DYNAMIC MARKETING CAPABILITIES IN SCIENCE-BASED FIRMS: 
AN EXPLORATORY INVESTIGATION OF THE PHARMACEUTICAL INDUSTRY

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Keywords

Capabilities, Dynamic Capabilities, Pharmaceuticals, Science, Marketing Strategy, Market Orientation
ABSTRACT

This paper investigates how market knowledge can benefit science-based firms. By reviewing the literature on dynamic capabilities and recent empirical works on the impact of market knowledge on technological innovation, we derive the concept of dynamic marketing capabilities and explore its validity through a qualitative study of high-performing pharmaceutical firms. We provide a description of key variables involved in market knowledge creation and release, and highlight how these activities support the creation of new products and the changes in the new product development process. We discuss our results by pointing out that dynamic marketing capabilities can contribute to a more granular understanding of management practices and performance heterogeneity in science-based settings and conclude our work by identifying its limitations and providing fruitful directions for future research on this topic.
INTRODUCTION

Can market knowledge contribute to the performance and evolution of science-based firms? Market knowledge is often disregarded in the management of science-based firms. These kinds of companies belong to industries where the core investment is in basic and applied research with respect to other strategic investments (Pavitt, 1984). In fact, science-based companies are founded with the aim of focusing on specific technological know-how and tend to develop and grow by nurturing their technological competence base (Teece, 1982). This has been documented in a wide range of industries including biotechnology (e.g., Zucker, Darby, Brewer, 1998), pharmaceuticals (e.g., Gambardella, 1995) and semiconductors (e.g., Holbrook, Cohen, Hounshell, Klepper, 2003). Despite the indisputable relevance of technological capabilities, the competitive landscape of science-based firms is now so complex that there seems to be contradictory evidence regarding this commonly-held belief. For instance, the average increase in R&D investments has not benefited the innovation pipeline of most pharmaceutical companies (Panetta & Raynor, 2005). Similarly, biotechnology firms are having problems delivering on their initial promise of launching many new products on the market in a reasonable period of time (Pisano 2006). More generally, the enthusiasm for the so-called new sciences that seemed to provide fruitful, new avenues of value creation for both private and public institutions, has cooled down in more recent years due to the high risk and high costs involved in innovation processes (Koumpis and Pavitt, 1999). Since it is publicly recognized that science-based firms are major contributors to the knowledge economy, all these examples highlight the need to better understand their actual strategies and sources of performance.

In this paper, we investigate if and how market knowledge can be a venue for value creation in firms that center their businesses on science. By building on the mainstream
literature on Dynamic Capabilities (Teece, Pisano, Shuen, 1997; Eisenhardt and Martin, 2000; Helfat et alii, 2007) and pioneering studies on the controversial contribution of market knowledge to technological innovation (Christensen and Bower, 1996; Danneels, 2002), we propose the construct of *dynamic marketing capabilities* to underpin our findings. Dynamic marketing capabilities pertain to the broader set of dynamic managerial capabilities managers use to build, integrate, and reconfigure the capability base over time (Adner and Helfat, 2003). Dynamic marketing capabilities are specifically aimed at developing, releasing, and integrating *market knowledge*, unlike the mainstream beliefs of the top managers running science-based firms that focus mainly on technological knowledge and R&D capabilities. In this respect, our research question and empirical investigation also find conceptual support in the resource-based rationale, according to which scarce resources are likely to lead to competitive advantage formation and sustainability (Barney, 1991; Peteraf, 1993).†

We explore the validity of our theory extension by focusing on the pharmaceutical industry. There are a number of reasons why we chose this setting as a representative sector of science-based contexts. First, it absorbs a considerable share of the R&D expenditure of science-based industries and produces significant value in terms of world sales (Niosi, 2000). Second, it places strong emphasis on innovation (Gambardella, 1995; Pisano, 1996) and has long been in the vanguard of resource-based studies (e.g., Henderson & Cockburn, 1994; Yeoh & Roth, 1999). Third, the evolution of the industry is punctuated by periods of technological change that profoundly influence the firm’s capability endowment (Henderson, 1994). For instance, in recent years, the convergence of biotechnology and organic chemistry as well as the promising new market trajectories shaped by new disciplines like high-throughput screening and combinatorial chemistry have presented specific challenges to the governance of R&D labs

† We would like to thank one reviewer for suggesting we make this point more explicit.
(Cockburn, Henderson, Stern, 2000) and are also making many big pharmaceutical firms in-source much of the technology that was previously outsourced (Thomke and Kuemmerle, 2002). Interestingly, the need for periodic capability reconfiguration is related also to market and institutional forces, as shown, for instance, by the invasion of generics, and the strong commitment of national healthcare systems to containing pharmaceutical costs.

According to our findings, dynamic marketing capabilities help firms: (1) develop new products, and (2) change their capability base over time. In so doing, dynamic marketing capabilities provide a more granular understanding of the management practices and performance heterogeneity of firms operating in science-based industries. Before presenting and discussing our findings and their limitations, we will first of all focus on a brief review of the dynamic capabilities literature and the key choices behind our empirical investigation.

**THEORY REVIEW AND EXTENSION**

The dynamic capability approach has emerged as an attempt to untangle the complex problem of competitive advantage sustainability in rapidly changing environments (Teece, Pisano, Shuen, 1997; Eisenhardt and Martin, 2000). It is especially the organizational dynamic that leads to a change in the capability base that helps a firm sustain its advantage in the long term (Helfat and Peteraf, 2003). In fact “a dynamic capability is the capacity of an organization to purposefully create, extend, or modify its resource base (Helfat et alii, 200/: 4)””. For these reasons, dynamic capabilities are considered meta-capabilities compared to ordinary or operational capabilities (Collis, 1994; Winter, 2003).

Learning processes are a key source of dynamic capabilities (Zollo and Winter, 2002) and managers play an active role in shaping and governing dynamic capabilities (Helfat et alii, 2007).
In particular, Adner and Helfat (2003) coined the term dynamic managerial capabilities to highlight the role that managers play in building, integrating, and reconfiguring the capability base of an organization. Dynamic managerial capabilities reflect managerial cognition (beliefs and mental models), managerial human capital (specific and generic skills and expertise), and managerial social capital (infra and inter-organizational ties). One of the reasons for firm performance heterogeneity in a given industry lies in different managerial assessments and decisions driven by both the idiosyncratic nature of the three underlying factors and their interaction over time (Adner and Helfat, 2003).

In an extension of this notion, we propose the construct of dynamic marketing capabilities. Dynamic marketing capabilities reflect human capital, social capital, and the cognition of managers involved in the creation, use, and integration of market knowledge and marketing resources in order to match and create market and technological change. We consider market knowledge as knowledge related to customer and competitor domains (e.g., Kohli and Jaworski, 1990; Narver, and Slater, 1990); marketing resources are instead tangible and intangible assets such as products, brands, and distribution channels (Grant, 1991). Our extension rests on two important assumptions. First of all, capabilities coordinate tasks and also present a functional dimension (Grant, 1996). In this respect, marketing represents an important area of functional knowledge in a firm’s value chain (Grant, 1991). Second, middle managers are an important direct determinant of the dynamic managerial capability-performance relationship just as much as top managers (Peteraf, 2005). Dynamic marketing capabilities involve decisions regarding not only the firm’s top management (e.g., the Marketing VP and other members of the top management team), but also the middle management (e.g., managers of the Marketing Department) that is involved in creating and using market knowledge and
marketing resources. A key point of our theory extension is that, in as much as dynamic capabilities are different from operational capabilities (Zollo and Winter, 2002), dynamic marketing capabilities are different from ordinary marketing capabilities. Marketing capabilities help firms earn a living in equilibrium by satisfying current customers, exploiting existing products and distribution channels, and advertising existing brands. Day (1994), for instance, maintains that channel bonding is a marketing capability that strengthens the relationship with distributors. Danneels (2002) found that a specific type of marketing capability that he calls customer competence, allows firms to serve certain customers. Dynamic marketing capabilities, instead, support firms in the process of changing from their stationary process. In fact, dynamic marketing capabilities are specifically focused on releasing and integrating market knowledge that helps firm evolve. Under dynamic marketing capabilities, we mean to include what others have labeled market sensing and customer-linking capabilities (Day, 1994), customer-oriented capabilities (Slater and Narver, 1998), and second-order customer competences (Danneels, 2002).

After introducing the reader to the choices we made in order to untangle the presence of dynamic marketing capabilities in our sample firms, in the following pages we highlight how they contribute to the process of value creation in science-based firms.

**EMPIRICAL METHOD**

Due to the exploratory nature of our research, we decided to adopt a qualitative methodology (Eisenhardt, 1989; Miles & Huberman, 1994; Lee, 1999). This methodology is also more consistent with the fact that capabilities are processes and present an embedded nature (Henderson, 1994). Following, in particular, the example of Danneels (2002) and drawing on
Burawoy (1991), in our field study we adopted the extended case method as the appropriate approach to investigate dynamic marketing capabilities in science-based industries.

In order to lay the basis for a possible generalization of our empirical results, we followed the suggestion of Rouse and Daellenbach (1999) who contend that resource-based studies should start by focusing on a single industry and selecting key performing firms from different strategic groups in the industry. We therefore identified some sample companies in the pharmaceutical industry belonging to different strategic groups. In selecting the sample firms, we used three relevant dimensions that, according to authoritative studies, have characterized strategic groups in the pharmaceutical industry, namely, scope commitment, resource commitment, and geographical location (Cool and Schendel, 1987; Cool and Dierickx, 1993). The final sample is composed of two global R&D-oriented American players (USPharma-Alfa and USPharma-Beta), two global European firms, one more R&D oriented, (EUPharma-Alfa and EUPharma-Beta) and two local European players (Locpharma-Alfa and Locpharma-Beta) less R&D orientation, but still competing to introduce innovations they developed in-house (Table 1).

Insert Table 1 about here

Our study was entirely conducted in Europe and included individual, in-depth, semi-structured interviews with members of the top management team, and other managers at the

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† In order to measure scope commitment, we paid attention to the types of products manufactured (focus on firms producing Rx pharmaceutical products), the range of market segments (we include in the sample both specialist firms, with most of the sales generated by the first three therapeutic categories, and more generalist firms), and the geographical scope (four of the six sample firms generate almost 40% or more of their sales abroad; the other two generate most of their sales locally). As regards resource commitment, four of the firms are big multinational players with an income of over $18 billion, while the other two are medium-sized players; we also considered a different commitment in terms of R&D and Sales (some of the sample firms tend to show higher R&D spending while the others clearly have a higher spending for Sales and Marketing activities). Finally, we included geographical location since in recent years the hub of the innovation process has shifted from Europe to the USA (R&D investment in the United States rose fivefold between 1990 and 2001, more than twice as much as in Europe (Standard and Poor’s Industry Surveys, 2004); other data show that since 1997, 62% of the new drugs launched came from the United States, while just 21% came from Europe (IMS, 2006).
headquarters and local subsidiaries. In order to select our informants we specifically focused on top managers involved in the product innovation process, because of the “visibility” of the object of inquiry (Pettigrew, 1990) with respect to the theme of dynamic capabilities. In doing so, we followed Eisenhardt and Martin (2000) who noticed that product innovation is an organizational process that is especially important in the practical investigation of dynamic capabilities. In fact, not only do firms generate new products via their innovation process, but they also produce new knowledge which can lead to a new capability base (Iansiti and Clark, 1994).

All the managers we interviewed held comparable positions in the sample firms and had acquired considerable experience in the company. During their professional career, they had been responsible for supervising the entire innovation process or launching at least one new product. We asked all our informants to choose one or two new products they had recently introduced in the market and reconstruct all the phases, from identifying the promising molecule to the market launch. We subsequently asked our interviewees to describe how their companies managed the strategic transition, considering the relevant opportunities and threats posed by the external environment. On average, we conducted five interviews in each firm, targeting three informants: the Marketing VP, the Business Development Manager, the R&D VP (or similar positions). The first three interviews were usually followed up by additional interviews in order to gather additional information or to confirm ideas that had emerged during the data analysis. During the follow-up phase, the same informants were interviewed as well as other informants who were signalled out to us. A total of thirty-one, semi-structured interviews were conducted in two separate rounds and in between we began processing our data. The interviews took place between January 2003 and May 2005. The respondents received the semi-structured


\footnote{In the case of US companies, we relied on the EU headquarters. We understand that this represents a limitation of our work even though data from the American headquarters have been provided.}
questionnaire some days before the meeting and every interview lasted from 90 to 180 minutes.

We also relied on an extensive archival search that included financial statements, annual reports, internal documents, industry publications, and other written material on the company (such as the Internet or the companies’ Intranet). In the next two sections, we highlight the functioning of dynamic marketing capabilities with respect to the release and integration of market knowledge in (1) the creation of new products, and (2) the reconfiguration of the process of new product development.

**DYNAMIC MARKETING CAPABILITIES AND PRODUCT INNOVATION**

Figure 1 shows the phases of new drug development in the sample firms. The way the process is organized is highly standardized and presents four macro stages: discovery, clinical, pre-clinical, and approval. All the phases are mandatory steps required by regulatory authorities. During the preclinical research, different compounds are screened in order to identify a candidate molecule. The compound is then biologically tested and officially filed with the FDA as a potential new candidate in the pre-clinical stage. The following clinical steps - Phase I, Phase II, Phase III - are required to assess the efficiency and safety of the product on a progressively wider patient sample. Finally, the new product has to be approved by the FDA and/or other domestic agencies in order to be launched on the US and other markets. In this phase, all the scientific data and extra tests required by the agency are produced by the firm. Only after it has been approved is the product considered sufficiently safe to be put on the market. Table 2 provides a representation of dynamic marketing capabilities with regard to key components and processes of market knowledge release and integration during product innovation.
Components of Dynamic Marketing Capabilities

Market knowledge seems to serve as a complementary source of information which impacts decision-making in the innovation process (see the bottom of Figure 1). Although R&D gets the lion’s share during the innovation process, the generation of high quality knowledge regarding customers and competitors provides a shared view of future market trends and the possible market impact of the new drug and heightens the success rate of the molecule. Two remarks by our informants clearly bear this out:

At the strategic level, we carefully balance our product portfolio. In evaluating new projects, considerations on market potential, medical needs, competition and centrality of some emerging markets, are just as important as our technical expertise and experience [EUPharma-Beta: Business Development Director].

Apart from R&D, the department that is involved in new product development more than any other is definitely the Marketing department. We are involved in each phase of new drug development because we study what our physicians and patients want. We follow a project from its initial development stages until the moment it is marketed. When the launch plan is ready, the local subsidiaries are responsible for implementing it [Locpharma-Alfa: Corporate Marketing VP].

This managerial belief seemed to be quite common among our informants regardless of the company and, more importantly, regardless of the function. This finding is consistent with the construct of the firm’s market orientation, according to which market orientation transcends the organizational boundaries of the marketing department (Kohli and Jaworski, 1990). Notably, the greater importance ascribed to market knowledge seems to have first emerged in the 1990s. According to our informants, in the past, the mindset of top managers focused more on the dynamics of technology behind R&D investments than on the strategic issues related to market and competitive forces.
Today the increasing emphasis on the production of market knowledge has drawn attention to the different roles and tasks within the organization. The human capital responsible for market knowledge release is primarily organized by the Marketing Department and involves three types of actors: market analysts (in charge of market research activities), marketing managers (who supervise the strategy for specific pathologies), and product managers (in charge of specific products and brands). Their decisions support the development and commercialization of new molecules. Although these actors are present in all the sample firms and considerably influence the process of market knowledge release, they differ in expertise and in number. As in the case of the broader concept of dynamic managerial capabilities (Adner and Helfat, 2003), this diversity can be interpreted as a potential source of heterogeneity. For instance, in two firms, benchmarking was considered particularly relevant in strategic planning and top management invested in the creation of a competitive analysis sub-function within the marketing department characterized by a number of market analysts with specific roles and with specific analysts in the subsidiaries. In other firms, we found there were junior analysts who supported more senior analysts in collecting information about specific products.

While the ultimate capacity to generate market knowledge resides in the heart of the Marketing Department, we noted the persistent presence of three additional types of actors whose ties with marketing people appeared to be crucial in gaining and releasing new market knowledge. These actors represent the social capital of dynamic marketing capabilities and include opinion leaders, detailers (i.e., the sales representatives of the pharmaceutical industry), and the managers of local subsidiaries. In the pharmaceutical industry, opinion leaders are represented by prominent doctors working in leading medical centers that treat specific pathologies. They usually represent a relevant resource to leverage in the development and
launch of new products. External ties with doctors are sometimes used to support promotional activities when a new molecule is introduced on the market. In these cases, opinion leaders help increase the scientific status of the new molecule. Most importantly, they are often directly involved in developing a new drug - i.e., they play the part of lead users (von Hippel, 1988). Over time, they gain considerable experience in the treatment of specific pathologies and their know-how turns out to be crucial in clinical development. All our informants recognized the central role of such users in integrating market knowledge with technological knowledge that resides in R&D. We consider the following observations enlightening:

As New Product Managers, we create a network of opinion leaders where we can go to obtain some market evidence according to our needs [USPharma-Alfa: Product Manager New Products].

New York has an international scientific advisory board that helps define the product strategy (...) [USPharma-Beta: Business unit Director].

Opinion leaders give us important indications about product strategies, general trends in therapeutic practices, and, in general, make suggestions on how to develop a new compound. They suggest the kinds of trials that are the best in a particular situation and provide fundamental feedback. We also refer to them for new project evaluations [EUPharma-Beta: Marketing VP].

Other influential actors that provide valuable market knowledge are in the Sales Department and Local Subsidiaries. Since they operate in different functions and organizations, managing the internal relationships of marketing people with these actors is quite important. Indeed, in order to evaluate the various projects, firms need field experience related to the specific therapeutic areas where investments were made. The products launched in the different markets in the course of the company’s history become of primary importance. A thorough understanding of market features, competitor and customer behavior, is usually released by the domestic Marketing and Sales departments. For example:

Corporate Marketing has significantly influenced many decision made by this company, but we never “go it alone”. Our subsidiaries work with us and we are
constantly in touch with Business Development and R&D [Locpharma-Álfa: Corporate Marketing VP].

Although our product managers contact the most important customers for specific market research, it is especially the on-going activity of our sales force that keeps us abreast of the problems and opportunities of the drugs already on the market [USPharma-Beta: Business Development Director].

As in the case of dynamic managerial capabilities (Adner and Helfat, 2003), the fact that all firms attribute importance to human and social capital does not mean that all perform well in these dimensions. For instance, the social capital behind a firm’s ties accumulates over time (Nahapiet and Ghoshal, 1998) and can become a source of heterogeneity in creating and developing market knowledge. In this respect, most (but not all) of our informants have stressed the importance of top management in cultivating relationships with the local subsidiaries where the analytical knowledge of the served markets is consolidated and continuously used to support the daily activities. Again, on this issue:

It is New York that, after an accurate strategic analysis of the technologies and markets, decides where to invest and the strategic therapeutic area to develop. Nevertheless, they are closely linked to the local marketing people. In order to understand how and where to invest, they also need our support. We can give detailed information about the markets served thanks to our experience in the sector [USPharma-Beta: Marketing VP].

Due to their past experience and strong links with end users (meaning both doctors and patients), local marketing units and detailers can more easily evaluate the market expectations and economic impact of the new products to be launched. All our informants stressed the importance of integrating local knowledge when a product enters the last development stages and clinical trials. For instance:

For products still in the early stages of the pipeline, market research is managed by headquarters. As the date of the market launch approaches, market research is stepped up and managed by the national subsidiaries [USPharma-Álfa: Product Manager of New Products].
Dynamic Marketing Capabilities in Action

At the project level, dynamic marketing capabilities release market knowledge during the different phases of the process. In particular, the bottom of Figure 1 was first sketched out by the R&D VP of LocPharma Alpha in order to show us how Marketing was involved in all the stages of the product development process. We tested the face validity of this draft and expanded it during the other interviews. We found a general convergence among the firms, even though the process tends to be more complex in big multinationals. In the attempt to draw a comprehensive chart, we explicitly asked our informants to describe the role of each department (namely, R&D, Manufacturing, Marketing, and Sales) at each stage of the process and how it influences a particular stage as well as the overall outcome of the process. As shown in the chart and documented throughout the interviews, the release of market knowledge appears to be U-shaped with respect to the phases of the process. Indeed, our analysis highlights that market knowledge is intensively released into the process primarily during the initial and the final steps of each development project. When the process initiates (discovery phase), dynamic marketing capabilities contribute by providing knowledge related to the opportunity of the potential candidate molecule. Given the cost and duration of R&D projects in the pharmaceutical industry, the general goal that characterizes market knowledge seems twofold: providing support for the fast development of the right molecule. Two informants provide interesting insights on this issue:

While some companies still think the Marketing and Sales Departments are only useful in the final positioning and launch of the drug, we believe that thanks to their rich databases and experience, Marketing people can identify the right technological avenue [EUPharma-Alfa: R&D VP].

Central Marketing is the core of the information flow within the company. New projects are usually started by Business Development and R&D initiative but to proceed we have to “give the green light” and provide all the necessary information [EUPharma-Beta: Marketing VP].
Following the discovery phase, the project is mainly handled by the R&D people for the biological tests and the final preparation of the IND – i.e., the first official promising compound to be filed with the FDA. Market knowledge is instead released again during the clinical phase. Clinical trials are carried out keeping in mind the future positioning of the product and the type of physicians that will prescribe the drug. Some attributes of the potential drug (such as the method to administer the drug, duration of the therapy, and rapidity of the drug efficacy) have to be defined according to the needs of the end users. Since the compound has to conform to specific market needs, R&D people experiment in order to give the drug the attributes that most appeal to the market. The following observations give a vivid picture of the need to integrate the market and technological knowledge at this stage:

When a product enters Phase II, the New Product Planning Team prepares three official marketing documents that are sent to the R&D. Basically, these documents identify the most important marketing needs in order to make it easy to market the product [USPharma-Alfa: Marketing VP].

By cooperating with each other [R&D, Marketing, Business Development] contribute significantly to defining the Target Product Profile. It is by cross-matching the R&D information with market information that we can especially design the product to satisfy our customers’ needs [EUPharma-Beta: R&D VP].

The more the project moves ahead, the more continuous is the need of integration. In particular, after the product is approved, dynamic marketing capabilities focus on a more analytical release of market knowledge for the product positioning. In order to demonstrate the new product’s level of innovation and its cost-advantage superiority (necessary to obtain reimbursement) there must be a continuous exchange of information between marketing, business development and R&D. The same is true when defining the optimal public relations strategy that usually involves key opinion leaders and leading scientific institutions.
Release of market knowledge depends on its codification. The actors working in the marketing department codify market knowledge by using specific documents that are diffused throughout the process. As noted by Nonaka (1994), the process of articulation and codification is crucial to releasing knowledge for organizational purposes. During the drug discovery phase, for instance, Market Analysis and Product Portfolio Management help understand whether the R&D investment is in line with the market served and with the molecules already offered by the firm. However, during the clinical phase, the Launch Plan is the core document where all the information is reviewed and combined. This comment from one informant mentions the details of this document:

Before Phase III begins, another official marketing document identifies the top five attributes of the product. R&D has to say if it can satisfy the requirements listed. The same document then becomes the guideline that defines the clinical trial protocols. At the end, or almost at the end of Phase III, all the data produced go definitively to Marketing for the pre-positioning, positioning and market launch [USPharma-Alpha: Product Manager of New Products].

Since communication and pricing strategies are particularly important in the initial product positioning, specific studies help calibrate the market launch of a new drug. As regards the first point, we found that several communication tools are used when the compound is being developed and researchers are told how to best satisfy the expectations of doctors and patients regarding the product. We also noted specific attention paid to pricing that is becoming more important as competition increases and cost containment policies become crucial to both health insurance companies and national health systems. In particular, many European countries are trying to cut healthcare spending by keeping pharmaceutical costs under control and imposing stringent reference prices and reimbursement restrictions. Under these circumstances, pharmaceutical companies must thoroughly understand how innovative the decision-makers consider the drug to be and whether it can obtain reimbursement. This phase is almost as
important as the initial research and development phases, because if the product fails to
demonstrate that it really is innovative, it might not obtain reimbursement or be given a lower
reference price.

The actual use of market knowledge seems to depend on the quality of interaction
between marketing and R&D people. In this respect, the presence of specific managerial
systems helps strengthen internal ties between the two groups. Although, integrative
mechanisms vary greatly from firm to firm, they can be grouped into two macro classes. The
first and more flexible set is made up of committees or structured meetings that bring together
people from different units - R&D, Business Development, and Marketing Departments. Other,
more structural arrangements have been identified as a source of constant integration between
marketing and R&D during routine innovation activities. For instance, it is common to use
cross-functional project teams or a matrix-based organizational structure which seems to serve
analogous purposes. At Locpharma-Alfa, for instance, every time a new project is approved, a
project team is formed. Although the project team is usually headed by R&D, it also includes
marketing and business development people who work together throughout the drug
development process.

THE RECONFIGURATION OF NEW PRODUCT DEVELOPMENT

When we asked our informants about periods of technological and market changes, we
recorded stories and anecdotes of threats and opportunities as their company evolved that
highlighted the need for a process of reconfiguration of product innovation capabilities. In
particular, since the new competitive context is characterized by more crowded and low-margin
markets and the presence of multiple technologies whose output is not as clear as it used to be,
companies have been forced to find new configurations in their innovation strategy. In this respect, market knowledge has, in some cases, been used to reorganize the product development process. In other words, it has contributed to resource allocation decisions that shape the strategic guidelines of future developments in addition to more traditional forms of knowledge in the industry practice, namely, scientific and technological knowledge (see Table 3).

Insert Table 3 about here

Components of Dynamic Marketing Capabilities

We noticed that the creation of market knowledge for reconfiguration purposes is linked to open-minded managerial beliefs, as confirmed by the following words of a Business Development and R&D Vice Presidents:

In order to sustain innovation, investing in R&D is simply no longer enough [USPharma-Alfa Business Development VP].

They (Marketing and Sales Department) also help us understand whether we are still doing the right thing when we keep investing in some molecules (…) or help us turn our attention to alternative avenues [EUPharma-Alfa: R&D VP].

Interestingly, such beliefs are not necessarily common knowledge among practitioners in the industry, as confirmed by the following remark of an R&D VP:

The tremendous reduction in many of our competitors’ pipelines in the last decade has drawn attention to the efficiency and effectiveness of drug development. Most executives thought that the race to M&A was the solution. In our company, we set out to integrate the Marketing and R&D departments more closely [EUPharma-Alfa: R&D VP].

In order to foster a greater awareness of the market dynamics, five of our sample firms have recently undergone a process of reorganization by changing the position and role of the central marketing department. The new role sustains the firm’s innovation capacity by fostering, mediating, and filtering information, and by sharing it with the different departments and making it easier to understand. This is exemplified by the following remarks:
Today, important decisions such as the allocation of funds given to therapeutic areas are made in agreement with the Marketing Department [USPharma-Alfa: Business Development Director].

Recently at USPharma-Alfa (in the last 4 or 5 years) Marketing has become more important. This company has traditionally been unbalanced, with more importance given to scientific aspects, in particular R&D. However, the need to compete in increasingly crowded markets and maintain a high market share has meant reorganizing the Marketing function and giving it a central role in the development process [USPharma-Alfa: Marketing VP].

In addition to the key role played by central marketing in the flow of information, four of our sample firms also rely on the function of the Business Development department that is responsible for creating new entrepreneurial market opportunities. Although this department operates in the head office, it has a representative in each country. Working closely with the head office, R&D, and Marketing, it is responsible for working out the firm’s development strategies by balancing the firm’s capabilities with the external opportunities. Business Development departments are a recent development and represent a fountain of new ideas that can be harnessed to predict market developments.

Our sample firms also seem to nurture external ties in order to capture market knowledge which is influential for reconfiguration purposes. Most of our informants highlighted a tradition of using consulting firms in order to trace the evolutionary patterns of the industry. For instance, two of our sample firms regularly employ consultancy-based Delphi methods in order to try to assess the opinions from experts in the field regarding the impact of specific institutional market forces. All the sample firms leverage their network of universities and experts in order to track potential discontinuities in market trajectories. While past literature has already identified the usefulness of this type of link at the R&D level by showing how firms can benefit from R&D people by investing in basic research and attending conferences (Henderson and Cockburn, 1994), according to our informants, in more recent years, people from Marketing and Business
Development have also wanted to broaden the scope of their market interaction and thus attend seminars and conferences to capture signals from the external environment. They thus contribute to a firm’s capacity to absorb external knowledge but, again, from a functional perspective related to market knowledge.

Dynamic Marketing Capabilities in Action

While reconfiguration is apparently established by adapting to technological dynamics, it is, in some cases, proactively activated by sector firms regardless of the common threats and opportunities that had characterized competitors in the market.

LocPharma-Beta provides an interesting case of reconfiguration that took place over a span of fifteen years. This firm is a small but significant player that has successfully served a specific regional market in Europe for many decades. Locpharma-Beta originally focused on developing and commercializing me-too products and producing and distributing drugs licensed by big operators to Southern European markets. Thanks to its long-term activity in specific market segments and regional areas and its large marketing and sales force, the company developed in-depth knowledge of the domestic market. The connection with the local medical community has been a key strategic factor in ensuring the prosperity of the company despite its weak R&D capacity and modest financial resources. When some big American biotech firms started looking for commercial partners in order to sell their products in Europe the competencies of Locpharma-Beta turned out to be an advantageous resource. In more recent years, Locharma-Beta has undergone a further change. Today not only is it the commercial partner of two leading biotech firms, it is also starting to play a relevant role in the creation of new molecules. The internal R&D department significantly improved when a new research center opened in a region of Europe and now cooperation with large biotech companies goes beyond mere commercial
agreements. Moreover, recent scientific discoveries and increasing competitive pressure is making Locpharma-Beta an important partner even because it is a partner in the co-development of new drugs. Today it is working on several co-development projects and has initiated a joint venture with a major biotech operator. In this joint venture, the companies work together, sharing ideas and implementing projects to develop biotech drugs, backed up by high-tech services in specific therapeutic areas.

This anecdote is reminiscent of the conceptual idea of proactive market orientation (Slater and Narver, 1998; Athuaene-Gima, Slater, Olson, 2005). While reactive market orientation refers to the study of current markets (in pharmaceuticals: THE patients, doctors, and hospitals already served) in order to develop new products by leveraging both existing technologies (e.g., organic chemistry or biotechnology) and traditional resources and assets (current customer base, brands, and so on), proactive market orientation regards the ability to understand the needs of potential customers and to serve them in unconventional ways with respect to the current resources. To our understanding, it seems that in cases such as the one described, the proactive leverage of market knowledge depends on both the intensity of the external signals and the cognition of managers that, in the end, represent the driving force of strategic behaviour.

Irrespective of the reactive or proactive approach, market knowledge for reconfiguration purposes seems to be codified in specific tools, ranging from scenario analysis and competitive benchmarking to competitive simulations and brainstorming activities. These tools are useful since they provide a common language with R&D people and create a common vision of the future. Market research is also of central importance in gathering new information about potential markets and this research can take different forms compared to those that characterize product innovation. In general, the more wide-ranging and exploratory the objective of the
market analysis, the more qualitative the nature of the market research. For instance, four of our sample firms annually or biannually organize international seminars to discuss the development of the industry and identify the firm’s future trajectory. On the contrary, the narrower the focus, the more quantitative the contribution of market research will be. One of our informants summed it up very clearly:

Not only do we evaluate the economic impact of a new product, but by using market information, our executives have to decide where to allocate R&D resources according to the medical needs that we have identified. For example, the hypertension market is really crowded. There are six different families of compounds, and each family has produced more than four generations of drugs. However, even if everything can be improved, in this area there is no medical need. On the contrary, in the Alzheimer market, where the medical need is very high, products for other pathologies are used, though a specific treatment does not exist. Despite our traditional background, we are investing a lot of resources to see if it is possible to find a new treatment for this pathology [EUPharma-Alfa: Marketing VP].

The different contributions made by people from different departments and functions requires mechanisms of integration. In this respect, international meetings seem to help create and strengthen the internal ties among the different functions, as one Marketing VP remarked:

Once or twice a year, there are important strategic meetings in New York where Marketing Managers from major markets meet experts from Headquarters and they develop theories regarding strategy changes, product improvements, and so on [USPharma-Beta: Marketing VP].

According to our informants, these kinds of meetings are especially important as regards sharing decisions and, more importantly, bringing together people with different functional views that could help companies develop. While these meetings sometimes raise conflicts over specific decisions, they pinpoint the real goals of the company and make it possible to better understand strategy planning and implementation. More generally, cross-functional committees are another relevant managerial mechanism that is used to create a sense of belonging and strengthen internal ties. The substantial difference with respect to the committees involved at the new product development level is that cross-functional committees tend to refer to higher levels
(involving primarily the vice presidents) and to the central part of the organization (namely, the headquarters). In short, these capabilities elicit a broader type of knowledge and leverage more strategic levels in the organizational hierarchies (e.g., Central HQ vs. local subsidiaries; Business Development department vs. Sales department).

**DISCUSSION**

In this paper we have introduced the concept of dynamic marketing capabilities and observed how it works in a selected sample of high-performing pharmaceutical firms. Our findings have highlighted why market knowledge helps initiate the innovation process and how it is combined with technical knowledge in the different stages of the product development process. We have also described why market knowledge can be an important source of capability reconfiguration in the product development process, and how it can guide this reconfiguration. Our description has been based on the observation of key variables involved in market knowledge release and integration, such as managerial beliefs, human and social capital, and managerial systems. We believe that our work provides at least three relevant contributions to the current strategic debate.

First, we believe that our paper extends our understanding of dynamic capabilities to include a functional dimension. To date, dynamic capability literature has been greatly influenced by Evolutionary Economics (Helfat and Peteraf, 2003) and the scattered and inductive evidence built around the discipline of Technology and Innovation Management (Teece, Pisano, Shuen, 1997; Lavie, 2006). With respect to this, Dosi, Nelson, and Winter (2000: 6) once argued that: “In areas of ‘hard technology’ the dynamic capabilities of the firm depend heavily on its R&D resources; in other areas that label may not be applied but analogous investments are made
(emphasis added)”. This paper has dealt with the notion of analogous investments especially as regards market knowledge and thereby contributes to extending the scope of the dynamic capability literature. In this respect, our empirical findings provide a venue for the study of other capabilities based on functional knowledge whose understanding could shed light on other important underpinnings in dynamic capability research.

Second, our paper contributes to the literature on the challenges posed by technological change to industry incumbents and, more precisely, contributes to the current debate regarding the role of market-related capabilities in the face of technological dynamics (e.g. Danneels, 2006; Henderson, 2006). Recent research in the field of technological innovation has highlighted the influence of marketing capabilities in technological adaptation. Works by Christensen (2006) have extensively shown that excessive attention paid to satisfying current customers can prevent firms from adapting to new emerging technologies (termed “disruptive technologies”) so that, in the long run, the survival of firms would be jeopardized. Empirical research by Danneels (2002) has instead shown how firms in technology settings could avoid being trapped by overly focusing on current customers and instead invest in exploring new customer segments. This result echoes the conceptual idea that a customer orientation is not per se detrimental to firms competing in a technological setting but depends more on the type of reactive or more proactive approach of the top managers guiding the adaptation process (Slater and Narver, 1998). Our empirical evidence is in line with this second thesis and extends it to include science-based industries, a setting where the contrast between marketing capabilities and technological capabilities is even more dramatic. Moreover, we specifically highlight the dynamics of change behind dynamic marketing capabilities, a process which remains implicit in the above-mentioned literature on technological innovation that focuses more on revealing the negative or positive role
of marketing capabilities over technological adaptation. In this respect, as recently noted by Peteraf (2005), the paradox of most works on the dynamic resource-based theory of the firm is that, despite their attention to organizational dynamics, they tend to contribute more to the “content” side of strategy than the process side. As such, the micro dynamics related to the nature and developments of the processes at the heart of the theory remain largely unexplored (Peteraf, 2005). By drawing special attention to the people, ties, beliefs, and managerial systems that come into play in the process of the release of market knowledge in the creation of new products and new capabilities, we think we have provided important evidence on the specific micro-processes that firms should carefully consider when dealing with change.

Third, we think that our paper provides an original contribution that sheds light on the performance of science-based firms. Despite their relevance for the knowledge economy, today firms competing in science-based industries are facing an increasingly competitive environment which renders even more complex the already complicated intrinsic conditions of high-risk and financial pressure that characterize their businesses. Just as in technological settings technological competences are not paramount (Danneels, 2006), it can be maintained that in science-based settings the management of R&D is increasingly becoming a necessary but not sufficient condition to sustain advantage over time. In this respect, the traditional organization-environment fit that mainly emphasizes the management of science and technology might not per se solve the problems behind the new competitive challenges. Although we fully realize that the current situation might benefit from a broader change in the institutional framework that governs the interaction between, for instance, universities and private firms (Pisano, 2006), we believe that firms could also balance their resource portfolio better by paying attention to the market dynamics behind their applied and basic research investment. In our work, we have suggested
that dynamic marketing capabilities provide an important reference point that can serve to manage the innovation process and also promote strategic change. In science-based contexts, a technology push approach tends to prevail (Nosia, 2000) and the market knowledge focus of dynamic marketing capabilities can help explain differences in performance variance. In fact, in industries where firms compete primarily on the basis of technological knowledge, the attention paid to dynamic marketing capabilities might turn into a source of uniqueness and rarity (e.g., Barney, 1991; Peteraf, 1993).

**LIMITATIONS, FUTURE RESEARCH, AND CONCLUSIONS**

Since our paper is explorative and not meant to be conclusive, we think that future research might go beyond the three limitations of this paper. First, despite the attention paid to the sample selected, our analysis remains an exploratory one and does not furnish any formal support to the dynamic marketing capability-performance relationship. More importantly, we can affirm that even the firms that pay the same attention to dynamic marketing capabilities, important differences can be found. As one can note, the description of our findings has highlighted the “commonalities in key features” but also sheds light on important “micro-differences in the details” (Eisenhardt and Martin, 2000) of marketing knowledge release and integration that could lead to heterogeneity in behaviour and performance even among firms that leverage dynamic marketing capabilities. In fact, differences in dynamic managerial capabilities among firms in an industry can bring about a better understanding of the sources of heterogeneity (Adner and Helfat, 2003). As seen in the results description, such differences can imply important time compression diseconomies (Dierickx and Cool, 1989) that further support the idea that dynamic marketing capabilities can broaden our understanding of performance
differences among science-based firms. Therefore, a quantitative test to unravel their relationship to performance might provide a further important step in understanding the real sources of heterogeneity in these businesses.

Second, our work has highlighted how cognition, human capital and social capital engage in the process of creating and integrating market knowledge. We have paid specific attention to the dynamics of these processes and the specific use of managerial systems. However, we still realize the importance of a more in-depth investigation of how market knowledge release and integration takes place and how it intersects with technological knowledge. For instance, network theory could contribute to providing a more formal representation of how the internal and external ties of marketing people evolve over time. More importantly, it could help highlight how marketing managers’ ties intersect with those of R&D people. In the direction traced by Zaheer and Bell (2005) that showed how internal capabilities and their interaction with the network structure impacts innovation performance, we think that a deeper understanding of the nested networks of marketing managers, R&D managers that are crucial to the innovation processes of science-based firms can help us better understand capability dynamics over time. Following Leonard Barton (1992)’s work that showed how the conflicting beliefs of managers from different functions transform core competences into core rigidities, it would be interesting to see, on a broader scale, to what extent the performance related to dynamic marketing capabilities depends on the actual alignment of beliefs among Marketing, R&D, and Business Development managers or whether it depends, for instance, on the prevailing policy adopted by one department over another.
Third, our argumentation suggests that our pharmaceutical-based findings can apply to a wider set of science-based industries. In doing so, we find support in the classic work by Pavitt (1984) that created a general taxonomy termed “science-based firms” that includes firms belonging to industries ranging from biotechnology and pharmaceuticals to aerospace and semiconductors. Our generalization also follows more recent economic and business investigations that have used pharmaceuticals and biotechnology as a general laboratory to theorize about the current conditions of science-based industries (e.g., Gambardella, 1995; Pisano, 1996 and 2006). More importantly, we think that the core of our research question and the thesis that emerges from our empirical findings (namely, the increasing role played by market knowledge in favoring firms’ innovation process and capability reconfiguration) is widespread in all these industries characterized by a technology-push tendency due to the overwhelming investment in R&D and the importance attributed to basic research and inter-organizational relationships with universities (Nosia, 2000). Most of these industries (e.g., Aerospace and Semiconductors) are now experiencing increasing financial pressure to obtain end results due to scant funding and increasing competition and may become more interested in market knowledge (i.e., technology users and direct competitors). Despite our arguments, we are aware of the risks behind our generalization and we would encourage future research to study dynamic marketing capabilities in other science-based sectors, by going beyond the traditional R&D approach that has always been adopted and to focus on inter-industrial differences.

In conclusion, we hope that our study sheds further light on the understanding of innovation dynamics in science-based firms and we hope that future research will follow our general guidelines in order to help scholars and practitioners pay greater attention to market knowledge as an important complementary source of competitive advantage.

** We are indebted to one reviewer for raising the possible risks related to this generalization.
REFERENCES


FIGURE 1
Market Knowledge Release and Integration along the New Drug Development Process

<table>
<thead>
<tr>
<th>1) Discovery</th>
<th>2) Preclinical</th>
<th>3) Clinical Trials</th>
<th>4) Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Compound</td>
<td>Biological Test</td>
<td>Prepare IND</td>
<td>Phase I Phase II Phase III NDA Launch</td>
</tr>
<tr>
<td>- Identify target molecules</td>
<td>- Analytical characterization of molecules</td>
<td>- Safety</td>
<td>- Efficacy</td>
</tr>
<tr>
<td>- Isolate receptors responsible for diseases</td>
<td>- Animal screening</td>
<td>- Healthy volunteers</td>
<td>- Afflicted patients</td>
</tr>
<tr>
<td>- Literature/patent search and evaluation</td>
<td>- Pharmacokinetic studies (main side effects, duration, absorption, metabolism)</td>
<td>- Maximum tolerable dose</td>
<td>- Bioavailability of different formulation and doses</td>
</tr>
<tr>
<td>- Synthesize compounds at laboratory scale</td>
<td>- Reproduction</td>
<td>- Side Effects</td>
<td>- Proof of safety and efficacy in long term use</td>
</tr>
<tr>
<td>- Evaluate compounds in animal models</td>
<td>- Mutagenicity tests</td>
<td>- Comparative studies</td>
<td>- Comparative studies</td>
</tr>
<tr>
<td>- Identify potential lead compounds</td>
<td></td>
<td>- Documentation of clinical trial data</td>
<td>- Documentation and validation of process technology</td>
</tr>
</tbody>
</table>

Technical Knowledge

Market Analysis
- Market scanning for new opportunities
- Strategic decisions in product portfolio composition

Product Portfolio Management
- Communication plan
- Product management
- Sales management

Launch Plan
- Segmentation, targeting and positioning
- Industrialization

Launch Plan Execution
- Communication plan
- Product management
- Sales management

PDT Lifecycle MGMT
### TABLE 1
A Selected Representation of Key Information of the Sample Firms

<table>
<thead>
<tr>
<th>Main Figures</th>
<th>Fiscal Years</th>
<th>Strategic Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
<td>2002</td>
</tr>
<tr>
<td></td>
<td>Therapeutic Class</td>
<td>Scope</td>
</tr>
<tr>
<td>USPharma Alfa</td>
<td>Sales</td>
<td>22,485</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>14.60%</td>
<td>12.50%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
<td>51.30%</td>
<td>47.40%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>40%</td>
<td>39%</td>
</tr>
<tr>
<td>USPharma Beta</td>
<td>Sales</td>
<td>44,736</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>16.70%</td>
<td>16.00%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
<td>49.40%</td>
<td>47.70%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>41%</td>
<td>36%</td>
</tr>
<tr>
<td>EUPharma Alfa</td>
<td>Sales</td>
<td>18,849</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>18.30%</td>
<td>17.20%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
<td>50.30%</td>
<td>51.20%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>66.80%</td>
<td>63.00%</td>
</tr>
<tr>
<td>EUPharma Beta</td>
<td>Sales</td>
<td>29,264</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>8.80%</td>
<td>8.60%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
<td>30.70%</td>
<td>31.20%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>53.90%</td>
<td>51.50%</td>
</tr>
<tr>
<td>Locpharma Alfa</td>
<td>Sales</td>
<td>616</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>13.10%</td>
<td>11.20%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
<td>38.8%</td>
<td>35.2%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>9.7%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Locpharma Beta</td>
<td>Sales</td>
<td>806</td>
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<tr>
<td>R&amp;D/Sales</td>
<td>10.2%</td>
<td>9.8%</td>
</tr>
<tr>
<td>R&amp;D/Admin. &amp; MKTG</td>
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<td>30.1%</td>
</tr>
<tr>
<td>Sales Abroad</td>
<td>-</td>
<td>-</td>
</tr>
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</table>
### TABLE 2
Dynamic Marketing Capabilities and New Product Development

<table>
<thead>
<tr>
<th>Components</th>
<th>Market Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Release and Integration</td>
</tr>
<tr>
<td><strong>Beliefs</strong></td>
<td>• Release and integration of market knowledge is contingent to the needs and problems arising during the process</td>
</tr>
<tr>
<td>• Market knowledge provides a shared view of future market trends</td>
<td>• Market knowledge is highly influential in the initial phases of the process</td>
</tr>
<tr>
<td>• Market knowledge provides a shared view of the new product impact on the market</td>
<td>• Market knowledge becomes predominant during the pre and post launch stages of the drug development process</td>
</tr>
<tr>
<td>• These beliefs go beyond Marketing VPs and are diffused among top management teams</td>
<td></td>
</tr>
<tr>
<td><strong>Human Capital</strong></td>
<td>• Market analysts, Marketing managers, Product managers</td>
</tr>
<tr>
<td>• Number and characteristics of roles present micro differences in the sample firms</td>
<td></td>
</tr>
<tr>
<td><strong>Social Capital</strong></td>
<td>• Internal ties between people from the Marketing and Sales departments (detailers)</td>
</tr>
<tr>
<td>• Internal ties between Marketing people from headquarter and people from the subsidiaries</td>
<td>• Flexible organizational mechanisms (new product committees and structured meetings)</td>
</tr>
<tr>
<td>• External ties with lead users and opinion leaders</td>
<td>• Structural organizational design arrangements (Matrix structure or Project-based organization)</td>
</tr>
<tr>
<td>• External ties with the scientific community</td>
<td></td>
</tr>
<tr>
<td>• External ties with consulting firms</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 3
Dynamic Marketing Capabilities and the Reconfiguration of Product Development

<table>
<thead>
<tr>
<th>Components</th>
<th>Market Knowledge Release and Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beliefs</td>
<td>Dynamics</td>
</tr>
<tr>
<td>• Market knowledge is considered influential in supporting organizational evolution by helping senior executives avoid environmental threats and leveraging opportunities</td>
<td></td>
</tr>
<tr>
<td>• This belief is diffused throughout the organization with different intensity</td>
<td></td>
</tr>
<tr>
<td>Human capital</td>
<td>Firms in the sample leverage market knowledge in order to adapt to discontinuous market and technological changes</td>
</tr>
<tr>
<td>• People working in central Marketing Departments (i.e., Marketing Department of the headquarters)</td>
<td></td>
</tr>
<tr>
<td>• People working in the Business Development department</td>
<td></td>
</tr>
<tr>
<td>Social Capital</td>
<td>They seem to pay attention to external signals especially in periods of change</td>
</tr>
<tr>
<td>• External ties with universities</td>
<td></td>
</tr>
<tr>
<td>• External ties with experts and consulting firms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some firms instead tend to adopt a more proactive approach to capability reconfiguration</td>
</tr>
<tr>
<td></td>
<td>Managerial Systems</td>
</tr>
<tr>
<td></td>
<td>Documents where market knowledge is codified (Scenario analysis; Benchmarking studies; Competitive simulations; Market research)</td>
</tr>
<tr>
<td></td>
<td>International meetings</td>
</tr>
<tr>
<td></td>
<td>Cross-functional strategic committees</td>
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</table>