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THE DYNAMIC RESPONSIVENESS OF ORGANIZATIONS

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Abstract

Organizational studies should address contemporary challenges of dealing effectively with the increasingly complex and dynamic business conditions. In this context we argue that structural features are linked to the corporate strategy process and affect the organization's ability to respond to ongoing environmental changes. Sustainable performance arguably derives from integrative strategy-making where business opportunities are pursued as they emerge while being directed and coordinated through forward-looking analytics. This combination of decentralized responsiveness and central reasoning identifies a dynamic system of interacting fast and slow processes. The fast system observes and reacts to environmental stimuli and the slow system interprets events and reasons about future actions. When the fast and slow processes interact they form a dynamic adaptive system that allows the organization to respond to uncertain and changing conditions. We apply this model to interactions among individuals in organizations where ongoing experiential insights among dispersed operating managers interact with the forward-looking planning considerations around top-management. This identifies an organization that is able to react to frequent and often unpredictable changes and adapt.

Keywords: adaptation, collaborative learning, dynamic systems, fast and slow processes, organizational culture, strategic responsiveness

Introduction

In their review of the organization literature Cheney, Lair and Kendall (2012: p. 68) note that “market-based rationalities have proven remarkably adaptive, resistant to and enabling of creative transformation, for good but often for ill as well” while “received views of rationality have been challenged”. This illustrates the organizational conundrum of choosing between planned rationality and dispersed responses to emerging market changes. Here we suggest that slow central reasoning based on analytical rationality and autonomous responsive initiatives triggered by ongoing environmental observations interact to form a dynamic adaptive system as a de facto sustainable organizational response mechanism. We believe this model of the adaptive organization complies with the request that “critical organizational scholarship is poised not only to react to a changing world but also to effect positive change” (Cheney et al., 2012).

It is argued that sustainable performance derives from an effective strategy-making process orchestrated within an organizational structure that is conducive to dynamic adaptive responses as a way to retain the competitive advantage in turbulent environments (e.g., Chakravarthy, 1982; Teece, Pisano and Shuen, 1997; Teece, 2007). This calls for proactive response behaviors combined with direction and economic optimization quite consistent with the concurrent calls for exploration and exploitation (March, 1991). The need for effective response capabilities is accentuated by increasingly turbulent business contexts with major technology shifts and ongoing innovation (Bettis and Hitt, 1995; Teece et al., 1997; Volberda, 1996) where organization theorists promote a decentralized decision structure to accommodate better responses (Galbraith, 1994, 1995; Heydebrand, 1989; Nault, 1998; Zenger and Hesterly, 1997). Conversely, the strategy literature has pointed to central planning as the means to gain economies from common direction and coordinated actions (Ansoff, 1988; Simons, 1990, 2000). Hence, the ability to accommodate dynamic responses to emerging opportunities while pursuing a long-term strategic intent is an important underpinning of the complex strategy-making

process and its ability to generate superior outcomes (Mintzberg, 1978, 1990; Mintzberg and Waters, 1985).

Contemporary organizations must cope with increasing information intensity, organizational interactions, and higher dependence on intangible assets (Child and McGrath, 2001) where the design solution is to move decisions down to the location of relevant information and expertise (Daft and Lewin, 1993; Volberda, 1996). This resonates with a broad literature advocating decentralization under pervasive uncertainty (Bigley and Roberts, 2001; Child, 1997; Galbraith, 1994; Heydebrand, 1989). Yet, there is also a realization that effective organizations have central integrative processes where dispersed decisions are embedded in more rigid structures (Hill, Martin and Harris, 2000; Jelinek and Schoonhoven, 1990). The challenge, therefore, seems to lie in the ability to combine experimentation at low-level decision nodes with features of high-level formal planning. In this context, management information and communication systems can be important for the interaction between responsive decisions in decentralized business units and central management controls. These information processing capabilities are essential means to assess ongoing environmental changes and coordinate business activities among organizational subunits as they engage in responsive initiatives (Galbraith, 1977, 1994).

The traditional view on organizational change is typically embedded as implementing a set of preplanned orderly activities (e.g., Hayes, 2007). In contrast, we conceive of organizational adaptation as deriving from decentralized responses that attempt to exploit opportunities as they emerge thereby generating experiential insights that can update the perceived environmental reality of top management at the center. This resonates with Tsoukas and Chia's (2002) referral to "organizational becoming" where dispersed actions interact with managerial attempts to make sense of the changing conditions and institutionalize a particular cognitive representation of the business environment. Accordingly, Whitley (2003) talks about a gradual move in organizational studies towards institutional frames for coordination of skills, delegation of authority, and joint problem-solving away from formal hierarchies.

In this paper, we extend this perspective and develop a concrete model of dynamic responsiveness in contemporary organizations characterized by the structural features of integrative strategy-making. Hence, we contribute to the field of organizational studies by outlining a new model explicating how an effective responsive dynamic can be established drawing on major perspectives from the literatures on organization, strategic management and modern theories of human cognition.

In the following, the article first adopts the idea of combined fast and slow processing to understand how contemporary organizations engage in integrative strategy-making allowing for dynamic responses to ongoing changes that adapt the organization to changing conditions over time. We argue for the importance of joint problem-solving and collaborative learning in responsive organizations that can become essential traits of the organizational culture and discuss the strategic leadership implications of this. Then the integrative strategy-making approach is described and insights from modern cognitive science are used to elaborate on effective process relations and the cultural traits of adaptive organizations. This theoretical reasoning is used to outline propositions on essential relationships in a dynamic responsiveness system for organizational adaptation. Finally, we discuss the implications for organizational studies in general and management practice in particular.

Background

The fundamental elements of human cognition are comprised by fast multifaceted processes of actions and reactions in the surrounding world, and slow processes that consider the experiential insights obtained from these encounters with the environment (Andersen and Fredens, 2013; Kahneman, 2011). The combination of fast and slow processes develops an understanding of the surroundings over time that gives meaning and purpose to the actions taken in turbulent contexts. Ongoing events and situations are observed in fast processes and the various impressions are interpreted and projected forward in slow time-consuming reasoning. The interdependence between fast and slow processing capabilities creates a dynamic system of observations, responses, insights and adaptive moves (Thompson, 2010).

We use this dynamic of the fast-slow processing system to understand interactions that take place among individuals operating in different parts of the organization and located at different hierarchical management levels. Frontline employees execute the daily transactions of the firm and the local managers observe the evolving environment through these first-hand experiences from things being executed and the way people react to them. These impressions can be collected for executive consideration in periodic forward-looking deliberations as a basis for developing strategic direction and coordinating corrective actions. Drawing on the management literature, we describe this dynamic of *integrative strategy-making* that combines central planning with decentralized responsive actions (Andersen, 2004, 2013).

Integrative strategy-making

Strategic management is often perceived as a cyclical process of planning, execution and monitoring performed (typically once a year) while considering outcomes multiple years forward in time (e.g., Ansoff, 1965, 1980; Anthony, 1965). The strategic management process is projected as a rational analytical approach to understand the evolving environment with the purpose of setting a direction for corporate activities (e.g., Schendel and Hofer, 1979). It consists of a number of distinct elements, e.g., mission statement, long-term goals, environmental analysis, short-term action plans and strategic controls (Boyd and Reunning-Elliott, 1998). This implies a learning loop where management is updated about realized outcomes that when held against the intended plans may point to needs for interim corrective actions and strategic initiatives for the next planning cycle. These strategic deliberations and the related decisions normally involve organizational members associated with top management at corporate headquarters.

The process may also involve line and operational managers throughout the organization engaged in developing divisional and departmental plans as part of the overarching corporate strategy (Richards, 1986; Schendel and Hofer, 1979). However, this strategy-making process is central in the sense that it is instigated by the top management team as the core forum for the forward-looking

reasoning that underpins the eventual strategic direction. With many aspects of the competitive environment being scrutinized and alternative options evaluated in this process, it is comprehensive, time-consuming and consequently ‘slow’. The slow forward-looking reasoning of the planning process that we may refer to as *strategic thinking*, is shown as the first learning cycle in Figure 1.

Please insert Figure 1 about here

A decentralized decision structure moves power down the organization so operating managers and employees can voice opinions and take responsive actions within their areas of responsibility without asking for permission. This gives influence to people located closer to the relevant situational information and operational expertise when unforeseen circumstances arise (e.g., Child and McGrath, 2001; Daft and Lewin, 1993; Volberda, 1996). In decentralized organizations actions can be taken relatively quickly in response to changing circumstances as the local decision makers have the relevant information available to decide on proper responses, i.e., they are ‘fast’. These fast responsive actions generate experiential insights as the local managers observe what works and what doesn’t within a relatively short period of time as actions quickly show particular effects or results. Hence, the local managers will receive immediate feedback from the reactions of major stakeholders implicated by the actions including colleagues, employees, customers, suppliers, business partners, etc. This creates a good sense of the changing character of the business environment that normally is invisible to top managers because they are consumed by many executive duties while ascribing to the cognitive limitations of human beings. Hence, the decentralized experiential insights gained by local managers from the fast operational responses generate updated information about current changes in the environment and provide important insights to the conceptual knowledge held by top management. These fast actions processes that we may refer to as *operational responses* are shown as the second learning-cycle in Figure 1.

The fast experiential insights gained by operational managers dispersed throughout the organization can be collected systematically and included for consideration in the slow forward-looking planning process at the corporate center. This provides an opportunity to obtain unique updated information about subtle environmental changes that otherwise might be unavailable to top managers and, therefore, go unnoticed when they engage in the long-term strategy considerations. Top managers often obtain essential information from colleagues and peers in the industry as well as direct reports and contacts within the organization, which may reinforce preconceived environmental perceptions (Mintzberg, 2009). When top managers have a limited number of real business encounters with direct experiences, the information updating can become increasingly skewed and reinforce a conceptual understanding based on past personal historical experiences that can be outdated, invalid or even irrelevant if they relate to different circumstances. Hence, cognitive biases can develop among executives as they, for a good reason, distance themselves from the daily operational activities (e.g., Bazerman and Moore, 2009). These sources of misperception may (partially) explain the prevalence of organizational inertia observed in organizational studies (e.g., Hannan and Freeman, 1989) and the limitations of ‘dominant logics’ (Bettis and Prahalad, 1995) where executives rely on the wrong experiences, when their corporate responsibilities are extended.

Hence, we argue that it is essential for top management to consciously take account of the ongoing experiential learning from fast operational responses made across the organization in response to current changes and include these insights in the forward-looking strategic thinking to avoid being blindsided by confirmation biases. That is, the central planning processes should be informed by ongoing experiences obtained from decentralized operational actions taken by low-level managers in response to changing business conditions (e.g., Andersen, 2004; Andersen and Nielsen, 2009). In this context the fast processes of operational responses should interact with the slow forward-looking strategic thinking and vice versa (Brews and Hunt, 1999). So, when the slow process deliberates about environmental conditions it should consider the current updated information from the fast ongoing

operational activities. Hence, the strategic thinking of the top management team should be connected to the actions taken by employees and operational managers working closely together with various stakeholders of the firm in their daily business transactions and learn first-hand from their reactions to events as they evolve.

The slow planning process can help develop a shared cognitive understanding of the firm's competitive environment by engaging key people in the strategy discussions (e.g., Andrews 1987; Ansoff 1965; Hill et al. 2000). Involving decision makers from different parts of the organization will expose the discussions to a broader set of organizational constituents with different insights and experiences that can form a more nuanced shared cognition of the strategic situation. The planning process can be seen as a discourse that reconciles diverse views and shapes a common understanding of environmental developments around the firm that gives general guidance to on-going decisions throughout the organization (e.g., Hendry 2000; Page 2007). The fast decision processes where empowered managers in different parts of the organization respond by exploring alternative solutions to changing demands in the business environment generate current insights from these experiences. That is, autonomous responsive actions that allow local experimentation may uncover new business opportunities that can be considered in the tactical considerations of the central planning process (Burgelman, 1996; Burgelman and Grove, 2007). This interaction between the fast actions processes and the slow forward-looking planning process is shown as the third combination of learning-cycles in Figure 1. We refer to these interactions as *tactical considerations* because they lead to interim decisions to adjust the strategic course throughout the planning cycle.

The slow forward-looking planning considerations must be linked to current experiences and insights gained from the fast actions taken in response to changing business conditions to regularly update the executive knowledge about the environment. The fast responsive actions taken at dispersed operating entities can be informed quickly through lateral communication links, e.g., between different operational managers, where responsive actions are coordinated through mutual adjustments

(Galbraith, 1994; Heydebrand, 1989). Conversely, the interaction between the slow planning and the fast actions processes require horizontal communication links between different hierarchical management layers reaching from frontline employees and low-level managers to divisional executives and top managers. Hence, an ability to exchange information and knowledge among organizational members with different types of expertise and insights is a precondition for collaborative learning and innovation that takes advantage of diverse knowledge and insights. These information exchanges can be carried out in multiple ways ranging from formal management control and reporting systems to informal conversations among managers at different hierarchical levels. This leads to the following proposition:

***Proposition 1:** Organizations that encourage exchange of knowledge and insights among individuals across functions and management levels are more innovative and generate more creative solutions to deal with uncertain conditions and complex challenges.*

The combined fast and slow processes can stimulate an underlying *dynamic system* that depicts an organizational ability to take responsive actions. A dynamic system is meta-stable without equilibria and fix-points and displays continuous movement (Kelso and Engström, 2006). Hence, a combination of fast and slow processes can create a dynamic system that is conducive to non-linear adaptive organizational movements over time. Dynamic systems are difficult to predict with the implication that “we can no longer, as we can with linear systems, decompose the systems into subsystems, solve each subsystem individually, and then reassemble the system into complete solutions” (Pfeifer and Bongard, 2009: 93). In other words, a dynamic system is suited to drive organizational activities towards responsive moves and thoughtful redirection that can adapt the strategy under uncertain and unpredictable business conditions (e.g., Bettis and Hitt, 1995). The fast responsive actions operate in conjunction with other responsive actions taken in different parts of the organization over time that together may uncover various opportunities that suit the emerging environmental conditions in unpredictable ways. Hence, an integrative strategy-making structure that combines slow forward-

looking strategic thinking with dispersed operational responses can be construed as a dynamic adaptive system that in effect constitutes the organization's response capabilities (Andersen and Fredens, 2013).

Internal communication

The account of integrative strategy-making illustrates that the decision structure and related communication and information processing systems are important organizational features of the strategy process (Sutcliffe, 1994; Sutcliffe and Weber, 2003). Centralization of decision rights confines decision making to top management while dispersion of power allows managers at lower hierarchical levels to take responsive actions within their areas of responsibility. In turbulent environments organizations must deal with a large amount of information to understand complex situations that involve a multiplicity of competence-based knowledge among individual specialists (Child and McGrath, 2001). By moving many decisions closer to the location of the involved operational insight and individual managerial expertise, the organization can gather relevant information faster and coordinate responsive actions with greater ease for better immediate outcomes (Daft and Lewin, 1993; Volberda, 1996). Hence, organization scholars suggest that the decision structure should be more decentralized when the firm is operating under pervasive environmental uncertainty (e.g., Bigley and Roberts, 2001; Child, 1997).

Such a shift towards more decentralized structures should embrace coordination through lateral (horizontal) communication between operational managers and functional specialists in different related parts of the organization (e.g., Achrol, 1997; Galbraith, 1995). However, even though modern organizations often are described as decentralized, non-hierarchical, and autonomous (Castells, 1996; Galbraith, 1994; Heydebrand, 1989) they also need central integrative processes and structure to be effective (e.g., Hill, Martin and Harris, 2000; Jelinek and Schoonhoven, 1990). So, decentralization may increase the ability to engage in responsive actions but it is not sufficient condition for the ability to generate sustainable performance outcomes. However, the joint consideration of diverse and possibly intertwined responsive actions in conjunction with coordinated planning of longer-term corporate

activities provides the foundation for economic efficiencies in corporate operations. This leads to the following proposition:

Proposition 2: Organizations that combine a decentralized decision structure with communication and information systems to exchange information between individuals across functions and management levels develop more effective solutions with sustainable performance outcomes.

Open vertical communication channels ensure that key observations, essential insights, and innovative suggestions can be brought forward to the slow planning system of analytical considerations for forward-looking long-term strategic directives. The management literature helps us pinpoint how the fast system is anchored in the responsiveness of decentralized actors and how the slow system is anchored around the top management driven central planning process. Hence, strategic management and control processes can conduct updated forward-looking evaluations of opportunities uncovered by decentralized responsive actions. The open communication across operational functions and hierarchical management levels provides a basis for collaborative learning among many diverse individuals.

Collaborative learning

Creativity and innovation can be interpreted as evolving properties of interacting fast and slow processes where cognition is formed through the combined processes of reasoning and ongoing actions. Ideas can arise in both processes but the eventual judgment as to which ideas are better for the organization derives from the slow forward-looking planning process. Here alternative directions are considered through reasoning and their consequences are assessed in simulated analysis based on assumptions. When the strategy is carried out, the fast decentralized actions processes are at play attempting to execute activities in accordance with the intent of the strategic plan while taking responsive actions to accommodate emerging changes that contradict initial assumptions. The intuitive sensing of experienced effects from responsive actions is part of the fast actions processes. New experiential insights gained by individuals from ongoing actions in the fast system can be passed on to

the slow system for forward consideration on a regular systematic basis. This forms the interacting effects between actions induced by the slow system, immediate actions taken in response to external events, and continuous observations of outcomes in the fast system.

However, individual employees and operational managers rarely act on their own but operate as social beings within the organization executing the daily transactions in pursuit of a common purpose. These individuals coordinate their actions through horizontal communication links and receive feedback from various stakeholders affected by these activities to make sense of the situation and the evolving surroundings (Lieberman 2007). This ability of individuals in an organization to engage in responsive actions when conditions change is important for responsiveness and adaptation. As noted by Andy Grove (1996) “the process of adapting to change starts with the employees, who through their daily work, adjust to the new outside forces”. They face new challenges and respond with innovative responses and as Teece (2007: 1319) pinpoints “enterprises with strong dynamic capabilities are intensely entrepreneurial”. Here the dynamic interaction between individuals is important to take advantage of the diverse experiences, insights and knowledge that exist in different parts of the organization.

The ability to adapt to entirely new complex situations girded with uncertainty requires collaborative efforts between many individuals because the cognitive capacity of humans has limits and the amount of information required to solve highly complex and ambiguous problems exceeds the capacity of single individuals (Antonenko, Paas, Grabner and van Gog, 2010). Dealing with ambiguous and uncertain situations requires different types of knowledge that can generate ideas and create new insights from operational experiences (Bransford, Brown and Cocking, 1999). That is, collaborative learning among many individuals in the organization will be more effective in developing good solutions to highly complex issues. This is expressed in the following proposition:

Proposition 3: *Organizations that apply collaborative learning processes as intermediate interfaces between fast experiential insights derived from responsive actions and slow forward-looking reasoning are more effective adapting their strategies to turbulent conditions.*

So, in dealing with complex and uncertain issues, the cognitive limitations of humans can be circumvented by learning collaboratively drawing from the diverse knowledge of multiple individuals involved in the problem solving (Kirschner, Paas and Kirschner, 2009). Consequently, the complementary interaction between fast responsive actions and the slow forward-looking planning process should be accomplished so diverse information is processed among many individuals from different parts of the organization to facilitate collaborative learning and joint problem-solving that generate better solutions. Hence, a collection of individuals including central decision-makers around top management and operational managers that respond to ongoing changes can engage in effective collaborative learning.

Interactive management process

The management literature tells us little about how this interaction should be organized and strategy process research has only paid limited attention to strategic controls (Simons, 1994). The control process implied by the strategic management model is simple and long-looped suggesting that intended and realized outcomes are compared and reviewed at the end of each planning cycle before it rolls forward (e.g., Ansoff, 1980; Schendel and Hofer, 1979). Yet, management accounting scholars have gained a substantial following for elaborate balanced scorecard systems with periodic follow-ups, such as, quarterly or even monthly interventions (e.g., Kaplan and Norton, 2001). As a starting point, we know that communication and information systems play an important role in linking individual decision makers together for mutual adjustment processing as discussed in the organization literature (e.g., Aldrich, 2008; Daft, 2010; Galbraith, 1977). We also know that collaborative learning as outlined in cognitive science is the basis for creative thinking and innovative solutions to complex environmental

challenges that in principle should derive from management discussions linked to the strategic control processes.

Earlier writings in the strategy field acknowledged the need for faster monitoring of strategic performance in dynamic environments. Ansoff (1980) outlined a formal process of ongoing strategic issue management for early detection and handling of environmental events that could affect the organization's ability to achieve its strategic objectives. Goold and Quinn (1990) identified the strategic control dilemmas when the environment creates potential uncertainty about competitive effects of chosen strategies as well as means-ends relationships of planned strategic initiatives. Hence, they proposed the use of multiple qualitative outcome indicators rather than a few simple quantitative performance measures that can be hard to use meaningfully in ex post performance analyses. However, these aspects have largely been subdued in subsequent strategy research and strategic control processes are only rarely subjected to thorough research efforts (Simons, 1994). The predominant depiction of strategic control remains a central diagnostic approach linked to the strategic apex around top management.

However, Simons (1990, 1994) introduced the concept of interactive control systems determined by four characteristics: (1) They are used regularly by top management, (2) they receive frequent attention by operating managers across the organization, (3) they entail face-to-face discussions between superiors and subordinates, and (4) they provide a platform for ongoing debate. Hence, the interactive control process confronts the forward-looking strategy considerations of top management with the current experiences obtained directly from managers involved in the actions pursued by the operating entities. According to Simons (1994: 81) an interactive control system “enables top-level managers to focus on strategic uncertainties, to learn about threats and opportunities as competitive conditions change, and to respond proactively”. It facilitates open dialog between top managers and subordinates in personal and regular discussions about the effects of responsive actions and strategic initiatives when the changing environmental context is uncertain. Hence, it constitutes a vehicle for

collective learning involving experiences from the fast actions pursued by managers in the organization's operational functions and the slow forward-looking strategic planning considerations around top management.

Creating a responsive dynamic

Dispersion of decision power allows exploratory initiatives to be taken by operating managers that may uncover new business opportunities. The strategic management process with related control systems can be used for forward-looking evaluations of strategic opportunities deriving from these decentralized experimental actions (e.g., Ansoff 1980; Richards 1986). Using management information systems to monitor organizational outcomes can provide new insights when outcomes deviate from expectations and new action patterns are revealed (Simons 1990, 2000). Hence, integrative strategy-making can proactively improve the strategic understanding of changing business conditions and develop solutions to them when fed regularly with updated environmental insights from the daily operations.

The ongoing responsive actions derived from many dispersed managerial decisions interact with numerous individual stakeholders implicated by the activities both inside and outside the organization (e.g., Bower 2005; Bower and Gilbert 2007) and these complex interactions constitute non-linear processes. The central planning process is characterized by rational deduction and linear computations aimed at comprehending, predicting, and determining a more certain strategic direction going forward. Hence, the combined fast and slow processes establish a contrasting difference between non-linear and linear processing modes that can be reconciled by the complementary nature of the slow thinking process and current insights from individual stakeholders in and outside the organization.

The underlying logic of this responsive dynamic is illustrated in Figure 2. In the fast actions processes at the operational level, employees and local managers take responsive actions to ongoing developments they are confronted with in the surrounding business environment. They engage in *experiential learning* as they observe and gain impressions from the reactions of the various stakeholders

affected by the responsive actions and thereby learn what can work under new circumstances. Essentially they do things to accommodate their daily transactional work, they sense the effects of responsive actions applied in that work, and form anticipations about what will work in the future. In the slow planning process at the strategic level, top managers and people around them (staff, senior managers, etc.) periodically, say once a year, engage in *forward-looking reasoning* to determine a proper strategic direction for the organization through an attempted rational analytical approach. They use available information about environmental traits, such as, demand, competition, technology, regulation, resources, competencies, etc., to inform the analyses and assessments of alternative strategic paths for the firm. In essence they try to set a general direction for the firm, while integrating different business activities to form a sufficiently competent organization and coordinate operational activities for economic efficiencies.

Please insert Figure 2 about here

The crucial question here is what information top management will use to conduct the forward-looking analyses. Much important knowledge and insights can be, and is, transferred to corporate executives from outside contacts with other executives and various industry specialists and influence the cognition of corporate executives. Hence, we suggest in line with the slow-fast processing rationale that the corporate executives also should consider the current insights from experiential learning generated by employees and managers at the organization's operational level. This type of information can at times follow informal channels directly from engaged employees to a top manager, possibly championed by line managers on the way. While this may be a somewhat unreliable communication route with little assurance of gathering all the important environmental information, it is possible to establish more systematic interfaces at the intermediate tactical level to facilitate open information exchanges.

The collection of current experiences from operational managers can be used to inform the strategic thinking of top management and might take the form of different information aggregation and crowdsourcing techniques (Hallin, Andersen and Tvætterås, 2012). This provides updated insights to the top managers and their analytical staff and can also entail engaged discussions between low-level and top managers to clarify the environmental uncertainties through open exchanges in a form of interactive control process (Simons, 1994). It is clear that there is a need for more frequent collaborative learning sessions as essential interfaces that exchange diverse insights from fast experiential learning as explicit input to the slow forward-looking reasoning (Figure 2).

This contemplates a time dependent dynamic system where the elemental fast and slow (and intermediate) processes operate at different clock-speeds and, therefore, must be linked together in a systematic but flexible manner (Figure 3). The fast *responsive actions* at the operational level are comprised by multiple short-paced learning cycles related to actions taken at dispersed locations throughout the organization that generate quick experiences and insights about what works under the emerging environmental conditions. The slow *forward-looking reasoning* at the strategic level constitutes a long-paced learning cycle where the feedback loop circumscribes a much longer time horizon where the long-term assumptions will be outdated compared to the insights gained from the fast experiential feedback loops. This reasoning leads to the following proposition:

Proposition 4: *Organizations that consider the current experiential insights gained from ongoing responsive initiatives in their forward-looking analytical planning process are more effective adapting their strategies to complex and dynamic business conditions.*

Hence, we need relatively high-frequency processes of monitoring, communicating, and collaborative learning to effectively bind the slow-fast processing system together. That is, the organization has to find a proper balance between periodic management reporting, sequences of interactive controls, and informal communication links over time. This constitutes a combination of approaches tailored to firm-specific needs and conditions, which in turn can become a winning formula

for sustainable competitive advantage through unique strategic response capabilities embedded as cultural traits that are hard to emulate. This formula may also comprise an ability to change the mix of approaches from time to time as environmental conditions change, where periods of high uncertainty and intensive change require more interaction and collaborative learning than periods of relative stable conditions.

Please insert Figure 3 about here

Limitations

The depiction of interacting fast and slow processes is obviously idealized and more often than not will fail to materialize. Many descriptions of planning departments conducting analytical work based on simple updating of prior assessments without experiential knowledge from current operations attest to that (e.g., Mintzberg 1994). While employees and managers with operational responsibilities may have many valuable field observations, they often have nowhere to communicate essential environmental developments because internal communication links are flawed and collaborative learning platforms are missing. Or, they may simply be confined to focus on annually set key performance indicators (KPIs) thereby pursuing technical perfection rather than looking for adaptive responses. This way information might be lost where ‘weak signals’ in the organization’s operations otherwise could give pre-warnings about important conditions emerging as well as viable solutions to deal effectively with them. Unfortunately, the connection between ongoing situational observations in the field and rational analytical considerations conducted in the planning department at corporate headquarters is often cut off.

Nonetheless, effective organizational learning under conditions of turbulence hinges upon a setting that is conducive to collaborative learning. This includes organizational norms, attitudes and expectations that encourage and inspire ongoing discourse in all parts of the firm. It includes

discussions around responsive actions in different operating entities to emerging environmental changes that create new insights in local entities with involved employees. This knowledge can also be communicated to and exchanged with individuals in other parts of the organization. Hence, it is important to encourage localized discourse as well as enabling connections between specialized local knowledge communities and central planning when dealing with complex organizations and strategic issues.

Organizational culture

The interacting fast-slow processing system implicates active interfaces with essential stakeholders including the firm's own employees where ongoing changes in business conditions perceived through the stakeholders' direct experiences are an important source of strategic intelligence for the organization. This organizational context provides the means to obtain direct and updated feedback gathered from many individuals and thereby enhance insights from current collective knowledge accessible to the firm (Hallin, Andersen and Tvætterås, 2012). However, in the social context of organizations, the prevailing culture influences how these individuals perceive the environment they operate in and how they interact with each other. Hence, Mesoudi (2011: 1) argues that "explanation of human behavior that ignores culture ... will almost certainly be incomplete". Schein (2004: 1) defines organizational culture as "a set of structures, routines, rules, and norms that guide and constrain behavior". This means that culture is a dynamic phenomenon created by people interacting in particular ways over extended periods of time initially shaped by the values and beliefs of a founding (or otherwise influential) leader that becomes commonly accepted norms.

At the organizational level, the norms and values embedded in the culture will influence the way people think, behave and act. So, culture is an inseparable part of the way human actions are carried out within a given environmental context. Individuals are shaped and classified by the culture they live and act in as well as their actions shape the culture (Hacking, 1999). The way individuals interact in an organizational human network can "exhibit complicated, shared behaviors without explicit

coordination or awareness” (Christakis and Fowler, 2009: 25). This means that perceptions, behaviors, and actions can vary according to the specific organizational culture (Adolph, 2009; Vogeley and Roepstorff, 2010). In short, the collective cognitive capabilities of human (organizational) networks develop distinct behaviors with heterogeneous and thus unique capabilities to respond and adapt to environmental changes.

A network of individuals can form a collective intelligence without a formal control center and has non-linear emergent properties that defy simple aggregation (Kaufman, 1993). Consequently, creativity and innovation is not just an individual mental activity, it is linked to the ways people act and interact. According to Csikszentmihalyi (1996: 1) “an idea or product that deserves the label ‘creative’ arises from the synergy of many sources and not only from the mind of a single person. It is easier to enhance creativity by changing conditions in the environment than by trying to make people think more creatively”. Therefore, innovative behavior depends on an organizational setting with creative surroundings with the right stimuli among interacting networked individuals. So, an organizational climate that motivates individual engagement is one of the means to form a creative and responsive culture.

Collaborative learning requires a setting where individuals can act and interact in a supportive social context, but it can only be fully understood by considering the role of culture as it influences the ability to communicate observations and exchange insights from new experiential knowledge. Culture can be perceived as information that affect individual behaviors thus implying that cultural variation arises from collective learning processes where individual information is exchanged in a social system (Richerson and Boyd, 2005). So, culture is information comprised by knowledge, beliefs, attitudes, norms, preferences and skills acquired from other individuals through various transmission and communication mechanisms.

Different groups of people, such as an organization, can co-develop distinct values and norms and compete with other sub-groups based on these behavioral traits. This is consistent with

evolutionary theory where firms compete on the basis of superior routines that are partially transferred and reorganized for adaptive purposes (Nelson and Winter, 1982). Here information constitutes a basic inheritance mechanism where the evolutionary process depends on the ability to express and interpret information (Distin, 2011). Language as a communication tool stores explicit knowledge where the development of common terminologies, definitions, concepts and generally understood practices provides a basis for cultural evolution. Hence, the communication and information systems that support the decentralized organizational structure also provides important interaction links for an organizational culture of environmental adaptation. This argumentation leads to the following proposition:

***Proposition 5:** Organizations with cultural traits that are conducive to combine fast experiential learning cycles with slow forward-looking planning cycles through interactive collaborative learning interfaces are more effective in sustaining the competitive advantage of the firm.*

Variations in culture can be passed on between individuals within the organization as well as with individuals in other organizations in the business community. Hence, we observe that human socio-economic development is based on gradual accumulation of many successive modifications that increase efficiencies where human innovation emerges as small incremental steps rather than random mutations (Richerson and Boyd, 2005). As Mesudi (2011: 33) argues “successful innovations are always slight modifications of what went before, or the combination of previously separate innovations.” That is, the many diverse experiential insights gained from dispersed responsive actions in individual creative processes develop new adaptive moves somewhat at random, but ideas from ‘migrating’ individuals from other organizations or from external contacts can complement internal learning from fast actions.

Cultural evolution can be a highly adaptive mechanism for organizations that are comprised by groups of individuals and constitutes a unique human phenomenon. The ability for collaborative learning is not merely a byproduct of individual learning and social behaviors but is based on distinctly

human “special-purpose mental mechanisms” (Richerson and Boyd, 2005: 100). So, the ability to engage in responsive actions and sharing experiential information in collaborative learning is culturally driven and a very economizing way to deal with turbulent environmental contexts. This dynamic system creates new insights and uncovers effective responses that can be applied more broadly across the organization through coordinated, or planned, replications of approaches that work.

Richerson and Boyd (2005: 113) argue that “organisms capable of imitation can afford to be choosy, learning when learning is cheap and accurate, and imitating when learning is likely to be costly or inaccurate”. That is, fast-slow processing capabilities driven by common cultural artifacts are effective in dealing with unexpected events in an uncertain world where intermediate interactive control discussions can determine when to experiment, replicate, and imitate corporate activities. Hence, cultural evolution suggests that open collaborative learning is superior both in terms of cost as well as in terms of adaptive capacity. The exchange of information in collaborative discussions between individuals with diverse operational and managerial insights and experiences will lead to better solutions for complex problems under ambiguity thus making cultural settings conducive to such creative and innovative interaction superior. Organizational cultures that encourage, enable, and facilitate creative and innovative behaviors supported by internal information exchange and communication links will respond more effectively to unexpected events through collaborative learning efforts.

Discussion and conclusion

Individuals in the organization and other close stakeholders like customers, suppliers and partners, observe environmental changes and gain new insights from the responsive actions taken by the firm and when this information is considered in the central planning considerations the diverse insights can help interpret the emerging conditions through rational analysis. A dynamic system between slow-fast processing creates a balance between ongoing identification of contextual situations and collective forward-looking reasoning that enhances the ability to handle unexpected changes. Organizations that

embrace a culture of collaborative learning are better at dealing with unprecedented complex situations and such a culturally driven evolution has a strong and durable adaptive capacity.

The logic behind the superiority of interacting fast and slow processes in organizations is supported by individual motivation, interacting dynamics, collaborative learning and cultural network arguments. Autonomy and individual involvement generate innovative responsive actions to changing business conditions. The responsive actions taken by individuals within the organization generate experience with updated insights about the changing conditions that can inform central forward-looking reasoning about environmental developments and thinking about the strategic direction for the organization. Collaborative efforts among individuals across the organization with different functional expertise, business experiences, and managerial orientations deal more effectively with the challenges imposed by a turbulent evolving environment. Hence, Nonaka (1994) explains how learning and knowledge creation among individuals in a group thrives on intension, autonomy and fluctuation. Intension is a central sense of direction and aspiration that guides the actions taken by individuals in the organization. A certain level of autonomy gives the individuals freedom to act and absorb new knowledge from their actions. Fluctuation is imposed by the uncertainty of the environment and forms creative tension. Local managers and employees take responsive actions to emerging changes and explore new ways to deal with the changing surroundings by sensing the immediate effects and outcomes observed among the firm's essential stakeholders. In an organizational setting this means that creative, innovative and responsive individuals require a certain level of authority to take actions autonomously within their individual areas of responsibility while long-term goals and aspirations create inspirational tensions.

New insights about different aspects of a changing business environment are obtained as individual employees do their daily things in the operational functions, interact with various stakeholders, and observe the effects of those actions. If individual managers are allowed to react to observed changes and respond to them within their areas of responsibility in line with common

aspirations, the organization will be able to build a large reservoir of relevant updated experiential knowledge from many different responsive actions. These diverse insights covering different aspects of the current environmental context can be usefully engaged in internal analyses among central decision-makers in the organization and provide better information for concrete forward-looking strategic decisions.

The human mind operates through fast and slow processing systems where the interaction between them provides current updates on environmental developments and interprets their consequences as a basis for making informed forward-looking decisions. Similarly, individual observations of environmental changes and decentralized responsive actions in organizational sub-groups combined with central evaluations of experiential insights provide updated cognition about conditions in the changing environment. Hence, effective organizations enable ongoing observations from responsive actions that experiment with the way things are done and encourage intense internal communication that feeds into forward-looking strategy considerations around top management at headquarters.

The essential leadership challenge is to enable this dynamic interactive system by structuring the organization appropriately and allow for both fast and slow processes as well as establishing appropriate communication and information systems to facilitate the needed interaction between them. Another implication is that strategic leadership assumes a role of enabling effective fast-slow processing capabilities by establishing an organizational setting and a corporate culture that is conducive to human interaction and collaborative learning. This means that a prime role of senior management is to think about appropriate decision structures, management information systems, and control processes based on durable corporate values, behavioral guidelines and consistent incentives.

This requires structure, processes, systems and cultural traits that enhance a dynamic system based on interacting fast and slow processes including dispersed responsive actions and experimentation, collective learning for viable solutions, and cultural transmission to gradually implement them based on

central forward-looking analyses. The implication for management practice is that individual cognition matters and, therefore, calls for efforts to actively involve local managers and employees and facilitate interactive information exchanges among them across functions and hierarchies. It implies that a primary leadership role is to instill responsive entrepreneurial behaviors based on supportive organizational structures and systems that facilitate local experimentation and collective learning across a broad set of actors in the firm while submitting potential solutions to the scrutiny of central planning.

Effective organizational adaptation under the conditions of turbulent environments depends on a setting that is conducive to collaborative learning. This includes organizational norms, attitudes and expectations that encourage and inspire ongoing discourse in all parts of the firm. It includes discussions around responsive actions in different operating entities to emerging changes that create new insights in the local entities around the involved employees. This knowledge can be collected, communicated, and openly exchanged with individuals in other parts of the organization. Hence, it is important to encourage localized discourse as well as enable connections between specialized local knowledge communities and central planning functions when dealing with complex organizational issues.

The proposed organizational setting is consistent with empirical studies of corporate entrepreneurship where strategy making is characterized as environmental scanning, planning flexibility, deep involvement (locus) and interactive strategic control (Barringer and Bluedorn 1999; Simons 1994). These elements also conform to the premises of the Bower-Burgelman model (Bower 2005; Burgelman 1996) where top management establishes the structural setting and corporate direction while responsive initiatives taken deep within the organization create new important strategic opportunities. So, the cognitive competencies of individuals within the organization are required for this to come to fruition and it is an important leadership role to drive this entrepreneurial potential towards better outcomes (Sathe 2003).

What the fast-slow systems thinking from cognitive science can do in this context, is to provide a foundation for understanding the required individual and organizational processes as underpinnings of a firm's dynamic capabilities. This also raises new relevant questions, such as, how executives and managers can support interactive strategy-making behaviors and form a strong organizational culture of collective learning and interactive control practices. The fast system of decentralized responsive actions may require some availability of slack to experiment that can be at odds with requirements for economic efficiencies and adherence to stringent budgetary goals and key performance indicators. However, the ability to engage in responsive actions and adhere to a culture driven evolutionary process may be a very economical way to deal with unexpected environmental developments and uncertain conditions in general because they constitute small low-cost probes with limited risks and thus may constitute an efficient way to search for potential solutions under complex circumstances.

The interaction between the fast probing processes and the slow reasoning processes provides the means to evaluate the small probes, select those that seem to work, and convert them into larger organizational initiatives where coordination of activities is important as the stakes for corporate success increase. The higher exposures are dampened by the fact that the small probes already have identified viable solutions and that a common corporate culture makes it easier to transpose good solutions to other parts of the organization. Hence, collective learning approaches and interactive control processes supported by effective communication and management information systems can allow good solutions to be refined along the way and become even better. In short, the interaction between fast actions and slow thinking processes constitute an effective way to respond and adapt to the often abrupt and highly complex environmental changes that need new innovative responses.

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Figure 1. Interaction Between the Slow Planning Process and Fast Responsive Actions

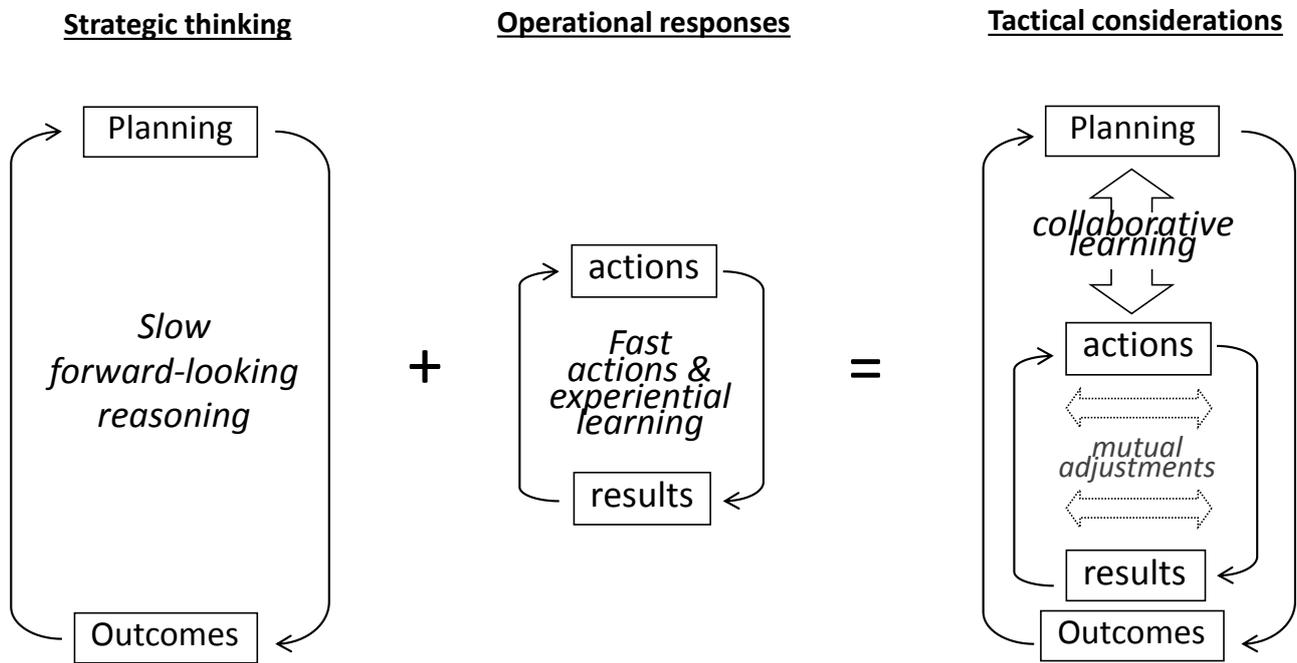


Figure 2. The Intermediate Role of Collaborative Learning

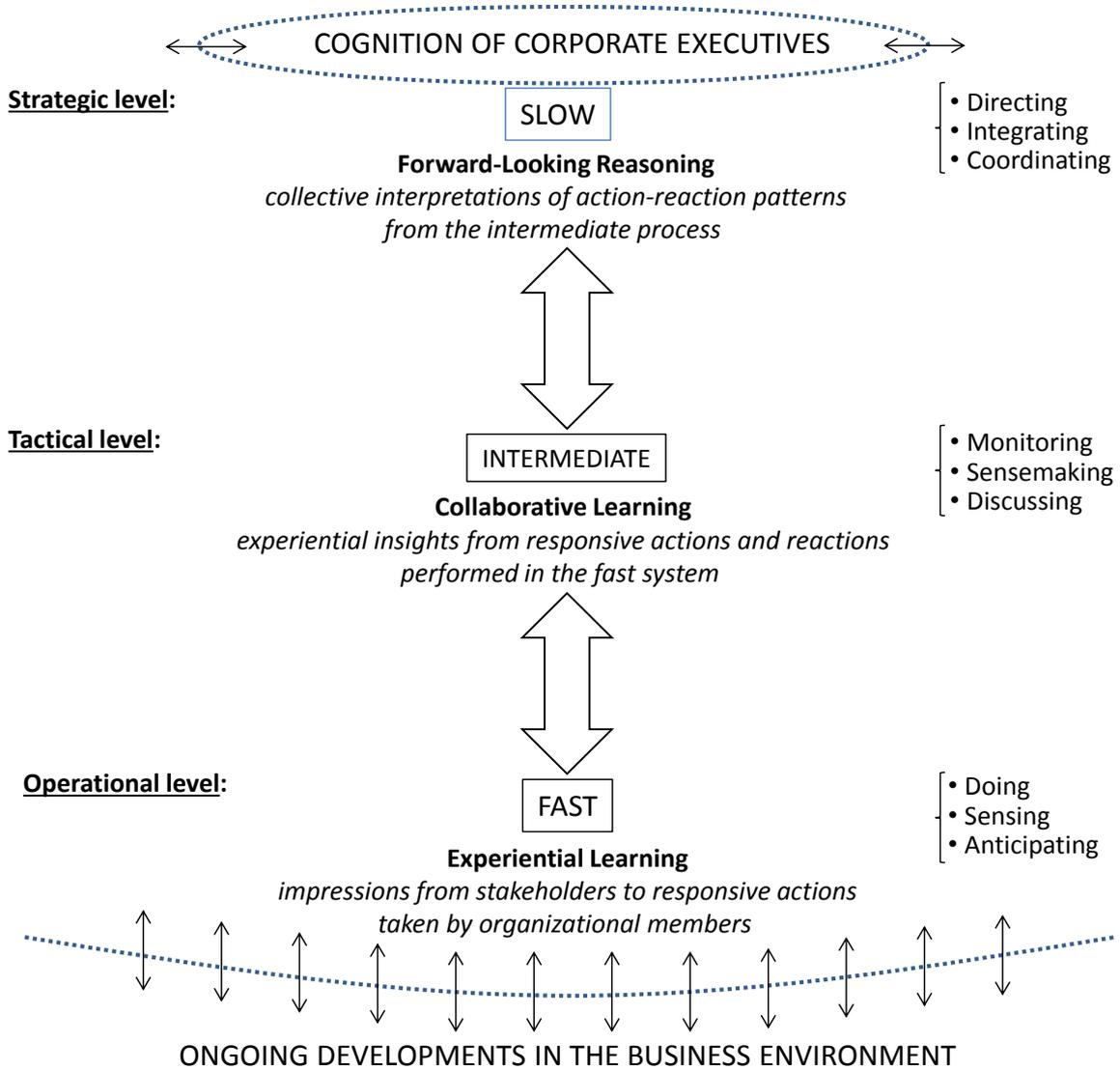


Figure 3. Operational Responsive Actions and Strategic Forward-Looking Reasoning Interacting Over Time

