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Entrepreneurial Capability: Opportunity Pursuit and Game Changing

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Opportunity Pursuit and Game Changing**

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Abstract

In this article, we introduce entrepreneurial capability (EC) as a means of capturing a firm's capacity to sense, select, shape and synchronize its pursuit of opportunities. After defining EC and explaining its dimensions, we propose that its most profound role lies in promoting companies' proactiveness in managing their business ecosystem in order to gain competitive advantages based on their entrepreneurial activities. We then discuss the role of EC in bringing about changes in the nature, domain and timing of competitive games. Finally, we articulate the implications of EC for managerial practices and future entrepreneurship research.

Key words: entrepreneurship, business ecosystem, competitive game, entrepreneurial capability

A major question in corporate entrepreneurship research is: Why are some companies able to adapt and reinvent themselves as industry leaders while others fail to do so? Some companies (e.g., Apple, Pixar, 3M, Google, Carrefour, Zara, and Virgin) have consistently been on the forefront of changing the rules of competition. Over time, these companies have shown deftness in sensing and shaping opportunities as well as synchronizing the deployment and use of their resources in changing their competitive arenas. These companies appear to benefit from a well-honed set of entrepreneurial capabilities (ECs) which they have developed and refined over time. Other companies, however, have failed to inculcate or exercise similar capabilities and spark off game change. Corporate entrepreneurship research would benefit from examining the nature and content of EC as well as when and how it affects game change. Such an examination is the focus of this article.

Some scholars have proposed that EC is a type of dynamic capability. A capability refers to a firm's capacity to perform a task or activity in pursuit of its mission. EC enables a company's transformation through sensing and shaping of opportunities as well as providing specific heuristics to evaluate, select and exploit them (e.g., Bingham, Eisenhardt and Furr, 2007; Teece, 2007). Unleashed, EC can bring about external changes that alter the domain, nature and scope of the competitive arena, the competitive game that is played, and how this game is played. Limited research exists today on EC and whether it differs in any significant way from other types of dynamic capabilities (Burgelman, 1983; Burgelman and Grove, 2007; Phan, Wright, Ucbasaran, and Tan, 2009).

Objective and Contributions

In this article, we seek to accomplish three objectives. First, we discuss the dimensions of EC and show their importance for the study and practice of corporate entrepreneurship. Second, we connect the dimensions of EC to game changes that alter the

competitive arena, and its key players, rules, and timing. Third, we discuss the key conditions under which EC can bring about game change.

We argue that developing and leveraging EC requires the coordination of the mindsets and actions of managers in the exploration and exploitation of opportunities. EC enables the triggering of internal and external changes that can profoundly change the rules of competitive rivalry and determine winners and losers in the marketplace. Further, we propose that EC combines dimensions that set it apart from other dynamic capabilities and allow it to spark off game change. As such EC bridges the gap between a firm's aspirations and resources by synchronizing the firm's actions with the timing and speed of changes in other players as well as in the overall external environment. When effectively enacted, EC ensures continuity of corporate entrepreneurial activities focused on the creation of novel ideas and the pursuit of opportunities that change the competitive game.

Our interest in EC stems from the profound changes that have taken place in the nature of competition, a competition which has become system-based. Networks of companies located around the globe simultaneously compete and collaborate to ensure continuous and radical innovation and to position their products as their industry's standard (Adner and Kapoor, 2010). Products have become complex, and different niche producers around the globe specialize and coordinate to achieve competitive superiority. Supply chains have also become global in nature, with countless players involved. Relationships between incumbents and these new players have become a key source of rapid and radical innovations. Established companies need to develop their ecosystem by creating hospitable environments in which they gain access to the knowledge, resources and innovations of other firms (e.g., suppliers) and create the conditions necessary for their products to win. Teece (2009: 16) defines an ecosystem as "the community of organizations, institutions, and individuals that impact the enterprise and the enterprise's customers and suppliers." It is

within the ecosystem that the competitive game unfolds, influencing multiple players who differ in capabilities and resources. A company can at times alter the competitive game to its advantage by developing a distinct EC that capitalizes on different endowments in its ecosystem.

Our discussion of the EC concept contributes to the literature on dynamic capabilities and corporate entrepreneurship in several ways. First, we bring clarity to and extend work on the content of dynamic capabilities by distinguishing an entrepreneurial element of those capabilities that allows a firm to induce external change. Some dynamic capabilities focus internally, enabling the firm to adapt its routines and to evolve with its environment. What makes EC unique is that it enables a firm to proactively initiate change in its environment by accessing external resources and orchestrating their combination with internal resources. EC implies creating new capabilities, rather than just keeping or upgrading existing ones. New capabilities allow the firm to venture into new arenas (Zahra, 2008), a key focus of corporate entrepreneurial activities (Phan et al., 2009).

Second, we contribute insights to the discovery-creation debate on opportunity exploration by offering theoretical arguments that EC operates in a way that induces and capitalizes on the co-evolution of recognition, discovery, and creation. Our discussion clarifies the genesis of corporate entrepreneurial activities and how they induce variety into the firm's operations, unleashing innovation and new business creation. Our discussion clarifies the mechanisms that make this translation possible, connecting research on corporate and strategic entrepreneurship (Ireland, Hitt and Sirmon, 2003).

Finally, we advance the discussion on industry emergence and evolution by highlighting the how EC triggers game change by yielding an ongoing variety of new ideas. While it is difficult to know ex-ante if a particular firm's actions will lead to a game change, a focus on EC reveals if a firm has the potential to influence its context. Our focus on EC

complements existing explanations of game change (e.g., DiMaggio, 1988; Lawrence and Suddaby, 2006). Our work elucidates an organizational level capability that occupies a middle ground between environmental shocks and the work of institutional actors and entrepreneurs.

The remainder of this article is structured as follows. First, we define EC and explicate its dimensions, distinguishing it from other dynamic capabilities. We then examine the mechanisms through which EC operates and evolves, and we articulate the conditions under which EC is more or less likely to trigger game change. We conclude with a discussion of the opportunity provided by the concept of EC for a synthesis of theoretical and practical insights across the fields of entrepreneurship, innovation, strategy, and organization.

Definition of EC

An emerging consensus suggests that firms develop two sets of capabilities, substantive and dynamic in order to thrive and persist (Bingham et al., 2007). Substantive capabilities typically encompass operating routines that are aimed at the efficiency and effectiveness of value chain tasks. Dynamic capabilities integrate and update substantive routines, triggering and enabling internal change (Zahra, Sapienza and Davidsson, 2006; Zollo and Winter, 2002), sometimes in profound and even unforeseen ways. Overall, they reconfigure and change the resources under a firm's control.

Some firms develop a special type of dynamic capability that extends beyond the change and integration of substantive routines, a capability whose aim is to synchronize and orchestrate the co-incidence of such changes with events and efforts emerging beyond the firm's boundaries; we refer to this as EC. The development and exercise of such EC in the pursuit and creation of opportunity stretches the influence and actions of a firm beyond the resources that it currently controls (Stevenson and Jarillo, 1990). Like other dynamic

capabilities, EC focuses on anticipating and realizing pending organizational change (Zahra and George, 2002). However, unlike them, its primary contribution lies in inducing change into to firm's environment to gain an advantage (Burgelman and Grove, 2007), a key objective of some corporate entrepreneurship initiatives. Even though both serendipity and external shocks can pave the way to a game change, what we seek to recognize by zeroing in on EC are the conscious actions that managers undertake in the pursuit of game changing outcomes, whether such outcomes are achieved or not.

We define EC as the ability to sense, select, shape and synchronize internal and external conditions for the exploration (recognition, discovery and creation) and exploitation of opportunities. Exercising this capacity increases the likelihood, but does not guarantee, that game change will occur. Still, our definition highlights three characteristics which distinguish EC from other dynamic capabilities. Explicating these differences can reveal why EC could be a useful concept to advance the study of entrepreneurship.

First, EC is characterized by the interplay of corporate entrepreneurs' (and managers') abilities to envision and mobilize action. EC involves judgments and actions of a multiplicity of entrepreneurs with different roles and contributions throughout the process of reshaping and employing a firm's capability portfolio (Augier and Teece, 2009; Teece, 2007; Adner and Helfat, 2003). For EC to eventually lead to game change, both individual judgment and collective intelligence matter. Individuals bring in a variety of perspectives and ideas, and their "heterogeneous mental models interact to create and arrange resources to produce a collective output" (Foss, Klein, Kor, and Mahoney, 2008: 73). What they do both individually and collectively influences the pace, focus and intensity of the firm's activities. Successful corporate entrepreneurship initiatives integrate these diverse views in a coherent manner to achieve desired strategic change (Burgelman and Grove, 2007; Phan et al., 2009).

Second, EC resides at the intersection of cognition and action. EC emerges and develops from the actions entrepreneurs take to reconfigure conditions within and outside the organization in accordance with their heterogeneous and collective mental models (Finkelstein and Peteraf, 2007; Foss et al., 2008). Thus, our notion of EC is distinguished from recent cognitive approaches to dynamic capabilities (Bingham et al., 2007; Gavetti, Levinthal, and Rivkin, 2005; Tripsas and Gavetti, 2000) by its addition of an action orientation and an emphasis on both individual and collective aspects of the process.

Third, EC involves both exploration (recognition, discovery and creation) and exploitation of opportunities to synchronize and shape emergent conditions internal and external to the firm. This requires the continuous identification, evaluation, realization and creation of opportunities, unlike other dynamic capabilities such as absorptive capacity that are knowledge-centered and strictly focused on converting external knowledge to internal knowledge exploitation (Zahra and George, 2002). This distinction is at the heart of the game changing potential role of EC, a capacity to extend the boundary of the firm, influence the convergence of internal and external conditions, and spark external change—a pillar of corporate entrepreneurship. By acknowledging the role of conjecture and uncontrollable forces, we avoid an overemphasis on percipience as a precondition to the recognition or creation of opportunities (Alvarez and Barney, 2007; Zahra, 2008). Still, our definition implies that EC requires entrepreneurs to view opportunity realization in ways that reach beyond the transformation and exploitation of internal capabilities to the dynamic creation and shaping of new knowledge and conjecture, key sources of variety and innovativeness.

Considered from this angle, EC resembles ambidexterity as a dynamic capability that centers on simultaneous exploration and exploitation (O'Reilly and Tushman, 2008). However, EC's role differs from that of ambidexterity, which breeds organizational change (i.e., a firm's adaptation), not external transformation (i.e., game change). An additional

aspect of balancing is present within exploration, wherein EC enables the concurrent recognition, discovery and creation of opportunities, going well beyond previous approaches that juxtapose those processes (Alvarez and Barney, 2007; Miller, 2007). EC allows for the simultaneous reaction to exogenous jolts and creation of opportunities endogenously; thus, from an EC perspective opportunities are best characterized as imagined (Klein, 2008).

EC Dimensions

EC consists of four distinct but interrelated dimensions that are anchored in the pursuit of opportunities: sensing, selecting, shaping, and synchronizing. In Table 1, we provide an overview of the nature of these dimensions, the mechanisms through which they operate, and illustrative supporting references from the literature to define each.

[Insert Table 1 about here]

The *sensing* dimension is about seeing or envisioning market and technological opportunities, within as well as beyond the confines of an industry, as in the case of cross-boundary disruptors (Felin, Zenger and Tomsik, 2009; Klein, 2008; Burgelman and Grove, 2007; Teece, 2007). For example, before arriving at Apple, Faddell (the “father of the iPod”) pitched his invention to several other companies (e.g., Philips and RealNetworks) who were unable to see its potential (Tynan, 2009). Yet, Apple sensed the possibilities for iPod to create and take advantage of significant convergence of forces and was able to take actions that helped orchestrate its emergence.

As Table 1 indicates, key mechanisms for sensing include alert scanning and searching (Tang, Kacmar, and Busenitz, in press; March and Simon, 1958), experimenting (Dyer, Gregersen, and Christensen, 2009), and imagining (Felin et al., 2009; Klein, 2008). Sensing opportunities can originate both from individuals within an organization such as middle managers or employees, as well as from a company’s dedicated collectivities such as

its R&D function or unit (Teece, 2007). It can also originate outside, through suppliers, customers, or other members of the company's network. Users have been found a frequent source of new opportunities' identification (Shah and Tripsas, 2007).

Whereas sensing can be heightened by deep knowledge and exposure to contradictory information, it can be hampered by selective learning. Selective learning can heighten a firm's blind spots (Zajac and Bazerman, 1991), narrowing its attention to new ideas and increasing inertia. Managers adept at sensing are alert to contradictory information, seeing it as a potential signal of new, hitherto unanticipated sources of new directions. Contradictory information can stretch managers' mindsets and imagination and encourage them to look into formerly unattended scenarios. Yet, contradictory information is often the cause of discomfort and dissonance. Firms with well-embedded EC encourage individuals to question the collective wisdom of the dominant mindset. The sensing dimension of EC is strongest when it contains elements that allow or create processes that require the collision of new possibilities with established "taken-for-granted" views and practices. Corporate entrepreneurship research has long highlighted the tensions between existing and emerging views of the company's business definition (Burgelman, 1991; Phan et al., 2009).

Selecting denotes entrepreneurs and managers' ability to identify and choose what potential opportunities to pursue; it may also be embedded in collectively-created systems that contain criteria for search. Paradoxically, then, EC requires both being open to new ideas, and being willing to forego some possibilities. For example, in an interview following the success of the iPod, Jobs acknowledged that Apple's ability to innovate and reinvent markets depended on being selective: "[We say] 'no' to 1,000 things to make sure we don't get on the wrong track or try to do too much. We're always thinking about new markets we could enter, but it's only by saying 'no' that you can concentrate on the things that are really important" (Burrows, 2004). Selecting is most directly linked to managers' thinking and

decision making processes, rendering such processes invaluable in conceptualizing the relevant business ecosystem and the opportunities that might exist.

Key mechanisms that facilitate selecting include evaluating and judging (Tang et al., in press). Selection can take place within a firm through internal competition or be left to market forces (Burgelman, 1994; Birkinshaw, 2001). Corporate entrepreneurship research suggests the need to bring in and consider as many ideas for innovation and venturing as possible then subject them to rigorous analysis and evaluation (O'Connor & Rice, 2001; Phan et al., 2009). For example, as explained by Google CEO, Eric Schmidt, new ideas are scrutinized through a series of hurdles that allow judging their growth potential: "You can do whatever you want as long as you track it. We have very sophisticated measurement systems at every stage of launch. We have what is called trusted testers. Then [we] beta test, which is forever" (Hof, 2008).

Shaping refers to the orchestrating of connections among internally and externally available capabilities and resources for opportunity realization. As Table 1 shows, key mechanisms for shaping an opportunity are bricolage, transposition, and meaning making. Bricolage involves the mobilization of the resources and capabilities at hand internally and externally, regardless of their original purpose (Lévi-Strauss, 1962). Transposition refers to creating an opportunity by taking a logic from one domain and bringing it into another, e.g., from fashion into the field of mobile telephony (Djelic and Ainamo, 2005). Finally, "meaning making" involves reasoning and justification, in which managers and entrepreneurs become theorizers and proponents of new courses of action to communicate and gain support from a range of stakeholders (Felin et al., 2009). For example, Steve Jobs said that "With iPod, Apple has invented a whole new category of digital music player that lets you put your entire music collection in your pocket and listen to it wherever you go" (<http://www.apple.com/pr/library/2001/oct/23ipod.html>).

Finally, *synchronizing* refers to temporally orchestrating a correspondence of internal and external elements. Internal alignment involves simultaneous exploration and exploitation of opportunities, while external alignment is about harmonizing a firm's actions with the speed of the environment and the opening and closing of windows of opportunity. For example, executive teams' rapid decision making is essential for succeeding in high velocity environments (Bourgeois and Eisenhardt, 1988; Eisenhardt, 1989). In these environments, synchronizing involves both understanding the speeds of the different elements requiring alignment and integration and actions to harmonize their "arrival." While capabilities themselves may be enduring, the co-occurrence of conditions in optimally matched states may be highly transient; thus, one of the keys to actual game changing may be synchronizing skills of the focal individuals or collectives in the firm with those outside.

Synchronizing operates through three mechanisms: temporal heuristics that specify sequence, pace, and timing; procedural heuristics that articulate process or actions for opportunity execution; and priority heuristics that articulate the ranking of opportunities in terms of their importance for the firm (Bingham et al., 2007). Driven by deep understanding of the firm's idiosyncrasies and those of the larger ecosystem, synchronizing requires appropriate timing and pace of a firm's decisions. It enhances persistence in the pursuit of new courses of action. Such capacities are critical during the emergence of game change when incumbents' reaction to changes and the strategic actions of a new mix of players reinforce and accelerate the process of redefinition of industry boundaries (Burgelman and Grove, 2007). For example, in the creation of the iPod, Apple aligned the speeds and contributions of different firms for the software and hardware development in order to deliver a product in a timely fashion; it also created an internal team to focus energy and effort on product emergence, while continuing elsewhere to explore and exploit opportunities related to its existing product lines.

The multiple dimensions of EC expose managers to a variety of opportunities and threats. In turn, this exposure can stimulate managers' imaginations and lead them to consider a wide range of possibilities. Given that conjectures, views and visions are open to different interpretation across managers, EC is also likely to provide both overlapping and divergent clues about pending changes and the opportunities associated with them. These differences could lead to conflicting visions for corporate entrepreneurial activities which nevertheless form a foundation of choices that ensure that variety permeates their thinking and operations. This variety increases the novelty of mental models, managerial processes, the firm's products and services, business models, and approaches to exploit opportunities.

As we suggest in Table 1, each dimension of EC provides management with unique, though interconnected, information (e.g., ideas to explore, opportunities to pursue, prototypes to evaluate, and alignment processes to fine-tune) that is useful in conceiving, selecting, evaluating, and co-aligning opportunities. This process is generated both by elements of the firm's human capital embedded in individuals as well as in the collective judgments and artifacts embedded in the organization as it conducts internal and external interactions. The four dimensions outlined in Table 1, therefore, transcend individual contributions; they form important organizational-level activities and skills. Though some individuals may show great foresight regarding the industry or a particular technology's evolution, their views will have impact only to the extent that they become embedded in the firm's search process.

Finally, our depiction of sensing, selecting, shaping, and synchronizing does not require that these dimensions necessarily occur sequentially or strictly in this order. Though there may be many circumstances that follow this particular path, and although this pattern seems logically appealing, we have intentionally avoided a depiction of the dimensions as a strict, linear process. Instead, we simply suggest that these dimensions of EC both co-exist

and affect one another in a variety of patterns difficult to predict in advance, and this is why they sometimes they have such profound effects that lead to game change, as discussed next.

EC INTEGRATION, EC EMBEDDEDNESS, AND GAME CHANGE

Game changing analogies have proliferated, as revealed by the plethora of titles that employ them (see e.g., Gray, Brown, and Macanuso, 2010; Osterwalder and Pigneur, 2009; Lafley and Charan, 2008). Authors have used the metaphor of a “game” as a gainful activity that involves rivalry, strategy and struggle (Merriam-Webster dictionary, 2010); objectives include identifying ways of improving the odds and outsmarting other players in pursuit of profit and growth. Authors have focused on established and newly created markets as the “playing field” but have rarely considered the broader context of economic activity (Dacin, Ventresca, and Beal, 1999).

We believe there are two main mechanisms that contribute to a firm’s proactively initiating steps for game change: the integration of EC dimensions and their organizational embeddedness. Below we discuss these mechanisms in relation to the processes of novelty generation, ecosystem transformation, and opportunity realization, all of which are instrumental in sparking off game change. We then elaborate on EC renewal, i.e. how its dimensions can be updated and kept current.

Integration of EC dimensions and game change

Generally speaking, all higher order capabilities of a business are aimed at creating or securing the long-term viability and welfare of the business. Thus, the central object of EC is to sense, shape, select, and synchronize activities, internal and external to the firm, in order to realize opportunities that enhance the viability and welfare of the firm. The outcomes of developing and exercising EC are far from predictable. Therefore, in Figures 1A, 1B, and 1C, we present three different but realistic paths of such potential outcomes. As Figure 1 depicts,

the direct object of EC (box 1) is to enact an opportunity realization process (box 2) which, in turn, enhances the ongoing performance of the firm (box 3). The performance results of such efforts will accordingly reinforce or alter EC (box 1).

[Insert Figures 1a, b and c about here]

Sometimes, as shown in Figure 2, EC (box 1) leads directly to radical or profound innovations that are manifested in the opportunity pursuit process (box 2). Such processes likely effect a firm's performance (box 3); and may have some moderate effects on the way others connected to them 'play the game' (box 5). At the same time, performance effects of radical changes are rather unpredictable (box 3). If the performance effects are negligible or are negative, we cannot always expect much impact on the behavior of competitors, suppliers, customers, or other players in the game. However, if the desired positive effects are unusually strong, we can expect game changing forces emanating from two sources. First, the positive feedback on the focal firm will enhance its determination to change the game in a manner that reflects and leverages the innovations in its opportunity realization process to change the game (box 5). Second, such strong performance will draw the attention and response of other players in the game to either imitate or otherwise leverage the radical innovations for themselves (box 4). These efforts to make sense copying or leveraging the focal firm's efforts will also hasten a change in the way the game is played (Box 5). Finally, not only will the performance of the focal firm alter its EC, but the changing game will also drive changes in its EC (box 1)—eventually restarting and altering the entire cycle.

The game change processes described in Figure 2 are a *by-product* of the focal firm's efforts to realize opportunities. The firm's intention may not be to alter the game at all, but rather to take advantage of an existing weakness which it hopes others will not copy or will be unable to copy effectively. As we have suggested, the greater the focal firm's success in its innovations, the greater the likelihood that the game will be changed as others hasten to

keep up and learn. It is possible, too, that the game is altered in ways that undermine the long-run stability and competence of the firm despite early successes. Failures can also inform players in ways that change the game.

This discussion indicates that *unintended* game change is most likely to evolve out of radical changes that meet with significant success. Such success encourages firms to persist, repeat, and refine their efforts; they will also likely redouble efforts to encourage external firms to cooperate with them and make changes that more fully leverage what they are doing. Success also encourages both competitive responses and imitation that lead to further game change. At this point, a self-reinforcing pattern is embedded in multiple actors in the field as they adjust their own processes and capabilities to meet the emerging new game.

Figure 3 depicts another, but less common, way in which game change emerges. Here, focal firms proactively attempt to change the game as a precondition for realizing the possible opportunity they have envisioned. In this process, the firm has concluded that a promising opportunity can be brought into existence only if the way the game is played is altered first. For example, a regulatory or financial barrier may need to be removed if their innovation is to succeed. For the most part, unless firms are ‘missionary’ type organizations (Mintzberg, 1980), business firms will not seek to change the game for its own sake. Changing the game is a means of synchronizing or creating conditions that allow the economic opportunity to be realized.

This path (as depicted in Figure 3), begins in a manner very different from the ordinary process shown in Figures 1A and 1B. Here, a firm takes actions to change aspects of the game (box 2). If met with any success, the alteration of the game allows the focal firm to engage its intended opportunity realization process (box 3). This new realization process, then, affects the performance of the firm (box 4); and, because the game has been altered in some small way, other firms in the industry may also be affected (box 5). Again, if the

results are positive, others will imitate or respond (box 4) and will push for institutionalize or even increase the game change itself (box 2). These game changes and performance itself will feedback to the firm's EC (dotted lines in 1C).

We believe that this latter, intentional process is probably less common because inertial forces constrain what firms can do and what they believe they can do. All else being equal, however, we would expect that firms with very strong EC may be more apt to attempt to alter the fabric of an entire ecology. Given the number of forces at play and the unpredictability of even the near future in dynamic environments, we doubt that firms can reliably and predictably "control" the consequences of such efforts. Rather, we suspect that those that play at this aspect of game changing do so through collective action that allows small, 'affordable' risks to be born. While we do not deny that some firms have honed their judgment and knowledge to high levels of expertise, we believe that constrained experimentation and trial-and-error learning, rather than percipience, is a likely explanation.

The different dimensions of EC may matter little if they are not interwoven and coordinated with one another to create momentum in a company's pursuit of an envisioned opportunity. Sensing the environment may be exciting and informative. Yet, unless wedded to selecting, shaping, and synchronizing, sensing becomes little more than an academic exercise, and the firm will fail to realize advantage. The emergence and evolution of EC depends upon honing and coordinating organization-level capabilities. This is why active integration by managers of the various EC dimensions is crucial: it confers potency to the various dimensions of EC, a value that goes well beyond the contribution of each individual dimension. This discussion suggests the following propositions:

Proposition 1a: Individual dimensions of EC are weakly but positively related to opportunity realization.

Proposition 1b: Integration moderates the positive relationship between the individual dimensions of EC and opportunity realization such that in the presence of integration, the positive relationship between EC and opportunity realization will be stronger.

The integration of EC dimensions also allows for novelty generation on an ongoing basis. Novelty refers to actions that fall typically outside an organization's existing repertoire. Still, novelty is critical to firms' long-run viability as contexts and competitive requirements constantly change. Perpetuating the quest for novelty requires a strong organizational culture which tolerates failure, such as that of Pixar who offers its employees "opportunities to fail together and to recover from mistakes together." (Taylor and LaBarre, 2006).

To move from variety to novelty generation, a firm's EC dimensions need to operate at the intersection of creation and destruction. As corporate entrepreneurship research suggests this is difficult for incumbents who usually fail to pursue novel paths and are phased out, though in some cases they may persist and even displace intruders (Tripsas, 1997). Because new entrants are less restricted by dominant standards or taken-for-granted rules (Autio, Sapienza and Almeida, 2000), game change is often championed by new-comers, whether start-ups or established companies willing to cross or span industry boundaries to initiate something new (Burgelman and Grove, 2007). New comers bring into the industry new mental and business models, and capitalize on these mindsets and skills. They also make use of their ECs, honed in other domains, to identify key points of entry and to determine how best to proceed to build solid positions and stabilize their market lead.

This discussion suggests the following proposition:

Proposition 2: Integrated EC is positively related to the creation of new opportunity realization paths, thereby increasing organizational novelty.

Internally, novelty generation contributes to imagining the re-shaping of the organization's processes, systems, resources, and capabilities necessary to realize and address the envisioned external disruption. Focused externally, EC can be channeled towards

envisaging changes in industry architecture (Jacobides, Knudsen, and Augier, 2006) and the business ecosystem (Teece, 2009: 16). Industry architecture denotes the evolving relationships among value chain participants and determines how labor and surplus are divided among the types of players involved in it (Jacobides et al, 2006). This architecture facilitates interactions that allow firms to identify opportunities for and constraints to change. Knowledge of this architecture becomes a useful template in the industry for identifying who does what (the roles) and according to what norms (the rules). The business ecosystem usually incorporates architecture across multiple industries.

Attending to industry architecture and the business ecosystem (Moore, 1993; Teece, 2007) expands the firm's playing field beyond the boundaries of its industry value chain. By interacting with existing players in its ecosystem (e.g., customers and suppliers) and proactively seeking new players (e.g., boundary disruptors), a firm can bring about ecosystem transformation. A prominent example of this success is P&G's "Connect and Develop" initiative, which has established more than 1000 active agreements with partners from its ecosystem. These agreements have facilitated P&G's opportunity realization by creating new markets and applications, developing technologies that build on convergence, and gaining access to innovation. These benefits will be greater when the firm has developed an integrated and coherent EC able to capture knowledge, resources, and ideas from diverse groups. This discussion suggests the following proposition:

Proposition 3: Integrated EC is positively related to the transformation of a firm's business ecosystem.

Organizational Embeddedness of EC and Game Change

When a firm's EC is embedded and distributed across its levels and locations, the firm can more readily engage in game changing behaviors. Although a company can choose to centralize access to information in order to facilitate unity and clarity of command and to

expedite information retrieval and processing, centralization has serious drawbacks of EC: it can deprive the organization of access to the rich and often soft information that permeates intra-organizational networks, and it can stem informal innovation hubs that grow naturally in the decentralized firm's operations.

With dispersed EC, a firm can capture and synthesize information within and outside the organization. As EC becomes embedded in the firm's diverse operations, it becomes easier to glean insights that enrich organizational intelligence and foster creativity. Members of the organization often have different views about the industry's evolution, how the firm fits within the industry's existing social structures and where potential changes may occur. Organizational members also pay differential attention to diverse sources, leading to multiple (and oftentimes conflicting) views about how to "upset the apple cart" by taking risks and pursuing innovations. Integrating and learning from these diverse views can enhance EC.

A highly embedded EC facilitates the sharing of different mental models about how to exploit emerging opportunities. These different and even divergent interpretations become a basis of strategic variety and novelty. They serve as the foundation for conceiving and developing strategies that bring fundamental changes in how entrepreneurs and managers view their competitive arena, rethink their assumptions, and consider how to shape their arena to their firms' advantage by engaging in game changing activities.

Proposition 4a: The higher the organizational embeddedness of EC, the greater the novelty a firm will generate internally.

Proposition 4b: The higher the organizational embeddedness of EC, the more likely the firm will initiate game change.

EC embeddedness facilitates and expedites data collection, analysis, interpretation and absorption. It also spurs the rapid development of new ideas or knowledge. When the firm has systems that effect speedy information processing and which are open to re-generation of

ideas, it is less susceptible to “paralysis by analysis,” where managers become captive of competing interpretations that they cannot resolve (Zajac and Bazerman, 1991). Resolving complexity in a coherent manner becomes a major challenge when the EC is highly diffused throughout the organization, and different groups of people hold divergent visions of things to come. To ensure rapid adaptation, managers need to develop EC in a way that quickly considers rival interpretations and attendant scenarios; they may integrate these views or simply select one path to pursue. Forming a habit of quickly choosing a resolution path allows senior managers to move ahead of their rivals and reshape the competitive game. Time itself may thus become an important means of creating game change.

P5a: The higher the organizational embeddedness of EC, the faster the firm will engage in game changing strategies.

Speedy action in recognizing and pursuing opportunities is one advantage of a highly embedded EC. Another advantage is the radicalness of game change strategies that the firm could undertake. EC brings to focus multiple, divergent and often radical views of the competitive arenas, its context, and the agenda of different players. This allows managers to theorize about the radical changes they might wish to initiate to “shuffle the cards” and introduce a new regime in the industry. Managers can visualize a new landscape where they can capitalize on their firm’s resources, skills and capabilities to redefine the core competencies essential to succeed in the new arena. By changing a few of the key industry “taken for granted” assumptions or fundamentals, the ecology of competition could be altered in profound ways—as happened with Apple’s iPad where the integration of applications by different converging technologies has created a new industry dynamic. Clearly, changing the ecology of the game is harder and riskier than simply upgrading products, changing pricing policies, or joining alliances. A well-honed and organizationally embedded EC makes it possible to recognize the potential for radical change, even when signals of pending transitions are weak. These observations suggest the following proposition:

P5b: The higher the organizational embeddedness of EC, the more likely the firm will engage in radical game changing strategies.

Game change differs in pattern, magnitude and pace. It can unfold through sudden, sweeping disruptions or through minute alterations that quietly build up momentum over time to amount to a visible transformation. Whether EC will pave the way to game change and of what nature and magnitude can only be determined ex-post. Game change can initially involve a disruption by creating and introducing into the market a revolutionary new product or a novel way of doing things that goes against the prevailing industry's dominant model or logic. This type of disruption opens up a new space of possibilities in the taken-for-granted industry architecture. If these efforts are deepened, disruption can grow into transformation whereby some important aspects of the playing field and the system of roles, rules, and relationships among players are preserved, while others are altered. Transformation occurs as a result of the opportunities emerging after a game is disrupted through experimentation by players, both established and new.

Game change can also involve the creation of a new game by envisioning and realizing a new playing field and related system of roles, rules and relationships. That, however, requires both meaning making and mobilization of collective action across a range of stakeholders, within and outside the industry, as well as lobbying efforts at the institutional level to legitimize the new game (Aldrich and Fiol, 1994). It also demands careful sequencing and timing of orchestration and negotiation activities so that a new industry architecture and business ecosystem can come into being (Jacobides et al, 2006; Teece, 2007).

EC Renewal

Finally, for EC to maintain and strengthen its game changing potential, it needs to be kept current and undergo ongoing renewal. As we indicate in Figure 1, 1B and 1C, renewal takes place in three main ways: by continuous incorporation of up-to-date knowledge from

the environment (mostly via the sensing dimension of EC), through the feedback obtained in the opportunity realization process, and from how the game changing process itself unfolds.

EC co-evolves with the environment (Volberda and Lewin, 2003; Lewin and Volberda, 1999). Similar to other capabilities, EC can be honed through experience and reflection (Bingham et al., 2007). This allows entrepreneurs to re-conceptualize their environments, identifying emerging changes and corresponding opportunities. As we proposed earlier, EC is a constellation of dimensions or sub-capabilities. Given the variety of these dimensions and the skills and resources they require, EC is apt to change over time in relationship to the dynamics of the ecosystems and opportunities being explored or utilized. For example, the ecosystem in which a competitive game is embedded provides clues about the appropriate *tipping point* where fit with the prevailing game should be abandoned and action towards a transformed or new, more vibrant ecosystem should be initiated.

This quality makes EC invaluable in defining the genesis of variety that breeds novelty and sparks entrepreneurial action. Thus, EC allows maintaining continuous pursuit of novelty in the presence of constraining forces that pull a firm towards exploitation (March, 1991). The heterogeneous knowledge introduced into the firm on an ongoing basis, the diverse perspectives and insights of managers and employees at all levels, their differential access to different types of knowledge, and their different ways of organizing and processing this knowledge and conjecture induce variety which can be harvested in the form of novelty. Capturing, comprehending, absorbing and exploiting these diverse types of knowledge is a daunting challenge (O'Reilly and Tushman, 2008; Adner and Helfat, 2003). As such, EC is a powerful organizational engine that employs this knowledge in the recognition, definition, refinement and evaluation of opportunities as well as their realization. Perpetuating novelty requires the creation of strong organizational culture that tolerates failure and can sustain its energy for simultaneous exploration and exploitation.

DISCUSSION AND CONCLUSION

Entrepreneurship researchers have long highlighted prior knowledge and alertness as antecedents of opportunity recognition. In this mode of discovery, recognition of opportunities is tantamount to connecting the dots (Baron, 2006; Baron and Ensley, 2006). While insightful, some believe this focus has overlooked “creation” types of opportunities (Alvarez and Barney, 2007). Others have suggested that discovery and creation form an ongoing cycle, with each stimulating the other (Zahra, 2008). Though such depictions of opportunity recognition and discovery/creation are useful, their powers are limited when it comes to ongoing businesses that find themselves in the throes of fundamental changes in their competitive landscapes. Some firms respond by becoming more rigid, others spring into action unleashing a myriad of efforts that end up more or less perpetuating the status quo. Yet, some firms engage in corporate entrepreneurial initiatives as they foresee opportunities to shape their industries and change the competitive game, making use of their EC.

Contributions

Our definition of EC and our delineation of its mechanisms for sparking off game change suggest a shift in perspective. The shift has multiple dimensions. First, the locus of entrepreneurial activity is not solely the individual manager, but lies in the interplay between individual insights and collective intelligence. Companies intent on game change, therefore, need to develop their intellectual capital in ways that develop, integrate and harvest that intelligence. Our approach shifts focus from the ongoing debate of discovery versus creation, to considering their interaction. As our earlier discussion illustrates, opportunity realization requires cognizance and recognition of the dynamic interplay between discovery and creation. An EC-centered approach also causes a shift in the conception of opportunity

exploitation itself. The view of balancing dynamic and operational capabilities, which has been dominating the literature is also expanded to include attention to building and sustaining ECs and keeping them current. Hence, beyond being a distinctive type of dynamic capability, EC offers a means to revisiting extant views on the nature of entrepreneurial opportunities.

We have also highlighted EC as a new category of dynamic capability, operating at the intersection of managers' and entrepreneurs' mindset and action and oriented externally, towards anticipating game change, and, when feasible and necessary, even inducing it. Our discussion extends the capability approach to the study of corporate entrepreneurship by offering insights into the content of dynamic capabilities, distinguishing a new category, and articulating a set of dimensions that allow a firm to engage and influence external change. Though the entrepreneurial aspect of dynamic capabilities has been acknowledged (Teece, 2007), to our knowledge this is the first attempt to distinguish EC as a distinctive capability.

Our discussion also advances the capability-based view by articulating a larger theatre of operations, beyond the boundaries of the internal organization of a firm with its resources, processes, routines, and assets to the competitive game. Our presentation emphasizes the importance of the business ecosystem and how a firm can proactively influence and transform it when undertaking corporate entrepreneurial activities that lead to game change. This allows us to add to the literature on entrepreneurial opportunities also by suggesting how EC can contribute to the co-evolution of opportunity exploration and exploitation. Thus, we enrich the discussion on industry emergence and evolution by highlighting the firm's role in initiating game. Our focus on EC complements explanations of game change based on exogenous forces such as external environmental shocks or the role of individual agents.

Implications for Practice

Our interest in and focus on EC is timely, given the myriad of internal and external changes companies need to make to foster corporate entrepreneurship, not only to adapt but to thrive and endure. Companies may be able to “skirt downturns entirely,” as explained by Google CEO’s Eric Schmidt, if they proactively manage the competitive game “by coming up with innovations that change the game in their industries—or create new ones” (Business Week, 2008). ECs facilitate the ongoing crafting and implementing of strategies that allow firms to view their competitive game in new ways. These issues, of course, have been the subject of much discussion in the literature (see e.g., Kim and Mauborgne, 2005). What makes our argument different is the recognition and identification of a unique set of capabilities that could be honed and deployed to effect fundamental changes in managers’ mental models of the industry, their firms, and the foundation of competitive superiority.

By focusing on EC and its elements, we highlight a need to go beyond individual-centered explanations of corporate entrepreneurial activities. EC offers an important means of defining (or creating) these opportunities, calling for collective intelligence rather than individual insight or foresight. Given these qualities, managers should focus on creating, nurturing and sustaining EC rather than simply motivating particular individuals. Managers can also attend to the synchronization of EC’s various elements across units and organizational levels. Synchronizing is a demanding task because different elements move at different paces and their misalignment could result in missed opportunities or miscalculations about the viability of these opportunities or the skills needed to harvest them.

Perhaps, the greatest contribution of the process of engaging EC is stretching managers’ thinking and frames of reference so that strongly-held assumptions about company and industry are challenged. Consequently, managers may need to consider “far-off” scenarios that are initially hard to justify or even to comprehend. EC requires managers to stretch beyond their familiar “search zone,” (March and Simon, 1958) to explore weak and

distant signals of pending change (Zahra, 2008). For instance, managers can begin to explore scenarios that predict their own company's demise; the convergence of distant and unrelated technologies and scientific paradigms; the occurrence of "black swan" events; politically radical global shifts, and many other possibilities. Such 'blue sky' exercises are familiar in traditional strategy models (Mintzberg, 1973). However, when they are firmly embedded in the fabric of the company, they can have a profound educational role: they revise managers' notions of what their industry (and company) is all about. The result is not only to upset the apple cart but to grow new apples and get them to new markets in new carts.

Managers and entrepreneurs can focus on identifying whether their organizations have EC, either partially or fully developed, and reflect on how best to nurture it and keep it current. As corporate entrepreneurs learn by doing, they can glean important insights that they can then use to upgrade these capabilities and widen their sphere of influence, while safeguarding against competence traps or capability decay—two reasons why some companies fail to respond effectively to change. EC, by definition, is proactive and therefore managers can use them to define new market spaces (Kim and Mauborgne, 2005) that could become entry points for further capability development or organizational growth. Companies that have ECs do not merely respond to change in their industry, they sometimes create or provoke change.

Implications for Theory and Future Research

We believe that the concept of EC holds promise to connect corporate and strategic entrepreneurship, which centers simultaneously on seeking opportunities and achieving competitive advantage (Ireland et al., 2003). If some organizations have well developed EC, then they possess one of the key sources of distinctiveness in their industries and markets. Researchers, therefore, need to empirically establish the existence of EC and how it relates to

other dynamic and substantive capabilities. It would be useful to determine also if there are different types of EC; such variety could explain, at least in part, the heterogeneity of strategic actions taken by firms in their respective industries. It would be also possible to determine how and under which conditions these different capabilities influence organizational adaptation, survival and performance.

Another area to explore is the configuration of different ECs. Given the multiple elements that constitute EC, it would be logical to expect that different and multiple types of capabilities exist that differ across opportunities, across firms, and even within firms. By developing taxonomies of these configurations, it would be possible to study these types as well as how and when they change in their texture. We can then link these shifts to corresponding changes in the opportunities recognized and realized.

The literature also underscores the importance of using the firm's capabilities to keep them current and productive (Zollo and Winter, 2002; Winter, 2003). Yet, the literature weighs the benefits of frequent use of these capabilities against the costs involved (Collis, 1994). Being a portfolio of capabilities that is focused on opportunity identification, creation and exploitation suggests that EC is continuously deployed in different forms and on different arenas. The heterogeneity of these opportunities and the contexts create avenues for learning that keeps ECs current and up-to-date. A question to explore is: How is this variety harnessed to maintain ECs' vitality while avoiding their dilution or even decay? This is an important question for corporate entrepreneurship research to tackle.

Having outlined our article's contributions, we believe it has several limitations that provide opportunities for further research. First, as it is a theoretical article, the validity of our ideas needs to be empirically tested. For example, we need an empirical exploration of the generalizability of the EC dimensions across a variety of contexts. Once validated empirically and linked to each other, we can use these dimensions to classify different capabilities and

connect them to the different opportunities companies might recognize and pursue. We can also trace longitudinally the co-evolution of capabilities and corresponding opportunities, which in turn also highlights the importance of multi-level research design.

By marrying EC and game changing behaviors, we hope to minimize a bias that pervades entrepreneurship research. It is usually assumed that proactiveness and risk taking are essential for market success, even though there is some limited evidence to the contrary (Miller and Friesen, 1982; Lumpkin and Dess, 2001). Of course, proactiveness, risk taking and innovativeness are highly desirable attributes but it is possible to have “too much of a good thing.” It is possible that continually honing an EC might have some dysfunctional effects that should be explored empirically. The conditions under which such dysfunctional effects occur also deserve investigation. For instance, by examining the innovative and financial performance of firms, we can better appreciate the implications of EC for evolutionary and technical fitness (Teece, 2007) and when (and how) ECs become an impediment to change.

The suggestion that ECs underlie opportunity exploration and exploitation helps to shift attention from individual level traits (e.g., alertness) to organizational-level issues (e.g., capabilities, systems and processes). This shift can make opportunity recognition, evaluation and exploitation more comprehensible since we can more easily observe how different EC components interact along these processes. It is often harder to analyze and empirically capture the elusive concept of alertness. Still, it is important to reiterate that the concept of EC translates, rather than replaces, alertness into a meaningful and useful concept within a clearer nomological network.

Finally, the concept of game change itself deserves greater attention: What defines a game? Are there different types of games? Why are some companies—established and new—more interested in game change than others? What precipitates such thinking? What are the

outcomes of such game changes and what role do ECs play in this regard? Why do some game changers lose their lead? What is the role of EC in effecting such failures?

Conclusion

In this article, we have advanced the concept of entrepreneurial capability as a means of sensing, selecting, shaping and synchronizing internal and external conditions for the exploration and exploitation of opportunities. We have proposed that each of these components consists of several sub-capabilities and has multiple dimensions. We have also highlighted the importance of entrepreneurial capability in (unintentionally and intentionally) changing the competitive game via corporate entrepreneurial activities; this explication adds to the rich literature explaining game change. We identify conditions under which firms pursue different game change strategies, stimulating innovation and venturing that fuels growth and superior performance. Our discussion sets an agenda for research on these issues and invites future empirical examinations of how some companies change the game and, by doing so, change the world.

Figure 1

Entrepreneurial Capability, Opportunity Realization and Performance Primary Path

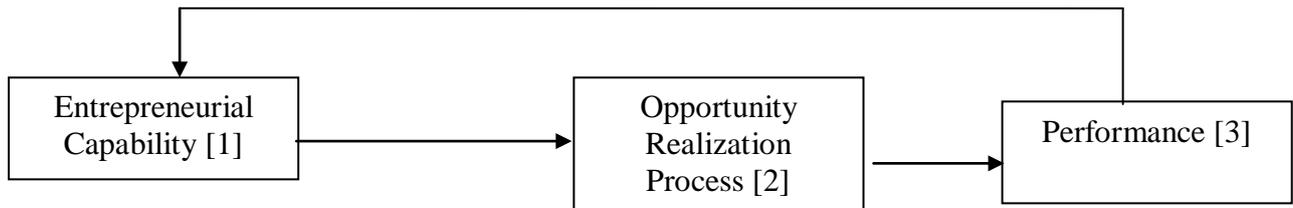


Figure 2

Entrepreneurial Capability, Radical Opportunity Realization, and Unintended Game Change

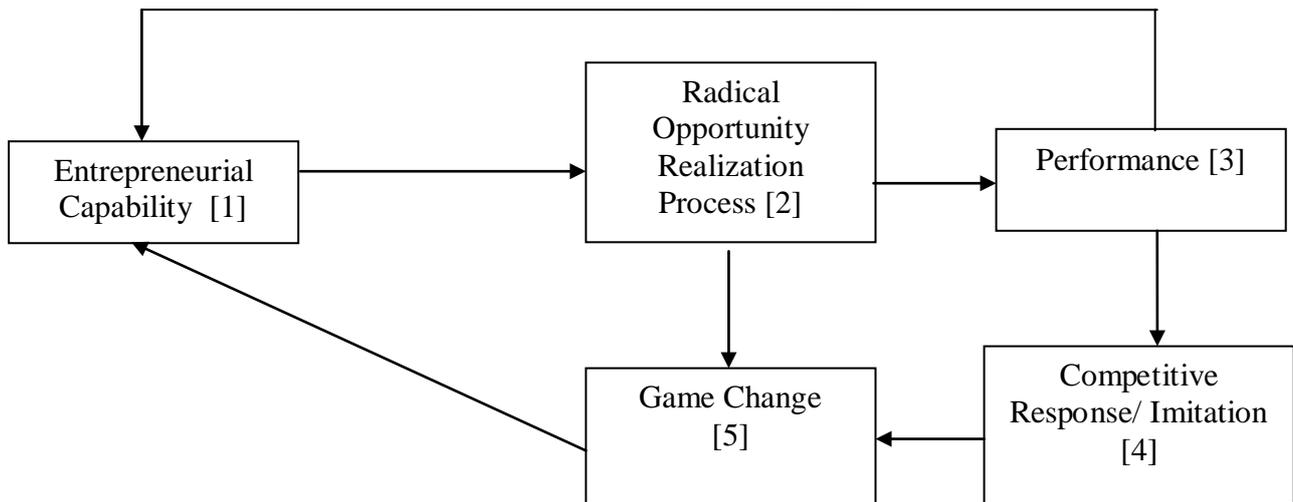


Figure 3

Game Change as an Intended Instrument of the Opportunity Realization Process

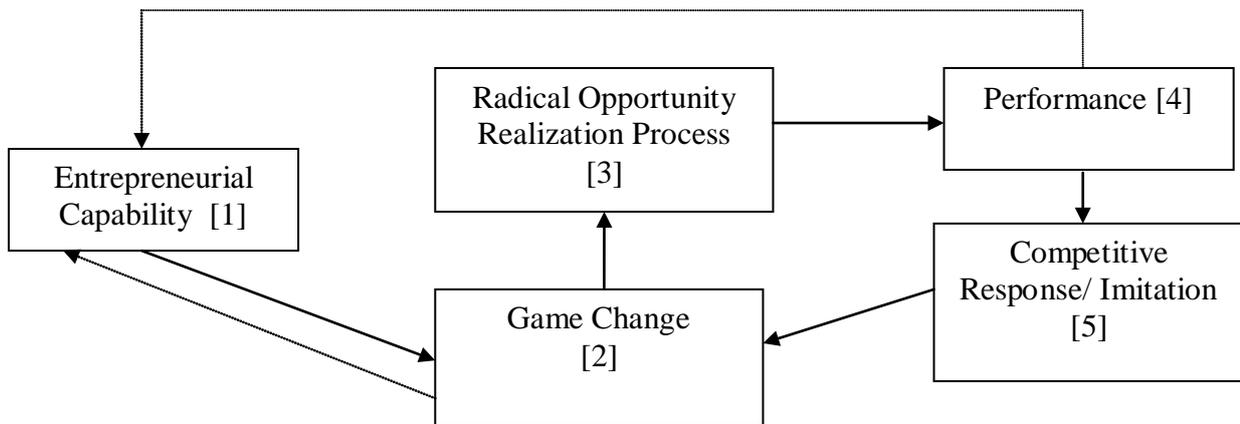


Table 1

EC Dimensions: Nature, Mechanisms, and Information

Dimension	Nature	Mechanisms	Information	Key Sources
Sensing	Seeing possibilities within and beyond the confines of an industry	Scanning and search Experimentation Imagination	Ideas for further exploration	Ardichvili, Cardozo and Ray, 2003; Arthurs and Busenitz, 2006; Baron and Ensley, 2006; Burgelman and Grove, 2007; Dyer, Gregersen and Christensen, 2009; Felin et al. , 2009; Klein, 2008; Shane and Venkataraman, 2000; Teece, 2007; Venkatraman, 1997
Selecting	Choosing what potential opportunities to focus on and pursue given a firm's strategic priorities and resources	Evaluating Judging	Opportunities for realization	Arthurs and Busenitz, 2006; Bingham, Eisenhardt, and Furr, 2007; Burgelman and Grove, 2007; Dyer; Gregersen and Christensen, 2009; Tang et al, in press; Thakur, 1999; Zahra, 2008
Shaping	Orchestrating connections among internal and external resources and capabilities for opportunity realization	Bricolage Transposition Meaning making	Prototypes of products/services and business models for evaluation	Alvarez and Barney, 2007; Ardichvili, Cardozo and Ray, 2003; Augier and Teece, 2009; Chesbrough, 2006; Djelic and Ainamo, 2005; Felin et al., 2009; Lévi-Strauss, 1962; Teece, 2007; Zahra, 2008
Synchronizing	Orchestrating temporal correspondence of internal and external resources and capabilities	Temporal heuristics Procedural heuristics Priority heuristics	Processes of internal and external alignment for fine-tuning	Adner and Helfat, 2003; Bingham, Eisenhardt, and Furr, 2007; Brown and Eisenhardt, 1997; Burgelman and Grove, 2007; Gersick, 1994; Vermeulen and Barkhema, 2002

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