Dynamic Capabilities as Macro and Micro Organizational Evolution

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We gratefully acknowledge support for this research from the National Science Foundation. We thank Dax Basdeo and Antoaneta Petkova for research assistance with the project.
Introduction and Research Question

Firms’ dynamic capabilities (Teece, Pisano, & Shuen, 1997), a conceptual approach embedded in the context of a resource based perspective, is rapidly emerging as a primary model of competitive advantage that is explicitly focused on conditions of environmental change (Eisenhardt & Martin, 2000). Teece et al., 1997:510) originally defined the dynamic capabilities approach as ways of “exploiting existing internal and external firm specific competences to address changing environments.” The “dynamic” aspect of the model concerns firms’ ability to modify and revise their competencies in order to achieve a better fit with an ever changing environment, while the “capabilities” component addresses changing internal and external organizational skills, resources, and functional competencies to better match the external environment. Stressing the creation of competitive advantage through the use of processes (organizational and management), positions (firm assets of all types), and paths (beliefs and habits that constrain future behavior) to develop high performance routines over the long run, Teece et al. (1997) characterize dynamic capabilities as “trajectories of competence development.” Thus, according to this framework dynamic capabilities combine flexibility, which enable firms to change, with constraints, which derive from these firms’ histories. Therefore, an important theoretical question for advancing research in the area is how firms balance learning from the past with the need to respond to change in evolving their dynamic capabilities.

Recently, Eisenhardt & Martin (2000) addressed the criticisms of the dynamic capabilities model as being theoretically ambiguous, by proposing that dynamic capabilities include many specific routines, which have been researched extensively, including product development (Clark & Fujimoto, 1991; Dougherty, 1992 replication and brokering (Hansen, 1999), and coevolving (Eisenhardt & Galunic, 2000). Further, in contrast to Teece et al.’s (1997) who characterize dynamic capabilities as firm specific processes developing from path dependencies, Eisenhardt and Martin (2000) argued that dynamic capabilities have many common features across organizations, and can be viewed as best practices. Therefore, a second important theoretical question that research on dynamic capabilities needs to address is the degree to which dynamic capabilities are associated with idiosyncratic versus general management and organization processes.

Finally, several recently published empirical papers provide historical case studies of the evolution of dynamic capabilities. These studies draw attention to the role of managerial beliefs primarily as a constraining (Holbrook, Cohen, Hounshell, & Klepper, 2000; Rosenbloom, 2000; Tripsas & Gavetti, 2000), but also as an enabling (Rindova & Kotha, 2001) factors in the evolution of dynamic capabilities. For example, Holbrook, Cohen, Hounshell, & Klepper (2000) showed that early market experiences had conditioning effects on the beliefs of managers in four semiconductor firms. Rosenbloom (2000) argued that NCR’s history provides strong evidence of the role that a firm’s top managers played in recognizing (or failing to recognize) changes in the environment that required corresponding changes in management and organizational processes. Similarly, Tripsas and Gavetti (2000) show that Polaroid was slow to respond to the shift from analog to digital imaging due to the values that managerial beliefs assigned to the different capabilities. Whereas all these studies emphasized the path-dependencies created by the cognitive inertia of managerial beliefs, Rindova and Kotha (2001) suggested that top managers’
beliefs about the importance of “evolvability” may have contributed to Yahoo’s relative success in evolving from search engine into an Internet portal in the late 1990s.

From the review of the theoretical and empirical work on dynamic capabilities several important questions in need of further theoretical development emerge. First, we need to better understand the relative importance of firm-specific competencies versus universal management processes and organizational routines in constituting a firm’s dynamic capabilities. Second, we need to focus on the role of the top management team as a source of flexibility or inertia. Third, we need to examine systematically the relative importance of internal (“organizational push”) versus external (“market pull”) factors in evolving dynamic capabilities. The latter question will enable us to understand the degree to which dynamic capabilities rely on proactive or reactive processes for managing change.

In order to address these substantial theoretical challenges we undertook an inductive theory building study of how the top managers of four firms conceived of the evolution of their firms’ capabilities. We selected four firms in two industries that were expected to be impacted significantly by the dramatic unexpected event created by the attacks on September 11th -- biotechnology and defense-related IT (Weiss, 2002; Wolfowitz, 2001). Contrary to our expectations, our informants did not associated the dramatic event with unexpected change. Rather they viewed it as catalyzing environmental changes, which they have already noticed and were in the process of responding to by reconfiguring capabilities and competencies. Thus, the managerial beliefs about evolving dynamic capabilities we studied reflected top managers’ need to respond to ongoing change, rather than to a dramatic unexpected event.

METHOD
Sample. Following our initial hypotheses that September 11th constitutes a dramatic unexpected event with important consequences for allocation of resources by government and firms, we focused on two industries that were expected to be affected by such resource relocations – defense-related IT and biotechnology. Following the guidelines for case selection for theory building from case studies provided by Yin (1984) and Eisenhardt (1989), we looked for firms that exhibited the phenomenon of interest – evolving dynamic capabilities -- to a high degree. Selecting such cases is necessary so that the phenomenon of interest can be readily observed. In each industry we identified several firms that met our initial criteria, including firms that: a) had some amount of history (i.e. were not recent start-ups); and b) had made statements in press releases or the media that they were in the process of reconfiguring some important aspect of their capabilities. We contacted all firms on our initial list and selected for the study four firms that committed to participate by giving us interview access to all members of their top management team. All participating firms expressed high level of interest in the potential findings of the study, which ensured high degree of cooperation during the interviewing process.

Data collection and analysis. Data was collected through in-depth, semi-structured interviews, and company archives. We interviewed the CEO, COO, SVP for business development, technology, marketing, finance, and human resources in all firms, as all as other members of the top management team or managers in the next level of the hierarchy who were responsible for the areas targeted for new competence development. We conducted a total of 36 interviews, which ranged from one hour to four hours. All interviews were recorded and transcribed.
Table 1 provides a summary of the interviewing approach and examples of questions used in the interviews.

**Data analysis.** The unit of analysis in the study is “a change initiative,” which was identified by an informant as an effort (past or ongoing) to change some aspect of the firm’s operations. We attempted to collect and analyze information about both implemented and aborted change initiatives, but we were primarily interested in what informants’ perceived as important initiatives for the evolution of their firms’ capabilities.

We began data analysis using within case analysis by compiling a list of the change initiatives informants have described in each firm. For each initiative we identified motivation, execution activities, and expected or actual outcomes. We cross-checked and consolidated these descriptions across informants. We looked for both commonalities in the change processes across initiatives, and for the overall pattern of evolution reflected in the totality of change initiatives. After completing the within case analysis, we began to compare the processes through which change unfolded (including motivations, activities, and outcomes) across the two firms operating in the same industry. Multiple iterations between data and theory led to the development of the framework presented in this paper. Once the framework was developed, we applied it to all four cases to examine how well it fit with the data (Yin, 1984). We also contacted all firms with requests to review the framework and provide comments on the findings of the study. Such procedures help establish the validity of results derived from qualitative analysis (Brown & Eisenhardt, 1996).

**THEORY DEVELOPMENT**
Past research on dynamic capabilities has emphasized the constraining effect of organizational history, technological trajectories, evolutionary paths created by organizational routines, and beliefs of top managers that tend to be inertial (Teece et al., 1997; Tripsas & Gavetti, 2000). Therefore, the expectation based on past research is that the evolution of dynamic capabilities will be ridden with obstacles. Whereas our informants did identify a range of organizational elements they were proactively seeking to change or were hoping would change, making these changes was not viewed as overcoming inertia or commitment to an existing path of competence development, but rather as a need for a qualitatively different realignment of different aspects of management and organizing in order to reach what several informants termed “the next level.”

Thus, one of the core processes through which dynamic capabilities evolve, which we observed in all four firms was a process of “upgrading the management capability of the firm.” We use the term “upgrading” because it was used by one of our informants and adequately reflects the notion, which informants expressed that they are working toward bringing the organization to “the next level.” Different organizations focused on different aspects of management and organizing in order to upgrade their management capability. Common elements included increasing the number of top managers to increase the level of functional expertise and experience at the top, and seeking to transfer responsibilities that were previously performed by the top management team to the next level of management. Upgrading management capability was associated with greater levels of interaction among top management teams, more joint problem solving, and transferring greater levels of responsibility for strategic decision making to
the next level of management. These activities also often led to structural reorganizations and formal redefinitions of the responsibilities of new units and substructures.

This finding confirms extant view of dynamic capabilities as constrained by the structural organization of firms (Teece et al., 1997; Rindova & Kotha, 2001). At the same time it disconfirms existing views that organizational structures tend to be static and to impede the evolution of a firm’s competencies. Our observations suggested that organizational structure and management processes were proactively used to reconfigure the competencies that a firm used to compete in the market place.

Reconfiguring market competencies is the second core process we observed through which firms evolve their dynamic capabilities. We use the term “market competencies” to refer to competencies that enable firms to serve different customer needs. Managers in all four firms we studied explicitly related the evolution of the dynamic capabilities of their firms to a change in market competencies, which change was expected to enable them to serve new customers to offer new services to extant customers. Either of these strategies, or a combination of them was viewed as the means for reaching “the next level.” Whereas the four firms could be seen as pursuing different means for developing new market competencies – one has completed an acquisition, which was expected to give it access to clients, it believed it could not have accessed otherwise; another has made a major investment in a new manufacturing facility, which was enabling it to reach out to bigger clients and provide a new range of services; yet a third was seeking to spin off one of its line of business, in order to garner resources to hire experts for other lines of business viewed as having higher market potential, there were some important commonalities in the actual processes that these moves led to. Underlying these diverse moves was an effort to gain access to specialized expertise, embodied in individuals that were viewed as being among the top in their fields of expertise – a strategy, which one informant described as “hiring a few good men.” Hiring top experts in areas targeted for developing new market competencies and supporting them through upgraded management capabilities appeared to be the underlying model for evolving dynamic capabilities that was common to all firms we studied.

An interesting question with regard to developing new market competencies is not only what processes enable firms to configure them effectively, but also how firms select market competencies for further development. Several informants described the process through which new competencies were identified as targets as “bubbling up” during regular managerial meetings discussing various issues, as well as a part of strategic planning efforts. Further, the more seamless the communication among top managers and across levels, as determined by the management capability of the firm, the more confident managers were in the effectiveness of their competence discovery process.

Our observation that the evolution of dynamic capabilities entailed developing new market competencies confirms ideas from extant research on dynamic capabilities, which links them to changes in specific functional capabilities (Eisenahrdt & Martin, 2000) and product-market knowledge flows (Helfat & Rabitscheck, 2000). However, our observations accord greater importance to the role of human capital in the process of developing new market competencies than past research has recognized before. In particular, it appears that identifying and gaining access to what is considered “top talent” in a given area is an important factor in evolving
dynamic capabilities. Further, our research highlights the role of organizational processes not only in developing, but also in discovering what new market competencies should be developed.

Together these insights suggest that the evolution of firms’ dynamic capabilities can be understood as change processes unfolding at two levels: a micro-evolution associated with the “upgrading” of the organization’s management capability in terms of staffing key positions with more experienced and skilled managers and redefining responsibilities at different levels of the organizational hierarchy, and a macro-evolution associated with developing new competencies in order to respond to changing customer demands. (“Changing customer demands” here refers to changing needs of existing customers and seeking to serve new customers). Further, these two evolutionary processes were driven by changing perceptions of top managers about what it takes to succeed in their markets and what managerial and market competencies were required to respond to the changes.

Analyzing the data across all firms suggested that the impetus for evolution in organizational capabilities came from a top management team belief about “the need to move to the next level.” This belief was a broadly defined aspiration for changing the level of growth and performance of the organization. Whereas some managers indicated quantifiable performance ranges that represented the “next level,” this aspiration tended to be more qualitative than quantatative, a Gestalt often defined in terms of the kind of clients or markets the firm can serve, which were viewed as inaccessible from the organization’s current level. The “next level” created a sense of urgency, a sense that things will be or have to be different, that the status quo will not do. This sense of urgency justified and motivated both the micro and the macro-evolutionary processes we discussed and the changes in resource allocations and organizational practices they entailed. Figure 1 summarizes the theoretical insights discussed in this section in an inductively-developed model of the processes through which a firm’s dynamic capabilities evolve.

Insert Figure 1 about here

Overall, our findings suggest that the evolution of firms’ dynamic capabilities combined changes in general management processes and reconfiguration of firm-specific competencies. They also reflected perceived changes in the environment and managerial beliefs about the need to reach “the next level.” Thus, the findings of the study extend current research on dynamic capabilities by exploring the role of both general routines and firm-specific competencies, and the role of internal and external factors in the evolution of dynamic capabilities.

REFERENCES:


**Holbrook, Cohen, Hounshell, & Klepper, 2000**


Miles & Huberman, 1984


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**Table 1: Interviewing Approach and Semi-Structured Interview Guide**

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<th>Interviewing Principles</th>
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<td>The design of this preliminary interview protocol reflects the goals of this research, which require us to elicit “unfamiliar meaning-structures, rather than to extend familiar ones” (Spender, 1989: 72). Thus, we intend to follow the principles of ethnographic interviewing (Spradley,1979), which treats informants as guides into a different, unfamiliar to the researcher culture, i.e. system of meanings and practices. Spender (1989) notes that managers readily do so because of their usually high levels of verbal skills and ability to retain their authority in relationship to the researcher. This interviewing approach allows the researcher to discover an informant’s “worldview” and to compare it to those of other informants. Therefore, a significant part of the interviewing task is achieved in the process of establishing rapport and communication with informants.</td>
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<th>Interview Themes</th>
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<td>• Personal history with the company: Tenure with the company and in the industry; previous managerial experience</td>
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<td>• Current scope of responsibilities, objectives at the start of one’s career and how they have evolved – usually reflecting the evolution of a given functional or client area.</td>
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<td>• How the managers’ responsibilities are intertwined with those of other top managers (relationship among capabilities) and how these have changed over time.</td>
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| | • What have changed the most, why, how, who initiated, who was involved, has this experience been carried to other change attempts.  
• Ask for specific change initiatives undertaken by the manager – why and what was the outcome. What was easy and difficult to do? Was that similar or different to other change initiatives.  
• Example of a change effort that the manager has observed that has failed and why?  
• What has frustrated change efforts? |
Figure 1: An Inductively Developed Model of Evolution of Dynamic Capabilities

Shifting Aspirations: "Need to Reach the Next Level"

Micro-Evolution: "Upgrading Management Capability"
- building up the top management team
- increasing responsibilities at lower levels of the organization

Macro-Evolution:
Discovering and developing new market competencies
- hiring "a few good men"
- linking new resources to upgraded management capability

Access to new sources of rent