DYNAMIC CAPACITY:
ON THE INTERPLAY BETWEEN ROUTINIZED AND AD-HOC CHANGE

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Abstract:

The dynamic capabilities approach aims to explain the adaptation of a firm’s resource and capability base in rapidly changing environments. However, despite two decades of research, the concept remains rather amorphous in regard to definitions, conceptualizations, and operationalizations in empirical research. Furthermore, exclusive focus on routinized activities has led to an incomplete picture of adaptation processes. In particular, in high-velocity markets, organizational adaptation relies on ad-hoc change governed by rule regimes that determine the firm’s trajectory. In this paper, we introduce the concept of dynamic capacity as the firm’s ability to integrate routinized and ad-hoc adaptation. Drawing on the micro-processes of sensing, seizing, and reconfiguration, we explain how the density of a firm’s rule regime regulates the pace of change. Consequently, the dynamic capacity facilitates a differentiation between different modes of adaptation and, therefore, pushes the envelope of the dynamic capabilities approach.

1. INTRODUCTION

How firms change is a persistent theme in organizational literature. Building on the resource-based view of the firm (cf. Barney, 1991; Peteraf, 1993), the dynamic capabilities view (DCV) has emerged as the dominant approach to explain organizational adaptation (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Put simply, the DCV focuses on how firms can change their value-creating resources and capabilities over time to achieve congruence with an
evolving environment. However, there is still some ambiguity surrounding the dynamic capabilities concept (Arend & Bromiley, 2009). This ambiguity is not surprising, given the fact that the concept is still in an early stage of its development (cf. Helfat & Peteraf, 2009b). Precisely because the dynamic capabilities perspective provides a useful view in strategic management (Barney, 2001; Newbert, 2007), we need a better understanding of it. However, even after two decades since its first conceptualization (Teece & Pisano, 1994; Teece, Pisano, & Shuen, 1990) and despite numerous attempts to establish a theoretical grounding, the DCV remains rather amorphous. Basically, the ambiguity of the concept is a consequence of various heterogeneous definitions of dynamic capabilities that provoke different connotations (Di Stefano, Peteraf, & Verona, forthcoming). The development of a common understanding is therefore the logical first step in sharpening the concept.

A better understanding of the nature of dynamic capabilities also requires an examination of their micro-level origins. Although, recently there have been several efforts by scholars to uncover the microfoundations of the capabilities concept in general and the concept of dynamic capabilities in particular (Abell, Felin, & Foss, 2008; Gavetti, 2005; Hodgkinson & Healey, 2009; Teece, 2007), there are still many questions to be answered regarding the interplay of individual and organizational factors. Further, research on dynamic capabilities tends to focus exclusively on single routines that drive change (Ambrosini & Bowman, 2009; Eisenhardt & Martin, 2000). Examples include routines for innovation (Danneels, 2002; Verona & Ravasi, 2003), for restructuring (Camuffo & Volpato, 1995; Galunic & Eisenhardt, 2001), for corporate venturing (Keil, 2004), for alliance building (Heimeriks & Duysters, 2007; Heimeriks, Klijn, & Reuer, 2009), for continuous morphing (Rindova & Kotha, 2001), or for replicating operational routines in post-merger integration processes (Szulanski, 2002). As a consequence, the DCV does not
enable researchers to examine the change behavior of organizations as a whole, but is concerned only with certain facets of organizational adaptation. Additionally, by focusing solely on routinized behavior, ad-hoc change, which is a functional equivalent to dynamic capabilities (Schreyögg & Kliesch-Eberl, 2007; Winter, 2003), is excluded from the analysis of change events. The focus on routinized adaptation is a result of the DCV’s anchorage in evolutionary economics (Nelson & Winter, 1982). Despite some notions (Di Stefano et al., forthcoming; Helfat & Peteraf, 2009b) of the DCV’s co-foundation in behavioral theory (Augier & March, 2008; Cyert & March, 1992; March & Simon, 1958), pivotal elements of behavioral theory, e.g. the role of decision-making structures, rule regimes, bounded rationality, and ad-hoc decisions within a set of rule-based expectation structures, have not yet been integrated into the DCV.

However, to a great extent, especially disruptive change happens in an ad hoc manner (Tushman & Romanelli, 1985). Felin and Foss (2005, p. 164) argue in this vein that “much of what really matters (note: not necessarily much of what happens) in organizations has to do with exceptions [...] rather than routines”. Consider, for example a merger between two large organizations, e.g. Daimler Corp. and Daimler-Benz AG (Epstein, 2004), Intels shift from memory to microprocessors (Burgelman, 1994), or business-process reengineering processes in an SME. Large adaptation processes, which happen only once, or very rarely, cannot be fully routinized. This especially holds true in fast-pace markets, which is where – according to seminal works (e.g. Teece et al., 1997) – dynamic capabilities are needed most urgently. In order to fully capture and understand processes of organizational change and strategic renewal, we need a conceptual lens to analyze adaptation processes more generally (cf. Baden-Fuller & Volberda, 1997), without sacrificing the benefits of drawing on the valuable insights that researchers in the tradition of the DCV have generated hitherto. The success of this endeavor is at least partly dependent on how
far researchers take human agency into account. Having this consideration in mind, a closer look at current DCV-research reveals some remarkable insights:

1. Empirical studies on dynamic capabilities, often, do not focus on routines as such but rather on antecedents or consequences of a general organizational ability to effect or to manage change (e.g. Helfat, 1997; Lichtenthaler, 2009; Luo, 2002). However, the consequences of such a conceptualization have rarely been discussed.

2. Uncovering the microfoundations of organizational evolution and strategic change is currently an intensely debated issue. Micro-level analyses of routines are needed (Easterby-Smith, Lyles, & Peteraf, 2009; Felin & Foss, 2005; Foss, 2005) in order to explain the origins of capabilities on the one hand, and organizational adaptation in general on the other (Gavetti, 2005; Teece, 2007).

In this paper, we analyze the existing state of the field of the DCV and indicate its main deficits: ambiguous definitions, unclear focus in empirical research, exclusion of the boundaries of change, and the lack of a systematic microfoundation. Based on this analysis, we develop the foundations of a rule-based dynamic capacity. An organization’s dynamic capacity is its ability to grasp impulses of change, either in an ad-hoc manner or via change routines (i.e. dynamic capabilities) or to suppress these impulses. Whether organizational change is effected or prevented is determined by the configuration of formal and social rules, which forms a corridor for organizational action. This corridor defines the boundaries of the organizational development path. Although we acknowledge that dynamic capabilities constitute a functional equivalent to ad-hoc change, the construct of a dynamic capacity builds on the interplay of routinized change via dynamic capabilities and the creation of “contexts for change”. Because it is not limited to
routinized change activities only, the dynamic capacity concept allows a more complete picture of adaptation processes in organizations to be drawn. Therefore, we add insights from the behavioral theory to describe the rule-based context for ad-hoc adaptation to the evolutionary foundation of the DCV. In sum, the aim of the paper is to generate a more differentiated view on adaptation processes and to overcome some of the shortcomings that currently exist within the DCV.

2. CONCEPTUAL BACKGROUND: THE DCV AND ITS SHORTCOMINGS

During the past two decades, the dynamic capabilities concept has become a central building block in explanations of how to adapt the firm’s resource and capability base according to the needs of a dynamically evolving competitive landscape. However, a look at selected definitions of dynamic capabilities (see table 1), shows that hitherto, there has been no general consensus regarding the nature and function of dynamic capabilities (Ambrosini & Bowman, 2009; Di Stefano et al., forthcoming; Gavetti, Levinthal, & Ocasio, 2007; Williamson, 1999). Additionally, the large number of significant contributions to the dynamic capabilities concept published in the last few years makes it hard to grasp the concept’s essence and to classify the literature systematically. The difficulties range from finding a commonly accepted definition to specifying the concrete function of dynamic capabilities. Zahra, Sapienza and Davidsson (2006, p. 921) noted already in 2006 that „reviewing this literature [of dynamic capabilities – ann.], we find it riddled with inconsistencies, overlapping definitions, and contradictions“. Papers entitled „Dynamic Capabilities: What are they?“ (Eisenhardt & Martin, 2000), “Understanding Dynamic Capabilities“ (Winter, 2003), „Explicating Dynamic Capabilities“ (Teece, 2007), or „What are Dynamic Capabilities and are they a useful construct in strategic management?“ (Ambrosini & Bowman, 2009) suggest that there is still some ambiguity concerning the concept.
**Ambiguous/inconsistent definitions:** Di Stefano, Peteraf and Verona (forthcoming) show in their recent review of various dynamic capabilities definitions, that there is still a lack of consensus regarding the concept’s *nature*. This is not surprising because the (dynamic) capabilities concept largely builds on the concept of organizational routines which itself is multi-faceted (Becker, 2004; Felin & Foss, 2009). Terminological haze is therefore a logical consequence. Drawing on the notion of organizational routines (Nelson & Winter, 1982), some researchers define dynamic capabilities as organizational and strategic *routines* (Eisenhardt & Martin, 2000), learned and stable *pattern[s] of collective activity* (Zollo & Winter, 2002), or as *change-oriented capabilities* (Zahra & George, 2002). In a very simplified manner, according to this perspective, dynamic capabilities constitute routines to change (operational) routines (Winter, 2003; Zahra et al., 2006). However, approaching the dynamic capabilities concept by defining them as a specific form of routine makes them *an observable phenomenon*. Methods for an empirical observation of routines have just recently been systematically identified by Becker and colleagues (Becker, 2005; Becker, Lazaric, Nelson, & Winter, 2005; Becker & Zirpoli, 2008).

In addition to definitions of dynamic capabilities as routine-based competences of the firm, there are also definitions in which dynamic capabilities are constructed in a broader sense and defined as organizational *ability* (Savory, 2006; Teece et al., 1997) or *capacity* (Helfat et al., 2007; Iansiti & Clark, 1994). In this sense dynamic capabilities can be perceived as *latent action* (Di Stefano et al., forthcoming) or as *(latent) potential of the firm to accomplish change and to adapt to a*
changing environment. However, it should be noted that defining dynamic capabilities as ability or capacity does not necessarily mean that they are not perceived as routine-based capabilities. In their response to Arend and Bromileys (2009) critique, Helfat and Peteraf (Helfat & Peteraf, 2009b, p. 92) argue that “the word ‘capacity’ in our definition [...] indicates only some minimal ability to perform a task, regardless of whether it is done well or poorly”; i.e. speaking of a capacity refers to the ability to execute a capability. However, a broad definition leaves a wide scope for different conceptualizations and operationalizations of the concept in empirical research, which directly leads to another shortcoming.

**Unclear focus in empirical research:** A look at empirical studies reveals that the dynamic capabilities concept has been conceptualized and operationalized very differently in empirical research. As a consequence, the picture of the nature of dynamic capabilities drawn by empirical studies is very fuzzy.

Despite the DCVs popularity and the vast number of theoretical papers on the concept, empirical research on dynamic capabilities has remained relatively rare (Pablo, Reay, Dewald, & Casebeer, 2007). At the moment, quantitative research studies outnumber qualitative on resource-based thinking in general (Armstrong & Shimizu, 2007; Newbert, 2007) and on dynamic capabilities in particular (Ambrosini & Bowman, 2009). However, ambiguous definitions of the concept hamper efforts to operationalize and to measure dynamic capabilities in quantitative studies. In this vein, Ambrosini and Bowman (2009, p. 37) argue, “that there may be a lack of evidence, because these capabilities have been poorly specified and hence researchers may not know what to look for”. Additionally, the focus of quantitative studies is primarily on the examination of various factors that enhance the generation or deployment of dynamic capabilities and on the consequences of
dynamic capability deployment. Examples include studies on the influence of experience with similar capabilities or markets on the generation or use of dynamic capabilities (Helfat, 1997; King & Tucci, 2002) on the one hand, and studies on the influence of dynamic capability deployment on diverse organizational performance measures (Lichtenthaler, 2009; Zollo & Singh, 2004) on the other hand. By doing so, scholars have employed a broad range of proxy variables to study dynamic capabilities in empirical research. Such proxies range from “managerial capabilities decisions about rewards, downsizing and choice to implement just in time inventory processes” (Arend & Bromiley, 2009, p. 84). As a result, much of quantitative research on dynamic capabilities focuses rather on the firm’s general ability to accomplish adaptation than on concrete processes, which makes the generation of a coherent view on the dynamic capabilities construct even more difficult.

Qualitative studies are useful to stimulate insights into the general “hows” of capability deployment. However, because qualitative research allows taking several facets of a phenomenon into account, various scholars have focused on a broad array of underlying processes of dynamic capabilities. Examples include learning processes (Collinson & Wilson, 2006; Danneels, 2002; Keil, 2004; Pietro & Easterby-Smith, 2006), recombination processes (Galunic & Eisenhardt, 2001; Salvato, 2003), coordination processes (Dyer & Nobeoka, 2000; Holbrook, Cohen, Hounshell, & Klepper, 2000), decision-making processes (Maritan, 2001), or search processes (Pablo et al., 2007; Tripsas & Gavetti, 2000). In their comprehensive review of twelve case studies that draw on the DCV, Ridder, Hoon and McCandless (2009) demonstrate that comparatively simple rules and norms play a pivotal role in determining organizational change behavior. Rindova and Kotha (2001, p. 1274) for example describe dynamic capabilities as “emergent and evolving, resting on openended organizing principles”, Dyer and Nobeoka (2000,
show how coordinating principles and rules facilitate knowledge transfers among knowledge sharing networks. Verona and Ravasi (2003) emphasize the role of organizational culture, systems and structures in connection with dynamic capabilities. Although these findings highlight the importance of norms, rules and principles for organizational adaptation, their role has rarely been examined in dynamic capabilities literature (for an exception, see Eisenhardt & Martin, 2000). Since firm survival depends not only on how change is accomplished, but also on how it is prevented, considering the role of organizational rules in the examination of adaptation processes could stimulate further insights into the fragile balance of continuity and change. However, this fragile balance has seldom been taken into consideration by researchers, which leads us to yet another shortcoming.

Exclusion of the boundaries of change: The dynamics of organizational evolution are characterized by the coexistence of the antagonistic forces of change/development and stability/continuity (Graetz & Smith, 2008; Gupta, Smith, & Shalley, 2006; March, 1991). Thus, dynamic capabilities need to account for the balance between those antagonistic forces. However, current literature in strategic management display a “pro-innovation bias” (cf. Abrahamson, 1991; Robertson, Swan, & Newell, 1996), i.e. an unreflecting equation of innovation/change and high performance. Consequently, the complex interplay between change and stability and the necessity to balance them both have rarely been addressed in the dynamic capabilities literature. This neglect is somewhat surprising for at least two reasons. First, existing concepts (note: not necessarily theories) that deal with the management of change show that besides forces for change there are usually also forces for stability and inertia in organizations which are sometimes dealt with under the header of resistance to change (Empson, 2001; Heath, Knez, & Camerer, 1993; Veugelers & Cassiman, 1999). However, the issues of resistance to change and inertia have
been widely ignored in dynamic capabilities research. Second, competitive advantage is a result of the (firm-specific) optimal balance between stability and change (Levinthal & March, 1993). This latter aspect has achieved major attention in research on organizational learning (March, 1991).

Just as an overemphasis on stability and exploitation can lead to competency traps (Levitt & March, 1988) and core-rigidities (Leonard-Barton, 1992), an overemphasis on change and exploration can lead to failure if firms never reap the profits from their investments (Chesbrough & Rosenbloom, 2002; Levinthal & March, 1993). Focusing solely on exploration and change can also lead firms to neglect improvement and adaptation of existing routines, may prevent the organization from benefiting from economies of scale, and may actually become a threat to the identity of the organization and its members (Dutton & Dukerich, 1991). Probst and Raisch (2005), for example, analyzed 100 organizational crises between 2000 and 2005 and identified uncontrolled firm growth and excessive change (in terms of scope and speed) as major sources of failure. Similarly, Siggelkow and Rivkin (2006) examined the downsides of excessive exploration in a simulation study. Thus, firms need to ensure that change is facilitated whenever it is necessary and that change is prevented whenever it is inappropriate. The question remains open, how the DCV can account for that balance. Efforts to overcome this shortcoming can be found in current works that combine the research streams of ambidexterity, i.e. the simultaneous pursuit of exploration and exploitation, and dynamic capabilities (Ancona, Goodman, Lawrence, & Tushman, 2001; He & Wong, 2004; O'Reilly III & Tushman, 2008; Volberda & Lewin, 2003). Balancing antagonistic tendencies also plays a pivotal role in revealing the micro-origins of adaptation (Teece, 2007).
Lack of microfoundations: Much of current research on (dynamic) capabilities builds on the seminal work of Nelson and Winter (1982) and their conceptualization of routines as “genes of the organization”. Consequently, researchers interested in studying organizational phenomena regarded routines and capabilities as the fundamental unit of analysis. Drawing on this “capabilities collectivism”, Felin and Foss (2005, p. 442) argue that “many of the problems associated with capabilities-based work are a result of the focus on collective level constructs (e.g. routines, capabilities) at the expense of individual-level considerations”. As a consequence, examining the microfoundations of organizational capabilities has become a central issue in strategic management.

A recent stream of research focuses on the role that cognitions play for the evolution and deployment of capabilities. Helfat and colleagues (Adner & Helfat, 2003; Helfat et al., 2007; Helfat & Peteraf, 2003, 2009a), for example, highlight the important role of managerial cognition for capability evolution. Similarly, Gavetti and colleagues (Gavetti & Levinthal, 2000; Tripsas & Gavetti, 2000) show how managerial cognition influences the organizational trajectory. However, recent research aims at establishing a closer connection between the individual level and the collective level. Examples can be found in Gavetti (2005), who examined the role of cognition for capability evolution in detail and Teece (2007), who broadly outlined the psychological and behavioral foundations of dynamic capabilities. However, these approaches are usually only loosely linked to organizational rules, which is striking, since formal and social rules determine concrete individual behavior (March, Schulz, & Zhou, 2000). Therefore, insights from behavioral theory can help to understand adaptation in dynamically evolving environments by facilitating the analysis of the role of actors in a rule-based organizational frame. Consequently, efforts to
uncover the micro-origins of dynamic capabilities necessarily have to take ad-hoc behavior in a rule-based context into account.

Research gap: In order to generate new insights into organizational change behavior, we need to emphasize that there are different forms of adaptation which can be differentiated (routinized versus ad-hoc change), but nonetheless have to be both taken into account to understand and explain organizational adaptation. What is currently missing in the discussion of organizational adaptation and development is therefore a framework that integrates different forms of adaptation and that allows for an integration of human agency.

3. DYNAMIC CAPACITY: A MICROFOUNDRATION OF DYNAMIC CAPABILITIES AND THE CONTEXT FOR AD-HOC CHANGE

Dynamic capabilities research distinguishes between ad-hoc problem solving and firm evolution through the deployment of strategic routines, i.e. dynamic capabilities (e.g. Winter, 2003). Zollo and Winter (2002, p. 340) argue that “an organization that adapts in a creative but disjointed way to a succession of crises is not exercising a dynamic capability”. Spontaneous reactions to external events or a one-time idiosyncratic change to the resource-base of an organization therefore do not constitute dynamic capabilities. Similarly, Helfat et al. (2007, p. 5) make the point “that the function that a dynamic capability performs is repeatable and can be reliably executed to at least some extent”. Dynamic capabilities therefore are a specific type of patterned behavior of firms, which is strategically relevant. As a consequence, dynamic capabilities refer only to a specific type of change, i.e. routinized activities that are repeatable and based on deliberate efforts. However, some kinds of change happen in an ad-hoc manner (Felin & Foss,
This is especially true for radical change, such as large M&A processes, restructuring processes, or business venturing.

Consider, for example the capability of managing M&A or alliancing activities. Some organizations may indeed have routines for target identification (Capron & Shen, 2007), due diligence (Zollo, Reuer, & Singh, 2002), the retention management of the target’s valuable human resources (Walsh, 1988), or post-merger integration (Szulanski, 2002). However, for the majority of organizations such processes are rare events or unique ad-hoc change. The high failure rate of post-merger integration processes (Badrtalei & Bates, 2007; Cartwright & Schoenberg, 2006) may serve as evidence. Consequently, firms, which do not acquire other organizations on a regular basis will not have M&A capabilities. Rather, they will manage the acquisition process in an ad-hoc manner. Such firms will probably “borrow” some know-how from consulting firms (e.g. for formal due diligence), but they will not have such dynamic capabilities themselves. However, in both cases, firms adapt their resource-base with the aim to increase competitiveness.

Insert table 2 about here

An examination of organizational rule-systems helps to systematically analyze the boundary conditions of firm adaptation. Additionally, it facilitates the analysis of micro-processes underlying dynamic capabilities, because rules define a corridor, which governs individual behavior. Understanding organizational adaptation therefore includes the generation of an
analytical lens to thoroughly examine routinized behavior and ad-hoc activities of organizations (table 2).

3.1. Organizational routines and the context for ad-hoc change

Organizational routines…: Routines are standardized responses to frequently asked questions, i.e. the execution of a routine relies on the existence of an if-then pattern which is triggered (Nelson & Nelson, 2002). As such, the function of routines is about reducing complexity (cf. Becker, 2004). Since management is basically about managing exceptions (cf. Felin & Foss, 2009), the DCV does not systematically answer the question, what happens if the management is confronted with new challenges? However, an elaboration on this issue is central for generating a deeper understanding of change processes and the evolution of knowledge within organizations.

Routines are collective phenomena (Becker, 2004; Becker & Zirpoli, 2008; Hodgson, 2008). They involve multiple actors who are connected by interaction and share similar beliefs about the correct performance of a routine (Feldman & Pentland, 2003). Although the revision of collective beliefs about a routine in principle is one possible consequence of deviation from its ideal form, most frequently, deviations are either ignored (Luhmann, 1995) or punished (Schulz, 2008). However, there is a different scope for accepted deviation from the collective understanding for each routine (Feldman, 2000; Warren, 2003). Some routines are highly structured and bureaucratic, whereas others are more loosely configured. Take, for example, the rigidity/openness of innovation routines in a large bureaucratic organization like Siemens in comparison to an innovation routine in a small high-tech firm. In large companies, innovation processes are often tightly structured, e.g. if process management know-how such as ISO 9000 is applied to design innovation processes (Benner & Tushman, 2002). On the contrary, small
organizations often innovate in a spontaneous and experimental mode governed by semi-structures that stabilize innovation processes (Brown & Eisenhardt, 1997). Ultimately, routines are structured by organizational rules that configure the integration of individual activities and practices to enable a collective performance. Further, organizational rules do also determine the degree of freedom for ad-hoc optimization and therefore specify the potential for endogenous change of the routine.

…and the context for ad-hoc change: In addition to routines that govern firm behavior, organizations need to provide a context for ad-hoc change, if there are no specific if-then patterns for adaptation available. This assumption results from the deliberation that no organization can have standardized responses, i.e. routines, for all of the challenges it faces, especially when it comes to the issue of strategic change. However, it is important to note that individual actors have different degrees of freedom to operate within this context for ad-hoc change. The boundaries of such a context for ad-hoc change are determined by formal and social rules (Cyert & March, 1992). Drawing on March, Schulz and Zhou (2000, p. 5) we can state that “rules consist of explicit or implicit norms, regulations, and expectations that regulate the behaviour of individual and social life; individual and collective actions are organized by rules, and social relations are regulated by rules”. Just like routines, rules exist independently of any individual. Similarly, rules are learned through socialization (Burns & Flam, 1987; March et al., 2000). They guide perceptions (attention) and behavior and, thus, facilitate the development of a collective mind (Weick & Roberts, 1993), a common mindset (Gupta & Govindarajan, 2002), shared mental models (Kim, 1993), and frames of reference (Gilbert, 2006; Tripsas & Gavetti, 2000).
As long as individuals act in accordance to the organization’s “weltanschauung” (Kim, 1993, p. 42) they enjoy high degrees of freedom to operate, because sets of rules or “rule regimes” (Burns & Flam, 1987, p. 100; March et al., 2000, p. 163) define the corridor of accepted behavior (Budzinski, 2003; Schulz, 2003). However, control mechanisms restrict the scope of accepted deviations (Ouchi, 1980; Warren, 2003). Ideally, rule-following behavior is based on internalization of a rule and its intention (Tyler & Blader, 2005). The adherence of formal rules is ensured through hierarchical control mechanisms (Schulz, 2008). Additionally, violations against social rules and norms are sanctioned by social control mechanisms (Fehr & Fischbacher, 2004; Fehr, Fischbacher, & Gächter, 2002; O’Reilly III & Chatman, 1996). Social rules have the potential to overrule formal ones, since the social interpretation of formal rules decides about whether they have to be observed or not (March et al., 2000; Pentland & Rueter, 1994). Therefore, the significance of formal rules depends on the established social norms within an organization. In many instances, the day-to-day operations are therefore governed by social – informal, unofficial or even illegal – rules (Burns & Flam, 1987, p. 222). As a consequence, research on organizational adaptation has to take social rules and their role in determining the boundaries of adaptive behavior into account. Conflicts emerge when individuals deviate from collective or hierarchical expectations about how to act in a certain situation. Thus, conflicts within an organization indicate that the limits of rule-deviation are reached and the range of tolerance in the performance of an organizational program is exceeded (Hedberg, Nystrom, & Starbuck, 1976).

The scope of a context for ad-hoc change, i.e. how wide or narrow the corridor for adaptation is, is determined by the density of organizational rules (Schulz, 1998). In highly bureaucratic organizations, for example, there are dense rule regimes that usually leave only a narrow scope
for ad-hoc behavior. In contrast, organizations that rely on flexibility and creativity need to display a lesser rule density and a broader scope for ad-hoc behavior. However, it is not only market dynamics (Eisenhardt & Martin, 2000), which influence the scope of the context for ad-hoc change. Drawing on existing literature, the deviation from existing rules may also differ in regard to (1) the existence of major threats or chances (March & Shapira, 1987; Staw, Sandelands, & Dutton, 1981), (2) changes in aspiration levels and expectation structures (Cyert & March, 1992; March & Shapira, 1987), or (3) the availability of slack resources (Hedberg et al., 1976; Levitt & March, 1988). Detailed analyses of the influence of rules on the configuration of ad-hoc contexts for change are necessary, because such contexts create the pathways of the organizational development.

3.2 Expectation structures and the (micro-) foundation of micro-processes

Expectations as rules specify if-then patterns of behavior, i.e. they specify which behavior is expected under certain conditions (Cyert & March, 1992; Luhmann, 1995). Additionally, expectations regulate the firm’s response behavior to adaptation needs. They are at least implicitly connected to objectives that constitute a certain aspiration level. However, by analogy to the concepts of the ecological structure of decision making (Cyert & March, 1992) and the internal selection environment (Burgelman, 1991, 1994), various ideas about how to achieve adaptation compete for attention and other scarce resources within organizations (Ocasio, 1997). Path dependent (Sydow, Schreyögg, & Koch, 2009) expectation structures determine the probability that certain adaptation ideas or impulses are selected. “Selection […] means that prior actions shape the availability and probability of next step alternatives” (Schulz, 2008, p. 238). Ideas that fit existing expectation structures have a higher probability to be realized. Furthermore, adaptation ideas serve either as trigger for the execution of routines or as an impulse for ad-hoc
change. However, the more often a specific case of adaptation happens in an ad-hoc manner, the more likely is the development of pattern for problem solving in a routinized way (Zollo & Winter, 2002). Ad-hoc decisions and activities can condensate in collective routines if their application is perceived as successful and their use is legitimized by the organization or top-managers.

Literature claims that especially (note: not exclusively) firms, which operate within high-velocity markets need dynamic capabilities (e.g. Teece et al., 1997). However, in high-velocity markets, firms will often lack approved patterns of problem solving because of the low predictability of future environmental states. Therefore, novel solutions are required that give rise to ad-hoc behavior (Winter, 2003). Nonetheless, even under such conditions, some firms may create micro-routines in terms of heuristics (Bingham, Eisenhardt, & Furr, 2007) or modular structures (e.g. dynamic communities) that enable a quick reconfiguration (Brown & Eisenhardt, 1997; Galunic & Eisenhardt, 2001; Salvato, 2003). Such adaptation processes are rules-based rather than routine-based. Additionally, creating ideologies or visions contributes to a change of existing mental models, encourages experimentation and therefore broadens the acceptance of ad-hoc solutions (March, 1994).

Existing expectation structures become the more scrutinized the higher the differences between expectations (aspiration levels) and achieved results are (Cyert & March, 1992; Kieser, Beck, & Tainio, 2003). Thus, the probability of a change of existing problem solving routines, i.e. dynamic capabilities, increases, if the concrete performance no longer matches aspirations. Disruptive change in the firm’s environment (e.g. new technologies, competitors) (Tripsas, 1997), the integration of a newly acquired company (Zollo & Singh, 2004) or organizational
growth (Greiner, 1972) can lead to a new configuration of the firm’s expectation structures and to adaptations of rule regimes. Since organizations learn by adjusting their expectations in order to encourage new forms of behavior (Levitt & March, 1988; March & Olson, 1975, 1976), a misfit between aspirations and results increases the likelihood that firms will draw on ad-hoc change instead of using established (dynamic) capabilities.

According to dynamic capabilities literature, existing expectation structures can be modified by the use high-order dynamic capabilities (or meta-capabilities) (Ambrosini, Bowman, & Collier, 2009; Collis, 1994; Winter, 2003). Such capabilities also serve to enable experience accumulation (Zollo & Winter, 2002) and “second-order exploitation” (Lavie & Rosenkopf, 2006). Consequently, they enable firms to deliberately create learning environments in order to reflect on existing routines (first-order dynamic capabilities) and rule regimes which specify the context for ad-hoc change. Organization development processes (OD), team development processes or team learning activities serve as learning arenas that facilitate reflection upon the current state of the organization and its routines and procedures (Antonacopoulou & Chiva, 2007; Edmondson, Bohmer, & Pisano, 2001; March, Sproull, & Tamuz, 1991; Ron, Lipshitz, & Popper, 2006; Starbuck, 1992). As a result of such activities, firms can develop routines in order (1) to learn from failure (Cannon & Edmondson, 2001), (2) to learn from small losses (Sitkin, 1992) or (3) to stabilize successful practices via articulation and codification (Zollo & Winter, 2002). The firm’s expectation structure determines how the micro-processes of sensing, seizing, and reconfiguration (Teece, 2007) are performed. However, it is important to note that all of the micro-processes can be either processed in an ad-hoc or in a routinized manner. In the subsequent section, we discuss the differences between a routinized and an ad-hoc accomplishment of these micro-processes.
Sensing: Firms must constantly scan, search, and explore across technologies and markets in their local and in their distant environment to identify opportunities and threats (March & Simon, 1958; Nelson & Winter, 1982). Cyert and March (1992, p. 173) argue in this vein that “organizations learn to pay attention to some parts of their comparative environment and to ignore other parts”. Research on opportunity recognition (Baron & Ensley, 2006; Mahnke, Venzin, & Zahra, 2007) further underlines the importance of environmental scanning. Teece (Teece, 2007: 1323) emphasizes that “(w)hile certain individuals in the enterprise may have the necessary cognitive and creative skills, the more desirable approach is to embed scanning, interpretative, and creative processes inside the enterprise itself”. As a consequence, organizations usually develop routines for observing the firm’s environment and its internal structures, processes or cultural values and norms. Schreyögg and Kliesch-Eberl’s (2007) concept of capability monitoring serves as an example of routinized sensing activities.

However, a central concern in organizations is how they can specify the boundary conditions for sensing activities, since the latter are – either as part of a sensing routine or as ad-hoc activity – always performed by individuals. Such boundaries can exist explicitly or implicitly and they govern individual sensing activities. As a consequence, firms develop and employ mechanisms, described by Argyris (1990) as organizational defense mechanisms, through which discussions of novel perceptions, which deviate too far from existing mental models or mindsets, are precluded. The case studies of Polaroid (Tripsas & Gavetti, 2000) or Rubbermaid (Helfat et al., 2007) show, for example, how past success leads to an insensitivity to changes in the environmental landscape and serves as main driver of inertia (see also Herriott, Levinthal, & March, 1985; Levitt & March, 1988).
Research on absorptive capacity is a stream of literature, which can further brighten our understanding of sensing processes. The firm’s absorptive capacity, which is the ability of a firm to recognize the value of new, external information, to assimilate it, and to apply it to commercial ends (Cohen & Levinthal, 1990), has been termed a central dynamic capability by some authors (Wang & Ahmed, 2007; Zahra & George, 2002) and depends on the mindset of employees and of the organization’s weltanschauung. Jansen et al. (Jansen, Van Den Bosch, & Volberda, 2005) distinguish between potential and realized absorptive capacity. They show that although diversity in the employees’ skill base increases potential absorptive capacity, organizations absorb more knowledge from outside the firm boundaries when the degree of diversity is low. This finding is counterintuitive, because it shows that an increase of the scope of sensing activities leads to a decrease of the probability that sensing results are absorbed by the organization.

The finding, however, leads to further insights regarding the differences between routinized and ad-hoc sensing, because it shows that the transition between individual sensing and the absorption of the sensed information by the organization is a critical issue. The advantage of routinized sensing basically stems from the existence of defined absorption procedures. In this vein, firms can use formalized methods to structure sensing activities of an individual (e.g. technology portfolios, competitor analyses during strategy development processes). By providing such formalized sensing methods (Becker & Zirpoli, 2009), the organization narrows the search scope of the individual and provides a procedure how to deal with new information. Although employees perform non-formalized sensing activities constantly (e.g. during sales talks, by reading newspapers, by comparing own products with the product range of competitors), newly generated knowledge may never be absorbed, if an organization has no predefined formal or
informal channels to process the results of non-institutionalized, individual ad-hoc sensing. Consequently, (1) the scope of sensing routines is predefined by formalized methods that structure sensing and determine which aspects of the environment can be seen and which cannot. (2) There are different mechanisms that firms can employ to absorb ad-hoc sensing results, which may include information that cannot be generated only by using formalized methods.

**Seizing:** Seizing primarily refers to the process of managerial decision-making: “In more concrete terms, this involves developing a consensus among the senior team about the strategic intent, avoiding the decision traps that path dependencies and mindsets bring, and aligning the business model and strategy. Without these capabilities, firms may sense opportunities and threats, but be unable to act on them in a timely manner” (O'Reilly III & Tushman, 2008: 191). Consequently, seizing is about the decision-rules and patterns that define the triggers for the activation of routines, which facilitate adaptation and asset reconfiguration. Therefore, behavioral theory (Cyert & March, 1992) and decision-making takes a center stage in the discussion of dynamic capabilities and the boundaries of the context of ad-hoc activities. The decision-making behavior of firms is again dependent from their past and, consequently, shapes current decisions as expectations to activate routines or to indicate boundaries are path dependent.

Detailed and complex sets of decision rules incorporate knowledge about appropriate response patterns to a large number of situations. Public administrations, for example, use a dense rule regime to regulate how ideas for optimizing a part of a business process are proceeded within the organization. This is also true for airline companies which have to ensure that pilots follow established procedures, do not deviate from checklists and by no means start to act in a manner “that is more individual than collective“ (Weick, 1990, p. 579). Dense rule regimes therefore
serve to slow the pace of change. Thus, a dense rule set provides stability, which facilitates the exploitation of existing capabilities. Weick (1990) and Weick and Roberts (1993) analyze in their studies of failure in high-reliability organizations how disastrous it can be when employees try to solve problems in an ad-hoc mode instead of sticking to established routines. Therefore, in complex and moderately dynamic markets, firms rely more on centralized expertise than on knowledge of lower level employees that is more close to market Siggelkow and Rivkin (2005).

On the contrary, high degrees of freedom characterize organizations with a less densely configured rule regime (e.g. firms primarily drawing on strategic guidelines), which enables spontaneity, creativity, and experimentation (Brown & Eisenhardt, 1997; Miner, Bassoff, & Moorman, 2001). Firms which operate in high-velocity markets usually adapt such rule regimes, since the speed of search becomes more important than the scope (Siggelkow & Rivkin, 2005). In other words: close-to-market knowledge becomes a crucial success factor. As a consequence, employees on lower levels are given higher degrees of freedom for ad-hoc decisions that enable the firm to use their knowledge. Robertson and Swan (2003) provide an example of highly specialized consultants that dispose of high degrees of freedom in their operative work in order to effectively use their individual expertise.

**Reconfiguration:** Asset Reconfiguration refers to the adaptation process itself; i.e. to what has classically been regarded a dynamic capability. Dynamic capabilities research exemplifies business process reengineering, restructuring, post-merger integration or new product development among others as approaches to accomplish adaptation (Danneels, 2002; Eisenhardt & Martin, 2000; Verona & Ravasi, 2003; Winter, 2003; Zollo & Winter, 2002).
Routines for reconfiguration are based on methods and procedures, which describe how to conduct a change process. As experience is accumulated, organizations articulate and codify knowledge to store it within artifacts such as documents, manuals, or checklists (Zollo & Winter, 2002). However, codified rules are useless if they are not combined with specific knowledge from employees who apply them (Kieser et al., 2003). Furthermore, Ambrosini and Bowman (2009, p. 40) pose the question: “Can a dynamic capability lie dormant until it is required?” The answer in many cases is yes: Firms usually do neither continuously perform business process reengineering, post-merger integration or restructuring nor do they always apply exactly the same set of methods with a similar scope. Therefore, these routinized dynamic capabilities are potentials that can be activated when reconfiguration is necessary; e.g. during M&A or alliancing activities. In the case of an event, dynamic capabilities can be activated and executed. However, the critical decision – the bottleneck for activation – whether a routine is to be activated or not happens in the stages of sensing and seizing. Consequently, the scope of sensing and decision-making patterns is highly important in analyzing the firm’s dynamic capabilities.

Ad-hoc reconfiguration happens either as small-scale or as substantial reconfiguration. Small-scale optimizations – structural drift or microscopic change (Tsoukas & Chia, 2002) – are performed by employees or groups during their operative activities within the corridor for ad-hoc change. Microscopic ad-hoc change originates from an individual employee’s efforts to modify certain aspects of an operational routine (i.e. to interpret guidelines or expectations in a new way) (Burns & Flam, 1987; Feldman, 2000). This kind of small-scale change is possible as long as no boundary rules which are defined by hierarchy or by the working group (clan; Ouchi, 1980) are violated. Ad-hoc large-scale activities that are performed within the organization for the first-time can be the nucleus for the development and accumulation of tacit and codified knowledge. Thus,
repeated practice can, ultimately, lead to the evolution of a dynamic capability (Zollo & Winter, 2002).

Because radical change cannot be accomplished continuously (Tushman & Romanelli, 1985) and organizations cannot be “chronically unfrozen” (Schreyögg & Noss, 2000), we need to distinguish between different types of adaptation. Adaptation within the boundaries for ad-hoc change leads to small-scale adaptation, first-order change and path preservation. From a dynamic capability perspective, this kind of change can be routine-driven, because routines for small scale adaptations or optimizations are frequently deployed (Winter, 2003). However, path-breaking change (second-order change) alters the relationship between stability and change (Lant & Mezias, 1992). The introduction of new business models and the change of market rules (e.g. the market entry of low cost carriers such as Southwest Airlines or Ryanair), newly emerging technologies (e.g. the introduction of digital imaging) or novel governmental regulations (e.g. deregulation policies during the 80s) serve as examples that give rise to a second-order change; the way the business is done and the underlying cultural values and norms have to be substantially changed to re-create the firm’s resource and capability base in order to gain or sustain competitive advantage. However, path-breaking adaptation almost necessarily follows an ad-hoc mode, because usually firms do not have any routines for governing second-order change.

4. DISCUSSION AND CONCLUSION

The initial purpose of the dynamic capability approach is to explain how firms adapt their resource and capability base in the face of rapidly changing environments (Teece & Pisano, 1994; Teece et al., 1997). Although behavioral theory is said to be a major theoretical underpinning of
the DCV, hitherto few studies have taken behavioral arguments into account. In this paper, we integrate insights of behavioral theory into the DCV. In particular, we discuss the role of individual actors within a rule-based organizational frame. Therefore, we shift attention from an evolutionary economics inspired routines-based perspective to a more integrative framework. Our analysis of the DCV and our microfoundation of routinized and ad-hoc adaptation result in the formulation of a dynamic capacity perspective. We define an organization’s dynamic capacity as its ability to grasp impulses of change, either in an ad-hoc manner, or via change routines (i.e. dynamic capabilities) or to suppress these impulses.

With the introduction of the novel dynamic capacity concept, we respond to current calls on overcoming to some shortcomings of the state of the dynamic capability approach (Ambrosini & Bowman, 2009; Arend & Bromiley, 2009; Easterby-Smith et al., 2009) and contribute to the examination of the micro-level origins of dynamic capabilities. In critically reviewing the dynamic capabilities literature, we identified four substantial shortcomings: ambiguous definitions, unclear focus in empirical research, exclusion of the boundaries of change, and lack of microfoundation. Our concept of dynamic capacity enables these deficits to be overcome by answering the Holy Grail question of, “how to sustain a capabilities-based advantage in the context of environmental change” (Helfat & Peteraf, 2009b: 99).

The use of the dynamic capacity perspective facilitates a more differentiated understanding of adaptation processes by including aspects of the tensions between change and stability in the evolution of the firm’s resource and capability base. The current understanding of dynamic capabilities only captures the routinized aspects of change, and the result is an incomplete picture of adaptation processes. Furthermore, many of the typical adaptation routines lie dormant in
organizations until they are temporarily activated (e.g. business process reengineering, post-merger integration). By specifying the role of ad-hoc behavior within a rule-based context, we systematically differentiate between routinized and ad-hoc forms of adaptation. Since ad-hoc activities do not happen in an unbounded organization, formal and social rules define the context for ad-hoc activities. However, routinized dynamic capabilities and the boundaries of the context for ad-hoc change stabilize the development path of an organization. The density of the rule set determines how wide or narrow the corridor for adaptation is. Some firms need loose organizational structures accompanied by simple rules to enhance quick adaptation; other firms need tight structures accompanied by a complex set of rules and routines to achieve stability by slowing the pace of change. Advancing Eisenhardt and Martin’s (2000) distinction between complex routines and simple rules, we therefore highlight the importance of rule set density on capability evolution.

Finally, we provide a microfoundation of the dynamic capacity that builds on dynamic capabilities research but extents current conceptualizations by integrating the role of individual ad-hoc adaptation within the rule-determined boundaries of the context for organizational development. With respect to recent efforts to uncover the micro-origins of the DCV, Easterby-Smith et al. (Easterby-Smith et al., 2009, p. S4) make the point that “Teece’s (2007) ambitious attempt to reveal the microfoundations of sustainable performance by disaggregating dynamic capabilities into its component parts opens up at least as many questions as it answers”. Consequently, we elaborate on the differences between routines and ad-hoc activities along the micro-processes of sensing, seizing, and reconfiguration which were introduced by Teece (2007). Our microfoundation of the dynamic capacity, building on both evolutionary economics and behavioral theory, enables an analysis of the firm’s adaptation behavior based on three
dimensions. The *micro-process dimension* draws on Teece’s distinction between sensing (speed and scope of search), seizing (decision-making practices), and reconfiguration (codified and tacit knowledge for governing change). The *response dimension* indicates in each micro-process dimension the density of the rule system with regard to routines and to the context for ad-hoc change. Formal and social rules specify the boundaries for ad-hoc activities or activate a certain routine respectively. The *time dimension* describes the degree of continuity of the execution of a routine (i.e. the deployable potential) in comparison to the scope for ad-hoc change. Consequently, the dynamic capacity concept allows an empirical analysis of the routine- and rule-based boundaries of the corridor of the resource and capability base’s development.
REFERENCES


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<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Iansiti &amp; Clark (1994)</td>
<td>Dynamic capability is the capacity of an organization to consistently nurture adapt and regenerate its knowledge base, and to develop and retain the organizational capabilities to translate that knowledge base into useful actions</td>
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<tr>
<td>Teece et al. (1994)</td>
<td>[Dynamic capabilities are] the ability of an organization to learn, adapt, change and renew over time</td>
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<td>Teece et al. (1997)</td>
<td>[Dynamic capabilities are] the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments</td>
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<td>Helfat (1997)</td>
<td>[Dynamic capabilities are] the subset of the competences/capabilities which allow the firm to create new products and processes and respond to changing market circumstances</td>
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<tr>
<td>Eisenhardt &amp; Martin (2000)</td>
<td>The firm’s processes that use resources – specially the processes to integrate, reconfigure, gain and release resources – to match or even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resources configurations as markets emerge, collide, split, evolve and die</td>
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<tr>
<td>Galunic &amp; Eisenhardt (2001)</td>
<td>Dynamic Capabilities are the organizational and strategic processes by which managers manipulate resources into new productive assets in the context of changing markets</td>
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<tr>
<td>Zahra &amp; George (2002)</td>
<td>Dynamic Capabilities are essentially change-oriented capabilities that help firms redeploy and reconfigure their resource base to meet evolving customer demands and competitor strategies</td>
</tr>
<tr>
<td>Zollo &amp; Winter (2002)</td>
<td>A dynamic capability is a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness</td>
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<tr>
<td>Winter (2003)</td>
<td>[Dynamic Capabilities are] those that operate to extend, modify or create ordinary (substantive) capabilities […] dynamic capabilities contrast with ordinary (or ‘operational’) capabilities by being concerned with change</td>
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<tr>
<td>Savory (2006)</td>
<td>The ability to reconfigure both the use and co-ordination of a specific configuration of resources, according to changes in the organization’s environment and strategic direction. This includes the abandoning of old configurations and the development of new configurations […] this will be described as a dynamic capability</td>
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<tr>
<td>Author(s)</td>
<td>Definition</td>
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<td>Zahra et al. (2006)</td>
<td>[Dynamic Capabilities are] the abilities to reconfigure a firm’s resources and routines in the manner envisioned and deemed appropriate by its principal decision maker</td>
</tr>
<tr>
<td>Helfat et al. (2007)</td>
<td>[A dynamic capability is] the capacity of an organization to purposefully create, extend or modify its resource base</td>
</tr>
<tr>
<td>Wang &amp; Ahmed (2007)</td>
<td>[Dynamic Capabilities are] a firm’s behavioral orientation constantly to integrate, reconfigure and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage</td>
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Table 2: Towards a microfoundation of a dynamic capacity

<table>
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<tr>
<th>Dynamic Capacity</th>
<th>Dynamic capabilities: Routines</th>
<th>Context for ad-hoc activities</th>
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<tbody>
<tr>
<td>Sensing</td>
<td>Routinized observation of opportunities or threats from markets, customers, and competitors or within the organization (e.g. strategic analysis, capability monitoring, technology foresights).</td>
<td>Ad-hoc activities to observe and to identify opportunities or threats from markets, customers, competitors or within the organization (e.g. observations of managers or employees beyond routinized processes but in accordance with the firm’s frame of reference).</td>
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<tr>
<td>Seizing</td>
<td>Routinized decision making (e.g. strategy development process, innovation gates).</td>
<td>Ad-hoc activities of formal decision-making or of social (informal) decisions to accept observations of opportunities or threats in order to enable subsequent implementation.</td>
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<tr>
<td>Asset Reconfiguration</td>
<td>Routinized implementation of innovations, adaptations, or replications (e.g. business process reengineering, innovation realization, business model transfer, cultural change, post-merger integration).</td>
<td>Ad-hoc implementation of innovations, adaptations, or replications (e.g. microscopic change of practices, paradigmatic cultural change, single market entry or acquisition).</td>
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