly*, **28**(2): 223-244.

Christensen, C.M. and Bower, J.L. 1996. Customer power, strategic investment, and the failure of leading firms. *Strategic Management Journal*, **17**(3): 197–218.

Cohen W.M. and Levinthal DA. 1989. Innovation and learning: The two faces of R&D. *Economic Journal,* **99**(397): 569–596.

Cohen, W.M. and Levinthal, D.A. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, **35**(1): 128–152.

Daft R.L. and Weick K.E. 1984. Toward a model of organizations as interpretation systems. *Academy of Management Review.* **9**(2): 284–295.

Denzin, N. and Lincoln, Y. (Eds.) 2000. *Handbook of Qualitative Research*, 2nd ed., Thousand Oaks: Sage Publications.

DiMaggio, P.J., and Powell, W.W. 1983. The iron cage revisited: Instituional isomorphism and collective rationality in organizational fields. *American Sociological Review*, **48**(2): 147–160.

Drucker P.F. 1967. *The effective executive*. London: Heinemann.

Dubois, A. and Gadde, L.-E. (2002) Systematic Combining: An Abductive Approach to Case Research. *Journal of Business Research*, **55**(7): 553-560.

Dumitrescu, L., Oana, S., Tichindelean, M. and Vinerean, S. 2011. Pursuing a customer-driven approach for innovation and marketing excellence. *Studies in Business and Economics*, **6**(2): 19–26.
Retrieved from http://econpapers.repec.org/RePEc:blg:journl:v:6:y:2011:i:2:p:19-26 (accessed 15 December 2014)

Eisenhardt, K.M. 1989. Building Theories from Case Study Research. *Academy of Management Review*, **14**(4): 532-550.

Eisenhardt, K.M. and Graebner, M. 2007. Theory building from cases: Opportunities and Challenges. *Academy of Management Journal*. **50**(1): 25-32.

Eisenhardt, K.M. and Martin, A.J. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*. **21**(10-11): 1105-1121.

Emden Z., Calantone R.J. and Droge C. 2006. Collaborating for new product development: selecting the partner with maximum potential to create value. *Journal of Product Innovation Management,* **23**(4): 330-341.
Flatten T.C., Greve G.I. and Brettel M. 2011. Absorptive capacity and firm performance in SMEs: The mediating influence of strategic alliances. *European Management Review,* **8**(3): 137–152.
Flyvbjerg, B. 2006. Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*. **12**(2): 219-245.
Fosfuri A. and Tribo J.A. 2008. Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega,* **36**(2): 173–187.
Garud R. and Nayyar P.R. 1994. Transformative capacity: Continual structuring by intertemporal technology transfer. *Strategic Management Journal,* **15**(5): 365–385.
George G. 2005. Learning to be capable: patenting and licensing at the Wisconsin Alumni Research Foundation 1925–2002. *Industrial and Corporate Change.* **14**(1): 119–151.
Giang V. 2014. 4 Countries that are leaving Silicon Valley in their tracks. Fast Company. Available from http://www.fastcompany.com/3030100/bottom-line/4-countries-that-are-leaving-silicon-valley-in-their-tracks (accessed 9 May 2014).
Gupta A.K., Smith K.G. and Shalley C.E. 2006. The interplay between exploration and exploitation. *Academy of Management Journal,* **49**(4): 693–706.
Hedberg B. 1981. How Organizations Learn and Unlearn, in Nystrom P. and Starbuck W.H. (eds.), *Handbook of Organizational Design*, Cambridge University Press: London.
Heeley M. 1997. Appropriating rents from external knowledge: the impact of absorptive capacity on firm sales growth and research productivity. *Frontiers of Entrepreneurship Research,* **17**: 390–404.
Hemmasi M. and Csanda C.M. 2009. The effectiveness of communities of practice: An empirical study. *Journal of Managerial Issues,* **21**(2): 262–279.
Hofstede, G. 2015. What about Estonia? Available from http://geert-hofstede.com/estonia.html (accessed 8 January 2015)
Holan P.M.D. and Phillips N. 2004. Remembrance of things past? The dynamics of organizational forgetting. *Management Science,* **50**(11):1603–1613.
Jimenez-Barrionuevo M.M., Garcia-Morales V.J. and Molina L.M. 2011. Validation of an instrument to measure absorptive capacity. *Technovation.* **31**(5): 190–202.
Kim C. and Inkpen A. 2005. Cross-border R&D alliances, absorptive capacity and technology learning. *Journal of International Management,* **11**(3): 313–329.
Kolk A. and Rungi M. 2012. Total exploitation orientation in capability development: The cross-case of Google, Ericsson, Microsoft and Nokia. *Research in Economics and Business: Central and Eastern Europe,* **4**: 5–25.
Lane P.J., Salk J.E. and Lyles M.A. 2001. Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal,* **22**(12): 1139–1161.
Leonard-Barton D. 1992. Core capabilities and core rigidities: a paradox in managing new product development. *Strategic Management Journal,* **13**(S1): 111–125.
Lichtenthaler, U. 2009. Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of Management Journal*, **52**(4): 822–846. (Retraction published 2013, *Academy of Management Journal,* **56**(6): 1830).
Lieberman, M.B. and Asaba, S. 2006. Why do firms imitate each other? *Academy of Management Review*, **31**(2): 366–385.
Marsick, V. and Watkins, K. 1994. The learning organization: An integrative vision for HRD. *Human Resource Quarterly,* **5**(4): 353-360.

Menon A., Chowdhury J. and Lukas B.A. 2002. Antecedents and outcomes of new product development speed: An interdisciplinary conceptual framework. *Industrial Marketing Management.* **31**(4): 317–328.

Meredith, J. 1998. Building operations management theory through case and field research. *Journal of Operations Management*, **16**: 441–454.

Mowery D., Oxley J. and Silverman B. 1996. Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal.* **17**(S2):77–91.

Nonaka I. 1994. A dynamic theory of organizational knowledge creation. *Organization Science.* **5**(1): 14–37.

Pedler M., Burgoyne J. and Boydell T. 1991. *The Learning Company*. McGraw-Hill: London.

Piekkari, R. and Welch, C. 2008. Doctoral Course on Case Studies in Management and Business Research, course notes, Espoo, Finland: Helsinki University of Technology.

Scott V. 2008. *Google*. Greenwood Press: Westport.

Silverman, D. 2000. *Doing Qualitative Research: A Practical Handbook*, Sage Publications.

Smid G., Bijlsma-Frankema K., Derksen H. and Bernaert G. 2005. e-Innovation and trust dynamics. *Strategic Change.* **14**(2): 93–106.

Spender J.C. 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal.* **17**(S2):45–62.

Spithoven, A., Clarysse, B., and Knockaert, M. 2011. Building absorptive capacity to organise inbound open innovation in traditional industries. *Technovation*. **31**: 10–21.

Starbuck W.H. and Hedberg B.L.T. 1977. Saving an organization from a stagnating environment. In H. B. Thorelli (ed.) *Strategy + Structure = Performance.* Bloomington: Indiana University Press: 249–258.

Stulova V. and Rungi M. (under review) Untangling the mystery of absorptive capacity: A process or a set of success factors?

Teece D.J., Pisano G. and Shuen A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal.* **18**(7): 509–533.

Todorova G. and Durisin B. 2007. Absorptive capacity: Valuing a reconceptualization. *Academy of Management Review.* **32**(3): 774–786.

Tushman, M. L., and Anderson, P. 1986. Technological Discontinuities and Organizational Environments. *Administrative Science Quarterly*, ***31***: 439–465.

Volberda, H. W., Foss, N. J., and Lyles, M. A. 2010. Perspective-absorbing the concept of absorptive capacity: how to realize its potential in the organization field. *Organization science*, **21**(4): 931-951.

Wang C.L. and Ahmed P.K. 2007. Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews,* **9**(1): 31–51.

Wang, P., Tong, T. W. and Koh, C. P. 2004. An integrated model of knowledge transfer from MNC parent to China subsidiary. *Journal of World Business*, **39**(2): 168–182.

Winter S.G. 2003. Understanding dynamic capabilities. *Strategic Management Journal.* **24**(10): 991–995.

Wright, A. D. 2000. Scenario planning: A continuous improvement approach to strategy. *Total Quality Management*, **11**(4-6): 433–438.

Yin, R.K. 2003. *Case study research: design and methods*, 3rd edition, Thousand Oaks: Sage Publications.

Zahra, S.A. and George, G. 2002. Absorptive Capacity: A Review, Reconceptualization, and Extension. *The Academy of Management Review*, **27**(2): 185-203.

Zhao, Z.J. and Anand, J. 2009. A multilevel perspective on knowledge transfer: evidence from the Chinese automotive industry. *Strategic Management Journal.* **30**(9): 959–983.

Appendix 1: Dimensions of the absorptive capacity

Continuing development

Category	**Code**
Internal	General internal
	Processes
	Product
	Technology
	People
External	Location
	Influences
	Cooperation (with other parties)
	Clients
	Information
Idea	
Time	
Technology	
Change	

Bottom-up innovation

Category	**Code**
Internal	Process
	People
	Product
Time	
Idea	

Trust-based internal cooperation

Category	**Code**
Internal	General internal
	People
	Cooperation general
	Cooperation forms
	Emotions
External	Client
Information	
Time	

Deferred knowledge use

Category	**Code**
Internal	General internal
	People
	Cooperation
	Form and substance
External	Client
Idea	
Information	
Time	