

# Connecting Reflecting and Acting: A New Perspective on the Development of Organizational (core) capabilities

Martina Kliesch  
Jochen Koch, and  
Daniel Geiger

Freie Universitaet Berlin  
Institute of Management  
Germany

[kliesch@wiwiss.fu-berlin.de](mailto:kliesch@wiwiss.fu-berlin.de)

[koch@wiwiss.fu-berlin.de](mailto:koch@wiwiss.fu-berlin.de)

[geigerd@wiwiss.fu-berlin.de](mailto:geigerd@wiwiss.fu-berlin.de)

## Abstract

The concept of organizational capability has been developed basically in the field of strategic management. Organizational capabilities are identified as one major source for the generation and development of sustainable competitive advantage). Recently the issue of changeability and flexibility of organizational capabilities is coming to the fore. Referring to the observation that markets and successful market positioning increasingly become subject to erosion-processes, the ability to develop (new) organizational capabilities is seen as being critical for sustainable competitive advantages, and this even more in turbulent or high velocity markets. The paper aims to examine these problems by asking if and to what extent a dynamic perspective could be introduced into the concept of organizational capability and how this paradox of combining stability and change can be unfold.

**Keywords:** organizational capabilities, routines, organizational rigidities, path-dependency, dynamic capabilities

## 1. Introduction

The concept of organizational capability has been developed basically in the field of strategic management. Organizational capabilities are identified as one major source for the generation and development of sustainable competitive advantage (Barney, 1997; 1994). Recently the issue of changeability and flexibility of organizational capabilities is coming to the fore. Referring to the observation that markets and successful market positioning increasingly become subject to erosion-processes, the ability to develop (new) organizational capabilities is seen as being critical for sustainable competitive advantages, and this even more in turbulent or high velocity markets. With concepts such as “dynamic capabilities” (Teece *et al.*, 1997; Kusunoki *et al.*, 1998; Eisenhardt and Martin, 2000; Winter, 2003) or “dynamic core competencies” (Lei *et al.*, 1996) different interesting propositions for the “*dynamization*” of organizational capability have already been introduced. Beyond differences in detail all these concepts refer to the notion “dynamic” in order to capture the renewal of organizational capabilities and to address the demands of changing environments (Danneels, 2002). At the same time the idea of dynamic capabilities refer to an organizational context and its embeddedness in idiosyncratic social structures. In this vein capabilities are conceived as a *distinct concept* meaning that a capability represents firm specific characteristics, which are complex in nature, involve formal as well as informal processes and are therefore not imitable and rare (Barney, 1991). A capability highlights unique action-patterns which are the outcome of time-intensive/long-term interactions. Therefore the idea of organizational capabilities does not really comply with the requirements of (significant) change and this combination of stability and change constitutes significant conceptual and practical problems.

The paper aims to examine these problems by asking if and to what extend a dynamic perspective could be introduced into the concept of organizational capability and how this paradox of combining stability and change can be unfold. In a first step, we focus on the internal logic of organizational capability providing an idea of the organizational context capabilities are embedded in. As will be shown, the traditional understanding of organizational capability comes close to the idea of organizational routines (Cohen and Bacdayan, 1994; Cyert and March, 1963; Nelson and Winter, 1982).

## 2. Characteristics of organizational capabilities

Basically influenced by resource-based theory, capabilities are understood as an idiosyncratic asset, i.e. a complex bundle of firm-specific resources (Hamel and Prahalad, 1994; Prahalad and Hamel, 1990; Turner and Crawford, 1994). The ongoing theoretical debate on the issue however has clarified that a capability is not only distinctive as an organizational resource among others but it is *distinctive* with regard to these other resources of an organization. A capability is a special kind of a resource that cannot simply be equated with regular assets available in an organization. In order to emphasize this “special distinctiveness” the asset-oriented notion has been left in favor of a *procedural* conceptualization of capability, one that focuses on the way of making use of (other) resources. Therefore a capability represents a meta-ability, a higher order skill of the organization to combine available resources/assets in a specific way. This combinative skill ensures that the available resources are uniquely allocated and interconnected so that the organization can not only successfully solve its pressing tasks but also build up a firm-specific potential for successfully mastering future challenges as well (Hamel and Prahalad, 1994; Turner and Crawford, 1994).

In an attempt to resume the essence of organizational capabilities, the following salient characteristics seem to emerge from the examination on and around organizational capabilities (see Schreyögg and Kliesch, 2005).

### 2.1 Practice-boundedness and appreciation

Capabilities are conceptualized as doing something that “*must be recognized and appreciated*” (Gherardi and Nicolini, 2002: 421; Weinert, 2001). Thus, capabilities are conceived to some degree as a success-bound category. It is only recognized and attributed to a performing social entity in the case of a successful and appreciated performance. Since performance is logically bound to action, capabilities furthermore clearly refer to action too, i.e. they cannot conceptually be separated from acting or practicing. Embedding organizational capabilities in practising or doing, means at the same time detaching the concept from an exclusively cognitive understanding. In other words, a capability means more than a set of cognitions; it covers a broader range of activities.

*Organizational competence ... arises from a constellation of interconnected practices* (Gherardi and Nicolini, 2002: 433). From this point of view, “doing something” is the result of a combination of different categories like for example heuristics, routines, social networks and emotions. Organizational capabilities are not the result of a plan, but emerge from some combinatorial dynamics among multiple bits of resources (Marengo, 1992). As a consequence of the emergent character the combination-process is not fully transparent and analytically understandable. Instead it is described as being a complex and even “somewhat mysterious social phenomena” (Dosi *et al.*, 2000: 1; Levinthal, 2000). The organization produces coordinated activity without a central understanding of how and why it works, although there may be an awareness of the managerial intention to achieve this coordination (Dosi *et al.*, 2000). In other words the “steering mechanism” of such competent organization in this sense is decentralized and dissipative.

Over time, this coordinated activity or ‘way of practicing’ becomes habitualized (Berger and Luckmann, 1966) thereby constituting specific patterns of practice. This aspect of capability as a pattern of practice is reflected in Nelson and Winter’s understanding of organizational capability as complex routines.

## **2.2 Reliability and Time-boundness**

“*At a minimum, in order for something to qualify as a capability, it must work in a reliable manner*” (Helfat and Peteraf, 2003: 999). This routine nexus of capability features prominently in the neo-evolutionary theory of economics (Nelson and Winter, 1982; Winter, 2000). This approach conceives organizational capabilities as a composition of a set of approved ‘linking- or combining-routines’. Viewed this way, any organizational capability is the result of an evolutionary formation process, a process in which a specific way of “selecting and linking” resources has proved to be successful in organizational problem solving. A singular success can trigger the building of a capability but a capability is not actually constituted unless a reliable “practice” has evolved over time. Capability is therefore bounded to repeatability.

Similarly, in the evolutionary framework of Hannan and Freeman (1977; 1984) the development of *reliable* action-patterns figure prominently. The presence of reliability is even considered the precondition for the survival of an organization. The authors point out

that reliability entails an “*unusual capacity to produce collective outcomes of a certain [...] quality repeatedly*” (1984: 153). Thus, the transformation from an occasional successful coordination effort into a reliable problem-solving pattern gains key importance.

Within evolutionary economics the idea of patterned organizational capability has been addressed in the context of complex routines. Nelson and Winter (1982) define routines as the “*general term for all regular and predictable behavioural patterns of firms*” (Nelson and Winter, 1982: 14). In a more recent contribution, Winter (2003) emphasizes that routines are not only replicable, but also learnt and specifically oriented behavioural patterns of organizations, i.e. routines refer to specific constellations of resources.

In the concept of Nelson and Winter routines are considered stable and they embody also a certain kind of “genetic disposition” of an organization. In this vein the procedural idea of an ongoing process of routine development is limited to the routine disposition at a given time. Routines can be changed and improved in a time consuming evolutionary process. However, change and variation of the routine set is not inherent in this concept as an endogenous variable but is evolutionary conceptualized and therefore understood as based on exogenous shocks.

More recently this idea of stable routines which change uncontinuously due to external pressures is abandoned in favor for a more flexible understanding of organizational routines. Feldman (2000) has introduced the idea of changing routines, conceptualizing routines as a trigger for change. Also the metaphor of a genetic disposition of an organization is substituted by more flexible ideas. Pentland and Rueter (1994) operate with the idea of organizational routines in the sense of a grammatical rule set. In this language metaphor, the organizational performance (like speech acts), i.e. the way resources are put together, is both limited and enabled by the background of a complex grammatical structure.

In all these concepts the procedural aspect of the genesis of organizational routines comes to the fore. Organizational routines are history-bound and they are carriers of the (learning) history of an organization. A developed set of routines therefore embodies the whole experience an organization has internalized by coping with a complex and competitive environment. Therefore it stands to reason to link the concept of routines with the idea of organizational capabilities.

Stressing the historical nature of organizational capabilities emphasizes that time is a basic dimension of a capability and that there are no time compression economies (Dierickx and Cool, 1989). Capability development takes time and the way that time is taken is relevant for the building of the capability. Organizational capability is a time-based concept, integrating the past, the present, and the future. It should be pointed out here, that it would be misleading to conceive organizational capabilities as totally stable and unchangeable entities. Capabilities evolve and evolution implies gradual adaptation processes over time. Helfat and Peteraf (2003) refer to exactly this point by introducing the idea of a capability life-cycle. They argue that capabilities, just the same as products, have development paths that follow recognizable stages from founding to decline/renewal.

### 2.3 Discussion

The short glance at the basic characteristics of capability shows that to a certain degree, a kind of natural change is inherent in any capability evolvement. Behaviouristic approaches to organizational Learning describe this process as adaptive-learning (see March and Olsen, 1976, p. 54f.). The underlying logic is one of the bounded rational organization, which consequently always selects and combines resources under conditions of ambiguity. Behaviouristic organizational learning theory follows a stimulus response logic, i.e. for our understanding of organizational capability: specific practicing processes are leading to observable actions that enable the organizations to gain experience. *“Organizations and the people in them learn from their experience. They act, observe the consequences of their actions, ... , and draw implications for future actions”* (March and Olsen, 1976: 67). If positively connotated, specific practicing patterns evolve over time and are leading to somehow reliable linkages and even to action patterns which anticipated to be successful (workable). It has to be pointed out here, that this “rationale” view on learning processes must be put into perspective as the learning-process is imperfect again. In contrast to the “optimal-machine” analogy, an competent organization can be viewed as an intelligent but fallible “organism” trying to adapt imperfectly to changing tasks (Dosi *et al.*, 2003: 170). Similarly it is referred to the mode of “adaption” (Cyert and March, 1963) or “mutation” (Nelson and Winter, 1982: 18) to explain change of capabilities.

In sum it can be stated that the evolvement of organizational capabilities always covers change in terms of explorative (Levitt and March, 1988; March, 1991) or incremental

learning processes and that a competent organization successfully displays learned problem-solving *patterns*. To that extent, any capability is consequently dynamic in nature.

### **3 The problematic side of organizational capabilities**

There is empirical evidence that once successful practicing-pattern can become the cause of failure (Miller, 1994; Burgelman, 2002). This is the case if environmental tasks change (changed market-rules/rules of the competitive game) and the established practicing-patterns are – from the point of view of the market – no longer successful. Capabilities, or specific ways of doing things, can thus become obsolete (Dougherty, 1995; Leonard-Barton, 1992). The reason for this process of stabilization or convergence is caused by the fact that organizations tend to unconsciously seek confirmation of their expectations in order to preserve its cognitive resources and maintain its structural stability (Weick, 1979). The findings on core-rigidities or even core incompetencies show that the same ways of doing are at one moment successful (in the opinion of the market) and can yet more or less abruptly turn into the contrary, i.e. failure. Dougherty found that “incompetencies seemed to have evolved from what had at one time been the firm’s core competence, but they had become reified, which refers to the process by which conventions originally intended to represent a reality come to be seen as real in their own right” (Dougherty, 1995: 117).

The reason why organizations are often not able to adequately change their ways of doing can be found in the emergence of path-dependence (Arthur, 1983). That is, once successful combinatorial activities generate positive feedback loops, thereby emergently constituting self-reinforcing processes (Liebowitz and Margolis, 1995). Once successful practices influence future practices in the sense of “history matters” (David, 1985). The emphasis is on the fact that options for the further development of organizational practices at each point of time are sharply constrained by the heritage of the past (Dosi *et al.*, 2000). Put differently, positive feedback induced self-reinforcing-processes solidify over a period of time resulting in a lock-in. This path-dependency disables the organization to realize alternative – more workable – ways of doing, thus fostering the emergence of an (unconscious) path-dependency.

This important fact is mentioned by a lot of writers in the field and it is often linked to the notion of path dependence and lock-in (Burgelman, 2002; Teece *et al.*, 1997). Under

certain circumstances organizations tend to a problematic closure and simplicity (Miller, 1993, Miller and Toulouse, 1998) and specific settings of capabilities reveal their rigid character. In this sense the development of a core capability is a time consuming process where history matters (David, 1985). Core capabilities are interpreted as the result of a complex and contingent historical development which leads to a specific social, cognitive and/or emotional organizational pattern (Tripsas and Gavetti, 2000) related to the highly specific allocation and combination process of (scarce) organizational resources.

But however the notion of path dependence means more than the mere statement that a company's capabilities are dependent on past decisions and events (Arthur, 1989; Cowan and Gunby, 1996). It refers also to the perils inherent in any developed core capability: to be locked-in. Thus even if the fact of path dependence is acknowledged by the most part of the literature the peril of a lock-in situation and its consequences is not really addressed. A prototypical conceptualization can be found for example in the following statement:

*"While path dependence is a basic premise in the resource-based view of the firm (i.e., every firm has an idiosyncratic set of resources and skills that lead to a potentially unique strategy and competitive advantage), it could make the firm less flexible and adaptable to environmental changes. On the other hand, path dependence can reinforce the firm's patterns of learning through complex social arrangements. As such it does not necessarily produce inflexibility and loss of dynamic quality in its core competences."* (Lei et al., 1996: 565)

Taking path dependence not as a mere metaphor but as a conceptual idea one has to state that this is definitely not the case. Path dependence leads always and by definition to a situation where a company has at least partly lost its capabilities (sic!) for coping with new efforts and certainly for double-loop learning (Argyris, 1976, 1990; 2004). If a company is locked-in by the specific capabilities which it has developed over a period of time, it is indeed only a matter of time until success leads to failure (Audia et al., 2000).

The process of path dependence in its stronger sense refers to this problem of the flip side of every capability. This does not mean that every core capability at a certain time is the only destiny of a company (Burgelman, 2002). There are certainly ways out of the capability trap (O'Driscoll et al., 2001), but the first and necessary step out of a lock-in capability is to develop an analytical perspective on it, including the concern of path



monitoring and path breaking abilities. The theory of path dependence shows that the overcoming of an existing core capability (which has shifted over into core rigidity) requires a path breaking ability and that means an ability to “destroy” capabilities. For the development of organizational capability this has a paradox implication: *The same* practicing pattern is at the same time source of success and failure, depending on the attributed usefulness.

But what happens if the previously successful practice becomes unsuccessful and flips into rigidity and becomes locked-in? Then the previously taken for granted problem-solving practices have – at least from a managerial perspective – to be called into question and reasons have to be found, *why* they fail and *why* the specific practice flips. Here, a problematic issue comes to the fore: Since capability represents a pattern of practice with a high degree of implicitness evolved over a period of time, the organization usually has not developed an articulated understanding of its capabilities.

In consequence organizations are faced with the dilemma of both utilizing and maintaining their “ways of doing” and at yet avoiding their so called “*dysfunctional flip side*” by renewing and replacing them. The *need for revision* and change goes hand with the potential rigidification (Leonard-Barton, 1992, 1995) of the patterns of practice. Thus, the distinction between a successful and a non-successful capability and the reflection on the reasons for a (potential) failure becomes relevant. In the following section we examine in which way the practice-based concept of organizational capability allows to meet this “need for reflection”.

#### **4 Organizational capabilities and reflecting**

The problem described above refers to a complex understanding of different aspects concerning the development, the maintenance and the results of organizational capabilities. From a managerial point of view this problem comes close to the decision dilemma between exploration and exploitation (March, 1991). In other words: how long should an organization stay with its developed capabilities and when it is the right time to overcome the established organizational patterns and to change an organization fundamentally? In different studies Miller has shown that many organizations miss this point of departure and stay too long with a (then) formerly recipe for success. The reasons for this misconduct are manifold but they are best summarized with a collective

organizational blindness. And this blindness is the worse the higher the formerly success has been. The theory of path dependence refers to this form of blindness in terms of social, emotional and/or cognitive forms of lock-in (Schreyögg *et al.*, 2003)

These forms of lock-ins could be interpreted as different problems of reflection. In its severest occurrence an organization is locked-in by self-reinforcing blindness constituting a "*reflection trap*". The descriptions of processes of escalating commitment for instance are good empirical examples of this phenomenon.

Contrasting these findings with the idea of dynamic capabilities one has to conclude or the problem is solved or it is only neglected in this concept. However for solving this problem in order to deal with the threat that "success could bread failure" an organization has to establish a reflection level of its on structures and processes. But this reflection level has to be different from the established capability. It could not be part of the capability itself (Schreyögg and Kliesch, 2005).

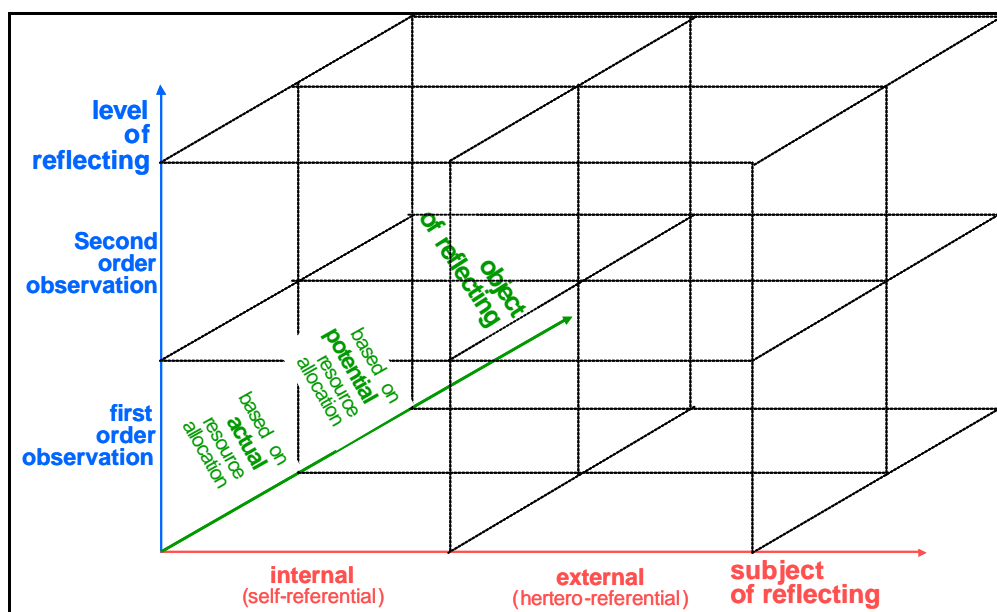
This requirement might be irritating and not really understandable in the perspective of those who advocate the concept of dynamic capabilities. If organizational capabilities are based on organizational practices and these practices include a certain kind of reflection because they are considered as being based on human actions, than the problem of blindness seems to be a pseudo-problem. On contrary one could state that organizational capabilities are *self-reflecting capabilities* because it is exactly this feature of reflection which is the hall mark of the concept.

On the other side the problem of blindness is a real one and it is related to processes of closed self-reference, meaning processes which are only self-reinforcing by focussing more and more on pure self-reference by excluding more and more any hetero-referential aspects. Therefore to understand this inherent reflection capacity it is necessary to distinguish different forms of processing self-reference. With Luhmann (1995) one can distinguish at least two important and different forms of self-reference, referring to different forms of self-referential operations which one can call *reflection* and *basal self-reference*. According to Luhmann, the operation of constituting a boundary constitutes the unity of a system but not the identity of that system. The difference between unity and identity is therefore important and is related to the position of an observer. While the unity of a system can be observed only by an external observer (an observer observing with another

frame of reference), the identity of a system is constituted by a self-observation of that system building upon the difference constituting the self-observing system.

When Luhmann (Luhmann, 1990; 1995) describes social systems not only as self-referential but also as autopoietic systems, he focuses on that insight: The operation of constituting a boundary of a system (which *is* the system) cannot be observed and therefore cannot be reflected *in* that moment of constitution or *by* the distinction which is constituted in that moment.

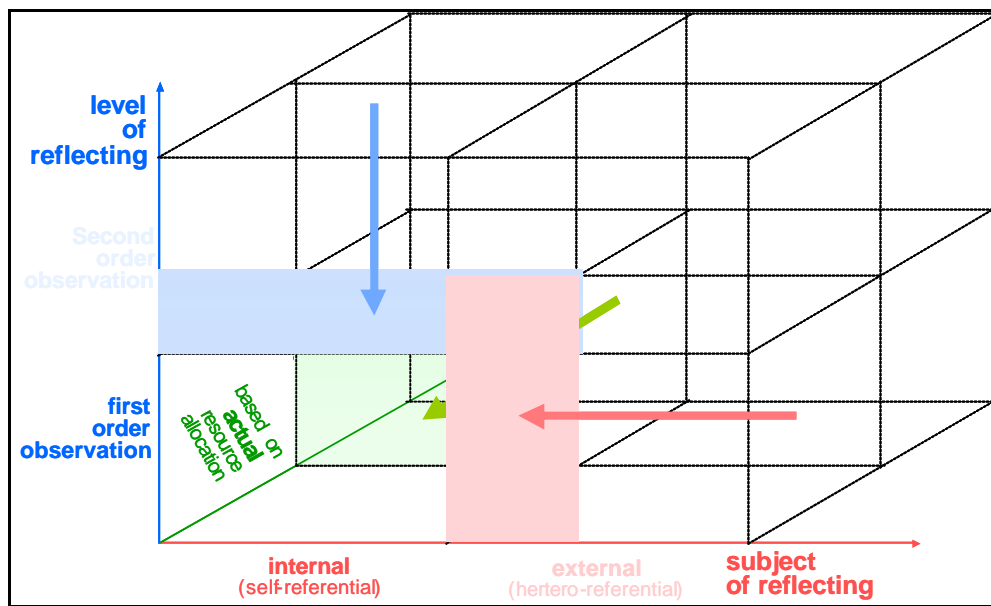
Following this conceptualization one can distinguish two different levels of reflection (first and second order observation), two different subjects of reflection (the self-reflecting organization and an external observer) and two different objects of reflection (the “organizational capability”, in terms of *actual* resource allocation and what is excluded by that “organizational capability”, i.e. the *potential* resource allocation). See Fig. 1:



**Fig.1.** Levels, Subjects and Objects of Reflecting

As a result of this conceptualization we can see (sic!) the possibilities and limitation of “reflecting capabilities”. For a dynamization of such capabilities an organization has to include a kind of hetero-referential, second-order observations regarding not only the

actual but also potential sets of resource-allocations. In contrast, a systematically blindness excludes all these fields: Applying the three dimensions to the evolving logic of organizational capabilities reveals the following picture: On the long run, an internal observer is first-order reflecting on actual resource allocations (capabilities) thereby constituting a “window of closure”. See. Fig. 2:



**Fig.2.** Evolving Capabilities and the Window of Closure

To sum up, with regard to the dynamic development of organizational capabilities we argue for an analytical and conceptual approach which enables an organization to distinguish between different kinds of reflection-activities and highlights the relevance of an “observation mode”. On the basis of three dimensions: (1) Level of observation, (2) Subject of observation and (3) Object of observation critical junctures for the development of organizational capabilities are exposed and supply the organization with points of contacts to get a handle on risk of dysfunctional flips and lock-in. It should be pointed out however, that the extracted reflecting activities take place simultaneously.

## 5 Connecting diverse frames of references as a solution?

Since, stabilizing and de-stabilizing processes cannot be realized *at the same time*, the processes of organizational capability evolvement and development may have to be “temporarily and locally deskewed”. By conceptually deskewing reflecting in practicing from reflecting on practicing, the concept of organizational capability with its underlying functioning logic is maintained, since there is time and space for the evolvement of complex linking-pattern in a permanent interaction process between organization and environment. In order to compensate the risk of a dysfunctional flip or to reside in a lock-in, the modus of an external second order observer is a necessary precondition. This external observer can complement internal observations and can potentially provide the organization with “enriched” irritations. By focussing on the observing of enacted resources-linkages (allocated resources) but also not-enacted resource-linkages (not allocated resources) and the reasoning for drawn distinctions the external observer can at least provide a focal organization irritations, which – due to the different identity (frame of reference) qualitatively differ from that of an internal observer. The reflecting activity we have in mind is a second-order observation, i.e. an observation of a first-order observer. Organizational capability is a – as has been shown above – practice-bound success category. By practicing distinctions are drawn automatically as (in terms of *new systems-theory*) doing means drawing distinctions. In first-order observing processes distinctions are drawn without being aware of how the distinctions are drawn. How the distinctions are drawn is thus the blind spot of the first order observer. This blind spot can be seen only by a second-order observing process. By asking how the distinction is drawn second-order observing reflects on the first-order practicing. The second-order observation practice constitutes a category different from first-order practicing. Second-order observing is not part of this first-order acting-practice (Luhmann, 1993). For a moment, through second-order observing, the organization takes time out in order to take time in to reflect on the reasons for specific way of doing. It should be pointed out however that a second-order observer – no matter if he observes as an external or internal observer - has no objective reality, but that it is socially constructed itself (Berger and Luckmann, 1966).

In general second order observations come close to “double loop learning” or as it is called by March, explorative learning (Argyris, 1976; March, 1991). By double-loop learning the

previously taken for granted background assumptions ('theories-in-use') guiding the action-practicing, are thought to be called into question, meaning that reasons for 'the certain way of doing' have to be found (Argyris and Schön, 1978). To put it differently, through this observation *capabilities are marked as potentially revisable*. It is marked with an index of uncertainty, i.e. the validity and temporality of capability becomes a sustainable critical issue in the (inter)-organizational discourse. From a managerial point of view the external reflecting on practicing-and non-practicing-patterns is a separate function to be executed on its own logic. By continuously checking whether the practicing-patterns still apply and/or registered events from inside or outside are likely to threaten the validity of the current capability in the future, flexibility in terms of critical reflection and response options for redirecting the firm can be gained. If the reflecting on practicing process is to succeed, it must be kept open; it must not become subject to (closing) routinization, otherwise – in this should be clearly pointed out here, second-order-observation-processes or double-loop learning run into problematic sides of routinization as well (Infinite regress) Only then is there a good chance of detecting extraordinary, unforeseen signals which may call the ongoing validity of the current capability patterns into question (for a detailed discussion of the organization of observation see Schreyögg and Kliesch, 2005).

In order to really irritate an organization with its evolving capabilities the available potential of irritation has to find the way into the organization. Only then organizational capabilities can continuously be supplied with a dynamic logic going (far) beyond the "natural dynamism" which is inherent in any organizational capability evolvment. In other words, the hurdle of connecting the internal and external observers has to be overcome. In that sense the development of dynamic organizational capabilities always needs two processes: A first processes which disconnects observing activities and a second process which connects the different frames of levels again.

## **6. Conclusion**

The central contribution of the paper is to that organizational capability is no longer exclusively a strategic and reliable ability but generally is marked with an index of uncertainty: The issue of validity and temporality of capability is institutionalized by highlighting the reflecting side of practices and extracting different kinds of those reflecting activities. This notion of a reflecting-practices might invite to regard the different

dimensions of 'observation' and reflecting as being able to gain insight on the nature of dynamizing organizational capabilities (Antonacopoulou and Tsoukas, 2002). In order to really establish a *dynamic* capability and not "just" normal capabilities a system of a "disconnected-connectivity" (may be in terms of loose coupling) needs to be established. Further research is needed on the question of how to accomplish this very complex and difficult undertaking.

## References

- Antonacopoulou E, Tsoukas H. 2002. Time and reflexivity in organization studies. *Organization Studies* **23**(6): 857-862.
- Argyris C. 1976. Single-loop and double-loop models in research on decision making. *Administrative Science Quarterly*(21): 363-375.
- Argyris C. 1990. *Overcoming organizational defenses*. Boston.
- Argyris C. 2004. Double-loop learning and implementable validity. In H Tsoukas, N Mylonopoulos (Eds.), *Organizations as knowledge systems*. New York.
- Argyris C, Schön DA. 1978. *Organizational learning: A theory of action perspective*: Reading, Mass.
- Arthur B. 1989. Competing technologies, increasing returns, and lock-in by historical events. *Economic Journal* **99**: 116-131.
- Arthur WB. 1983. Competing technologies and lock-in by historical events: The dynamics of allocation under increasing returns. International Institute for Applied Systems: Laxenburg.
- Audia PG, Locke EA, Smith KG. 2000. The paradox of success: An archival and a laboratory study of strategic persistence following radical environmental change. *Academy of Management Journal* **43**: 123-148.
- Barney JB. 1991. Firm resources and sustained competitive advantage. *Journal of Management* **17**(1): 99-120.
- Barney JB. 1997. Looking inside for competitive advantage. In A Campbell, LK Sommers (Eds.), *Core competency-based strategy*: 13-29. International Thomson Business Press: London.
- Berger PL, Luckmann T. 1966. *The social construction of reality: A treatise its the sociology of knowledge*. Anchor Books: New York.
- Burgelman RA. 2002. Strategy as vector and the inertia of coevolutionary lock-in. *Administrative Science Quarterly* **47**: 325-357.
- Burgelman RA. 2002. *Strategy is destiny. How strategy-making shapes a company's future*: New York.
- Cohen MD, Bacdayan P. 1994. Organizational routines are stored as procedural memory: Evidence from a laboratory study. *Organization Science* **5**: 554-568.
- Cowan R, Gunby P. 1996. Sprayed to death: Path-dependence, lock-in and pest control strategies. *Economic Journal* **106**: 521-542.
- Cyert RM, March JG. 1963. *A behavioral theory of the firm*. Prentice-Hall: Englewood Cliffs, NJ.
- Danneels E. 2002. The dynamics of product innovation and firm competencies. *Strategic Management Journal* **23**: 1095-1121.

- David P. 1985. Clio and the economics of qwerty. *American Economic Review* **75**(May): 332-337.
- Dierickx I, Cool K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science* **35**: 1504-1510.
- Dosi G, Hobday M, Marengo L. 2003. Problem-solving behavior, organizational forms, and the complexity of tasks. In CE Helfat (Ed.), *The sms blackwell handbook of organizational capabilities*: 167-192. Blackwell Publishing Ltd: Malden.
- Dosi G, Nelson RR, Winter SG. 2000. Introduction: The nature and dynamics of organizational capabilities. In G Dosi, RR Nelson, SG Winter (Eds.), *The nature and dynamics of organizational capabilities*. Oxford University Press: New York.
- Dougherty D. 1995. Managing your core incompetencies for corporate venturing. *Entrepreneurship Theory and Practice* **19**(3): 113-135.
- Eisenhardt KM, Martin JA. 2000. Dynamic capabilities: What are they? *Strategic Management Journal* **21**: 1105-1121.
- Feldman MS. 2000. Organizational routines as a source of continuous change. *Organization Science* **11**(6): 611-629.
- Gherardi S, Nicolini D. 2002. Learning in a constellation of interconnected practices: Canon or dissonance? *Journal of Management Studies* **39**(4): 419-436.
- Hamel G, Heene A (Eds.). 1994. *Competence-based competition*. John Wiley & Sons: Chichester u.a.
- Hamel G, Prahalad CK. 1994. *Competing for the future*: Boston.
- Hannan MT, Freeman J. 1977. The population ecology of organizations. *American Journal of Sociology* **82**: 929-964.
- Hannan MT, Freeman J. 1984. Structural inertia and organizational change. *American Sociological Review* **49**: 149-164.
- Helfat CE, Peteraf MA. 2003. The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal* **24**: 997-1010.
- Kusunoki K, Nonaka I, Nagata A. 1998. Organizational capabilities in product development of japanese firms: A conceptual framework and empirical findings. *Organization Science* **9**(6): 699-718.
- Lei D, Hitt MA, Bettis R. 1996. Dynamic core competencies through meta-learning and strategic context. *Journal of Management* **22**(4): 549-569.
- Leonard-Barton D. 1992. Core capabilities und core rigidity: A paradox in managing new product development. *Strategic Management Journal* **13**: 111-126.
- Leonard-Barton D. 1995. *Wellsprings of knowledge*: Boston.
- Levinthal D. 2000. Organizational capabilities in complex worlds. In G Dosi, RR Nelson, SG Winter (Eds.), *The nature and dynamics of organizational capabilities*. Oxford University Press: Oxford.
- Levitt B, March JG. 1988. Organizational learning. *Annual Review of Sociology* **14**: 319-340.
- Liebowitz SJ, Margolis SE. 1995. Path dependence, lock-in, and history. *Journal of Law, Economics, and Organization* **11**(1): 205-226.
- Luhmann N. 1990. *Autopoiesis of social systems*. Oxford University Press: New York and Oxford.
- Luhmann N. 1993. Deconstruction as second-order observing. *New Literary History* **24**: 763-782.
- Luhmann N. 1995. *Social systems*. Stanford University Press: Stanford.



- March JG. 1991. Exploration and exploitation in organizational learning. *Organization Science* **2**(1).
- March JG, Olsen JP. 1976. Organizational learning and the ambiguity of the past. In JG March, JP Olsen (Eds.), *Ambiguity and choice in organizations*: 54-68: Bergen.
- Marengo L. 1992. Coordination and organizational learning in the firm. *Journal of Evolutionary Economics* **2**: 313-326.
- Miller D. 1993. The architecture of simplicity. *Academy of Management Review* **18**: 116-138.
- Miller D. 1994. What happens after success: The perils of excellence. *Journal of Management Studies* **31**: 325-358.
- Miller D, Toulouse JM. 1998. Quasi-rational organizational responses: Functional and cognitive sources of strategic simplicity. *Revue Canadienne des Sciences de l'Administration* **15**: 230-244.
- Nelson RR, Winter SG. 1982. *An evolutionary theory of economic change*. The Belknap Press of Harvard University Press: Cambridge, Mass.
- O'Driscoll A, Carson D, Gilmore A. 2001. The competence trap: Exploring issues in winning and sustaining core competence. *Irish Journal of Management* **22**(1): 73-90.
- Pentland BT, Rueter H. 1994. Organisational routines as grammars of action. *Administrative Sciences Quarterly* **39**: 484-510.
- Prahalad CK, Hamel G. 1990. The core competence of the corporation. *Harvard Business Manager* **2**: 79-91.
- Schreyögg G, Kliesch M. 2005. Dynamic capabilities and the development of organizational competencies: Working Paper Institut of Management. Freie Universität Berlin, **25/05**, 40 pages.
- Schreyögg G, Sydow J, Koch J. 2003. Organisatorische pfade - von der pfadabhängigkeit zur pfadkreation? In G Schreyögg, J Sydow (Eds.), *Managementforschung* **13**: 257-294. Gabler: Wiesbaden.
- Teece DJ, Pisano G, Shuen A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal* **18**(8): 509-533.
- Tripsas M, Gavetti G. 2000. Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management Journal* **21**: 1147-1161.
- Turner D, Crawford M. 1994. Managing current and future competitive performance: The role of competence. In G Hamel, A Heene (Eds.), *Competence-based competition*: 241-263. John Wiley & Sons: New York, Brisbane, Toronto et al.
- Weick KE. 1979. *The social psychology of organizing*. Addison Wesley: Reading, Ma.
- Weinert FE. 2001. Concept of competence: A conceptual clarification. In DS Rychen, LH Salganik (Eds.), *Defining and selecting key competencies*: 45-65. Hogrefe&Huber: Seattle.
- Winter SG. 2000. The satisficing principle in capability learning. *Strategic Management Journal* **21**: 981-996.
- Winter SG. 2003. Understanding dynamic capabilities. *Strategic Management Journal* **24**: 991-995.