



## Product competence exploitation and exploration strategies: The impact on new product performance through quality and innovativeness

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### ABSTRACT

The ability to manage existing assets and capabilities (exploitation) and the development of new capabilities (exploration) are arguably among the most relevant new product success factors. However, while exploitation-related capabilities are based on certainties regarding the efficiency of a company, exploration-related capabilities require the analysis of new technologies and processes. In existing literature, there is a gap concerning the trade-off between the exploitation and exploration of competences. Based on the theoretical background of Resource Based Theory, Dynamic Capabilities Theory and Discovery and Creation Theory, a model is proposed to analyze this gap. In this study, which examines 197 manufacturing organizations, we build on the dualities of the two types of competences and their impact on speed-to-market and market performance. The findings indicate that the choice between exploitation and exploration depends on the goals of new product development. While exploitation increases product objective quality, exploration enhances product innovativeness to the firm. Furthermore, we found that both exploitation and exploration constitute important success factors when it comes to launching new products. Finally, moderate effects of competitive intensity and market turbulence are also examined. High levels of market turbulence improve the results of exploitation, while low levels of competitiveness may encourage exploration.

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### 1. Introduction

New product development (NPD) is a crucial element in the long-term success and growth of businesses (Hooley, Greenley, Cadogan, & Fahy, 2005). One of the most important topics in innovation literature is the way different factors are associated with new product success (Chang & Cho, 2008; Henard & Szymanski, 2001). Among these factors, a company's capabilities in the area of product innovation are considered essential to continued corporate survival (Day, 1994; Menguc & Auh, 2006). Specifically, the introduction of new products depends on the ability to transform organizational competences into reliable input to market innovation (Atuahene-Gima, 2005; Yalcinkaya, Calantone, & Griffith, 2007). At a fundamental level, these competences are related to the knowledge created and accumulated by a firm through human capital and organizational routines, processes, practices and standards (Soosay & Hyland, 2008). When applied correctly, these competences may help develop completely new attributes in NPD or improve existing products, for instance their quality (Rust, Moorman, & Dickson, 2002). In this situation, it is really important for a company with the ambition to grow to decide how to explore and exploit its competences. The aim of this paper is to provide businesses with the information they need to

improve their innovative ability and with it the performance of the objective quality their new products.

The relationship between product innovation and market performance not only depends on existing capabilities, but also on their continued renewal (Yalcinkaya et al., 2007). A firm's ability to compete in the long term may lie in its ability to integrate and build on its existing competences, while at the same time developing fundamentally new ones (Lavie & Rosenkopf, 2006). Simultaneous investments in the exploitation of existing product innovation capabilities and the exploration of new ones may help create a competitive advantage (Soosay & Hyland, 2008). Furthermore, for a company to survive and prosper, there has to be a balance between exploration and exploitation (March, 1991).

The two types of competences outlined above are different in nature and few organizations are able to exploit their existing product innovation competences, while at the same time renewing and replacing them with entirely new competences (Atuahene-Gima, 2003). Furthermore, although both types of activities are important to an organization's survival, they are contradictory in nature (Holmqvist, 2004). Literature has shown how the exploitation of competences tends to limit the exploration of new ones and vice versa (Kyriakopoulos & Moorman, 2004). Some researchers argue they are mutually exclusive (Voss, Sirdeshmukh, & Voss, 2008). Moreover, the exploitation of existing competences tends to yield more immediate and certain returns compared to exploring new ones (Sethi & Sethi, 2009). Despite

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the trade-off between exploration and exploitation, theoretical and empirical evidence suggests that paying insufficient attention to either one reduces the performance of organizations (Atuahene-Gima, 2005). Furthermore, Garcia and Calantone (2003) show that there is a symbiotic relationship, in that exploitation provides the funds required for successful exploration, which in turn provides technological input for the exploration of vital future competences. In essence, the two types of competences have a complementary and mutually reinforcing effect on company performance (Gupta, Smith, & Shalley, 2006).

In existing literature, there is evidence of a gap regarding the best way to manage the trade-off outlined above. This study builds upon the dualities involved in the exploration and exploitation of competences and their impact on new product performance along two different pathways. We begin by analyzing the relevance of exploiting competences when it comes to improving the ultimate performance of a new product based on quality enhancements and contributing to the exploitation of certainties inside the firm, after which we look at how the exploration of competences drives product innovativeness to the firm, which in turn enhances the ultimate performance of a new product. Our aim is to shed light on how exploitation is related to objective quality and how exploration is related to innovativeness to the firm. Finally, this study contributes to the discussion regarding the trade-off between exploiting and exploring competences by examining the impact of two different environmental conditions (competitive intensity and market turbulence).

Innovativeness is assessed on the level of innovativeness to the firm but not with regard to the customer (Lee & O'Connor, 2003; Song & Montoya-Weiss, 2001). Thus, this research does not attempt to categorize projects in a way similar to the approach by Griffin and Page (1996). Thus, our approach of innovativeness is similar to the technological complexity that entails developing a new product inside the firm (Danneels & Kleinschmidt, 2001). Quality is assessed in terms of objective quality and the question whether a product performs as expected (Calantone & Knight, 2000) meets quality standards (Rust et al., 2002) and has a low probability of failing (Curkovic, Vickery, & Dröge, 2000). Therefore, other types of quality, such as service quality and external quality (Zeithaml, 1988), fall outside the scope of this study. Finally, we focus on speed-to-market as an outcome variable, which is defined as “the pace of activities between idea conception and product implementation” (Menon, Chowdhury, & Lukas, 2002), with “speed” being used at times for the sake of brevity.

This paper is organized as follows. To begin with, a literature review is provided regarding the dualities of competence exploitation and exploration and their trade-off. Secondly, building on the theoretical review, the model and hypotheses are proposed for empirical testing. Next, the research methodology, including data collection, construct measurement and non-response bias, are discussed, after which the principal results obtained and managerial contributions of these findings are presented.

## 2. Conceptual background: resource based view theory, dynamic capabilities theory and discovery/creation theory

The resource-based view theory is a recommendable framework for understanding how firms achieve competitive advantage and how that advantage may be sustained over time (Peteraf, 1993; Prahalad & Hamel, 1990), the central proposition being that firms are heterogeneous in terms of the strategic resources they own and control (Barney, 1991). In particular, the resource-based view assumes that each firm can be conceptualized as a unique bundle of tangible and intangible resources and capabilities (Peteraf, 1993). Resources are viewed as those (physical, human or organizational) assets that can be used to implement value-creating strategies (Prahalad & Hamel, 1990). However, sustainable competitive advantages are the result of the characteristic of some specific resources: valuable, rare, inimitable and non-substitutable (Peteraf, 1993; Prahalad & Hamel, 1990).

Capabilities, by contrast, refer to a firm's ability to deploy and coordinate different resources using organizational processes, to achieve a desired objective (Prahalad & Hamel, 1990). They refer to the knowledge skills and related routines that constitute a firm's ability to create and deliver superior customer value (Day, 1994) and attain a competitive advantage (Cooper & Kleinschmidt, 1994). These competences are developed over time through complex interactions among the firm's resources (Lee, Lee, & Lee, 2003). The underlying rationale is that the resource-based view has not adequately explained how and why certain firms realize a competitive advantage in situations of rapid and unpredictable change.

The dynamic capabilities framework (Teece, Pisano, & Shuen, 1997) offers insight into how major or continual environmental change increases the development and use of dynamic capabilities (Zahra, Sapienza, & Davidsson, 2006), suggesting that firms need to possess dynamic capabilities to protect their superior of creating new products and processes, and respond to changing market circumstances performance record in a rapidly changing and turbulent environment (Eisenhardt & Martin, 2000; Teece, 2007). Dynamic capabilities contrast with ordinary capabilities by being concerned with change (Winter, 2003). Dynamic capabilities refer to a firm's ability to integrate, build and reconfigure internal and external competences to respond to rapidly changing environments (Teece et al., 1997). They are understood as the subset of competence/capabilities, which allow the firm to reconfigure a firm's resources and routines in the manner, envisioned and are deemed appropriate by the firm's principal decision-maker(s) (Zahra et al., 2006), even in terms (Teece et al., 1997). Furthermore, increasing dynamic competition in technology-intensive industries demands greater attention to dynamic capabilities (Vaaler & McNamara, 2010). Thus, this framework facilitates not only the ability of an organization to recognize a potential technological shift, but also its ability to adapt to business ecosystems and shape them through innovation (Hill & Rothaermel, 2003). However, this theory focuses mainly on business goals, without clarifying how business opportunities are created.

The Discovery and Creation Theory, which was developed by Alvarez and Barney (2007), proposes an alternative approach to understanding how opportunities are exploited or explored by a firm and addresses another important issue in resource-based theory in the field of strategic management. While the former view (Discovery Theory) positions that opportunities are discovered and exist “out there” waiting to be found, the latter dominant view (Creation Theory) posits that opportunities are created as a function of actions that occur during entrepreneurial processes (Short, Ketchen, Shook, & Ireland, 2009). The decision-making context in Discovery Theory is risky because it assumes that opportunities are objective in nature. Thus, depending on the different transactional difficulties that companies are designed to resolve, they could adopt different organizational forms in uncertain settings (Alvarez & Barney, 2005). Furthermore, companies could pursue different strategies will require diverse capabilities to attaining them. Since organizations are looking for new opportunities to improve their performance, they could adopt different kinds of behavior to make realizing this objective easier (Alvarez & Barney, 2007). On the other hand, in Creation Theory, opportunities are not assumed to be objective phenomena that are the result of exogenous shocks to an industry or market. Instead, they are created by the actions and reaction of firms exploring new ways of producing products or services. Under the Creation Theory, a firm's actions are essential to exploring ways of producing new products or services (Alvarez & Barney, 2007). Furthermore, Creation Theory allows companies to implement strategies that other firms have not internally developed and which, consequently, may help create valuable, rare and inimitable resources and capabilities that provide a competitive advantage.

The three theories discussed above provide a guideline to the relevance of resources, the dynamic capabilities that firms should

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