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## Editorial

# The Answer is Blowing in the Wind of Creative Destruction: Reflections on the Strategic Management of Technology and Innovation Research

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The strategic management of technology and innovation is the focus of one of the most vibrant research communities in management today. Indeed, it has been like that for several decades. As an example, a study conducted a few years ago to commemorate 50 years of the journal *Management Science* found that, out of 12 categories of research dealing with technological innovation and entrepreneurship published in the 50 years of the journal's existence, the category with the highest number of published papers was "technology strategy" (Shane and Ulrich, 2004). In addition to a strong presence in the major generalist journals, several highly respected journals, such as *Research Policy* and *Industrial and Corporate Change*, have long specialized in technology-related research with strategic implications. Researchers with interest in the intersection of technology, innovation and strategy also represent a large percentage of several of the largest divisions in the Academy of Management (e.g. TIM, BPS, OMT, ENT) and conferences and organizations centered around innovation and technological change, such as DRUID, have gained in significance and membership over time.

An exhaustive review of the vast literature to date would be a difficult undertaking in itself, well beyond the scope of this introductory note for a special issue on the strategic management of technology and innovation. Instead, I will limit myself here to highlighting some of the theoretical foundations on which our community has been built, drawing the attention to a couple of reasons behind its success (not only in numbers but also in terms of impact on academia and business practice), and pointing out examples of prominent work done by our members and the exciting new research that is taking place today and will continue to propel this field in the coming years.

There are at least two basic reasons behind the success of the research community around the strategic management of technology and innovation. The first reason is the importance of the topic itself. The impact of innovation and technological change on company strategies and industry dynamics not only continues to be a crucial theme for scholars and practitioners alike, but its importance seems to increase as the years go by – if only judged by the number of industries around us that have recently undergone

major innovation-prompted transformations. Understanding and managing technological change and its implications has therefore emerged as one of the key elements of competitive advantage in modern markets. The second reason is the fact that, given the nature of technological innovation, performing research in this area calls for true interdisciplinary approaches. Research on the management of technology and innovation is often done from different perspectives, including economics, strategy, organizational theory, sociology and psychology. Such diversity of approaches makes the field vibrant, challenging, and provides each disciplinary base with a dose of healthy humility in the sense that we all recognize that no discipline has the "final word" on the complex issues we study. It also makes the area larger and more interesting than other areas of research with less disciplinary heterogeneity.

It is then probably fair to say that researchers in the strategic management of technology and innovation area tend to be more eclectic in their research approach than other management researchers. It is no surprise that the scholar who is widely considered as the cornerstone of technological innovation research, Joseph Schumpeter, had a non-traditional, broader view of how companies and the economy as a whole worked and evolved compared to most other scholars studying these issues at his time. Two other scholars whose work is often highlighted as seminal for the study of innovation, Kenneth Arrow and Robert Solow, were also considered innovators within their specific fields. Much of the research carried out today on the management of technology and innovation continues to honor this tradition of novelty and boundary spanning.

Research carried out by the pioneers in the study of innovation and technological change in the 20th century helped to create the key conceptual structures on which much of the current research has been built. Schumpeter's key insight that innovation is the source of growth for economies and organizations alike, and that innovation punctuates cycles of change, growth and stability, can be perceived in the important work of Abernathy and Utterback (1978, 1975) and Gort and Klepper (1982), that in turn gave rise to a whole stream of work on innovation and strategy along the industry life cycle (e.g., Anderson and Tushman, 1990; Suarez and Utterback, 1995; Agarwal, Sarkar and Echambadi, 2002; McGahan, 2004) and corresponding battles for technological dominance (e.g., Rosenbloom and Cusumano, 1987; Schilling, 2002; Suarez, 2004; Murman and Frenken, 2006). Much of this research blends perspectives from

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different disciplines in the study of technology evolution and its strategic implications (e.g., Garud, Jain and Kamaraswamy, 2002; Tushman and Rosenkopf, 1992). Similarly, Schumpeter's focus on the company, and particularly the role of the entrepreneur and the institutions that support their creative enterprise, gave rise to a rich stream of research on the process of innovation within companies, and the nature of entrepreneurship and the entrepreneur (e.g., Roberts, 1968; Shane, 2008; for a review of the early literature see Gorman, Hanlon and King, 1997) as well as a search for sectoral differences in innovation patterns (e.g., Pavitt, 1984).

Arrow's (1962) pioneering work gave us a rigorous conceptual framework to understand innovation as new information. From his work, a large stream of research has emerged on the strategic use of intellectual property and the conditions necessary to capture the value of innovation. Some of this research deals with company-level strategy issues (e.g. Teece, 1986; Arora, Fosfuri and Gambardella, 2001; Pisano, 2006; Wagner and Cockburn, 2010); while others focus on the boundary between company strategy and regional/national innovation policy, such as those pieces dealing with location strategies and spillover effects (e.g., Griliches, 1992; Alcácer and Chung, 2007; Furman and Stern, forthcoming).

Decades of research have significantly improved our understanding of the strategic impact of innovation and technological change, but the field is still young and growing fast. By spanning new boundaries or by revisiting established research using new perspectives or methods, current research is adding new understandings about the management of innovation and technological change. For instance, despite the fact that many taxonomies of innovation had been proposed in the literature (e.g., Foster, 1986; Abernathy and Clark, 1985; Henderson and Clark, 1990), the taxonomy proposed by Christensen (1997) not only added new insights but also reinvigorated research on the strategic implications of innovation. Similarly, while much of the early research on the process of innovation was conducted with a within-company perspective (e.g., Allen, 1977; Schon, 1966; and later research such as Dougherty, 1992), subsequent research showed that companies could also harness the innovative capabilities and ideas of their customers, suppliers and even the larger community (e.g., Von Hippel, 1994, 2005; Chesbrough, 2003; Cohen and Levinthal, 1990). More recent work has expanded prior contributions by focusing on the specific governance and coordination mechanisms in situations where innovation involves the participation of multiple organizations, often with different, and sometimes conflicting, goals. Some of this recent work uses economic tools (e.g., Simcoe, forthcoming), while others use a sociological or ethnographic approach (e.g., Long and O'Mahony, 2010).

Recent research has also added fresh perspectives to the study of innovation along the industry life cycle. While a handful of prior research on technology management had already looked at some of the social dynamics that co-occur with technological change (e.g., Clark, 1985), existing research has complemented this view by focusing on the "fuzzy front end" of industry emergence (Santos and Eisenhardt, 1999) and looking at the role that technological frames (e.g., Kaplan and Tripsas, 2008) and categories (e.g., Rosa et al., 1999; Pontikes, 2008) play in the evolution of technology and company performance. Researchers in our field have also continued to revisit another classical concern in the strategic management of technology: the effect of entry timing on company performance in high-technology markets. Building on earlier work (e.g., Lieberman and Montgomery, 1988, 1998; Mitchell, 1991; for a review, see Suarez and Lanzolla, 2007), recent research has looked at the fate of entrants in markets characterized by rapid succession of technology generations (e.g., Bohlmann, Golden and Mitra, 2002; Franco et al., 2009) and searched for specific industry milestones that can be used to study the performance of different cohorts of entrants (e.g., Agarwal and Bayus, 2002; Suarez, Grodal and Gotsopoulos, 2011). Another major stream of recent literature has looked at the

capabilities needed to compete in high-technology markets, particularly in reference to the concept of "dynamic capabilities" (Teece, Pisano and Shuen, 1997; Eisenhardt and Martin, 2000; for a review, see Di Stefano et al., 2010).

The strategic management of technology and innovation as an area of study has been growing uninterrupted during the last decades. Given the importance of the topic and the caliber of the researchers who continue to join the community, this trend can be expected to continue over the foreseeable future. It is interesting to note that even in the tough global economic climate of the last few years, the most innovative companies in each industry (e.g., Apple, Google, Zynga, BMW, Samsung, Facebook) have been able to keep growing and maintain or even improve their profitability, just as Schumpeter had warned us a long time ago. This reminds us that innovation can indeed work as the engine of the company and economic growth, even in difficult times. The answer, my friends, may still be blowing in the wind of creative destruction.

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