

## Building new competencies for new business creation based on breakthrough technological innovations

**Citation for published version (APA):**

Vanhaverbeke, W. P. M., & Kirschbaum, R. (2003). *Building new competencies for new business creation based on breakthrough technological innovations*. (ECIS working paper series; Vol. 200317). Technische Universiteit Eindhoven.

**Document status and date:**

Published: 01/01/2003

**Document Version:**

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

**Please check the document version of this publication:**

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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Eindhoven Centre for Innovation Studies

**Building new competencies for new business creation based on  
breakthrough technological innovations**

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Working Paper 03.17

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July 2003

**BUILDING NEW COMPETENCIES  
FOR NEW BUSINESS CREATION BASED ON  
BREAKTHROUGH TECHNOLOGICAL INNOVATIONS**

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October 2002

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# **BUILDING NEW COMPETENCIES FOR NEW BUSINESS CREATION BASED ON BREAKTHROUGH TECHNOLOGICAL INNOVATIONS**

## **Abstract**

This paper focuses on the question *how* companies can build new capabilities or competencies based on discontinuous technological innovations? In particular, we analyze how corporate ventures are set up to develop and commercialize these radical innovations can play a crucial role in the process of building new competencies (not only technological capabilities). New competencies are in turn the basis to create a range of new businesses. Building and deploying competencies are intrinsically related to new business development or other forms of corporate venturing and both co-evolve over time.

The paper furthermore analyses what it takes to promote new business development (NBD) or corporate venturing (CV) as a trigger of corporate renewal. We argue that new competencies can only be built through a sequence of CV-initiatives and that both competence building and NBD can only fully be understood in relation to corporate strategy making. On the one hand, existing competencies and corporate strategy (vision or strategic intent) serve to direct and select these NBD-efforts through which the firm can enter new but attractive businesses and build new competencies (required to operate successfully in these businesses). A corporate vision should stretch the company beyond its existing resources and knowledge base; it leads to a fruitful misfit between what the company is and what it intends to become. On the other hand, new competence building also drives and refines the cognition of corporate strategy. New competence building and NBD based on radical innovations also demands to think differently about the organizational context and the role of top and middle managers. Finally, building competencies is not only a dynamic but also an organizational learning process: developing non-traditional businesses and new competencies is a function of a firm's ability to organize itself into a knowledge-creating system. Management roles also play a crucial role in successfully implementing CV and new competence building.

# 1. Introduction

How firms can achieve, sustain and safeguard competitive advantage is a fundamental question in the field of strategic management. The resource-based view of the firm (RBV) is one of the most important frameworks explaining how companies succeed in achieving that advantage and how they can manage to sustain it over longer periods of time (Barney, 1991; Peteraf, 1993; Prahalad and Hamel, 1990; Wernerfelt, 1994). More recently, the literature has spent a lot of attention to understand *how* firms build competitive advantage. The dynamic capabilities approach is considered to be a promising avenue to understand how competitive advantage is achieved (Helfat, 1994; Teece, Pisano and Shuen, 1997; Eisenhardt and Martin, 2000)<sup>1</sup> and recent work on the interaction between corporate venturing and strategic management focuses explicitly on new competence building as a result of corporate entrepreneurship activities (Hitt *et al.*, 2002; Zahra *et al.*, 1999).

As scholars have paid a lot of attention to the question how firms build and deploy capabilities, we expect to find in the literature various explanations of how companies get organized (or reorganized) and how management embarks on particular actions or projects to develop new competencies or to deploy existing ones. More particularly, we are interested in corporate venturing or new business development<sup>2</sup> projects as drivers for competence development and deployment. Surprisingly, this has only recently been tackled as a research topic. Notable exceptions are Bakker *et al.* (1994), Floyd and Wooldridge (1999), Helfat and Raubitschek (2000), Hoskisson and Busenitz (2002), Kazanjian *et al.* (2002), and Zahra *et al.*, (1999). These contributions highlight the importance of new product development to the development and exploitation of capabilities and knowledge. In that way, they bring the role of product development, venturing initiatives and corporate entrepreneurship back into the (dynamic) analysis of resources, capabilities and knowledge. They indicate how firms can utilize competencies and knowledge to introduce sequences of new products that in turn may extend the competencies of the company. Successful new product development and commercialization

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<sup>1</sup> Dynamic capabilities are defined as a “...firm’s ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments” (Teece, Pisano and Shuen, 1997) and are considered to be very valuable in regimes of rapid change or high-velocity markets.

<sup>2</sup> New business development (Roberts and Berry, 1985) is used as synonym for corporate venturing (Von Hippel, 1988; Block and MacMillan, 1995), corporate incubators (Hansen *et al.*, 2000) and corporate entrepreneurship (Ellis and Taylor, 1987; Zahra and Covin, 1995; Kuratko, Montagnano and Hornsby, 1990)

builds on but also augments the knowledge and capability base of the company. Hence, new product/business development or other types of corporate ventures – e.g. internationalization initiatives - are the organizational *carriers* to extend existing competencies and to build new ones. Bakker *et al.* (1994) for instance argue that the concept of corporate competencies increases the efficiency and effectiveness of the NBD-process, which in turn enables the company to build competitive advantage in new, attractive business areas.

In this paper, we are primarily interested in the question how companies can achieve competitive advantage in new and attractive business areas taken into account that their existing set of competencies or capabilities are inadequate. Companies regularly find that many attractive growth opportunities lie outside their current technology base and markets/applications. More specifically, we focus on radical innovations (or the emergence of new technologies) as enablers to set up new business development initiatives that, if successful, provide the company with new, profitable business units. New product development projects can in most cases be developed utilizing the existing (technological) competencies of the company. But the existing competencies are no longer appropriate when a company starts up NBD-projects where applications/markets and technologies are new to the company. NBD has been considered as a major route to corporate renewal and growth (Karol *et al.*, 2002). It is an important organizational vehicle to build new competencies. We argue in line with Beer *et al.* (1990) that the migration from the existing set of competencies to the required set has not to be organized as a ‘change program’ independently from the new business development efforts. On the contrary, building new competencies is in almost all successful companies achieved through a structured and persistent approach to new business development initiatives. They are the two sides of the corporate renewal process: The internal business ventures are the carriers to build new competencies and, as a result, organizational competencies evolve over time in concert with the new business development efforts.

The co-evolution of organizational competencies and new business development efforts can be described as a multi-layered change and learning process. It is multi-layered because different organizational and managerial aspects have to be taken into account simultaneously to effectively build new competencies: the differentiated role of frontline, middle and top managers, the interaction between competence building and corporate strategy, strategic intent

or vision, the organization and management of new business ventures; external technology acquisition strategy, etc...

The development of new competencies is also an organizational learning process. Knowledge accumulation and capability building is in itself a learning process. As NBD is a long, uncertain and failure-laden activity where applications are ill-defined and the technology still fluid, the learning process should be characterized as “learning by doing” or “learning by using” (Badaracco, 1991; Dierickx and Cool, 1989; Reed and deFilippi, 1990; Teece, Rumelt, Dosi and Winter, 1992). Lynn *et al.* (1996) call it a learn and probe process: companies develop their products by probe potential markets, learning from the probes and probing again. Probes are more experimental than analytical in nature and are designed for market learning rather than for market evaluation (Rice *et al.* 1998). Lei *et al.* (1996) have analyzed the linkages organizational learning and competence development. They emphasize that the development of new competencies and organizational learning are mutually interdependent over time: organizational learning is a necessary condition to generate new business opportunities stemming from radical innovations or new technologies. Competencies, in turn enable the company to refine and focus learning efforts (Lei *et al.*, 1996)

The paper is structured in the following way. First, we focus on the changing competitive landscape and the organizational and managerial challenges it entails. As the market value of existing business units erodes because of changes in the competitive environment or the emergence of new competence destroying technologies (Abernathy and Clark, 1985; Christensen, 1997), companies may be forced to build new competencies to stay competitive. This is a management field where the majority of the companies have poor track records. In the third section we analyze how some companies approach new business development (or corporate venturing) in a structured way, how they implement corporate growth and renewal strategies through articulating and structuring internal and external business venturing efforts. More specifically, we pay attention to the relation between the development of new businesses and that of new competencies. Next, in a fourth section, we argue that new business development and corporate strategy are intrinsically related to each other as soon as companies intend to enter new businesses that require the acquisition and exploitation of new competencies. The relationship between new business development and corporate strategy is typically a dynamic one: corporate strategy may activate and direct new business development

and the accompanying competence building. Similarly, new competence building also drives and refines the cognition of corporate strategy. In a fifth section, we discuss how companies actually build new competencies through new business development. This part of the paper is an application of how dynamic capabilities work. The sixth section focuses on the new knowledge or competence creation in the wake of but also as a necessary condition for corporate ventures. The seventh section analyzes the role of top, middle and frontline managers and the organizational context – to use the terminology of Bartlett and Ghoshal (1993) – that is required to enable new competence building and new business development based on radical innovations. The paper concludes with some final observations and possible avenues for further research.

## **2. The changing competitive landscape and inappropriate organizational answers**

The competitive landscape is changing rapidly. Significant discontinuities such as globalization, deregulation, blurring industry boundaries through new business models, technological convergence and disintermediation pose new managerial challenges forcing managers to create new competencies (Prahalad, 1998). Similarly, discontinuous technological innovations (Tushman and Anderson, 1986) may threaten the strategic position of incumbents. Radical innovations translate some core competencies into ‘core rigidities’ (Leonard-Barton, 1992, 1995). But new technologies also enable companies to create competitive advantage in existing and new, yet unstructured industries.

Changes in the competitive landscape also diminish the market value of a company’s existing business portfolio. New entrants, slowing industry growth, new substitutes and changing customer needs enforce companies to look for new business opportunities to stay competitive in the long run. As Hamel and Prahalad (1994) have argued, competition for the future is competition for opportunity share rather than market share. The search for these opportunities may for many (industrial) companies be related to technological opportunities. Many firms have found that the most interesting growth opportunities lie outside both their current technology base and markets they are serving. Firms with technological capabilities explore new technological areas in search for profitable business opportunities. The success of this

explorative search depends on the technological distance between the existing technology base and the new technological field and on the absorptive capacity of the company (Cohen and Levinthal, 1990). Experimenting with novel technologies allows a company to value the potential of these technologies in a more accurate way.

There are companies that managed to grow profitably through new business development that requires the building of new competencies. Well-known cases are GE's successful entry in the CT scanner industry, Du Pont's biodegradable polymer (Biomax), Motorola's mobile telephone business, Hewlett-Packard's successful development of the ink jet and ink business, and Corning's optical fiber business. However, many scholars have argued that most companies do not have good track records in managing discontinuous change and in turning breakthrough innovations into long-term growth and profit engines (Christensen, 1997; Prahalad, 1998; Prahalad and Hamel, 1990; Tushman and O'Reilly, 1996). Furthermore, large firms (or incumbents) are on average not adept to manage the challenges and reap the business opportunities related to the emergence of disruptive or discontinuous technologies (Bower and Christensen, 1995, Christensen, 1997; Dougherty and Heller, 1994; Dougherty and Hardy, 1996; Leifer *et al.* 2000). Finally, many companies with strong technological capabilities have systematically problems converting discontinuous technological innovations into competitive advantage in new industries, applications or markets.

There are different reasons for these inappropriate corporate answers to technology driven competitive challenges. We only mention a few of them. First, established public companies are hold to yearly or quarterly earnings expectations. In line with this, most companies have organized their businesses as profit centers, so that business units will not get committed to promising, radical innovation projects because the pay-off period is too long and return on investment uncertain. Next, people that are championing a breakthrough innovation are vulnerable when corporate culture does not support risk-taking behavior (see also section 6). The commercial success of this type of innovations is highly uncertain: only a few of the many interesting technological inventions are turned into a new profitable business. Moreover, these high-risk initiatives can only be developed over a considerable period of time, sometimes 10 to 15 years in different industries: it is very likely that deteriorating short-term financial performance will drive the organization to kill projects that do not directly contribute to the success of the current businesses (Rice *et al.*, 1998).

Hence, some firms manage to grow through a strategy of starting up new businesses. Many other firms seem not to have the organizational and managerial capabilities to get that far. Why some firms are capable to profitably exploit non-traditional business opportunities – we look more specifically at opportunities based on radical technological innovations – and why others are bound to their existing and maturing set of businesses. The next section focuses on structuring the “new business development”-process as one of the major route to corporate growth and renewal.

### **3. Learning through internal and external corporate venturing: selecting and nurturing valuable (technology based) business opportunities**

Management of *technological innovations* and that of *technology based new business development* is a key element in explaining why some companies successfully implement growth strategies. The technological innovativeness of a company is significantly influenced by the way how research and development activities are managed and how the interaction between central lab and business groups / divisions are structured. Central labs still play an important role in reshaping and rejuvenating a companies technological capabilities: the way how these labs are organized internally plays an important role in explaining the difference between successful and unsuccessful innovating companies (Iansiti, 1993). However, as technological pace and complexity is increasing companies have to complement internal development with external acquisition of technology through alliances and acquisitions (Granstrand *et al.*, 1992; Lambe and Spekman, 1997). Technological learning is more and more based on a combination of internal and external learning: internal learning by the internal development of new products and processes as a result of internal R&D, external learning from the technology acquired through technology alliances. Both types of learning are considered complements reinforcing each other's productivity (Cohen and Levinthal, 1990; Duysters and Hagedoorn, 2000).

Internal development and external acquisition of technology are important to build new technological competencies but they have to be complemented by additional corporate initiatives to start-up and develop technology enabled new business opportunities. Many multi-

business companies have decentralized profit and loss responsibility to the business unit level in order to spur the market responsiveness and to reduce time-to market when introducing new products into the market (Ghoshal and Bartlett, 1997). Decentralization of responsibility allowed business unit managers to apply their resources more efficiently to new market opportunities and technological developments that could add value for (potential) customers (Bartlett and Ghoshal, 1993).

The backside of this trend towards decentralization is that business units with short-term profit responsibility will only approve R&D and product development that seeks to exploit existing or highly related technological competencies and market intimacy. Business units will spontaneously overemphasize ongoing and incremental innovations -the shaded area in the lower left corner of figure 1- because of the low risk involved, the relatively short development time and the opportunity to deepen the existing, in-house expertise. This emphasis on ongoing innovations can be a valuable strategy as long as the competitive environment is stable and technological changes are competence enhancing. However, it is dysfunctional when a company faces a turbulent competitive environment or when disruptive technologies are emerging (Bower and Christensen, 1995; Lynn, 1996). When companies heavily invest in sustaining their current technologies and competencies, they face considerable problems in redirecting the focus on emerging, non-traditional technologies (Christensen, 1997). Corporate strategy can be redirected and new competencies learned in anticipation or in response of the changing competitive context, but that requires that companies invest in breakthrough ideas and in corporate entrepreneurship. As existing businesses are inherently inert the development of radical innovations into new businesses has to be cultivated. If companies are not able or willing to do so, strategic inertia emerges in the face of innovative opportunities and their core competencies might turn into core rigidities (Leonard-Barton, 1992, 1995)

*Insert here figure 1*

A company faces considerable organizational challenges if the most attractive growth opportunities lie outside its current applications and technologies. As business units will stick to the well-known business areas and technologies, the upper right part in figure 1 remains unchallenged. This high risk zone represents also the growth opportunities that cannot be realized by relying solely on the company's existing competencies. In these cases a company

has to develop new competencies to meet the technological and commercial requirements of the growth opportunities. Large diversified companies usually develop a separate organization within the company to learn new competencies and to acquire the required technologies (Burgelman, 1995; Christensen, 1997; Lynn, 1998; Tidd *et al.*, 1997). We make a distinction between internal and external venturing, but both types of venturing are indispensable organizational instruments to acquire technology, build new competencies and improve corporate entrepreneurship. We have first a look at internal ventures before explaining external ventures.

Internal corporate ventures can be structured in different ways, and its appropriateness depends on the balance between the need to learn new competencies and to leverage the existing ones (Burgelman, 1984; Tidd and Taurins, 1999). One of the interesting internal corporate venture structures in this respect is the New Venture unit or what we call the New business development (NBD) unit<sup>3</sup>. New business development based on radical innovations can be one of the key organizational instruments to rejuvenate or renew the company's technological capabilities and the resulting business portfolio. The unit aims to identify and advance promising new developments which, although they fall outside the scope and strategy of the existing business units or divisions, are related to the existing competencies, culture and strategy (see next section). The unit is usually set up as a small team of dedicated people with different expertise. It is operating on a restricted budget but it can tap into the company's resources whenever necessary: the central R&D center plays a crucial role in technological problem solving, while business units frequently share their know-how about markets, customers and manufacturing. The unit has full operational autonomy and is evaluated and controlled directly by top management.

The New Venture unit can, be considered as a safe haven where risky but promising innovation projects are nurtured and developed for an extended period. A small, dedicated project team carefully analyzes and evaluates all the innovation projects which are unfamiliar for the company concerning the technology/product characteristics or the market/application opportunities. Many companies use a stage-gate like process to identify and select the most

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<sup>3</sup> There are other strategic approaches that established companies use to spur corporate venturing. Frequently used alternatives are hiring creative people from outside the organization, creating an

promising opportunities and to turn them into successful new businesses (Cooper, 1985, 1993; Cooper and Kleinschmidt, 1995). It is a long term process in different phases; at the 'idea generation'-phase a quick and dirty assess of the attractiveness is carried out; later on evaluations intend to diminish uncertainties of the projects; business plans have to be prepared for a start-up company; and, finally, pilot plant(s) have to be scaled up to commercial business units. Top-management decides at each 'gate' whether or not a project can enter the next stage. Developing radical innovations is a high risk venture and the main advantage of the stage gate process is the stepwise reduction of uncertainty at low investment costs in its thin the initial stages. Large investments will only be poured into the venture when the risks have been lowered to an 'acceptable' level

There are different reasons why the new business development process is crucial for the *rejuvenation* of technological capabilities and the long-term profitability of a company. First, many interesting (technological) ideas may not fit into the strategy of the existing business units or they may be too risky to undertake the business units that operate as a profit center (Roberts and Berry, 1985). Second, a systematic scanning of the available technologies and ideas inside the company and in the environment (technology and market scouting, consultants, customers, exhibitions, universities, patent inspection, etc...) is becoming a strategically important activity because of the increasing technological complexity of products or the emergence of disruptive technologies (Granstrand *et al.*, 1992; Bower and Christensen, 1995). These trends are forcing (even technologically leading) companies to acquire technology externally through licensing, spinning-in, technological alliances and acquisitions (Lambe and Spekman, 1997). Finally, top management may deliberately nurture promising technological innovations as carriers for the development of new businesses and competencies.

Large diversified companies complement internal corporate venturing with external venturing. External venturing has several advantages and will become even more important in the future for the following reasons. First, the number of radical innovations developed by small start-ups in emergent technologies and the number of spin-offs from universities is increasing. Next, external venturing allows a company to monitor, firsthand, new technologies and applications and to have a window on the latest technological developments. Finally, apparent time to

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internal market for ideas, setting entrepreneurial activity as a strategic priority of the company, granting creative people some free time, etc.... For an overview, see Stringer (2000).

market shortens when a company can spin in a promising venture compared to the situation in which it has to commercialize an innovative idea from scratch. External venturing is valuable when radical innovations represent technological fields or applications areas that are completely new to the company (the so called ‘suicide area’ in figure 1) and that have a low probability of success. Roberts and Berry (1985) argue that companies should avoid large-scale entry in this situation. They recommend companies to build familiarity with the new area through (inexpensive) venture capital or educational investments. Over time, the investing company will get a better understanding of the potential success of the new technology. It has the option to eventually spin-in the venture when familiarity with the technology is sufficiently strong and the venture proves to be promising.

Some companies recognize that new business development and new competence learning should be managed in an integrative way. DSM, a Dutch Specialty Chemicals and Materials company with annual sales close to EUR 8 billion, reorganized its new business development activities and external venturing into a single business group, DSM ‘Venturing & Business Development’. The business group is actively involved in new business development (internal corporate ventures), investments in Venture Capital Funds and in promising start-up companies (external venturing), and equity and non-equity alliances with universities and other business with complementary technologies or other intangible assets such as knowledge about and manufacturing expertise.

In short, companies might have a number of good reasons to learn new competencies. Some face maturing businesses, turbulence in markets or changes in business models applied by competitors. Others have to cope with the emergence of competence destroying technologies. Still others want to rejuvenate the business portfolio as a result of changes in the corporate strategy. Whatever the reason, successful companies are continuously searching for new and profitable business opportunities based on radical innovations which in many cases requires new competence building since the technologies and applications involved are new to the company (or even to the world). New competence building and new business development or corporate venturing are the two sides of the same coin. The decision to develop new businesses creates a fruitful misfit between the existing competencies and those that are required, but NBD is at the same time the ‘organizational carrier’ through which new competencies are developed or acquired. Furthermore, we have argued that new competence

building also challenges companies to set up appropriate organizational structures –formally or informally- to spur corporate entrepreneurship because the existing business units or divisions are obviously biased towards ongoing and incremental innovations. Companies learning new, technology enabled competencies need not only a strong in-house technological infrastructure but also a strong external technology acquisition capability since companies, especially in fast changing technological fields, have to complement internal R&D efforts with technology from outside the company (Kazanjian *et al.*, 2002).

#### **4. New business development and corporate strategy**

In the previous section, we have argued that new competence building is inextricably knit up to new business development or corporate venturing. Since there are usually many interesting new business projects or external ventures in search for the corporate financial resources, we have still to answer the question which projects get selected and developed into a new corporate venture.

There are of course different ways to select the most promising (projects for) new business ventures. Some companies emphasize the role of informal organizational channels of product and executive champions to explain how radical innovation projects get the support from top management and the financial resources (Maidique, 1980; Greene *et al.*, 1999). Other companies are in favor of a more objective approach using a set of predetermined criteria to select among the interesting technological ideas (see also Elder and Shimanski, 1987). Financial criteria are of course decisive. DSM's 'Venturing & Business Development', for instance, uses the following financial criteria. Annual average market growth should be larger than 10%, potential turnover after 3 to 5 years should be EUR 1-3 million and after 5 years more than EUR 10 million, gross margin larger than 50% and the internal rate of return definitely more than 20% over a period of 10 years.

But financial criteria focus only on performance requirements for each project, they do not indicate how well radical innovations fit into the overall corporate strategy and how they may be valuable in creating new competencies (Venkatraman *et al.* 1992). Therefore, most companies include additional criteria to position radical innovation projects vis-à-vis a

company's strategy (Burgelman, 1986; Twiss, 1986; Strebel, 1992; Spender and Kessler, 1995; Dougherty and Hardy, 1996). How is corporate venturing and new competence building linked to corporate strategy? Some authors have emphasized the need to establish a dynamic interaction between technology development and corporate strategy (Hamel and Prahalad, 1994; Itami and Numagami, 1992; Kazanjian *et al.*, 2002)<sup>4</sup>. Itami and Numagami (1992) distinguish three kinds of relationships that are conceivable between strategy and technology. We discuss them one by one focussing primarily on the question how corporate strategy can shape new technological capability building.

The first perspective focuses on the contemporaneous match between (current) strategy and (current) technology. The authors label the relationship "strategy capitalizes on technology". Within this perspective technology is a tool or weapon to create a competitive advantage in particular markets. The extant technology also acts as a constraint for strategy making. Finally, technology is also a threat since competitors' technological capabilities have to be matched by the focal company. Most of the past research has been devoted to explain this static matching of strategy and technology. This perspective implicitly assumes that technology and technological capabilities are two variables that remain intrinsically independent from each other. When observed over time both technology and strategy change, but "...current strategy does not affect future technology directly, nor does current technology affect future strategy in any explicit way. They are not truly interactive" (Itami and Numagami, 1992, p. 121). Therefore, this perspective is of no help in explaining how corporate strategy can shape new technological competence building and how the latter might also have an impact on future strategy making.

The two other approaches imply that there exists a dynamic interaction between corporate strategy making and technological competence learning. The second perspective is called "strategy cultivates technology". This perspective covers a range of strategic decisions that have long-term implications for technological competence accumulation. It ranges from strategies where companies decide to extend their technology base to strategies as "stretch"

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<sup>4</sup> The same need for a dynamic framework is echoed in the literature about technological capabilities, where technology based companies face an apparent paradox: companies have to take advantage of the existing technical capabilities - competencies - without being hampered by the technological trajectory they followed in the past (Helfat and Raubitschek, 2000; Leonard-Barton, 1992, 1995; Teece, Pisano and Shuen, 1997). The tension between leveraging existing capabilities and the creation of new ones through entrepreneurial activities is also at the core of the emergent literature about strategic entrepreneurship (Hitt *et al.*, 2002).

(Hamel and Prahalad, 1994). Strategy as a willfully “misfit” or “stretch” is a corporate strategy that intends to build new competencies by overextending corporate goals beyond the current (technological) competencies. Strategy as stretch creates a misfit between extant and required competencies, it creates a tension that challenges managers and employees and stimulates corporate learning accelerating in this way the building of new competencies.

The third perspective is complementary to the second: it focuses on the impact of current technological capabilities on the future strategy of the company. The current technological competencies of a company or the deepening or extension of it may drive the cognition of (future) strategy<sup>5</sup>. Many technological driven companies only realize after some time that their current technology base or the peripheral technologies, who they are experimenting with, provide new opportunities for future strategy making. A strong commitment to and deep knowledge of a particular technology field allows “a company to see a strategy that other firms fail to imagine” (Itami and Numagami, 1992, p. 127). However, the authors indicate that the technological involved should not be too close to or too far from the current technological capabilities of the company. When the new technology is too close to the current capabilities it has no potential to stretch the corporate strategy. When it is too far removed from current capabilities it will not be accepted or legitimized in the company to serve as the starting point for a new strategic direction. This also implies that companies only can learn when the learning distance between the current knowledge capabilities and the targeted technology is not too large. Knowledge based diversification is always in some way an organic diversification around core competencies, since companies will not be able to explore, value and integrate the knowledge when the required capabilities are too far removed from the current competencies (Prahalad and Hamel, 1990; Hoskisson and Busenitz, 2002).

Itami and Numagami (1992) mention that in real business settings, the three perspectives occur at the same time and interact with each other. However, they do not elaborate on how these perspectives interact with each other. We argue that the two ‘dynamic’ relationships between technology and strategy are intrinsically related to each other and are complementary parts in the building of new (knowledge based) competencies. *Experimentation, strategic intent and*

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<sup>5</sup> Itami and Numagami (1992) emphasize that positive effect of cognitive processes. The literature has emphasized the negative effects focussing on the inability to unlearn (Hamel and Prahalad, 1994) the

the *organizational context* are in our opinion the three key concepts in explaining how companies successfully stretch their competencies into new technology realms. In the remainder of this section, we focus on experimentation and strategic intent and their mutual interaction. The relationship between competence building and organizational context of a company, as it was defined by Ghoshal and Bartlett (1994), will be analyzed in section 7.

When companies experience that their existing technological capabilities are no longer adequate to compete successfully or when attractive business opportunities lie outside their current technology base, they may be tempted to empower engineers and managers to come up with new and radical innovations. Top management of large companies may hope that the legitimization of idea generation and experimentation with new technologies will lead to the ‘cognition of the future strategy’. But this strategy making process does not come automatically, even when the strategy is ‘emergent’ (Minzberg and McHugh, 1985; Ghoshal and Bartlett, 1997). Empowerment and ‘emergent strategy’ only get translated into a successful corporate renewal, domain redefinition and/or the building of new technological competencies, when there is at the same time a compelling sense of overall strategic direction in the firm. Releasing the entrepreneurial forces in a company does not automatically translate into the desired competence building that secures the firm’s future revenue streams. If there is no sense of overall direction in the company chaos is likely to emerge: Business units that are managed as profit centers will stick to incremental innovations with short-term revenues; central lab researchers will focus on challenging breakthrough inventions that cannot be developed as corporate ventures because of inadequate technology or market feasibility; individual intrapreneurs may start up a venture that has to be divested later on because there is no way to integrate it in the company. Burgelman (1986) claims that a company needs to allow for initiatives that do not fit with its current strategy, but they always have to be screened in terms of appropriateness for the company’s future strategy.

Companies have to have a sense of overall strategic direction when they have the ambition to rejuvenate competencies or to build new ones. Corporate strategy as stretch – e.g. an

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impact of technological trajectories and organizational inertia (Ahuja and Lampert, 2001; Cohen and Levinthal, 1990; Leonard-Barton, 1992, 1995; Levinthal and March, 1993).

overarching corporate purpose (Ghoshal and Bartlett, 1997) or strategic intent<sup>6</sup> (Hamel and Prahalad, 1994) - leads to a substantial “misfit between a company’s extant competencies and its ambitions (Hamel and Prahalad, 1994). This ‘misfit’ creates a tension between exploitation of current competencies and the exploration of new ones (March, 1991), between control and stability on the one hand and flexibility and creativity on the other hand (Zahra *et al.*, 1999). Strategy as ‘stretch’ provides a direction but also identifies the major competencies to be built and is therefore a crucial part of strategic renewal processes (Ghoshal and Bartlett, 1997; Volberda *et al.*, 2001). It is important to mention that strategic intent (‘strategy that cultivates future technology’) ensures consistency in direction and identifies the major capabilities to be built, but remains silent about the way *how* to built these competencies. That’s where new business development or corporate venturing comes in. We distinguish two important roles for corporate venturing in relation to corporate strategy.

First, corporate venturing plays a crucial role in developing new competencies. A strategic intent or vision does not specify how new competencies have to be built. New competencies are learned gradually by several new ventures each requiring the development of some new technology. Bakker *et al.* (1994, p. 15) formulate it as follows: “NBD endeavors the need to overcome the misfit of the current organization with the desired organization by identifying, acquiring and developing competencies”. These ventures are developed sequentially with each subsequent project building on the experiences gained from the previous ones (see also section 6). Second, and even more important, internal and external corporate venturing based on unfamiliar or radical innovations plays a crucial role in recognizing the potential of new technologies (or scientific disciplines) for future strategy making of the company. Too frequently, scholars do not question how the strategic vision of a company solidifies: it is the result of a strategy formation process that is to an important extent facilitated by the corporate venturing process (and the related explorative technological research). With each new (internal *and* external) venture the company learns about new technologies, applications and markets, which in turn sharpen the recognition of new strategic opportunities. In other words, the corporate strategy making process is fostered by the ongoing technology building process (technology drives the cognition of strategy). Hence, the continuous interaction between

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<sup>6</sup> Hamel and Prahalad (1994) make a distinction between strategic architecture (= the point of view about long-term competitive position) and strategic intent (= provides the emotional and intellectual energy to

corporate strategy and NBD (approaches 2 and 3) leads to a co-evolution of both, where they mutually nurture each other in a never-ending process.

## **5. An example: corporate strategy and new business development activities at DSM**

We illustrate the mutual and dynamic relationship between corporate strategy and NBD-activities or corporate venturing by means of a case study of DSM, a European chemical company that transformed itself during the last two decades from a petrochemical to a specialties chemical company.

DSM is a Dutch chemical company that was founded in 1902 as a state-owned coal-mining company. As it expanded its coal mining and processing activities, production of the by-product coke oven gas also increased. Later on the company further diversified when it covered that this gas could be converted into ammonia, a raw material for the production of fertilizers. The increase in demand for chemical products after the Second World War opened up new opportunities. The company made the most of these opportunities by moving into the production of industrial chemicals and raw materials for synthetic fibers.

Later, the demand for coal fell off sharply as a result of the emergence of petroleum and natural gas. DSM had foreseen this development and quickly shifted its focus; By 1970 two thirds of the company's sales were accounted for by chemicals and fertilizers, and the last state-owned mine closed in 1975. Petrochemicals sales grew quickly and became DSM's most important business by far. In the seventies and eighties company implemented several organizational changes in order to achieve sufficient economies of scale and diversify into advanced polymers and fine chemicals.

Since the late 1980s, it has been working to take a leading position in activities that add higher value, have stronger growth, and are less prone to economic cycles. From 1985 onwards the company adopted ambitious innovation strategies, through which it moved into the production of highly innovative specialties which turned out to have pay out times of 10 or more.

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bridge the gap between current competencies and ambition). For simplicity we stick to the term

In 1989 DSM was privatized and listed on the stock exchange. In the nineties the company concentrated on closely aligning its research efforts with business needs and on developing processes and products with a high added value, in particular products for the pharmaceutical and food industries and advanced polymers. At the end of the century, the company grouped its business portfolio into three clusters: life science products, performance materials and industrial chemicals (mainly petrochemicals). Industrial chemicals are commodities (bulk chemicals) and their profitability is highly dependent on economic cycles. The other two clusters are R&D intensive, focus on high-added-value specialties (niche market strategies). DSM is active worldwide and the group had in 2000 annual sales of close to EUR 8 billion and employed about 22.000 people.

If there is one constant factor in DSM's history it is its ability to change. This was true of the DSM that rapidly transformed itself 30 years ago from a state owned coal-mining company into private chemical company; and it is still true of today's DSM, which is further developing into an integrated, global chemical concern focusing on high-added value specialties. The ability to change or the redirect the corporate strategy is a common feature of companies that have emphasized corporate entrepreneurship and organic diversification around core competencies (Burgelman and Doz, 2001)<sup>7</sup>. DSM represents the type of company that is culturally disposed towards recognizing the importance of change in the future. The superior ability to change in anticipation of or in response to discontinuities is not only the result of experience accumulation, but also of deliberate learning investments (Zollo and Winter, 2002). One of them is the articulation of the corporate strategy as we have seen in the previous section. Considerable time is spent at formulating and reformulation the corporate vision each time DSM places reasonable bets on the strategic changes in the future. We illustrate this point with the most recent strategic change within the company.

DSM managed in the period from 1995 through 2000 to roughly double its sales (sales went up from EUR 4.5 billion in 1995 to 8 billion in 2000) and had a solid financial position. It nevertheless changed its corporate strategy considerably in 2000. The new strategy further concentrated on global leadership positions in high-added value activities characterized by high growth and more stable profit levels. To this end, the company was transforming itself into a company specializing in advanced chemical and biochemical products and performance materials (specialties). The previous, three pillar (cluster) corporate strategy was replaced by a

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<sup>7</sup> 'strategic intent'.

<sup>7</sup> Well known US companies that have similar characteristics are Johnson & Johnson, 3M and Hewlett-Packard.

two pillar strategy as DSM sold its petrochemicals business to Saudi Arabian company SABIC in 2002. The new strategy aimed to achieve sales of around EUR 10 billion by 2005: at least 80% of these sales will be accounted for by specialties (clusters 'Life Science Products' and 'Performance Materials'). These two clusters generated sales of EUR 4 billion in a time span of five years while divesting the petrochemical business at the same time.

This bold shift in DSM's corporate strategy is however no radical break with the company's past. It is the next logical step in a long track record of continuously changing the company in response to the new challenges of markets of technologies. The recent emphasis on 'Life Science Products' (LSP) and 'Performance Materials' (PM) is the logical consequence of DSM's strategy vision: According to the management, trends in the chemical industry were leading towards a structure with three strategic groups (Porter, 1985) of chemical companies. At one end of the spectrum one has the large conglomerates, with sales of over EUR 25 billion and a broad portfolio of products (e.g. companies such as Dow Chemical, DuPont, Bayer, and BASF). Due to the relative stability provided by their size, the broad variety in their portfolio and the liquidity of their stocks, the investment community accepts that their portfolio encompasses substantial volumes of cyclical commodities. At the other end of the spectrum there is a group of highly focused pure play specialists. Their size is limited, usually not surpassing the EUR 3 billion mark. Many of these pure play companies are the outcome of the ongoing reshuffling process (e.g. companies such as Lonza, Givaudan and Novozymes are prime examples). In between these two strategic groups another one of global 'multi-specialty' players is developing (e.g. companies such as AKZO Nobel, CIBA, Clariant, Degussa, ICI, Rhodia, and Rohm & Haas). These firms have a size of roughly EUR 5 to 15 billion in annual sales and a portfolio consisting predominantly of a set of chemical specialties<sup>8</sup>.

DSM's management intended with the strategy vision to become a leader in the strategic group of global 'multi-specialty' players by readjusting its portfolio focus and size. In order to be successful as a multi-specialty player DSM identified the following competitive drivers. First, company has to aim for leadership in every business segment it wants to operate in<sup>9</sup>. A second

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<sup>8</sup> Somewhat outside this chemical spectrum are the large global oil companies, which are relevant for chemicals as they increasingly dominate the petrochemical business, and the group of large global pharmaceutical and food processing companies, which are also consolidating.

<sup>9</sup> This objective was already part of DSM's strategy before the change in 2000. For the parts of the businesses portfolio that were relevant for the new DSM - i.e. adjusted for the planned divestment of Petrochemicals - the company had global leadership for 63% of its sales and regional leadership for another 16%.

vital condition for success is a coherent portfolio. Through a coherent portfolio a multi-specialty player can outperform pure play companies and generate added value over a simple clustering of separate business entities. A third essential element for success is cost control<sup>10</sup>. The fourth point on the list of essentials for a successful multi-specialty player is non supply cyclical stable earnings profile. Another essential element is a solid financial structure expressed in a healthy balance sheet. Finally, a successful multi-specialty player is an innovative company. Innovation is an area, it was argued, in which a multi-specialty player has clear advantages, since a larger company not only has more critical mass to support expensive R&D programs but can also bring into play the combination of various technologies and skills.

The development of a ‘coherent portfolio’ as a condition to become a global ‘multi-specialty’ player needs some further explanation. This coherence is reflected in, for example, a focus on specific end markets and in the technologies applied. The company’s technological capabilities in both biotechnology (LSP cluster) and more classical fields of expertise such as materials science (PM cluster) are the result of a growing awareness of the value of and subsequent implementation of a technology related growth strategy. Similarly, the company focussed on five major end markets where it had ample market expertise (business to business) and customer intimacy. Together these five markets accounted for more than 70% of sales.

The development of a coherent portfolio around a few technological competencies and end markets is an ongoing process where technological developments and strategy changes mutually shape and drive each other – combining the ‘strategy cultivates technology’ and ‘technology drives the cognition of strategy’ perspectives on the relation between technology and corporate strategy. Being highly involved in the petrochemicals in the seventies and eighties, the company decided to diversify into high-value added chemical products as an answer to the maturing petrochemical business. The R&D department started a major research program resulting in the early development of a few in-house developed, radical innovations. These innovations, in turn, led to the cognition that the company could be an important player in some ‘Performance Materials’-industry branches. As the company developed technological capabilities and gained market experience in Performance Materials, it gradually expanded its

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<sup>10</sup> This focus on controlling and reducing costs as a strategy to achieve competitive advantage in specialty businesses has been corroborated by recent empirical research (Dess *et al.* 1999, 1997; Zahra and Covin, 1993). Experiences with specialty businesses acquired over time have provided DSM managers ample proof of this. Given the fact that sooner or later many specialty businesses will show signs of so-called ‘commoditization’, this sense of urgency relating to cost control is becoming more and more important.

efforts in this technological area and finally PM became one of the three clusters (divisions) in the company's strategy at the end of the millenium. Similarly, the company became more and more interested in developing technological capabilities in biotechnology in the nineties. It had already developed a few innovative products for the food and beverage industry (e.g. sweetener) and biotechnology was considered to be an interesting growth engine to compensating for the deteriorating prospects in petrochemicals and industrial chemicals. Biotechnological products today represented 15% of DSM's total sales in 2001, making it one of the leaders in this respect in the European chemical industry.

The new strategic vision to become global multi-specialty player forced DSM to readjusting its portfolio focus again: it had to withdraw from petrochemicals and simultaneously boost its presence in chemical specialties such as LSP and PM. DSM defined biotechnology and performance materials as its two technological mainstays but the potential synergies at the intersection of these technologies have been largely left untapped. DSM now identifies the combination of both technological fields as the key technological area to new innovative successes in extant and newly emerging markets and to give the company a competitive edge as a multi-specialty player.

The recognition of the strategic potential of the intersection between LSP and PM has been growing steadily in the company as a result of the ongoing technology development and acquisition in these technological fields. The potential value of this strategic focus on the growing business opportunities at the intersection between biotechnology and chemical processes has recently been highlighted by industry watchers (Bachmann *et al.*, 2000). New biological production processes such as genetically enhanced fermentation, bio-catalysis, plant-based production may offer different production process and product advantages<sup>11</sup>. Advances in biotech lead to cleaner, sustainable, more flexible and cost-effective processes to manufacture both existing chemical products as well as complete new products. Furthermore, biotech offers sometimes substantial reduction in production and capital costs and lower minimum efficient production scale. New biotech based products will be price-competitive, biodegradable or nontoxic and will have improved or new product features (Bachmann *et al.*,

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<sup>11</sup> Bio-catalysis means that enzymes from living organisms are used as catalysts in cemical reactions. Plant-based production uses genetically engineered crops to produce different types of chemicals (e.g. bio-degradable polymers).

2000). Hence, biotechnology will transform the production of chemicals and will enter the realms of among other things plastic additives, polymers, pigments and coatings. Bachmann *et al.* (2000) also mention that chemical companies which already have strong operational skills and customer relationships in these markets are best positioned to achieve profitable growth through biotech. There are clear advantages for first movers who can develop the technical leadership and the intellectual property reserves that might keep latecomers out.

Looking at the potential to combine biotechnology in relation to materials, chemical companies have hardly scratched the surface. Being aware of that potential, DSM management promoted that technological area –the so-called biomaterials or bioterials- as a top priority in the corporate vision. Building technological capabilities in that technology field is set forward as a stretching goal: in other words, the current strategy cultivates future technology. However, this focus on bioterials is in itself the result of an ongoing recognition process that is a ‘byproduct’ of the research and development efforts and technology acquisition in the areas of biotechnology and materials science. Researchers and managers at DSM identified bioterials because of their acquaintance with and knowledge about both technologies (Cohen and Levinthal, 1990): In other words, current technology also drives the cognition of future strategy.

The recognition of potential benefits of combining both research-fields starts with a relatively simple observation: Nature (chemical processes in bio-organisms) reaches a tremendous level of control and complexity with a limited number of molecular building blocks. In synthetic chemistry, on the contrary, researchers synthesized an awful number of molecules and building blocks, but with very limited control and complexity. In the last years progress is made in two ways. The diversity in molecules synthesized by living organisms is increased by biotechnology. On the other hand a substantial jump has been made in synthetic chemistry towards more control and complexity, the so-called molecular nanotechnology or nanochemistry (Atwood *et al.*, 1996). Hence, till now know-how in the area of biotechnology has been applied to life science businesses and material science to synthetic chemistry. Through combining both research areas the company is a first mover in entering the area of bioterials, where biotechnological know-how is introduced into chemistry and vice versa. This leads to increased

control and complexity in production processes but also to completely new classes of molecules with unexplored application potentials<sup>12</sup>.

The combination of biotechnology and materials science means a further streamlining of the technological coherence within DSM. As we have argued, corporate strategy and technological competencies mutually interact generating a process of continuous technological competence building and providing a direction for future competence building that is in line with the stretched strategic goal setting. The mutual interaction between corporate strategy and technological competencies has several implications for the organization of R&D activities, the internal (new business development) and external venturing process (acquisition of and alliances with other companies and institutions), and the rejuvenation of existing and building of new technological competencies. This is the topic of the next section.

## **6. Closing the gap: internal development and external acquisition of technological competencies**

The resource-based view of strategy has traditionally ignored the role of corporate entrepreneurship. Only in recent years scholars have drawn from the resource-based view to understand outcomes of new corporate ventures (Majumdar, 2000; Hitt *et al.*, 2002; McGrath, Venkatraman and MacMillan, 1994; McGrath, 1995; Thornhill and Amit, 2001; Zahra *et al.*, 1999). We have argued (in sections 3 and 4) that corporate entrepreneurship plays a key role in companies that are rejuvenation existing technologies competencies and building new ones to compete successfully in new and attractive markets. There are different ways to organize corporate venturing in a large, multi-business company but it is always crucial to organize the different venturing activities in an effective and efficient way. This is, as will argue, one of the most difficult challenges for most companies because of the complexity of corporate venturing itself.

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<sup>12</sup> Examples of developments in DSM are: bio-active packaging and coatings, biomedical applications of materials, Examples of developments in DSM are: bio-active packaging and coatings, biomedical applications of materials, non-natural amino acids, sustainable chemical processes based on biotechnology, bio-inspired molecular architectures for functional applications, materials for communication hardware.

Organizing corporate venturing starts with the recognition that the required technology in NBD differs from that in the more conventional new product development (NPD). Technology and markets are fairly well known in NPD and the required technological innovations are incremental in nature (see figure 1). NPD is one of the activities that belong to the exploitation of current technologies. On the contrary, NBD is about exploring new and promising technological fields, it is about competence building. When a company starts a NBD project the technology is still evolving, potential markets are ill-defined or nonexistent, and timing is highly uncertain. Therefore, Lynn *et al.* (1996) argue that the logic in NBD is far more experimental than analytical. The target is also completely different: NPD is a well-understood, phased process to develop a new product from idea generation to launch (Cooper, 1985, 1993). It is a process with a clear target. NBD on the contrary is in the first place an experiment to maximize learning, it is "... a vehicle for gaining insight into what target markets to pursue, which technologies to use, and what features and benefits to incorporate" (Lynn *et al.*, 1996, p. 28).

The experimental nature of NBD and the uncertainty it entails are responsible for the fact that most ideas get killed long before they enter the phase of a corporate venture. Only the most promising ideas become a corporate venture after they survived several, subsequent go/kill decisions of top management. Many ideas or projects survive one or more phases but then get useless for the company. The result is that corporate venturing also has to generate cash by licensing technology, selling projects or spinning-out corporate ventures. Even externally acquired technologies may prove to be not valuable, and has to be sold again.

Second, entering new businesses and developing new technological competencies implies that the company cannot exploit its current competencies as in the case of NPD-projects. It has to search for new technological knowledge and market information outside its own boundaries. Importing and absorbing external knowledge is the most important activity in new business creation; NBD is at that point quite different from NPD that leverages existing knowledge and 'new platform development' that recombines and extends existing knowledge (Kazanjian, 2002). The imported knowledge can take various forms, "...including new employees, purchased equipment, licensed technologies, or acquisitions of other companies. Sources of imported knowledge include customers (Von Hippel, 1988), suppliers (Leonard-Barton,

1995), alliance partners (Gomes-Casseres, 1989; Kogut, 1988), universities, government laboratories and consultants” (Kazanjian, 2002, p. 179).

Since importing knowledge is so important, corporate venturing intending to build new competencies should be defined broadly. It entails internal venturing, external venturing and alliance formation (or acquisition). Internal venturing, however, is only relevant when the company already has some technological experience in a particular field. Interesting venture opportunities may stem from technologies in which the company has no expertise. Therefore, external venturing (e.g. having a minority holding in venture capital funds or start-ups) is an interesting tool for the company to get a window on emergent technologies. Once a particular idea or technology proves to be valuable, the company can spin in the start-up. Finally, a company can establish an alliance with one or more partners because it lacks part of the technology, the market know-how or the manufacturing facilities<sup>13</sup>.

When the target is to explore new markets and technologies and build new competencies, then corporate venturing should entail internal and external venturing and alliance formation. These three activities should also be managed in an integrative way. Some companies that create multiple new businesses have organized their new venturing or NBD into a new venture division (Fast, 1978) or corporate incubators (Hansen *et al.*, 2000). The advantages of a separate unit that usually reports only to senior management are multiple: first, the ventures that are too risky for managers of existing business units get nurtured for a considerable time; second, the small unit is also apt to explore new technologies and build new competencies: it can hire dedicated front-line managers (project champions), it can tap into the capabilities of the central R&D-lab (and shaping its explorative research), it can negotiate license agreements or establish alliance with companies that have (complementary) technology or market know-how (Leonard-Barton, 1995). Maybe the most important advantage is that experienced unit-members become experts in detecting and evaluating new venture opportunities, in established a social network outside the company, and in acquiring external technology from different sources. In this way, the unit becomes a valuable vehicle for knowledge building (Kazajian, 2002).

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<sup>13</sup> The company can also opt for an acquisition when the uncertainty related to a venture is small (Hoskisson and Busenitz, 2002).

Third, because corporate venturing plays a key role in a company's long-term strategy (see section 4), NBD projects always have to be developed in constant dialogue with the broader strategic framework. New businesses can only be developed after a double-check. First, the targeted application or market should be attractive (Porter, 1980) and, second, the new business ventures should fit into the corporate vision or long-term strategy of the company. Because NBD-projects are high-risk ventures it is of utmost importance to diminish uncertainties early on and to analyze how it can contribute to the corporate strategy and competence building process. Evaluating NBD-projects along these two dimensions (attractiveness and fit with the strategic context) at several times during the genesis of a new business is critical to the success of corporate entrepreneurship.

The two dimensions –attractiveness and fit with the strategic context- provide a framework to evaluate different business opportunities. Ideas about new business opportunities are considered at first as 'attractive' and 'in alignment with the company's strategic context'. But new business development is a high-risk undertaking and after a quick or a more extensive evaluation most ideas. They might be spread all over the surface of the framework in figure 2.

*Insert here figure 2*

Depending on the location of a project in the framework, different actions have to be taken. Management should kill a project when the technology is no longer attractive and does not fit the corporate strategy. It is almost impossible to generate cash from it because other companies won't be interested in it. The company can license or sell the technology when the latter is attractive (i.e. when it can be translated in an interesting business opportunity) but does not fit the strategic context of the company. However, a company can establish an alliance with another company with complementary technologies or assets when the business opportunity is extremely attractive even when the alignment with the company's strategy is unclear. Because of the high attractiveness, the company bears no risks: it can always sell the venture later on.

Internal and external venturing takes care of projects that are highly attractive and have a moderate fit with the corporate strategy. In other words, these projects are not exploiting the existing competencies of the company, but are exploring new but related technologies that can

be translated into valuable business opportunities. Finally, when a project is attractive but is highly related to the current strategy of the company, corporate venturing can still play a role in nurturing the business project if the risks involved are too high to be taken by an existing business unit.

In short, corporate venturing plays a crucial role in implementing the strategic renewal or the domain redefinition that is the immediate result of a corporate vision that stretches the company beyond its current businesses and competencies. Corporate ventures explore new (but related) technologies that have the potential to generate attractive business opportunities. To realize these new business opportunities corporate venturing is central in new competence building and should therefore also be a major focal point in the study of the learning organization. (Hitt *et al.* 1996, Zahra *et al.*, 1999) Corporate venturing is experimental in nature, is highly focused on importing knowledge from outside the company and has to be organized in a constant dialogue with the strategic context of the company. Therefore, corporate venturing should be defined in a broad way.

## **7. Implications for the management context**

We have argued that corporate venturing and the corporate strategy making process are closely related to each other as soon as companies have the ambition to enter new businesses that require new competence building. Corporate strategy, corporate venturing based on radical innovations and competence building co-evolve through mutually reinforcing interactions. This in turn requires some reflection about the organizational context and management roles.

The strategy making process has long been the privilege of top management supported by specialized staff or strategy-consulting firms (Bartlett and Ghoshal, 1994). The top created the strategy and middle and frontline management only had to implement it. Control systems were a crucial instrument to comply with the imposed corporate strategy. Yet, when a company is competing in an environment characterized by technological or market discontinuities, top management has a clear disadvantage detecting these changes since senior managers are too far removed from the front line (Burgelman and Doz, 2001). Front line employees, internal entrepreneurs and middle managers have to be involved in the redirection of a company because they are continuously confronted with these changes in the environment. Front-line

managers and employees are the key drivers the entrepreneurial process in the company. In this way, they are vital strategic resources in the search process for new business opportunities: senior managers can no longer afford to isolate them from the strategy making process in the company (Bartlett and Ghoshal, 1993, 1995).

Similarly, a strategic vision cannot be imposed as a grand design in a top-down fashion on the organization. When a company has the intention to enter new business and build up new competencies, it enters uncharted areas and senior managers can no longer predict where the strategy-making process exactly will lead. It is an open-ended process where managers at different levels and employees are involved the search process for new business opportunities.

On the other hand, new and promising ideas coming from individual employees, new business development teams, skunk works or researchers will not be translated into the creation of new businesses if the company is not structured in such a way that these initiatives get understood and endorsed by the top management. Stimulating entrepreneurial activity at the bottom is a necessary but not a sufficient condition for corporate renewal. Successful corporate venturing and new competence building require that the strategy-making process is a two-way process. A bottom-up process is necessary to guarantee the diversity of perspective that is crucial in volatile or uncharted environments. But a bottom-up process is insufficient as Hamel (1996) remarks: it will lead to competing strategic agendas and the fragmentation of resources. Therefore, the bottom-up process has to be complemented by a top-down process which – if properly managed - creates unity of purpose. This is also the major role of top managers in the company: they define a new common purpose and ambition and challenge the *status quo*. This can be translated as ‘creating a shared vision’ but to be effective companies have to go beyond the creation of a shared ambition. Bartlett and Ghoshal (1993, p. 39) argue that creating a common purpose and ambition, “...on the one hand legitimizes the company’s stretch targets and, on the other hand, creates sufficient strategic turmoil to stimulate organizational learning”.

Creating and sharing a common purpose has a considerable impact on front-line units. It shows managers the gap between the current capabilities and those that are required to stay competitive in the future. This tension legitimizes the entrepreneurial activities in the front-line units but it also offers a sense of direction and ambition where the company is heading to.

Therefore, new ventures have to ‘fit’ with the corporate strategy to get legitimized and funded. However, the relationship between corporate strategy and corporate venturing is a dynamic one. The company is gradually building new competencies by nurturing external ventures, creating new internal ventures and developing new business. This process drives the cognition of new strategic perspectives as we have illustrated by means of the DSM case (e.g. the role of bioterials in the strategy making process). As a result, the ‘strategic vision’ is a moving target. Building new competencies leads to the cognition of new strategic opportunities putting the current strategic vision under continuous pressure to adapt accordingly.

## 8. Conclusion

This paper focuses on the question how companies can achieve competitive advantage in new and attractive business areas when this requires the development of new (technological) capabilities. Building new competencies has been a hot topic in the literature during the last five to ten years but only a few scholars have pointed at the crucial role of corporate venturing or new business development in competence building. We have argued that most successful companies build new competencies through a sequence of corporate venturing initiatives. Corporate venturing can be considered as a major organizational carrier to extend existing competencies and to build new ones.

Furthermore, we have argued that both competence building and corporate venturing can only fully be understood in relation to corporate strategy making. The relationship between corporate venturing and corporate strategy is typically a dynamic one: corporate strategy (or call it vision or strategic intent) may activate and direct new business development and the accompanying competence building, but the latter also drives and refines the former. On the one hand, existing competencies and corporate strategy (vision or strategic intent) serve to direct and select these NBD-efforts that propels the company into new but attractive businesses and urge the company to build new competencies (required to operate successfully in these businesses). A ‘corporate vision’ or ‘organizational purpose’ communicated by the top management and translated into strategic objectives challenges the organization by creating a misfit between what the company is and what it intends to become, by showing the gap between the existing resources and knowledge base and those required to live up its ambitions.

On the other hand, new competence building also drives and refines the cognition of corporate strategy. This has been illustrated by means of the corporate renewal process within DSM.

New competence building and NBD based on radical innovations also demands to reflect on the organizational context and management roles. The strategy making process is no longer the privilege of top executives. Similarly, a strategic vision cannot be imposed as a grand design in a top-down fashion on the organization. When a company has the intention to enter new business and build up new competencies, senior managers cannot predict where the strategy-making process will lead. It is an open-ended process where managers at different levels and employees are involved the search process for new business opportunities. The strategy making process is a two-way process, where the embedded strategic vision offers on the one hand the legitimization of entrepreneurial activities throughout the company, but on the other hand also provides a selection criterion for new initiatives (i.e. fit with corporate strategy). As companies build new competencies, managers (at different levels in the organization) also become aware of new strategy opportunities.

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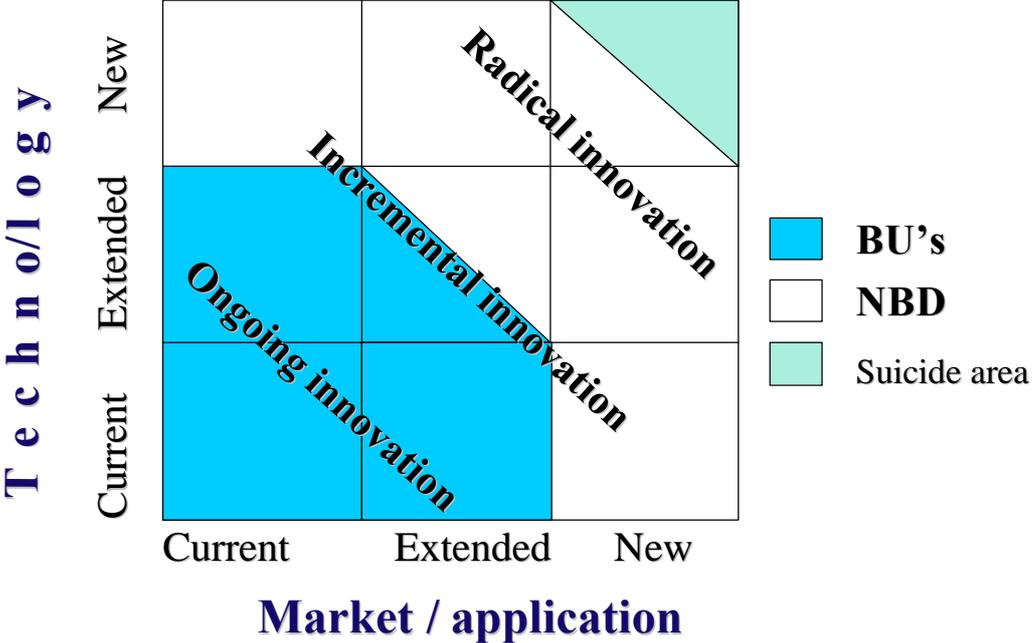
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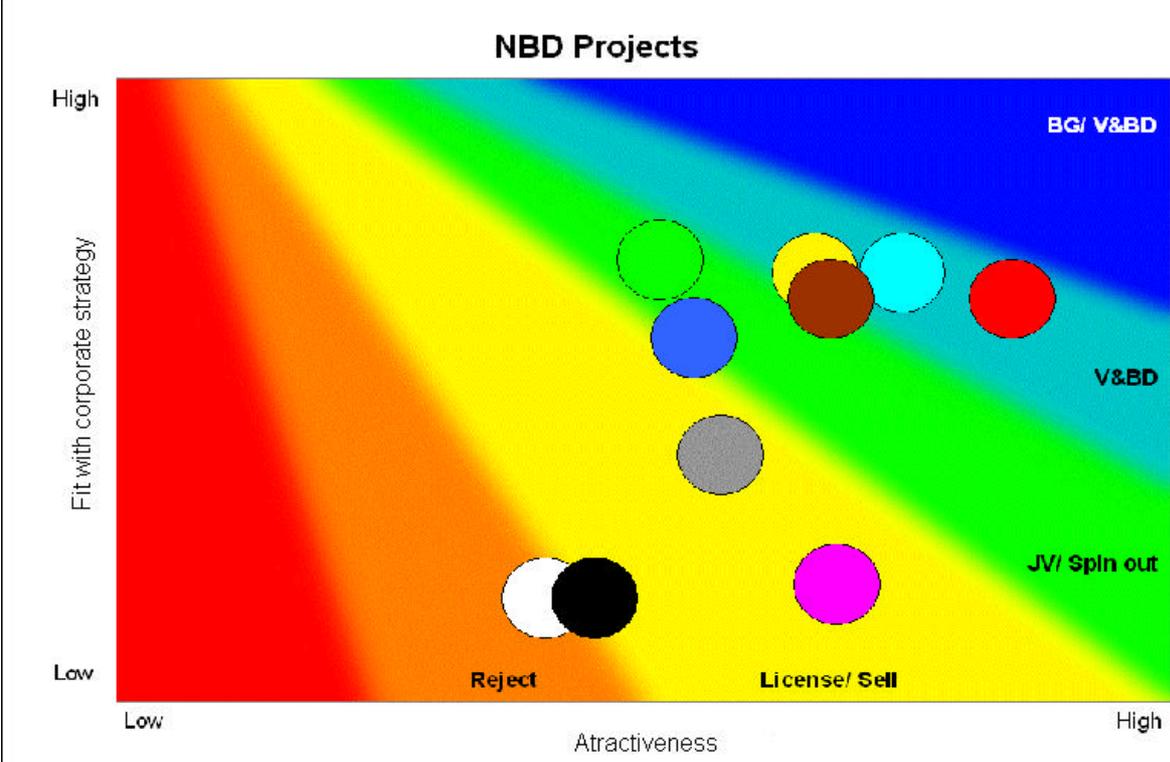
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Figure 1: New business development



Source: Adapted from Ansoff (1957, 1965) and Roberts and Berry (1985)

Figure 2: Evaluation of business opportunities



Source: DSM



Eindhoven Centre for Innovation Studies

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