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Structural approaches to organizing for radical innovation in established firms

Ana Luiza De Araújo Burcharth and John Parm Ulhøi

Abstract: *Management research has consolidated around the idea that organic structures (typically found in start-ups and young firms) are better at generating novel ideas and products, while mechanistic ones (typically found in established companies) are better at generating incremental improvements. Therefore, the usual recommendation to established firms with the goal of producing radical innovations is to develop them outside the firm itself. This paper questions this 'standard solution' and discusses alternative organizational approaches to producing radical innovation that avoid extreme forms of separation and relate to critical contextual issues. The paper ends with a discussion of implications for managers.*

Keywords: *organizational structure; radical innovation; corporate entrepreneurship; ambidexterity*

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Technological innovation has been widely recognized as a promising vehicle for continued wealth creation and sustainable competitive advantage (Schumpeter, 1934). The development of new technical competences that can lead to new businesses and markets has especially been associated with significant impacts on firm performance, as compared with incremental changes in current processes and product lines. For this reason, radical innovations are considered to be key drivers of companies' revitalization and expansion (Tushman and Anderson, 1986), especially given today's rapid technical progress, high market volatility and knowledge-based competition, in which new opportunities are continuously emerging and previously acquired competencies are fast becoming obsolete. Here, by radical innovation, we mean innovation based on a technology that requires knowledge, information and expertise that are considerably different from the existing resources of the firm. It thus differs from the firm's existing technology in that it must be either

entirely new or derived from a combination of the firm's existing knowledge base from the point of view of the firm and not of the market. Although the importance of organizational and administrative innovations is recognized, the focus is explicitly on technological innovation.

Yet, time and again, radical innovations are assumed to emerge in high-tech start-ups (Hill and Rothaermel, 2003). Following this assumption, established firms are generally associated with the ability to produce incremental innovations, based on the exploitation of existing resources. Even though the possibility of incumbents introducing major innovations is not dismissed a priori, the literature persistently argues that mature enterprises tend to face difficulties in recognizing, creating and adapting to technologies that require substantial changes in their organization (Anderson and Tushman, 1990; Henderson and Clark, 1990; Utterback and Suarez, 1993; Christensen, 1997).

As a result, the way in which established companies

can make use of new technological opportunities is still an important issue in the literature (Methe *et al*, 1996; Leifer *et al*, 2000; Ahuja and Lampert, 2001; Cattani, 2006; O'Connor and DeMartino, 2006). Strategy research – specifically theory on dynamic capabilities and ambidexterity – has been developed precisely to address this important question. The ‘conventional solution’ typically prescribed for mature firms in this literature is to incubate and grow radical innovations outside the existing company, thereby creating physically separated dual structures that can accommodate the contradictory logics of exploration and exploitation. Reintegration may then take place later, preferably when the product has already reached the market (Yeaple, 1992; Iansiti *et al*, 2003). So far, however, this prescription has produced far from satisfactory results (Gibson and Birkinshaw, 2004). Few companies (for example, Intel and Nokia) seem capable of performing on the basis of this model, leading scholars to suggest that ‘venturing will not solve a corporate growth problem’ (Campbell *et al*, 2003, p 37). There is therefore a need to identify alternative solutions to this problem.

We question the ‘conventional wisdom’ on this point. More specifically, we examine the question of *which structural solutions can support the development of radical innovations in established companies and in which contexts such structures are feasible*. Our aim is to identify and discuss approaches to organizing radical innovation that do not necessarily involve separation from the mother company and that relate to critical contextual issues. While a substantial part of this research has discussed the relative advantages of overall archetypical structures (organic *v* mechanistic and, more recently, hybrid and ambidextrous forms) and their related individual characteristics (that is, autonomy, centralization, formalization), our discussion is centred on the idea of *structural approaches*. Unlike overarching organizational forms, structural approaches refer to micro-level solutions to organizing that may coexist in one organization at any given point in time. Although not assuming that there is one single most effective organizational form or universally most advantageous practice, we depart from the view that organizing consists of highly context-dependent and asset-specific processes that do not allow for one-size-fits-all approaches.

From this perspective, the main contribution of the paper is to develop a more nuanced and yet still simple framework that connects contextual and organizational variables. It specifically distinguishes the market, the organization and the technology dimensions of change associated with innovations. This is a key point, because if the structural solutions previously developed are to inform practice, then we must explain when they are

most appropriate. Thus, our paper also has clear relevance to practitioners in the field of innovation management: to inform such managers confronted with the challenge of designing structures most suitable for the development of radical innovations – structures that ought to be adapted to specific circumstances.

The paper is organized as follows. The next section reviews the literature on the relationships between organizational structures and innovation. The subsequent section outlines the framework, which matches various approaches to organizing radical innovation to different organizational contexts. The final section concludes the paper and discusses the implications for researchers and managers.

Management research on the interaction between structure and innovation

The impact of organizational structures on firm innovativeness has long been of interest to scholars and practitioners (Burns and Stalker, 1961; Aiken and Hage, 1971). A rather large body of literature has emerged on this subject, centred on the debate of how the architectural design of companies influences information flows, distribution of responsibilities and incentives throughout the innovation process.

A key insight is the realization that radical and incremental innovation employs rather different structural arrangements (Aiken and Hage, 1971). It is claimed that continuous and incremental improvements better match hierarchical structures (also referred to as mechanistic organizations). Such structural arrangements involve well defined roles and responsibilities, highly formalized work processes and relatively short time horizons (Burns and Stalker, 1961). Radical innovations, on the other hand, have been found to emerge from loose and decentralized – so-called organic – structures that favour experimentation, entrepreneurial initiative, flexibility and long-term orientation (Aiken and Hage, 1971; Tushman and Anderson, 1997).

However, organizations can alternate between the two ideal types of structure or combine key properties from both archetypes. A variety of such ‘hybrid forms’ or semi-structures (Brown and Eisenhardt, 1997) have been documented in the literature as different solutions to the problem of matching structure and innovation needs. Others have gone so far as to suggest that organizations should develop a simultaneous combination of loose and tight structures in ambidextrous management systems (Tushman and Anderson, 1997; Grover *et al*, 2007). Unlike hybrids, structures in ambidextrous organizations are separated into independent subsystems, connected only at the corporate level so as to reduce internal

inconsistencies, thereby concurrently stimulating exploration and exploitation activities.

Following this reasoning, several structural solutions to ambidexterity have been introduced as alternatives to the old 'flexible *v* efficient' dilemma. Available solutions include skunkworks (or dedicated organizational groups)¹ (Yeaple, 1992; Hill and Rothaermel, 2003), spin-outs (Teece, 1996; Leifer *et al*, 2000) and corporate venturing² (Leifer *et al*, 2000; Campbell *et al*, 2003; Iansiti *et al*, 2003). Though distinct in design, these solutions share the idea of creating isolated, autonomous teams that should reduce the capability-rigidity drivers of mature companies.

O'Connor and DeMartino (2006) have further contributed to this literature by introducing solutions for radical innovation that do not necessarily include separation from the mother company. In a nutshell, their models are variants of the structural ambidexterity model, which avoid extreme forms of separation. They include, for example, the use of specialized teams responsible for radical innovations, which act at existing business units or at the corporate level. Promising as they may seem, however, little is known about when these models can be applied. While enlarging the range of possible structural solutions for radical innovation is an important contribution, further clarification is needed as to the circumstances in which these solutions may work and be emulated by other companies.

However, ambidexterity is not the only solution to the quest for balance between exploration and exploitation. Some scholars argue that these two activities compete for the same pool of resources and require different mindsets and processes, and are therefore mutually exclusive. They suggest the use of another mechanism, namely *punctuated equilibrium*, according to which organizations temporarily move through cycles of exploration and exploitation. Others have called for a balance at the macro level via market and non-market mechanisms, in which individual organizations specialize in one type of activity (Gupta *et al*, 2006).

To sum up, research in the field seems to be consolidated around the idea that organic structures are better at generating novel ideas and products, while mechanistic ones are better at commercializing such ideas and making constant improvements. As straightforward as it may sound, this is the persisting message in the literature, despite the explicit effort to build more complex and subtle analyses that extend simplistic, dichotomous organizing models. In this fashion, the usual recommendation to firms planning radical innovation projects has been to create ambidextrous structures that, to some extent, can assimilate and implement the best from both worlds. In fact, many plead for external incubators, corporate venturing and investment in start-ups as ways

of promoting radical innovation within established firms (Leifer *et al*, 2000; Hill and Rothaermel, 2003). While the portfolio of structural solutions has attracted much interest (O'Connor and DeMartino, 2006), less attention has been paid to the contexts in which these solutions are suitable. As Ahuja *et al* (2008, p 53) have expressed it, 'While the literature [on organizational structure] has done an admirable job of identifying these various structural solutions, the frequency of these solutions, *the conditions under which they are seen to emerge*, their performance implications over the medium to long term, as well as their limitations, still need to be empirically assessed' (emphasis added).

A nuanced framework for organizing radical innovation

Following the above discussion on the relationships between organizational structures and innovative activities, we now propose a framework for different structural solutions to the problem, involving various combinations of contextual and organizational variables. Before proceeding further, however, it should be mentioned that we consider organizing for radical innovations exclusively from an internal perspective: that is, as a process primarily based on technical competencies fostered within the organization. Acquisitions, spin-ins or mergers are thus not addressed in this paper.³ Moreover, addressing the initial processes of idea generation (the discovery of new ideas competency) falls outside the scope and available space of this paper. Rather, we focus on the development of the radical innovation itself: that is, on the activities that mature opportunities into a potential viable business proposal, and the subsequent adjustment and/or replacement of business models that ultimately leads to the setting up of the business itself (incubation and acceleration competencies).

Structural approaches to radical innovation

Our point of departure is the extended range of structural solutions documented by O'Connor and DeMartino (2006) in a three-year study of 12 established companies. This forms the basis of our framework, since their model clearly deviates from the dual-structure model.

The structural approaches are described in Table 1. Although distinct in terms of governance modes, location and design, they basically suggest the creation of specialized teams for assisting the development of radical innovations within the existing structure (with the exception of the corporate venture model), thereby introducing ambidexterity into the organization's fabric. While these are not the only possible solutions, we posit that they amount to a diverse and rich set, and should be

Table 1. Organizational structural models of radical innovation.

Model	What it is	How it works	Strengths	Weaknesses	Location
Incubation	A group in the R&D department dedicated to identifying new opportunities, linked to a group focused on nurturing the opportunities during the creation of the business.	Besides supporting the creation of new ideas, it assists in the development of technology, introducing considerations about the design of the business model.	Allows ideas to mature before being transferred.	Does not ensure self-sufficiency of the business related to the new technology.	Within R&D department or tightly connected to it.
Holistic sequential	Expands previous model by adding a business acceleration group. Designed to support the project throughout the whole process – identification and incubation of opportunities and establishment of a business.	Coaches nascent projects until they are ready to be transferred to business units (ie by adjusting processes, distribution channels and revenue models). Manages the timing of the transition, which needs to be coordinated with the budget and the investment cycles of the unit concerned.	Facilitates integration into existing units, since many projects are not ready after incubation phase.	Difficulty in assisting the transition of unaligned projects or those that are not destined for integration with existing business units, thereby under-scoring them.	Within selected operating units or tightly connected to the R&D department.
Corporate venture	Formal organization that nurtures separate internal ventures that will become subsidiaries or new divisions.	Takes on projects from an early incubation phase that are furthest away from commercial reality and runs them until they can stand on their own.	Provides room for the maturation of technologies that are the most risky and can potentially encounter more resistance.	Limited access to resources and assets from mother company.	Separate organization structure, but whose board members are managers of the mother company.
R&D management system	The central R&D function is dedicated to advancing radical innovations, whereas most R&D units located in individual business units are designed to serve their needs (immediate or long-term).	Central R&D unit dedicated to developing radical innovations, which are transferred to business units when mature. Should be linked to an exploratory marketing group to counterbalance its technology bias.	Identifies and incubates both aligned and unaligned projects.	Possible only in large firms. Bias towards new businesses that are too small and limited due to poor market expertise; business units do not take responsibility for investing in new opportunities.	Central R&D department.
Self-similar	A corporate-level radical innovation team is created and copied in smaller scales throughout the firm (in each business unit). Typically composed of the chief technology and scientific officers and the president at corporate level, and by a portfolio leader and a small staff at divisional level.	Senior management coaches and advises projects with a potential impact on multiple divisions. Projects that are believed to affect one unit specifically are developed within that unit. They are accompanied by a portfolio leader and small staff throughout the process of market learning, economic modelling and project management.	Helps to clarify ideas in strategy and how the business might grow. Promotes radical innovation both at the corporate and divisional levels.	Early ideas and high-uncertainty projects are not even considered in the system until they have attained some level of technical and market promise Poor integration of market knowledge.	Corporate management <i>and</i> business unit.
Mirrored models	Two radical innovation teams are chosen: one within the R&D division and another at a particular division. While the first is responsible for technology development, the other is engaged in business development.	Projects are identified, selected and incubated within the R&D organization, but at the <i>same time</i> complementary capabilities are developed by the receiving unit, before a product is close to being marketed. These capabilities include searching for value-chain partners, talent and acquisition candidates. If the business turns out to deviate too much from the receiving division, an entirely new one is created.	Allows for the simultaneous development of complementary aspects of the commercial activity (that is, as technology development is occurring), whereas the holistic model is more linear. Immediately creates linkages to operating units.	Unaligned opportunities that do not have a clear place may be downgraded, as the business development part may suffer lack of interest/resources.	R&D department <i>and</i> targeted business unit (possibly new unit).

Source: Authors' elaboration based on O'Connor and DeMartino (2006).

seen as attractive starting points (which can of course be tailored to the individual needs of each firm).

Importantly, the organizational approaches presented in Table 1 may also foster linkages with other parts of the mother company, rather than promoting dissociation. Such linkages are crucial to innovation processes, because they involve competencies other than technical ones – for example, commercial and administrative competencies. Therefore, we propose classifying these models according to the interface relations they stimulate: that is, to the extent to which these solutions connect with diverse groups across the organization. This choice is justified by the fact that lack of interaction has been diagnosed as a major reason for the failure of the ambidextrous (dual) model: ‘separation also can lead to isolation, and many R&D and business-development groups have failed to get their ideas accepted because of their lack of linkages to the core business’ (Birkinshaw and Gibson, 2004, p 49). A recent study of radical innovation at Ericsson, Denmark, has shown the devastating effects that radical innovation can have when it is allowed to develop out of ‘orbit’ with the ‘mothership’ (Madsen and Ulhøi, 2005).

Specifically, *interdisciplinary* and *interfunctional* interface relations are differentiated (Christensen, 2002). Organizational structures that promote *interdisciplinary relations* facilitate communication and interaction between groups of professionals from different disciplines or backgrounds. The ‘corporate venture’, ‘R&D management system’ and (to a certain extent) ‘self-similar’ models are especially good at promoting this. This is because they aggregate diverse competencies under a team or group, providing them with high levels of decoupling from the mother organization. Conversely, structures that foster *interfunctional relations* make connections between various business functions (such as R&D and production) easier, thus providing higher levels of intra-unit coherence and coordination. The ‘mirrored model’ is arguably that which creates the strongest linkages between departments, since these linkages are created simultaneously. This is followed by the ‘incubation’ and ‘holistic sequential’ models, which work as intermediating units between the R&D division

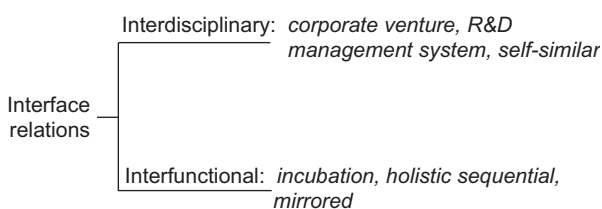


Figure 1. Structural solution models according to the interface relations they provide.

and the business units, nurturing associations between them. This classification is demonstrated in Figure 1.

The relative strengths of each structural model in terms of interdisciplinary or interfunctional interface relationships are crucial features, because they respond to the particular requirements of each innovation context. It is precisely this context that we discuss in the following section.

In which context are they suitable?

In order to discuss the suitability of these structural solutions, we map the context of a particular radical innovation according to the degree of organizational, market and technological change they imply. The choice of these elements is justified by the fact that they constitute the characterizing dimensions of innovations (Tidd *et al.*, 2005). As Teece (1996, p 211) has pointed out: ‘the range of enabling structures are quite large and includes venture teams, “skunkworks”, new venture divisions and the like. The *suitability* of these various structures depends on a variety of *technological*, *market* and *organisational* factors.’ (emphasis added)

The three axes are defined as follows:⁴

- (1) *Technology* refers to changes that belong to the domain of products, processes and artefacts. Even though only radical innovations are considered (in the sense that knowledge new to the firm is involved); the new knowledge is distinguished in terms of the technological distance to the current knowledge base of the firm, for example, the degree of newness of the technological principle.
- (2) *Market* refers to changes associated with target customers, distribution channels, marketing approaches and entering into new markets.
- (3) *Organization* refers to the required change in terms of culture, human resources, strategic formulations and, most importantly, competencies. By definition, radical innovations require the development of new capabilities, but they can be differentiated according to the degree of organizational novelty they involve compared with the current resource base of the firm.

Figure 2 shows this context in simplified form.

Although we stress that various combinations are possible within this map, for the sake of simplicity we use three representative situations as exemplary contexts.

Contexts

- I Radical innovations within the market domains of existing business units tend (i) to incorporate novel technologies in existing products, and/or (ii) to replace technologies for essentially the same customers and markets, making use of the existing

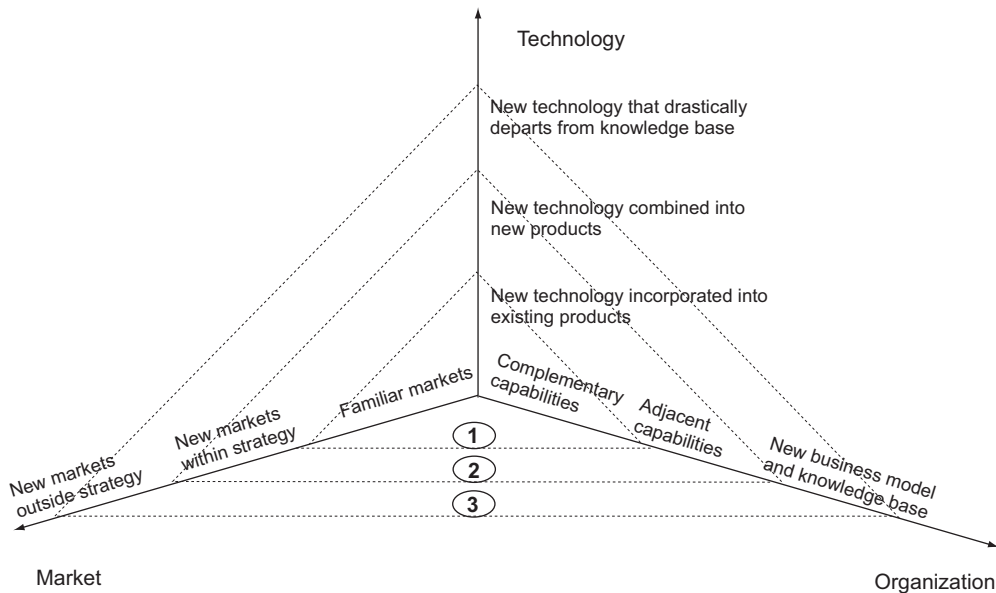


Figure 2. Radical innovations in context: technology, market and organizational degrees of change.

value chain and possibly the same production sites. Therefore, companies often have a well developed routine for establishing contacts with customers and users, understanding the market, and for introducing innovations designed to strengthen their position in familiar markets. Nevertheless, cannibalization of current lines of business may occur occasionally. For the organization itself, this implies a need to learn new technological competencies that are tightly connected to or overlap to a great extent with the current resource base. This will in turn typically require upgrading employees' skills and hiring some new employees or consultants. One example is Oticon, a hearing aid manufacturer, which in 2005 launched a new device incorporating Bluetooth technology (Epoq). Although Oticon had no previous expertise in wireless technology, it was able to integrate it into existing lines of hearing aids (which resulted in Epoq acquiring radically new functionalities) in the same consumer market. Thus, the development of Epoq could to some extent draw on existing competencies.

- II Radical innovations in the scope of a new business unit or market: for example, when innovations pave the way for new markets, which nonetheless remain consistent with the firm's present strategy. This requires the development of new technical competencies that belong to a technological domain adjacent to the existing one. For example, Danisco, a food manufacturer that has traditionally sold ingredients using traditional chemistry, has applied biotechnology to the development of a new class of enzymes targeted at animal feed markets.

- III These are the radical innovations that lead to the most extreme processes of change, as they disclose new and entirely unfamiliar markets outside the company's present strategy, challenging its current business model. Because the knowledge composition is so different, it implies a drastic departure from the current knowledge base and state-of-the-art business. Companies are in fact exploring unknown territory in this context, in the sense that the new technological competencies required are loosely associated (or not associated at all) with the current core competence. This will normally justify the hiring of a new group of employees with a different set of skills and expertise, as well as massive investments in new infrastructure. One example of this is the development of computers in the 1950s by IBM, a company previously manufacturing punched card systems. Because punched card processing equipment was loosely related to the emerging techniques in computers, IBM had to develop 'from scratch' competencies for the emerging business computer market. Furthermore, computers were initially developed for the American defence industry, a fairly new market for IBM (which traditionally sold punched cards to railway companies and the US Census).

Matching structure and context

The main argument of this paper is that various structural configurations are suitable in different circumstances, as shown in Figure 3. In *Context I*, in which companies target familiar markets, and can, to a large extent, leverage existing capabilities for the

	Interface relations	
	Interdisciplinary	Interfunctional
Context	(I) Self-similar	Incubator Holistic sequential
	(II) R&D management Self-similar	Holistic sequential Mirrored
	(III) Corporate venture R&D management	–

Figure 3. Matching context and structure to radical innovation: a proposed framework.

Key: (I) Radical innovations within the market domains of existing business units; (II) Radical innovations within the scope of a firm’s new business unit or market; (III) Radical innovations outside the current strategic domain.

development of new ones, structures should allow for a greater degree of organizational coupling. Typically, these innovations can be managed without fundamental changes in the overall architecture of the organization, albeit with a strong commitment from corporate managers (who can ensure that resistance and opposition will not stop the project). The self-similar model fits well in this case, since it allocates a responsible team at the divisional or corporate level (especially when cross-disciplinary work is needed and the processes for new product development can, to a large extent, be followed). The creation of a business incubator also meets the needs of this kind of innovation. It allows the idea to mature and gain consistency in a special environment, in situations in which standard processes and rules do not need to be strictly followed. The ‘holistic sequential’ is a good alternative when the receiving operating unit needs more time to take over the project. Both the ‘incubation’ and ‘holistic sequential’ models are good at forging linkages with marketing and production units – important partners for radical innovations with relatively low degrees of technology, market and organizational change.

In *Context II*, several structural configurations can be identified. As in *Context I*, the ‘self-similar’ solution can also be applied here. The establishment of a management team at corporate level is particularly attractive, since it will have a broader overview of organizational needs and can, if needed, direct the setting up of a new operating unit or changes in the profile of existing ones, thereby finding the appropriate home for this kind of radical innovation, which falls into the ‘white spaces’ of businesses. However, the use of specialized teams at

divisional level is not desirable, since misalignment of the innovation to current business units can have fatal consequences. Another option available to large organizations is the ‘R&D management system’ model, in which an innovation is developed within a central R&D unit (which ideally also includes an exploratory marketing group, whose role is to learn about new markets with which the company is not familiar). Because it typically does not respond to the needs of a firm’s business units (other R&D teams take care of that), a central R&D function can thus develop innovations that will ultimately renew the company – whether or not they are aligned with a specific division, applied to multiple divisions, or require the establishment of new ones. Both ‘self-similar’ and ‘R&D management’ models are capable of nurturing interdisciplinary relationships, and for this reason they are particularly suited to firms operating in science-based industries. Otherwise, the ‘holistic sequential’ and ‘mirrored’ models can be implemented, since they are better at forging connections with other business functions. Radical innovations that are based on the premises of tacit knowledge will typically require this type of interfunctional relationship. However, the mirrored model can only be applied if an appropriate receiving unit can be identified from the start.

Finally, *Context III* is the one actually requiring high levels of autonomy from the mother company and the use of loosely coupled teams. Integration across functions is not desirable in this setting, because it can be rather dangerous to rely on the development of innovations within existing business units. By cutting down on resources and talents, they tend to destroy nascent businesses that are unrelated to their existing operations. Therefore we suggest using solutions that are strong in interdisciplinary relationships: the ‘corporate venture’ and ‘R&D management’ models. The ‘corporate venture model’ is focused on developing radical innovations that are the furthest away in terms of the resource base of the company and that will ultimately lead to unfamiliar markets. For this reason, not much can be gained from establishing linkages with the other parts of the organization. Typically, it is innovations that will lead to the new subsidiaries and will not be integrated into the mainstream business. ‘R&D management system’ can also be appropriate in this setting, especially if the company is large enough to devote R&D assets to the short- and long-term needs of the divisions and if it is highly dependent on science. As stated previously, this solution accommodates both aligned and misaligned projects.

Summary

It is important to bear in mind, however, that our framework does *not* suggest one ultimate solution for

each context, and points to the inadequacy of corporate venturing as *the* solution for all settings. This is because the 'optimal' solution will depend on the overall structure of the company and on its particular context. Moreover, companies do not need to subscribe to a single structure. They can apply multiple solutions simultaneously to respond to the specificities of each project. Moreover, structures are also evolving and may need to be adapted along the way. Some of the models presented are extensions of others. The 'holistic sequential' model, for example, extends the 'incubator' by adding a business acceleration group. Furthermore, it also has to be taken into account that some solutions are particularly suited to the incubation phase (the design of the business opportunity), while others are suited to the acceleration phase, that is, for the setting up of the business itself. We agree with O'Connor and DeMartino (2006) that these are complementary, yet distinct, competencies necessary for the launch of successful radical innovations. The 'incubation' and 'R&D management system' models especially strengthen the incubation competency, whereas the other models (that is, 'holistic sequential', 'corporate venture', 'self-similar' and 'mirrored' models) strengthen the acceleration competency, since they are designed to foster both technological and business development, including related aspects of commercial activity, such as searching for value-chain partners and acquisition candidates. What must be highlighted is the need to consider carefully the nature and context of innovations (moving beyond the simple dichotomy of radical *v* incremental), so that more suitable structures can be designed to accommodate their development.

Concluding remarks

There is ample literature arguing that innovativeness is structurally anchored in the firm's organization. In this paper, we have explored how established companies can modify their own structures in order to design solutions that foster the development of radical technological innovations.

Our work builds explicitly on O'Connor and DeMartino's (2006) study, which extends the portfolio of structural solutions for companies willing to venture in radical innovation projects. From an innovation management theory point of view, our paper is interesting in two respects. First, it identifies the contexts in which these solutions are suitable – delimited in terms of a variety of technological, market and organizational factors. Second, it transcends the discussion of contingencies (such as environment, size and strategy) as

determinants of the context. This is a highly relevant and timely discussion, since we have recently witnessed the repeated failure of corporate venturing (Campbell *et al*, 2003).

Our work holds some key lessons for practitioners. First, managers engaging in radical innovation need to recognize the important roles of organization structure. Before considering and subsequently designing an organizational arrangement, managers must discover where each specific project stands in terms of degree of change (with respect to technology, market and organization elements). This represents a more nuanced perspective that goes beyond the simple dichotomy of radical *v* incremental. A careful diagnosis of the specific contexts of an innovation project is highly important, as they require different degrees of organizational coupling. Even in the very early stages, it is possible to locate an idea in the diagram presented in Figure 2 (which can naturally be adjusted along the way). Second, our framework shows that radical innovations are not necessarily incompatible with the existing organization. On the contrary, it calls attention to the importance of well functioning linkages to other parts of the company that can have a substantial impact on the success of radical innovation projects. Third, our framework sensitizes executives to the fact that structural separation is essential only on (rare) occasions, and furthermore, that other paths to building ambidexterity into an organization are possible.

Further conceptual and empirical work on the framework is required, however. A first obvious step is to assess the framework empirically and to measure the relative strength of each structural approach in the various contexts identified, for example, through the collection of longitudinal data.

Notes

¹ Skunkworks constitute a selected group of employees (typically under 100) that is separated from the parent organization with the objective of developing non-conforming products (Ahuja *et al*, 2008).

² A corporate venturing unit is inspired by the techniques used within the venture capital industry. Its stated mission is to stimulate and nurture entrepreneurial projects or investments that differ substantially from the core business (Campbell *et al*, 2003).

³ We are not suggesting that companies own all the resources needed for the development of innovations. Rather, we focus on organic processes, in which organizations actively develop innovations, irrespective of whether external sources of knowledge and competencies are used. Therefore, we exclude neither collaborative nor open forms of innovation on a global scale.

⁴ Organizational resources include tangible and intangible assets that an organization can use to produce an outcome. Routines are seen as organizational processes that may involve bundles of resources to achieve a desired outcome. Capabilities are conceived as high-level routines or bundles of specific routines (Grant, 1996).

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