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## Technology-driven strategy and firm performance: Are strategic capabilities missing links?☆

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### ABSTRACT

This empirical study of 146 U.S. new ventures examines how strategic capabilities mediate the effect of technology-driven strategy on firm performance. The results reveal that technology-driven strategy is positively related to technology capabilities and information technology capabilities, but negatively related to marketing capabilities and market-linking capabilities. Furthermore, all types of strategic capabilities are positively related to firm performance. The findings provide evidence that strategic capabilities play a mediating role between technology-driven strategy and firm performance and show that, like market-driven strategy, technology-driven strategy is also an important and successful founding strategy because it can exert great impact on firm performance through strategic capabilities.

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### 1. Introduction

Are technology-driven or technology focused ventures more successful than market-driven ventures? Popular press reports often cite anecdotal evidence suggesting that technology-driven companies have higher success rate. Many scholars have explored the relationship between strategic orientation and firm performance, most frequently focusing on the effect of market orientation on performance. In particular, marketing scholars have examined the direct link between market orientation and performance outcomes (Hult & Ketchen, 2001; Jaworski & Kohli, 1993; Matsuno, Mentzer, & Özsomer, 2002; Morgan, Vorhies, & Mason, 2009; Narver & Slater, 1990) as well as moderators of this relationship (Boso, Story, & Cadogan, 2013; Kirca, Jayachandran, & Bearden, 2005; Selnes, Jaworski, & Kohli, 1996; Slater & Narver, 1994; Voss & Voss, 2000; Wang, Chen, & Chen, 2012). A common finding from these studies is that market orientation positively relates to firm performance, regardless of environmental conditions and cultural settings. Nevertheless, some researchers have questioned whether the mere presence of market orientation can enable firms to achieve superior performance. For example, Zhou, Yim, and Tse (2005) argue

that an overemphasis on customers may impede research and development (R&D) and innovation activities, thereby lowering a firm's innovation performance. Thus, a new line of research has emerged that focuses on identifying other types of strategic orientation that may complement market orientation (Berman & Hagan, 2006; Gatignon & Xuereb, 1997; Mu & Di Benedetto, 2011).

The fundamental dichotomy of the strategic orientation construct lies in the distinction between market-driven strategy and technology-driven strategy. In a meta-review article, Song, Podoyntsyna, van der Bij, and Halman (2008) report that the survival rate for technology ventures fell to 21.9% after 5 years. Recent studies indicate that technology-driven firms have higher performance and exit rates (Braguinsky, Klepper, & Ohyama, 2012; Eesley, Hsu, & Roberts, 2014). Imprinting theory suggests that founding strategies have long-lasting effects on new venture performance. Founding strategy locks the new venture into a particular strategic direction, because startups develop internal consistencies and investments that tend to perpetuate those strategies (Miles & Snow, 1978). In addition, Boeker (1989) suggests that founding strategies persist decades after the founding of firms (see also Eisenhardt & Schoonhoven, 1990). As an important type of founding strategies, technology-driven strategy should be related to new venture performance and long-term success. Thus, it's essential to study the deployment mechanism linking technology-driven strategy to new ventures' performance.

In this study, we focus on market-driven strategy and technology-driven strategy. Market-driven strategy refers to a market orientation that focuses on customers, competitors, and broader market conditions (Jaworski, Kohli, & Sahay, 2000). Market-driven firms engage their customers and listen to their needs, taking a close look at the end markets

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and considering customer demands before developing a technology platform or product (Narver & Slater, 1990). Market-driven firms often produce sustainable products with visibly notable targeted value, thus a market-driven strategy helps firms establish market leaderships and revenue-growth potential (Han, Kim, & Srivastava, 1998; Jaworski & Kohli, 1993). Technology-driven firms begin with a clear focus on R&D activities as the source of future commercializable products (Hamilton, Vila, & Dibner, 1990). They can develop new technologies, design products on those technologies, and have entire market buy their products because their products are technologically superior (Gatignon & Xuereb, 1997; Hurley & Hult, 1998; Song & Parry, 1997). A technology-driven approach mobilizes a firm's entry into new market niches and enables a firm to rapidly deliver products to market since it skips lengthy traditional market research (Mu & Di Benedetto, 2011; Shanklin & Ryans's, 1984). Berman and Hagan (2006) suggest that technology-driven strategy can spur innovation and growth, reduce time to market, and provide early warning of potential business disruption. Thus, it is possible that technology-driven strategy, which leads to at least partially the superior performance, complements market orientation.

Research has also shown that, rather than having a direct effect on firm performance, strategic orientation may act through intervening variables to improve performance outcomes. Morgan et al. (2009) argue that we still know little about how market orientation is connected with firm performance. These arguments encourage a new line of research that attempts to identify such variables like innovation (Han et al., 1998), organizational learning (Mu & Di Benedetto, 2011) to understand the process by which strategic orientation is connected with performance. A significant category of such intervening variables may be strategic capabilities. Strategic capabilities include the skills and knowledge firms need to develop their strategic assets advantageously. Strategic orientation as a strategic choice should drive the way firms acquire and deploy strategic capabilities (DeSarbo, Di Benedetto, Jedidi, & Song, 2006; DeSarbo, Di Benedetto, Song, & Sinha, 2005; Di Benedetto, DeSarbo, & Song, 2008; Zhou & Li, 2010). Many studies examining strategic capabilities have shown that they have a direct, positive relationship with firm performance (DeSarbo et al., 2005, 2006; Di Benedetto et al., 2008; Song, Di Benedetto, & Nason, 2007; Song, Dröge, Hanvanich, & Calantone, 2005). Thus, strategic capabilities may act as the intervening variables between strategic orientation and firm performance, and exploring the possible mediating role of strategic capabilities would help us understand the function mechanism of strategic orientation. However, prior studies have given little attention to this topic. Although Morgan et al. (2009) examine the relationship between market orientation and performance, marketing capabilities and performance, and the interaction between market orientation and marketing capabilities and performance, they fail to examine the relationship between market orientation and marketing capabilities. Similarly, technology-driven strategy has not been studied as a precursor to strategic capabilities, and no studies have identified and empirically examined strategic capabilities as intervening variables between technology-driven strategy and firm performance, the mediating effects of strategic capabilities remain unclear.

To address these research gaps, in this study we explore how technology-driven strategy relates to firm performance. A technology-driven firm operates under the notion that it knows what is best for customers and have entire markets buy its products because the products are technologically superior (Gatignon & Xuereb, 1997). Thus, technology-driven strategy should be related to firm performance. Unlike prior research that focuses on direct effects (Sainio, Ritala, & Hurmelinna-Laukkanen, 2012; Zhou et al., 2005), this study proposes that strategic capabilities operate as an action mechanism that facilitates the implementation of technology-driven strategy. We examine the effect of technology-driven strategy on strategic capabilities and empirically analyze the mediating effects of four key elements of strategic

capabilities—technology, marketing, market-linking, and information technology capabilities—on the performance implications of strategic orientation using new ventures' data. This study contributes theoretically and empirically to the existing literature by examining the effects of technology-driven strategy on firm performance and strategic capabilities, which may provide insight into the functional mechanism of strategic orientation and enhance our understanding of why some firms successfully implement strategic orientation and perform better than others.

## 2. Theory and hypotheses

Research indicates that strategic orientation does not automatically lead to better performance (Zhou et al., 2005), but rather it has only potential value and requires complementary capabilities to be deployed in the chosen strategic direction to achieve superior performance (Hult, Ketchen, & Slater, 2005; Morgan et al., 2009; Ngo & O'Cass, 2012; Theodosiou, Kehagias, & Katsikea, 2012). According to the resource-based view (RBV), a firm's competitive advantage is primarily driven by its valuable, rare, inimitable, and nonsubstitutable resources (Barney, 1991). The strategic management literature pays much attention to strategic capabilities, which facilitate the effective deployment of strategic assets (Di Benedetto et al., 2008). Unlike assets, capabilities are unobservable, difficult to quantify, and cannot be easily traded or imitated because they are deeply embedded in organizational routines and practices (Day, 1994). Scholars stress the critical role of capabilities in a firm's attempt to achieve superior performance and view capabilities theory as an extension of the RBV. According to the RBV, strategic capabilities are associated with the processes of strategy development and execution. Strategic orientation reflects the strategies implemented by a firm and encompasses its capabilities (Menguc & Auh, 2006).

Drawing on past research and the RBV, we construct a conceptual framework (shown in Fig. 1) to illustrate how technology-driven strategy facilitates the development of strategic capabilities, which in turn enhance firm performance.

In our framework, we treat technology-driven strategy as an important type of strategic orientation, in addition to market-driven strategy. We also focus on four key elements of strategic capabilities that prior research has linked to competitive advantage and long-term success: technology, marketing, market-linking, and information technology capabilities (DeSarbo et al., 2005, 2006; Di Benedetto et al., 2008; Song et al., 2005, 2007). Strategic capabilities are defined as complex bundles of skills and accumulated knowledge that enable firms to coordinate activities and make use of their assets (Day, 1990). Technology, marketing, market-linking, information technology capabilities are most often identified in the literature as significant precursors or critical drivers of competitive advantage (DeSarbo et al., 2005, 2006; Di Benedetto et al., 2008; Song et al., 2007). Our framework proposes that strategic capabilities play a critical role in acting as an effective deployment mechanism linking technology-driven strategy to firm performance.

### 2.1. Technology-driven strategy and firm performance

Technology-driven strategy refers to proactively developing and rapidly integrating new technologies and the use of these technologies in new product development (Gatignon & Xuereb, 1997). A technology-driven firm is likely to excel in developing technologically superior products and services (Mu & Di Benedetto, 2011; Song & Parry, 1997), and it has been posited that consumers prefer such products and services (Gatignon & Xuereb, 1997). A strong emphasis on technology mobilizes a firm's entry into new market niches (Mu & Di Benedetto, 2011), and allows a firm to rapidly deliver products to market because it only skims—or skips altogether—lengthy traditional market research. As such, technology-driven strategy enables a firm to create superior

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