

Conceptualizing Innovation Orientation: A Framework for Study and Integration of Innovation Research

1. Judy A. Siguaw, Cornell-Nanyang Institute of Hospitality Management*
2. Penny M. Simpson, Valley Markets and Tourism Center and University of Texas–Pan American
3. Cathy A. Enz, Innovation and Dynamic Management in the School of Hotel Administration at Cornell University

**Address correspondence to: Judy A. Siguaw, Cornell-Nanyang Institute, S3-01B-49 Nanyang Avenue, Singapore 639798, Republic of Singapore.*

Abstract

The term innovation orientation has been frequently used in the innovation literature, but with a mix of conceptualizations and meanings. Drawing from work found in the innovation, management, and marketing literatures over the past 35 years, the concept of innovation orientation as a system is conceptualized and defined in this article. The domain of innovation orientation is delineated as a multidimensional knowledge structure and a framework for understanding innovation orientation and its consequences in an organizational context are developed. The framework defines the innovation orientation knowledge structure as composed of a learning philosophy, strategic direction, and transfunctional beliefs within an organization that define and direct the organizational strategies and actions toward specific innovation-enabling competencies and processes. These innovation-oriented firm competencies are in the areas of resource allocation, technology, employees, operations, and markets. The framework then explains that these appropriately developed innovation-enabling competencies lead to innovation outcomes, specifically ideal innovation form, type, and rate that, in turn, affect firm performance. An inventory of propositions for future research that correspond to the innovation orientation concept is also presented in this comprehensive framework. This study provides two important contributions to the existing innovation literature. First, the article examines the vast innovation literature to arrive at a clear definition of the innovation orientation construct to provide a consistent conceptualization for future research. Second, the article develops a comprehensive, organized framework for understanding innovation orientation and its effects. In doing this, the framework extends the dynamic capabilities research stream by offering an explanation of how innovation orientation fosters the development of organizational competencies and makes it possible for a firm to recognize and respond to shifts in market dynamism.

Conceptualizing Innovation Orientation: A Framework for Study and Integration of Innovation Research

Firms innovate in a number of ways, including business models, products, services, processes, and channels (Carr, 1999) to maintain or capture markets, to outdistance competitors, and to assure long-term growth and survival, especially in highly complex and turbulent environments (e.g., Eisenhardt and Brown, 1999; Freeman, 1994; Lawless and Anderson, 1996). Considering these and other likely benefits of innovation, substantial research has examined innovations, focusing primarily on innovation typologies, research and development economics, and innovation diffusion (e.g., Freeman, 1994; Miles and Snow, 1978; Van de Ven et al., 1999). Though this prior research has provided substantial contribution to the innovation literature, the narrow focus on innovations ignores the propensity of an organization to continually innovate as an organizational objective, especially since innovations in and of themselves are not necessarily the key to long-term business success, as noted by Tushman (1997). Instead, a firm's long-term success may rely more on an overall firm-level innovation orientation that produces capabilities that spawn innovations and less on specific innovations. Such an organizational innovation system or orientation has yet to be formalized in extant literature, despite the plethora of innovation-related research.

A review of the extensive innovation literature over the last 35 years (see Table 1 for a summary of representative works) indicates that prior research falls primarily into the categories: economics of research and development (R&D); effects of market orientation on product and process innovation; practitioner-oriented essays promoting the normative how-to approach or the general value of innovation; the innovation adoption process; the development of typologies based on innovativeness; and descriptive studies, generally anecdotal, of firm characteristics that serve to generate innovation. Most recently, a handful of studies have acknowledged innovation orientation as a construct in its own right. For the most part, however, these studies do not clearly define the term or provide a framework for understanding the construct, and they often conceptualize the term in the context of the marketing function rather than at the organizational system level (e.g., Moorman and Slotegraaf, 1999). These sometimes vague and inconsistent definitions and operationalizations of innovation orientation, as emphasized by Garcia and Calantone (2002), have inhibited the integration of the innovation research and an

understanding of the concept and have obscured the key role that ongoing knowledge structures play in enabling continuous innovation in a firm.

The purpose of this article, then, is to demarcate the domain of innovation orientation, to develop an operational definition, to create a framework for examining innovation orientation, and to offer a corresponding propositional inventory. This framework will provide managers with justification for an innovation orientation and guidance in creating organizational strategies, design, and competencies to implement and sustain long-term, continuous innovation. To accomplish these goals, knowledge based-theory (King and Zeithaml, 2003), the resource-based view of the firm (Barney, 1991), and the diverse innovation literature are used to develop a new, overarching innovation orientation conceived as a systemic, organizational knowledge structure.

Other researchers have called for this broad perspective, essential to identifying, managing, and leveraging firm-controllable innovation patterns of understanding throughout an organization: Hurley and Hult (1998, p. 52) conclude that “creating a more innovative culture requires a change in the system, because people's beliefs about innovation are related to beliefs about other aspects of the system”; Moorman and Slotegraaf (1999) observe that the innovation research has largely ignored the interaction dynamics of functional capabilities, and Hargadon and Sutton (2000, p. 157) encourage a total enterprise view of innovation by noting that innovation has “everything to do with organization and attitude.” A recent empirical work by Subramaniam and Youndt (2005) specifically links knowledge structures to innovation capabilities, noting that most studies fail to explain how organizational knowledge gets accumulated and connected to specific types of innovation capabilities. Hence, the defining factor of long-term survival through innovation appears based not on specific, discrete innovations or on a single market or learning orientation but rather on an overarching, organization-wide knowledge structure, termed innovation orientation. This view of innovation orientation is important in that (1) it advocates a holistic perspective; (2) it fosters theory development by distinguishing between the innovation-orientation system and its potential organizational competencies and subsequent outcomes such as innovation and firm performance; (3) it offers a broader, formalized conceptualization of innovation orientation than previously discussed in the literature; and (4) it offers a starting point for researchers seeking to understand the more sweeping effects of the organization, as a whole, on innovation. The formal recognition of an innovation-orientation system as an all-encompassing set of understandings manifested in specific, but sweeping, innovation-enabling behaviors should

reduce the ambiguity Garcia and Calantone (2002) and others identified in the extant innovation literature. In addition, the conceptualization of innovation orientation offered here moves beyond recent models of knowledge antecedents of innovation capability that focus on intellectual capital (Subramaniam and Youndt, 2005) while preserving the importance of the knowledge-innovation link.

Although the focus in this article is on the explication of innovation orientation, some commonalities are shared with dynamic capabilities studies (e.g., Eisenhardt and Martin, 2000; King and Tucci, 2002; Winter, 2003). Both Eisenhardt and Martin (2000) and the present study advocate the resource-based view and share an appreciation for the conceptualization of dynamic capabilities as path dependent and idiosyncratic. Additionally, both works, as well as those of King and Tucci (2002) and Winter (2003), strongly support the notion that manipulation of knowledge resources is critical and that market dynamism dictates the pattern of dynamic capabilities. However, the present article extends the dynamic capabilities research stream by offering the innovation orientation (i.e., organizational-knowledge structure) as an explanation that fosters the development of organizational competencies—that between the external market and the establishment of dynamic capabilities is an innovation orientation that directs a firm toward reinforcing and transforming its knowledge to build innovation. In this view, innovation orientation allows a firm to recognize shifts in market dynamism and, more importantly, to vary the dynamic capabilities or processes in alignment with an orientation, which is the precursor to the change of processes. Innovation orientation is the knowledge structure that permits the recognition of market dynamism and then provides a knowledge template to develop the required process and to build a firm's dynamic capabilities.

Defining Innovation Orientation

Relatively few studies within the large body of the innovation literature have addressed the concept of innovation orientation. The earliest of these articles is from Manu (1992, p. 334), who explains innovation orientation as encompassing “the total innovation programs of companies and is strategic in nature because it provides direction in dealing with markets.” Manu and Sriram (1996, p. 81) conceptualize innovation orientation as a multicomponent construct consisting of new product introduction, R&D expenditures, and order of market entry, whereby “single variable categorizations of innovativeness do not fully capture the complexities of

innovativeness.” The specific components used in Manu and Sriram's typology, however, were limited to variables in the profit impact of market strategy (PIMS) database; thus, the typology fails to consider organization-wide beliefs and a knowledge structure that may inhibit or promote total firm innovativeness. Berthon, Hulbert, and Pitt (1999, p. 37) define innovation orientation in terms of technological superiority: firms that “devote their energy toward inventing and refining superior products.” This conceptualization consists of both openness to innovation (Zaltman, Duncan, and Holbek, 1973) and a capacity to innovate (Burns and Stalker, 1977). This latter perspective of innovation orientation overlaps Hurley and Hult's (1998, p. 44) conceptualization of innovativeness as “the notion of openness to new ideas as an aspect of a firm's culture” and Hult, Hurley, and Knight's (2004, p. 430) view of innovativeness “as the capacity to introduce ... some new process, product, or idea in the organization.”

Kundu and Katz (2003) consider “intention to be innovative” as an element of innovation orientation, whereas Homburg, Hoyer, and Fassnacht (2002, p. 96) view innovation orientation as a function of “the number of innovations a company offers, how many customers these innovations are offered to, and how strongly these innovations are emphasized.” Worren, Moore, and Cardona (2002, p. 1127) conceptualizes innovation orientation as consisting of entrepreneurial intent—the linkage between “product modularity and the firm's strategic intent for developing new items or entering new markets with existing products”—and innovation climate—where new ideas are encouraged and employees share a common mission. The employees are also integral in the innovation orientation conceptualizations of both Atuahene-Gima and Ko (2001, p. 61), who consider it to be “human resource practices that foster support for innovative and risky behavior and that enable employees to keep up with changing technologies,” and Amabile (1997, p. 52), who maintains that “the most important elements of the innovation orientation are: a value placed on creativity and innovation in general, an orientation toward risk (versus an orientation toward maintaining the status quo), a sense of pride in the organization's members and enthusiasm about what they are capable of doing, and an offensive strategy of taking the lead toward the future (versus a defensive strategy of simply wanting to protect the organization's past position).”

The preceding definitions of innovation orientation emphasize both the lack of a general theoretical consensus as to what constitutes an innovation orientation and commonalities of the construct's components. Most definitions concur first and foremost that innovation orientation is a learning philosophy in which firms have common standards and beliefs about learning and knowledge that pervade and guide all functional areas toward innovation. For example, Worren,

Moore, and Cardona (2002) promote the idea of “common mission” and innovation climate of new ideas; Hurley and Hult (1998) discuss the open-to-new ideas corporate culture of innovation orientation; and Atuahene-Gima and Ko's (2001, p. 61) definition requires an environment that allows “employees to keep up with changing technologies.” These conceptualizations strongly imply that a learning philosophy must be an inherent component of innovation orientation. This learning philosophy may reinforce the importance of creativity (Amabile, 1997; Worren, Moore, and Cardona, 2002), the openness to innovation (e.g., Berthon, Hulbert, and Pitt, 1999; Zaltman, Duncan, and Holbek, 1973), and the positive attitude toward risk (Amabile, 1997; Atuahene-Gima and Ko, 2001), contingent on firm-specific principles.

Second, prior definitions agree that an innovation orientation is strategic (Amabile, 1997; Manu, 1992; Worren, Moore, and Cardona, 2002). Innovation orientation is generally considered an intentional and calculated plan or strategic intent (Worren, Moore, and Cardona, 2002) that provides direction toward an organization-wide commitment to more and faster innovations. As a strategic initiative, some authors conceptualize innovation orientation as broad in scope and as encompassing the total enterprise and all functional areas of the organization rather than just a single functional area, such as R&D or marketing (e.g., Amabile, 1997; Worren, Moore, and Cardona, 2002).

As the final component of innovation orientation, the preceding definitions and conceptualizations argue for a specific work force interaction or transfunctional acclimation arising from the learning philosophy and strategic direction components that cross all functional areas. The innovation-orientation transfunctional acclimation is generally seen as a set of common understandings and beliefs pervading the innovation-oriented firm that creates a unifying comradeship, enthusiasm, and devotion among employees (Amabile, 1997; Worren, Moore, and Cardona, 2002). The common beliefs, values, and understandings are disseminated so that the organization thinks as one collective body that aspires to see the organization succeed through innovation rather than an assortment of separate functional units, each with its own sometimes disparate goals.

Finally, innovation orientation is most often erroneously defined in terms of innovation outputs, usually in numbers of new products and processes (see Berthon, Hulbert, and Pitt, 1999; Homburg, Hoyer, and Fassnacht, 2002; Manu and Sriram, 1996). Though the desired outcome of an innovation orientation is innovation, the innovations do not define the orientation:

They are the outcomes. An innovation orientation drives the firm strategy, learning, and functional interaction toward the goal of innovations

Synthesizing the broader issues surfaced in the literature, innovation orientation is defined as the following:

A multidimensional knowledge structure composed of a learning philosophy, strategic direction, and transfunctional beliefs that, in turn, guide and direct all organizational strategies and actions, including those embedded in the formal and informal systems, behaviors, competencies, and processes of the firm to promote innovative thinking and facilitate successful development, evolution, and execution of innovations.

This definition conceptualizes innovation orientation as a set of understandings about innovation built into the fabric of a firm's knowledge structure that influences organizational activities, but not as a specific set of normative behaviors (i.e., encouraging risk taking) as proposed in most prior research. This view is supported by Zien and Buckler's (1997, p. 276) finding that all innovative firms have the same key, interwoven principles at work, but that each firm's "implementation 'formula' is particular and specific to that company."

The conceptualization of innovation orientation adopted in this study separates out beliefs from actions by framing innovation orientation as a knowledge structure rather than an organizational culture or an amalgamation of norms and behaviors. At the organizational level, a knowledge structure is an ever-changing set of "goals, cause-and-effect beliefs, and other cognitive elements" that "define expected relationships, behaviours, and actions for organizational members" (Lyles and Schwenk, 1992, p. 157). Thus, an innovation-oriented knowledge structure is a set of organization-wide shared beliefs and understandings about learning, the future concept of the firm and its strategies, and the unification of its various functions that shape a firm and lead to competencies supportive of innovation. This distinction is emphasized because orientation constructs, particularly in the marketing literature, are frequently defined in terms of both beliefs and actions (e.g., Calantone et al., 2002; Kohli and Jaworski, 1990). This blurring of actions and antecedent beliefs so often found in existing conceptualizations of marketing orientation is challenged by Deshpandé (1999). Similarly, conceptualizations of entrepreneurial orientation, which "embodies strategies and actions that the firm may undertake in order to actualize corporate orientations and goals" (Hult, Hurley, and Knight, 2004, p. 432), also combine actions with beliefs (see also Naman and Slevin, 1993).

Since these compound conceptualizations tend to confound how action and beliefs work together and to cloud the ability to understand concepts, the innovation orientation construct devised here delineates these elements and focuses on the construct as a knowledge structure, not the subsequent actions.

Although new, this proposed conceptualization of innovation orientation has some support from emerging research that suggests the importance of collective understandings that orient or guide an organization and the people in it to engage in activities intended to encourage, value, and reward innovation efforts (e.g., Damanpour, 1991; Schlegelmilch, Diamantopoulos, and Kreuz, 2003; Troy, Szymanski, and Varadarajan, 2001). More specifically, Pitt and Clarke (1999, p. 301) state that “innovation is the purposeful orchestration and directed application of organizational skills and knowledge,” and Buckler and Zien (1996) report that companies retaining an innovative spirit constantly reenergize employees with organizational myths and legends that communicate and reinforce the shared values of the firm.

Theoretical Underpinnings

A knowledge structure that is clear, specific, unique, pervasive, and guides action toward innovation may be the source of a sustainable competitive advantage for a firm under both resource-based and knowledge-based theories of the firm. A resource-based view explains that firms create a sustainable competitive advantage by possessing inimitable, nonsubstitutable, rare, and valuable resources and capabilities (Barney, 1991). However, no one skill or resource may lead to a sustained competitive advantage; instead, companies must be willing to constantly destroy and rebuild their core competencies (i.e., to innovate) to remain market leaders (Fiol, 2001; Teece, Pisano, and Shuen, 1997). The resource-based view has been tied to innovation capabilities in previous work and provides a logical foundation for grounding the concept of innovation orientation (Hadjimanolis, 2000).

Knowledge-based theory also suggests that knowledge development and deployment may be a truly sustainable competitive advantage (e.g., King and Zeithaml, 2003; Martin and Salomon, 2003). The idea of knowledge development and deployment is an inherent part of an innovation orientation. Because innovation orientation involves understandings and beliefs about innovation (i.e., continuous and radical change, adoption of new methods), new

knowledge is requisite and the knowledge capital surging throughout the firm is continuously growing and morphing to identify the next position of strength needed to keep the firm ahead of competitors and markets. Thus, a real source of competitive advantage is an innovation orientation, specifically its knowledge development and strategic intent that directs functional competencies such as human resources, marketing, and operations.

A Multidimensional Model of Innovation Orientation

Recall that innovation orientation is composed of beliefs and understandings that lead to innovative action; innovative actions are the outcomes, not the components, of an innovation orientation. These beliefs and understandings, as specified in the definition provided here and modeled in Figure 1, are shaped by the components: a learning philosophy, a strategic direction, and a complementary, transfunctional acclimation. A large number of advantages and even disadvantages accrue to a firm as a result of an innovation orientation and its accompanying competencies. This article, however, examines only the pathways from an innovation-orientation knowledge structure to its competencies, and then to innovation-related outcomes and firm performance, to avoid deemphasizing the central focus on innovation orientation. This collective innovation-directed knowledge structure guides, orients, shapes, and coordinates the organizational competencies that yield ongoing, organization-wide innovations and subsequent firm performance.

In accordance with Hurley and Hult's (1998) and Moorman and Slotegraaf's (1999) conclusions, innovation orientation, and the organizational elements that it affects, is seen as an organizational system. As Gharajedaghi and Ackoff (1984, p. 293) state, "A system is a whole that cannot be divided into independent parts; the behavior of each part and its effect on the whole depend on the behaviour of other parts." Removing components of the system for examination means the essential properties of the components are lost when separated from the whole system. When only pieces of the innovation system are examined, as is common within the literature, the system's overall structure is not revealed, nor is its functions and component interactions (Gharajedaghi and Ackoff, 1984). Under a systems approach, the innovation orientation construct is dynamic in that a firm's innovation orientation is constantly evolving as the key elements of the learning philosophy, strategic direction, and transfunctional

acclimation shift. Thus, though the various elements of an innovation orientation will be described in a following section, it is important to view the overall concept as a whole.

Learning Philosophy

Requisite to an innovation-oriented firm is a learning philosophy defined as a pervasive set of organization-wide understandings about learning, thinking, acquiring, transferring, and using knowledge in the firm to innovate. A wide variety of definitions and conceptualizations of learning philosophy and the broader notion of a learning organization exist (Bell, Whitwell, and Lukas, 2002; see Crossan et al., 1995 for an excellent summary of the organizational learning literature dimensions through 1993). For example, Cohen and Levinthal (1990) use the term absorptive capacity to capture the ability of a firm to gather, assimilate, and apply new knowledge. In this view, learning is a function of prior knowledge predominately but also experience, intensity of effort, and knowledge diversity. That study explains that “organizations with higher levels of absorptive capacity will tend to be more proactive, exploiting opportunities present in the environment, independent of current performance” (p. 137), resulting in a “self-reinforcing cycle.” Likewise, a learning philosophy is conceived here to enable various functional units within a firm to learn from and apply knowledge in a self-reinforcing cycle from diverse sources, including past experience.

Other researchers have empirically substantiated a linkage between organizational learning and innovation. For example, Sinkula, Baker, and Noordewier (1997) specified three core facilitators of organizational learning—organizational values, market information-processing behaviors, and organizational actions—which served as the basis for a subsequent organizational learning scale developed and tested in relation to market orientation and organizational performance (Baker and Sinkula, 1999). Baker and Sinkula (1999) noted the “wide agreement that learning climate and firm innovation are highly correlated” (p. 515) and that “it is obvious that a learning orientation is closely related to organizational innovation” (p. 517). Calantone et al. (2002) used measures of commitment to learning, shared vision, open-mindedness, and intraorganizational knowledge sharing to define learning orientation. These works verify the importance of a learning environment to firm innovativeness and financial performance.

Strategic Direction

Innovation-oriented firms possess the inclusion of a future-oriented concept of the business, captured in the strategic beliefs and understandings that define who the firm is and how the activities of the organization are assembled to ensure that innovation happens in a timely fashion—the strategic direction. The strategic component of an innovation orientation “reflects the strategic directions implemented by a firm to create the proper behaviors for the continuous superior performance of the business” (Gatignon and Xuereb, 1997, p. 78). In essence, this component is the way of thinking and leading that drives the firm over the long run, keeping it innovative. Strategic direction involves clarity of thought and purpose and is generally articulated through vision and mission statements and objectives.

The strategic direction component of innovation orientation complements the entrepreneurial orientation construct, explicated by Naman and Slevin (1993). Both encourage strategies that drive the creation of new ideas and facilitate proactive and competitively aggressive positioning (Cooper, Woo, and Dunkelberg, 1989). However, strategic direction focuses on strategic understandings and beliefs toward innovation in the firm, whereas entrepreneurial orientation is perceived behaviorally as the processes, practices, and activities that result in innovation (Slater and Narver, 1993, 1995). In other words, entrepreneurial orientation is an amalgamated construct composed of both strategies and actions (Hult, Hurley, and Knight, 2004; Naman and Slevin, 1993), whereas strategic direction is conceptualized as strategic organizational cognitions that will lead to innovation.

Much of the strategy literature has failed to incorporate organizational learning research into its overly analytical proclivity toward direction setting and strategic renewal, as noted by Crossan and Berdrow (2003). Nevertheless, some research has focused on the effects of specific strategic factors on innovation. Bart (1998), for example, found that portions of the strategic process, including the statement of competitive strategy and the articulation of one overarching goal, significantly affects firm innovativeness, whereas Ozsomer, Calantone, and Di Benedetto (1997) found that strategic aggressiveness positively influences innovativeness. More recently, Schlegelmilch, Diamantopoulos, and Kreuz (2003, p. 118) constructed a framework where strategic innovation is defined as “the fundamental reconceptualization of the business model and the reshaping of existing markets (by breaking the rules and changing the

nature of competition) to achieve dramatic value improvements for customers and high growth companies.” The authors posit that culture, processes, people, and resources drive strategic innovation, which then affects customer value creation and competitive positioning. Their conceptualization, though less comprehensive than the present one, recognizes an orientation to innovate and suggests similar relationships; however, the Schlegelmilch, Diamantopoulos, and Kreuz construct ordering and effects differ from those proposed in this article.

Transfunctional Acclimation

Typically, a unique set of structures and guiding principles that determine activities and behaviors are embedded in each functional area of a firm. The various functional areas of an innovation-oriented firm, however, should be guided by a unique, embedded knowledge structure—called transfunctional acclimation—that encourages and facilitates knowledge transfer across and within subunits to retain diversity of views and fosters cooperative beliefs and understandings among all functional areas to direct them toward innovation. As Sivadas and Dwyer (2000, p. 33) state, “Innovators need some mechanism to connect departmental ‘thought worlds’ so that insights possessed by individual departments can be combined to develop new products that harness the collective wisdom of all involved.”

Prior studies involving new product development have supported the need for cooperation and mutual goals across multiple functional areas. For example, Song, Montoya-Weiss, and Schmidt (1997) argue that new product development cannot be successful without reducing the barriers between departments and may actually be inhibited by poor formal and informal communication between functional areas (e.g., Cooper, 1993). Other studies note that strong coordination among R&D, marketing, and operations is critical for innovation success (e.g., Song, Neeley, and Zhao, 1996; Zirger and Maidique, 1990). Thus, in this study, innovation orientation, through the transfunctional acclimation component, is the mechanism that captures the departmental thought worlds about how functional knowledge structures are used to learn and strategize as a total enterprise or collective body to facilitate innovation within the organization.

The knowledge structure of the firm, or innovation orientation, has been defined in this section, and its three key elements—learning philosophy, strategic direction, and transfunctional

acclimation—have been discussed in detail. As attitudes and beliefs lead to action (Fishbein, 1967), innovation orientation is modeled as a set of beliefs and understandings that lead to firm-wide actions resulting in firm competencies that enable innovation throughout the firm. Organizational competencies that emerge from possessing a strong innovation orientation are now discussed.

Requisite Competencies and Research Propositions

Organizational competencies are the activities an organization is good at doing (Warren, 2002). A more innovation capable organization is one that is able to build and deploy distinctive resources faster than others (Winter, 2003), with this ability arising from the existence of a clearly identified learning philosophy, a strategic direction, and a transfunctional acclimation aimed at innovation. Firms possessing strong innovation orientations encourage the acquisition of competencies that facilitate innovation. The deliberate managerial actions, processes, procedures, and practices are honed to a set of innovation competencies because of the overarching innovation orientation that unifies and guides action.

This conceptualization of competencies is similar to that of dynamic capabilities (Eisenhardt and Martin, 2000) in which the competencies are not related to a specific technology or product but to a set of abilities that make a firm more agile and responsive to change via an integrated and flexible system that extend a firm's innovation orientation into action. Eisenhardt and Martin's view of dynamic competencies emphasizes organizational processes, broadly defined, whereas the conceptualization of organizational competencies employed in the present article focuses on the deliberate managerial actions, processes, procedures, and practices that are done in the firm to develop specific innovation-facilitating competencies.

Over time, the congruency in interactions of all organizational activities builds a breeding ground for innovations that ultimately leads to sustained firm performance (Figure 1). For example, the learning philosophy dictates and directs organization-wide learning in ways that enhance the chances of building skill in specific actions that improve or enhance learning, such as improved opportunities for learning and knowledge dissemination through technology. Likewise, the strategic direction of the firm dictates priorities and informs resource choices that

may lead to continuous improvement in planning, organizational processes, and design. Finally, the transfunctional acclimation will foster interdepartmental communication structures and processes for managing information sharing to better facilitate coordinated innovation efforts. Under the systems approach adopted in this article, the three elements of innovation orientation and their effects on organizational competencies must be viewed together as one construct: innovation orientation. The organizational competencies that emerge from a strong innovation orientation are skills or activities that become more refined and valuable with continuous investment over time (Hitt, Keats, and DeMarie, 1998; Prahalad and Hamel, 1990). The literature suggests that the dominant organizational competencies required to implement an innovation orientation are carefully built and accumulated over time in the domains of resource allocation, technology, markets, human resources, and operations (e.g., Kumar, 2002; Nelson, 1991; Ritter and Gemunden, 2004; Verona and Ravasi, 2003). Each of these competencies is representative of the total enterprise and are all affected by the overarching knowledge structure that is an innovation orientation. These specific organizational competencies included in the model are discussed next.

Resource Allocations

A firm's resources offer no competitive advantage (Murray and Donegan, 2003). Instead, careful and correct allocation of resources, based on the beliefs and understandings of the innovation orientation as determined by the firm's learning philosophy, strategic direction, and transfunctional acclimation, enables innovative efforts. That is, resource allocation will be determined by the knowledge structure of the firm based on the firm's ability to acquire and use knowledge as it relates to innovation (i.e., learning philosophy), its understanding and beliefs toward innovation (i.e., strategic direction), and its ability to guide all functional areas toward cooperative innovation (i.e., transfunctional acclimation).

Firms that embrace an innovation orientation will provide the resources, such as capital, tools, and human resource talent, for a broader range of innovations and are more likely to fund radical innovations. Innovation-oriented firms direct resources specifically toward innovative ideas, are supportive of human resources who champion new ideas, regardless of the employee's job title, and reduce the bureaucratic red tape needed to get approval to pursue an idea (see, e.g., Loof and Heshmati, 2002). Further, they are willing to place the human talent

needed behind innovations to ensure success. In short, these firms provide sufficient resources to fully develop and sustain innovation within the organization at a higher rate than competitors (e.g., Cozijnsen, 1993; Henard and Szymanski, 2001; Kanter, 1983) and recognize that the innovative process is a long-term investment requiring commitment (Thamhain and Kamm, 1993; Van de Ven et al., 1999). The innovation orientation of a firm can vary in strength on a continuum, in which those with stronger orientations will be more likely to devote resources to innovation throughout the firm. Firms that fail to appropriately invest risk core rigidity that can actually stifle innovation (Hitt, Keats, and DeMarie, 1998; Tushman and O'Reilly, 1997). These findings lead to the testable proposition:

***P1:** Firms with a strong innovation orientation (i.e., overarching knowledge structure) are more likely to devote resources to all areas of the firm in efforts that specifically encourage the creation, development, and implementation of innovations.*

Technology Competencies

Innovation orientation directly determines the technology choices a firm makes and how that technology is leveraged to ultimately produce high-quality innovations leading to firm performance as modeled. Although the components of the innovation orientation knowledge structure are best viewed together, the learning philosophy element of innovation orientation will determine which technologies are acquired and developed to facilitate organization-wide learning, the strategic direction component will likely foster technologies that facilitate innovative processes and structures, and the transfunctional component will focus on technologies that facilitate intraorganizational communications. Both Utterback and Abernathy (1975) and Galbraith and Schendel (1983) suggest that firms selecting performance-maximizing strategies will also emphasize a technology orientation. Other research has found that highly innovative firms tend to choose and devote resources to the development, acquisition, and use of new technologies and R&D that facilitate and enhance the adoption of change in the organization, its processes, and offerings (see, e.g., Han, Kim, and Kim, 2001). Results of recent empirical studies have highlighted the importance of a firm's technological choices on the success rate of a firm's innovations (Gatignon and Xuereb, 1997; Han, Kim, and Srivastava, 1998), though technology is not the primary driver of productivity growth (Farrell, 2003). Innovation-oriented firms use technology both as a tool and to stimulate innovation. Consequently, innovation-

oriented firms are proactive in researching, developing, acquiring, and using new technologies (e.g., Grupp, 1998) to affect innovation. Accordingly, the literature leads to the following proposition:

P2: Firms with a strong innovation orientation (i.e., overarching knowledge structure) are more likely to develop and deploy new technologies to stimulate and sustain innovation.

Employee Competency

The way a firm views, interacts with, and enables its employees through knowledge dissemination, clarity of direction, and commonly shared understandings either facilitates or inhibits their capacity to invent. Thus, the innovation orientation elements require the firm to select, train, and reward employees that value learning, are oriented toward innovation in all areas of the firm, and who will work together, even across functions. An innovation-oriented firm focuses attention on engaging people: "If we want people to be innovative, we must discover what is important to them, and we must engage them in meaningful issues" (Wheatley, 2002, p. 12). Numerous authors have provided prescriptive guidance for managing people in an innovative firm, reporting that top management in an innovation-oriented firm encourages employee interaction and innovation and demonstrates that the ideas of employees at all levels are valued (e.g., Hosseini, Azar, and Rostamy, 2003; Kanter, 1983; Thamhain and Kamm, 1993). These organizations openly foster employee risk-taking associated with innovative ideas to improve all aspects of the organization (e.g., Calantone, Garcia, and Droge, 2003). In this type of work community, employees are energized by the orientation of the firm, and new ideas are routinely generated and embraced by employees who feel they belong and that their contributions are valued (Chandler, Keller, and Lyon, 2000; Cozijnsen, 1993; Kanter, 1983; Szakonyi, 1994). Researchers also argue that innovation is fostered in organizations that enhance employee autonomy, permit free expression, and devise interfunctional cooperation (e.g., Fairlough, 1994; Kanter, 1983; Thamhain and Kamm, 1993).

Though much of the literature suggests a one best way to foster employee innovation, the metamessage is that management must appreciate, encourage, direct, and enhance the willingness of employees to place their energy and diversity of ideas in the service of a set of collective understandings and beliefs to help orient or guide an overall innovation community.

As Tang (1999) suggests, leadership that works to assemble an open employee environment can significantly affect organizational innovation. The literature overwhelmingly suggests the presence of specific employee-directed competencies of innovation-oriented firms, which leads to the following proposition:

***P3:** Firms with a strong innovation orientation (i.e., overarching knowledge structure) are more likely to implement formal and informal policies, procedures, practices, and incentives specifically devoted to stimulate and sustain innovation-directed individual employee actions.*

Market Competency

Market-focused competencies are essentially derived from the much-researched construct market orientation, which is composed of attitudes and behaviors that create “superior value for buyers and, thus, continuous superior performance for the business” (Narver and Slater, 1990, p. 21). Two conceptualizations of market orientation dominate the literature: one defined in terms of the three behavioral components—customer orientation, competitor orientation, and interfunctional coordination (Narver and Slater, 1990)—and the other in terms of three firm activities—information generation, information dissemination, and responsiveness (Kohli and Jaworski, 1990). Both conceptualizations classify marketing outcomes (i.e., responsiveness defined by Kohli and Jaworski [1990] as the design of plans based on market intelligence and the execution of such plans) and operational competencies (i.e., interfunctional coordination) as marketing competencies. In this way, the responsiveness dimension of market orientation as conceptualized by Jaworski and Kohli (1993) is a form of innovative behavior. Hult, Hurley, and Knight (2004, p. 431) agree that responsiveness should be separated from the information components of market orientation; specifically, they argue “that translating market intelligence into action is part of a larger planning and decision-making process that affects even internally oriented changes” and that innovations (i.e., the response) will follow from the understanding of market intelligence.

Similarly, interfunctional coordination is defined as the “coordinated utilization of company resources” (Narver and Slater, 1990, p. 22) and is an operational competency rather than a marketing competency. Moreover, prior research has advocated uncoupling the market

orientation components because an aggregate construct may “limit its strategic value for management practice” (Lukas and Ferrell, 2000, p. 244). Adopting these recommendations in the present study, responsiveness and interfunctional coordination are detached from market orientation to define market competency as the gathering and dissemination of information about customer- and competitor-oriented needs, behaviors, and intent.

Although Narver and Slater's (1990) components of market orientation have been found to relate significantly to innovation (e.g., Han, Kim, and Kim, 2001; Han, Kim, and Srivastava, 1998), the literature concerning the exact relationship between innovation culture and market orientation has been equivocal. Hurley and Hult (1998) and Hult, Hurley, and Knight (2004) model market orientation as an antecedent of an innovative culture. Menon and Varadarajan (1992) suggest that an innovation culture encourages information dissemination (one of Kohli and Jaworski's [1990] market orientation components), which implies that innovation orientation is an antecedent of market orientation. The present study concurs with this latter view and proposes that innovation-oriented firms value, develop, and implement market competency activities to enhance innovation. That is, the beliefs and understandings surrounding learning, strategic direction, and transfunctional acclimation will encourage the collection of customer and competitor intelligence and the dissemination of that intelligence across all functional areas so that product innovations provide greater value added for customers than do competitive products. These aggregate findings suggest the following:

***P4:** Firms with a strong innovation orientation (i.e., overarching knowledge structure) are more likely to implement policies, procedures, practices, and incentives specifically devoted to gathering and disseminating information about customer and competitor markets to stimulate and sustain innovation.*

Operations Competency

In this study, operations competency relates to all management-controlled activities that affect the work of an organization—the processes and way of working and the formal and informal organization design, including how management views work process change and all communication channels. Innovation-oriented firms specifically develop operational competencies that facilitate new learning, continuous change, and improvement in

administrative and work processes and encourage gathering and disseminating information from an array of sources to improve the mechanisms and processes within the firm. Many authors have discussed this aspect of innovative firms by emphasizing the existence of quality and continuous improvement in processes and production (e.g., Damanpour, 1991; Troy, Szymanski, and Varadarajan, 2001).

Also subsumed in the operational competency component is the organizational structure of the firm and the literature is adamant about the importance of structure to innovation (e.g., DeCanio, Dibble, and Amir-Atefi, 2000). Specific structural changes that enhance innovation are often advocated, such as flatter hierarchies, to facilitate communications and implementation of new ideas. The literature suggests that innovation-facilitating intrafirm structures are characterized by decentralization, an informality that lacks rigid guidelines, job assignments, and boundaries (e.g., Damanpour, 1991; Troy, Szymanski, and Varadarajan, 2001). Within such a structure, individuals are empowered, and job assignments are ambiguous, nonroutine, and broad in scope (Kanter, 1983; Szakonyi, 1994). In essence, organizational design encourages interaction and creates synergies between functional areas. In reality, innovative firms do not always follow the normative behaviors prescribed by these writers. General Electric and 3M are both specifically recognized for their innovativeness, yet, neither has a flat structure, suggesting no one best organizational design defines an innovation orientation.

Organizational culture is another facet of operational competency shaped by the innovation orientation of the firm. The collective firm knowledge structure regarding learning, beliefs, and understandings that define the organizational direction and functional interactions toward innovation will influence organizational design and processes. Often characterized as a culture in which employees are encouraged to challenge and experiment, many scholars argue that innovation-oriented firms must create an environment in which employees are free to explore without fear of punishment (Dundon, 2002; Horibe, 2001). Hence,

P5: Firms with a strong innovation orientation (i.e., overarching knowledge structure) are more likely to organize and coordinate operational processes and structures and to engage in shaping the organizational culture to stimulate and sustain innovation.

Linking Competencies to Innovation-Related Outcomes

As illustrated in Figure 1, the organizational competencies derived from a strong innovation orientation directly determine innovation form, rate, and type, which then affect performance outcomes, including market position, operational efficiency, and financial results, with all relationships moderated by environmental turbulence. The present study's model suggests that the innovation orientation of a firm indirectly shapes performance via the building of the competencies previously discussed. Nevertheless, some studies have reported direct effects between organizational innovativeness and performance (e.g., Subramanian and Nilakanta, 1996). Others have not found direct connections with performance (Chandler, Keller, and Lyon, 2000), perhaps because the total value of innovation is not always immediately apparent but rather is realized only over time and after competencies are built and actualized (Gilbert and Bower, 2002). The posited links from organizational competencies to innovation and firm performance modeled in this study are only briefly discussed next because of their extensive support in the literature.

Innovation Form Linkages

An innovation orientation is likely to affect both forms of innovation presented in the literature: radical and incremental. Radical innovations redefine the market and cause disruptive change within the organization (e.g., Fairlough, 1994; Lawless and Anderson, 1996). Incremental innovations are minor changes stemming from an orderly, natural progression in knowledge (e.g., Lawless and Anderson, 1996). Cumulatively, incremental innovations may have a large impact, but singularly they are almost imperceptible because their effects are minute (Hollander, 1965). Although innovations likely fall along a continuum from incremental to radical, most studies focus on the endpoints of this continuum (e.g., Dewar and Dutton, 1986). In reality, firms with a proclivity toward the adoption of radical innovations also embrace more incremental innovations (e.g., Dewar and Dutton, 1986; Germain, 1996), and the innovativeness of a firm is positively related to greater novelty in product innovations (Vázquez, Santos, and Alvarez, 2001).

Organizations with stronger innovation orientations will build the organizational competencies that make it possible to produce more innovations of all types—from radical to incremental and in between—up to a point of diminishing return. Peters and Waterman (1982) suggest that when more tests and trials take place, the number of successful innovations

increases, although more innovations will not always have positive effects. The present authors likewise believe that the relationship between numbers of innovations and performance is nonmonotonic; after some ideal point, the returns from more innovations of all types diminish because of the inability of the firm to focus on numerous innovations or to depart from core competencies (see, e.g., Teas, 1994, for a discussion of the classic ideal point in a services marketing context). Supporting studies include Tushman and O'Reilly (1996) and Damanpour and Gopalakrishnan (1999), who found that firms designed to facilitate innovation (i.e., possess an innovation orientation) had greater flexibilities and capabilities in adopting both radical and incremental innovations and the firm's ability to pursue both forms of innovation resulted in long-term success. These findings from prior research suggest the following proposition:

***P6:** Strong innovation orientation firms will have organizational competencies that are more likely to produce greater numbers of both radical and incremental innovations, although the relationship is nonmonotonic.*

Innovation Type Linkage

An innovation orientation should facilitate the development of organizational competencies that lead to innovations in all aspects of the firm: marketing; processes, which are sometimes referred to in the literature as technical; and administrative activities. Although research on all but new product innovation is scant to nonexistent in the literature (Han, Kim, and Srivastava, 1998), evidence of this linkage is provided by Hurley and Hult (1998). They linked innovativeness, defined as “the organization's overall approach to innovation” to the capacity to innovate, defined as “the ability of the organization to adopt or implement new ideas, processes, or products successfully” (p. 44).

Most previous literature has focused primarily on different types of innovations in products (i.e., markets), processes, and administrative innovations (Tushman and O'Reilly, 1997). Process innovations are changes in ways of doing business or producing products and services: anything that alters the way the work gets done, the way the jobs get designed, or the way the execution occurs (Smeds, 2001). “Administrative innovations involve organizational structure and administrative process; they are indirectly related to the basic work activities of an organization” (Damanpour, 1991, p. 560) and may include downsizing layers of the organization

and creating a flatter organizational structure. An innovation orientation should increase innovations in processes, administrative innovations, products, and beyond. Innovation orientation means making innovation the focus of the whole organization. As a result, innovative activities should occur across all functional areas and within all types of tasks. Duss (1992, p. 5), in conjunction with Schumpeter (1911), offers support for this perspective by arguing that innovativeness is “profitable increases in economic efficiency brought about by the putting up of new resource combinations by entrepreneurs” and may occur in technology, methodology, organizational, and market developments. In total, these previous findings and discussion suggest the following proposition:

***P7:** Strong innovation orientation firms will have organizational competencies that are likely to produce more innovations in all of the innovation types—marketing, process, and administrative innovations.*

Rate of Innovation Linkage

The innovation literature is replete with references to the speed or rate of innovation development (e.g., Calantone, Garcia, and Droge, 2003; Hurley and Hult, 1998). For example, Vázquez, Santos, and Álvarez (2001) report a positive association between a firm's innovativeness and the rate of innovation, and Griffin (1997) found contingency in development cycle speed. Others (e.g., Hage and Aiken, 1970) have found that project characteristics, such as complexity, affect speed of product development. Undoubtedly, innovation cycle time is used as an outcome measure in part because it is relatively easy to assess. Speed of innovation is included in this research with the understanding that faster cycle times will not always have positive effects. Returns gained from faster innovations diminish at some point, making the relationship between the speed of the innovation development process and performance (e.g., rate of return) nonmonotonic. Based on this previous research, innovation-oriented firms are argued to have the organizational competencies to modify the timing of innovations, to speed the cycle appropriately, and to absorb the innovations occurring outside the environmental scanning logic because they are more proficient in fostering a synergistic environment conducive to change. Formally stated,

P8: Strong innovation orientation firms will have organizational competencies that are more likely to take innovations from inception to implementation at a faster rate, although the relationship is nonmonotonic.

The Relationship of Innovations to Firm Performance

A variety of studies have explored the linkage between innovation form, type, or rate and organizational performance. Tatikonda and Montoya-Weiss (2001), for example, found that organizational process factors affect outcomes such as product quality and costs, which then affect market outcomes. Likewise, Damanpour and Evan (1984) and Han, Kim, and Srivastava (1998) report that administrative and process innovations are positively related to organizational performance, whereas Damanpour and Gopalakrishnan (2001) found that high-performing organizations have a history of adopting an equivalent number of product and process innovations. Similarly, Ittner and Larcker (1997) found a significant relationship between innovations and firm performance measures such as return on assets and growth within the computer industry. Though much of the past research has focused on one form of innovation, taken together the literature suggests that the introduction of various types of innovation (i.e., marketing, process, and administrative) will lead to higher levels of performance. However, the relationship between both numbers of innovations and the speed of the innovation development process and performance measures such as return on investment and profitability is likely nonmonotonic—that is, that after some ideal point, the returns from more or faster innovations diminish—because of the inability of the firm to focus on many innovations and to adequately develop innovations prior to commercialization. Hence,

P9: The more innovations introduced (i.e., market, process, and administrative), the higher the level of firm performance, although the relationship is nonmonotonic.

Innovations may range from radical to incremental. As Damanpour and Gopalakrishnan (1999, p. 77) state, “Organizational performance is a function of innovating, not adopting radical, technical, product, or any one type of innovation alone.” Further, Palmer and Brookes (2002) found incremental innovation improved performance, although Baker and Sinkula (2002) cautioned that incremental changes translate into only short-term competitive advantages.

Other researchers have found that innovation rate (Cefis and Ciccarelli, 2005; Vázquez, Santos, and Álvarez, 2001) and more novel or radical product innovations increase company performance (Marsili and Salter, 2005; Vázquez, Santos, and Álvarez, 2001). Relevant to this link between the type of innovation and performance is the following proposition:

***P10:** The more both radical and incremental forms of innovation are implemented, the higher the level of firm performance, although the relationship will be nonmonotonic.*

Finally, both the number of innovations produced and the cycle time from idea to fruition are measures of the level of innovation commonly reported in the literature. Research in this regard indicates that the number of innovations implemented positively influences performance (Hall and Bagchi-Sen, 2002), with one caveat. As previously noted, the number of innovations must be manageable and central to the core business of the firm to positively affect firm performance. The body of research about the effects of cycle time on performance has seen mixed results. Several studies have found no direct influence of innovation process speed on performance outcomes (e.g., Bolton, 1993), whereas other research that considers extraneous factors have found effects. For example, Datar et al. (1997, p. 45) found that “faster product development above certain threshold levels leads to higher market share,” and Ittner and Larcker (1997) found that cycle times increased performance measures under certain conditions (i.e., cross-functional teams and the use of advanced design tools). This latter study, in particular, would seem to support the model proposed in the present article by suggesting that the linkage between speed and performance is positive and significant when operational and people-focused organizational competencies exist to support an innovation orientation. Therefore,

***P11:** The greater the speed of innovations developed, the higher the level of firm performance, although the relationship will be nonmonotonic.*

Environmental Turbulence as Moderator

Any number of variables may moderate or mediate the innovation orientation to firm performance path, but environmental uncertainty is the most apparent and well-documented

factor in the literature and therefore is included in the model. Environmental uncertainty, or turbulence, may be viewed as occurring along a continuum, with “clarity, certainty, and stability about environmental demand at one extreme and ambiguity and uncertainty at the other” (Friedman and Goes, 2000, p. 319). For the most part, the innovation literature supports the idea that environmental turbulence facilitates innovation (e.g., Calantone, Garcia, and Droge, 2003; Chandy, Prabhu, and Antia, 2003). The logic underlying this association is based on research suggesting that product innovation is generally an expensive process for which the costs are rarely recouped (Miller, Droge, and Toulouse, 1988); therefore, firms in stable environments have less need of incurring these costs, whereas firms in turbulent environments must constantly innovate to stay ahead of the competition and to meet changing customer needs (Miller, Droge, and Toulouse, 1988).

Though form, diversity of type, and speed of innovations will likely increase firm performance, the relationship is not guaranteed; its strength and longevity will be influenced by a variety of factors (Song and Parry, 1997). In a comprehensive examination of past empirical innovation-performance research, Capon, Farley, and Hoenig (1990) found the relationship to be ambiguous. Though two thirds of the studies reported a positive relationship between product innovation and performance outcomes, the remainder found either no relationship or a negative relationship. Li and Atuahene-Gima (2001, p. 1123) attribute the contradiction in results to omissions of “factors that may moderate the strength of the relationship between product innovation strategy and firm performance.” Their study, one of the first to include moderating effects of the environment, found that environmental turbulence serves to strengthen the relationship between innovation and performance. Given the evidence in the literature about environmental uncertainty facilitating innovation, the following proposition is offered:

***P12:** Environmental turbulence will moderate the relationships among a firm's innovation orientation; organizational competencies; innovation form, type, and speed; and firm performance.*

Contribution of the Framework and Conclusions

Several major theoretical contributions emerge from this conceptual framework. A clear and theoretically grounded definition of innovation orientation is provided as an important first step in building the construct. This proposed definition is based on an organizational knowledge structure perspective, a perspective not frequently used to frame organizational concepts in the literature. The foremost contribution of the present article is the creation of an overriding framework for understanding and managing innovation founded on insights from multiple disciplines, knowledge-based theory, and the resource-based view of the firm. This broad view of innovation orientation is especially important for four reasons. First, a focus on explicit areas for innovation, such as products or processes, may limit innovations to narrow categories, whereas an innovation orientation perspective encourages the integration of innovation into all areas of the firm to better create a long-term sustainable advantage. Second, a broader view of innovation, rather than one limiting innovation to either just products or processes, is essential to identifying, managing, and leveraging firm-controllable innovation patterns of understanding. Third, the formal recognition of an innovation orientation system as a pervasive set of understandings should reduce the ambiguity found in the current innovation literature, which has yet to agree on a definition of the construct (Garcia and Calantone, 2002). Finally, the framework provided here will help innovation-striving firms identify and develop organizational conditions and competencies needed to fulfill innovation objectives.

As recent work has shown, a firm's ability to use its knowledge resources is a key factor in the development of dynamic capabilities (Subramaniam and Youndt, 2005). Within the context of the diverse and fragmented innovation literature reviewed in this article and the broad strategic planning process, the innovation orientation concept defined and modeled in this article offers a clear and potentially rich view to begin the managerial challenge of developing an innovation orientation that will influence a firm's sustainable innovation capability. Business history teaches through numerous examples that innovation in products or in processes alone is insufficient to create long-term survival or a competitive advantage. Instead, there must be a collective set of understandings and beliefs, pervasively accepted throughout the firm and likely to occur at all levels and functions, that facilitates continual processes to insure long-term competitive advantage. Hence, the most appropriate focus of future research is the more global conceptualization of firm innovation orientation, or the propensity of the firm to innovate overall, rather than a narrow focus on the form of innovations, the rate of innovations, or even the type of innovations, although these variables are important outcome measures and should improve with the adoption of an innovation orientation. This article reverses this considerable omission in

the literature by placing past research results into an overall framework that should enhance understanding of the innovation-oriented firm.

The highest priority for future research must be the development of a standard measure of innovation orientation based on the elements defined in this study. Until this measure is developed and verified, the role of innovation orientation on any aspect of firm performance will remain a mystery. The relative weight of each of the knowledge structure components and the organizational competencies in resources, technology, operations, employees, and markets and their overall contribution to the innovation orientation of the firm should also be determined for such a measure. The developed innovation orientation measure will then allow the testing of each path in the overall proposed framework. Specifically, the effects of innovation orientation on innovation have yet to be examined empirically. The position taken here is consistent with that of Varadarajan and Jayachandran (1999) and others who note the need for research examining the effects of innovations in areas other than new products and the speed of new product introductions on firm performance.

Other fruitful areas of research include a comparison of strong innovation-oriented firms to weak innovation-oriented firms; a longitudinal examination of innovation-oriented firms, especially in relation to their intra-industry and their weaker innovation counterparts; and a comparison of innovation-oriented firms by industry. Too often some of these relationships have been assumed to hold true without rigorous, empirical research to provide support. This proposed framework will allow such testing. In addition, a firm's innovation orientation is still a nascent stream of research that presents a fallow field for interested parties. It is hoped that the framework provided here will yield a wealth of future work in this highly interesting area.

Acknowledgments

We wish to thank G. Tomas M. Hult for his comments and suggestions offered at the beginning of this project.

Table 1. Representative Innovation Literature by Focus

Topic	Exemplary Research
Economics of Research and Development	Bloch (2005), Freeman (1994), Grupp (1998), Marsili and Salter (2005), Tipping, Zeffren, and Fusfeld (1995)
Effects of Market Orientation on Product and Process Innovation	Han, Kim, and Srivastava (1998), Lukas and Ferrell (2000), Varela and Benito (2005), Zhou, Chi, and Tse (2005)
How-To and Value of Innovation	Chen, Liu, and Tjosvold (2005), Kim and Mauborgne (2000), Tushman and O'Reilly (1997, 1999), von Hippel, Thomke, and Sonnack (1999)
Innovation Adoption Process	Larsen and Ballal (2005), O'Neill, Poudier, and Buchholtz (1998), Rogers (1995), Van de Ven et al. (1999)
Innovativeness Typologies	Ansoff and Stewart (1967), Brown and Maylor (2005), Freeman (1974), Miles and Snow (1978)
Descriptive Studies of Innovative Firm Characteristics	Bolton (1993), Conway (1997), Cozijnsen and Vrakking (1993), Freeman (1994), Heydebreck (1997), Kanter (1983), Kiely (1993), Nadler and Tushman (1990), Szakonyi (1994), Thamhain and Kamm (1993), Webster (2004)
Innovativeness or Innovation Orientation Mentioned	Amabile (1997), Atuahene-Gima and Ko (2001), Berthon, Hulbert, and Pitt (1999), Calantone, Cavusgil, and Zhao (2002), Damanpour and Gopalakrishnan (1999), Homburg, Hoyer, and Fassnacht (2002), Hult, Hurley, and Knight (2004), Hurley and Hult (1998), Kundu and Katz (2003), Manu (1992), Manu and Sriram (1996), Mairesse and Mohnen (2002), Subramanian and Nilakanta (1996), Tang (1999), Vasquez, Santos, and Álvarez (2001), Woodside (2005), Worren, Moore, and Cardona (2002)

Conceptualizing Innovation Orientation: A Framework for Study and Integration of Innovation Research*

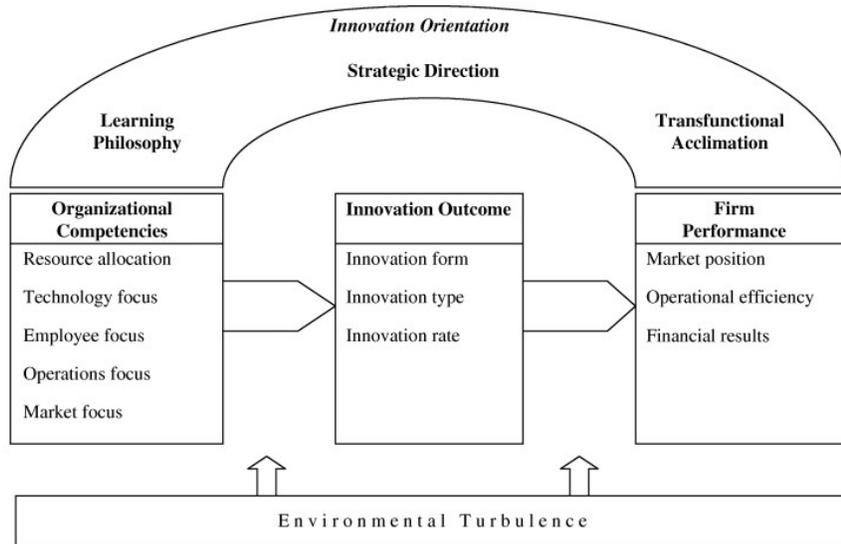


Figure 1. Model of Innovation Orientation: Drivers, Actions, and Outcomes

References

- Amabile, Teresa M. (1997). Motivating Creativity in Organizations: On Doing What You Love and Loving What You Do. *California Management Review* 40(1):39–58.
- Ansoff, H.I. and Stewart, J.M. (1967). Strategies for a Technology-Based Business. *Harvard Business Review* 45(6):71–83 (November–December).
- Atuahene-Gima, Kwaku and Ko, A. (2001). An Empirical Investigation of the Effect of Market Orientation and Entrepreneurship Orientation Alignment on Product Innovation. *Organization Science* 12(1):54–74.
- Baker, William E. and Sinkula, James M. (1999). Learning Orientation, Market Orientation, and Innovation: Integrating and Extending Models of Organizational Performance. *Journal of Market-Focused Management* 4(4):295–308.
- Baker, William E. and Sinkula, James M. (2002). Market Orientation, Learning Orientation and Product Innovation: Delving into the Organization's Black Box. *Journal of Market-Focused Management* 5(1):5–23.
- Barney, Jay B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17(1):99–120.
- Bart, Christopher K. (1998). A Comparison of Mission Statements and Their Rationales in Innovative and Non-innovative Firms. *International Journal of Technology Management* 16(1–3):64–77.
- Bell, Simon J., Whitwell, Gregory J. and Lukas, Bryan A. (2002). Schools of Thought in Organizational Learning. *Journal of the Academy of Marketing Science* 30(1):70–86.
- Berthon, Pierre, Hulbert, James M. and Pitt, Leyland F. (1999). To Serve or Create? Strategic Orientations toward Customers and Innovation. *California Management Review* 42(1):37–58.
- Bloch, Carter (2005). R&D Investment and Internal Finance: The Cash Flow Effect. *Economics of Innovation and New Technology* 14(3):213–23.
- Bolton, Michelle Kremen (1993). When Is Necessity the Mother of Invention? In: *Handbook of Innovation Management, Part I*. Mark Dodgson and Roy Rothwell (eds.). Oxford: Blackwell Publishers, 14–41.
- Brown, Steve and Maylor, Harvey (2005). Strategic Resonant Firms, Mass Producers, Big Fish and Flat Liners: A Study of Policies, Practices and Performance in Innovation. *Technovation* 25(4):307–19.

- Buckler, Sheldon A. and Zien, Karen Anne (1996). From Experience: The Spirituality of Innovation: Learning from Stories. *Journal of Product Innovation Management* 13(5):391–405.
- Burns, Tom and Stalker, G.M. (1977). *The Management of Innovation*, 2d ed. London: Tavistock.
- Calantone, Roger J., Cavusgil, S. Tamer and Zhao, Yushan (2002). Learning Orientation, Firm Innovation Capability, and Firm Performance. *Industrial Marketing Management* 31(6):515–24.
- Calantone, Roger J., Garcia, Rosanna and Droge, Cornelia (2003). The Effects of Environmental Turbulence on New Product Development Strategy Planning. *Journal of Product Innovation Management* 20(2):90–103.
- Capon, Noel, Farley, John U. and Hoenig, Scott (1990). Determinants of Financial Performance: A Meta-analysis. *Management Science* 36(10):1143–59.
- Carr, Nicholas G. (1999). Forethought: Visualizing Innovation. *Harvard Business Review* 77(5):16.
- Cefis, Elena and Ciccarelli, Matteo (2005). Profit Differentials and Innovation. *Economics of Innovation and New Technology* 14(1–2):43–61.
- Chandler, Gaylen N., Keller, Chalon and Lyon, Douglas W. (2000). Unraveling the Determinants and Consequences of an Innovation-Supportive Organizational Culture. *Entrepreneurship Theory and Practice* 25(1):59–76.
- Chandy, Rajesh K., Prabhu, Jaideep C. and Antia, Kersi D. (2003). What Will the Future Bring? Dominance, Technology Expectations, and Radical Innovation. *Journal of Marketing* 67(3): 1–18.
- Chen, Guoguan, Liu, Chunhong and Tjosvold, Dean (2005). Conflict Management for Effective Top Management Teams and Innovation in China. *Journal of Management Studies* 42(2):277–300.
- Cohen, Wesley M. and Levinthal, Daniel A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly* 35(1):128–52.
- Conway, Steve (1997). Informal Networks of Relationships in Successful Small Firm Innovation. In: *Technology, Innovation and Enterprise*. Dylan Jones-Evans and Magnus Klofsten (eds.). Houndmills. London: MacMillan, 236–73.
- Cooper, Arnold C., Woo, Carolyn Y. and Dunkelberg, William C. (1989). Entrepreneurship and the Initial Size of the Firm. *Journal of Business Venturing* 4(5):317–32.

- Cooper, Robert G. (1993). *Winning at New Products: Accelerating the Process from Idea to Launch*, 2d ed. Reading, MA: Addison-Wesley.
- Cozijnsen, Anton (1993). Predicting Innovation Success with the DIPO-Instrument. In: *Handbook of Innovation Management, Part II*. Anton Cozijnsen and Willem Vrakking (eds.). Oxford: Blackwell Publishers, 95–108.
- Cozijnsen, Anton and Vrakking, Willem (1993). *Handbook of Innovation Management*. Oxford: Blackwell Publishers.
- Crossan, Mary M. and Berdrow, Iris (2003). Organizational Learning and Strategic Renewal. *Strategic Management Journal* 24(11): 1087–105.
- Crossan, Mary M., Lane, Henry W., White, Roderick E. and Djurfeldt, Lisa (1995). Organizational Learning: Dimensions for a Theory. *International Journal of Organizational Analysis* 3(4):337–60.
- Damanpour, Fariborz (1991). Organizational Innovation: A Metaanalysis of Effects of Determinants and Moderators. *Academy of Management Journal* 34(3):555–9.
- Damanpour, Fariborz and Evan, William M. (1984). Organizational Innovation and Performance: The Problem of Organizational Lag. *Administrative Science Quarterly* 29(3):392–409.
- Damanpour, Fariborz and Gopalakrishnan, Shanthi (1999). Organizational Adaptation and Innovation: The Dynamics of Adopting Innovation Types. In: *The Dynamics of Innovation: Strategic and Managerial Implications*. Klaus Brockhoff, Alok K. Chakrabarti and Jürgen Hauschildt (eds.). Berlin: Springer, 57–80.
- Damanpour, Fariborz and Gopalakrishnan, Shanthi (2001). The Dynamics of the Adoption of Product and Process Innovations in Organizations. *Journal of Management Studies* 38(1):45–65.
- Datar, Srikant, Jordan, C. Clark, Kekre, Sunder, Rajiv, Surenda and Srinivasan, Kannan (1997). Advantages of Time-Based New Product Development in a Fast-Cycle Industry. *Journal of Marketing Research* 34(1):36–49.
- DeCanio, Stephen J., Dibble, Catherine and Amir-Atefi, Keyvan (2000). The Importance of Organizational Structure for the Adoption of Innovations. *Management Science* 46(10):1285–99.
- Deshpande, Rohit (1999). Introduction. In: *Developing A Market Orientation*, ed. Rohit Deshpande. Thousand Oaks, CA: Sage Publications, Inc., 1–6.
- Dewar, Robert D. and Dutton, Jane E. (1986). The Adoption of Radical and Incremental Innovations: An Empirical Analysis. *Management Science* 32(11):1422–33.
- Dundon, Elaine (2002). *The Seeds of Innovation: Cultivating the Synergy that Fosters New Ideas*. New York: AMACOM.

- Duss, Henrik Johannsen (1992). The Measurement of Innovation: An Inquiry into the Possibilities and Prospects of Measuring Entrepreneurial Action. Working Paper, Copenhagen Business School, Marketing Institute, November 8.
- Eisenhardt, Kathleen M. and Brown, Shona L. (1999). Patching: Restitching Business Portfolios in Dynamic Markets. *Harvard Business Review* 77(3):72–82 (May–June).
- Eisenhardt, Kathleen M. and Martin, Jeffrey A. (2000). Dynamic Capabilities: What Are They? *Strategic Management Journal* 21(10–11):1105–23.
- Fairlough, Gerald (1994). Innovation and Organization. In: *Handbook of Industrial Innovation, Part I*. Mark Dodgson and Roy Rothwell (eds.). Aldershot, UK: Edward Elgar Publishing Limited, 325–36.
- Farrell, Diana (2003). The Real New Economy. *Harvard Business Review* 81(10):104–12 (October).
- Fiol, C. Marlene (2001). Revisiting an Identity-Based View of Sustainable Competitive Advantage. *Journal of Management* 27(6):691–9.
- Fishbein, Martin (1967). Attitudes and the Prediction of Behavior. In: *Readings in Attitude Theory and Measurement*. M. Fishbein (ed.). New York: John Wiley, 477–92.
- Freeman, Chris (1994). Innovation and Growth. In: *Handbook of Industrial Innovation, Part I*. Mark Dodgson and Roy Rothwell (eds.). Aldershot, UK: Edward Elgar Publishing Limited, 78–93.
- Friedman, Leonard H. and Goes, James B. (2000). The Timing of Medical Technology Acquisition: Strategic Decision Making in Turbulent Environments. *Journal of Healthcare Management* 45(5):317–30.
- Galbraith, Craig and Schendel, Dan (1983). An Empirical Analysis of Strategy Types. *Strategic Management Journal* 4(2):153–73.
- Garcia, Rosanna and Calantone, Roger (2002). A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review. *Journal of Product Innovation Management* 19(2):110–32.
- Gatignon, Hubert and Xuereb, Jean-Marc (1997). Strategic Orientation of the Firm and New Product Performance. *Journal of Marketing Research* 34(1):77–90.
- Germain, Richard (1996). The Role of Context and Structure in Radical and Incremental Logistics Innovation Adoption. *Journal of Business Research* 35(2):117–27.
- Gharajedaghi, Jamshid and Ackoff, Russell L. (1984). Mechanisms, Organisms and Social Systems. *Strategic Management Journal* 5(3):289–300.

- Gilbert, Clark and Bower, Joseph L. (2002). Disruptive Change: When Trying Harder Is Part of the Problem. *Harvard Business Review* 80(5):94–101 (May).
- Griffin, Abbie (1997). PDMA Research on New Product Development Practices: Updating Trends and Benchmarking Best Practices. *Journal of Product Innovation Management* 14(6): 429–58.
- Grupp, Hariolf (1998). *Foundations of the Economics of Innovation: Theory, Measurement and Practice*. Cheltenham, UK: Edward Elgar Publishing Limited.
- Hadjimanolis, Athanasios (2000). A Resource-Based View of Innovativeness in Small Firms. *Technology Analysis and Strategic Management* 12(2):263–81.
- Hage, Jerald and Aiken, Michael (1970). *Social Change in Complex Organizations*. New York: Random House.
- Hall, Linda A. and Bagchi-Sen, Sharmistha (2002). A Study of R&D, Innovation, and Business Performance in the Canadian Biotechnology Industry. *Technovation* 22(4):231–44.
- Han, Jin K., Kim, Namwoon and Kim, Hong-Bumm (2001). Entry Barriers: A Dull-, One-, or Two-Edged Sword for Incumbents? Unraveling the Paradox from a Contingency Perspective. *Journal of Marketing* 65(1):1–14.
- Han, Jin K., Kim, Namwoon and Srivastava, Rajendra K. (1998). Market Orientation and Organizational Performance: Is Innovation a Missing Link? *Journal of Marketing* 62(4):30–45.
- Hargadon, Andrew and Sutton, Robert I. (2000). Building an Innovation Factory. *Harvard Business Review* 78(3):157–64 (May–June).
- Henard, David H. and Szymanski, David M. (2001). Why Some New Products Are More Successful than Others. *Journal of Marketing Research* 38(3):362–75.
- Heydebreck, Peter (1997). Technological Interweavement: A Means for New Technology-Based Firms to Achieve Success. In: *Technology, Innovation and Enterprise*. Dylan Jones-Evans and Magnus Klofsten (eds.). Houndmills, UK: MacMillan, 274–302.
- Hitt, Michael A., Keats, Barbara W. and DeMarie, Samuel M. (1998). Navigating in the New Competitive Landscape: Building Strategic Flexibility and Competitive Advantage in the 21st Century. *Academy of Management Executive* 12(4):22–42.
- Hollander, Stanley (1965). *The Sources of Increased Efficiency: Study of DuPont Rayon Plants*. Cambridge, MA: MIT Press.
- Homburg, Christian, Hoyer, Wayne D. and Fassnacht, Martin (2002). Service Orientation of a Retailer's Business Strategy: Dimensions, Antecedents, and Performance Outcomes. *Journal of Marketing*, 66(4):86–101.

- Horibe, Frances (2001). *Creating the Innovation Culture: Leveraging Visionaries, Dissenters, and Other Useful Troublemakers*. New York: John Wiley and Sons.
- Hosseini, Hamid Khodadad, Azar, Adel and Rostamy, Ali Asghar Anvary (2003). The Intervening Role of Innovative Climate: A Study of Middle Managers in Manufacturing Organizations in Iran. *Public Organization Review* 3(2):151–70.
- Hult, G.Tomas M., Hurley, Robert F. and Knight, Gary A. (2004). Innovativeness: Its Antecedents and Impact on Business Performance. *Industrial Marketing Management* 33(5):429–38 (July).
- Hurley, Robert F. and Hult, G.Tomas M. (1998). Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination. *Journal of Marketing* 62(3):42–54.
- Ittner, Christopher D. and Larcker, David F. (1997). Product Development Cycle Time and Organizational Performance. *Journal of Marketing Research* 34(1):13–23.
- Jaworski, Bernard J. and Kohli, Ajay K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing* 57(3):53–70.
- Kanter, Rosabeth Moss (1983). *The Change Masters: Innovation and Entrepreneurship in the American Corporation*. New York: Simon and Schuster.
- Kiely, Thomas (1993). The Idea Makers. *Technology Review* 96(1): 33–40.
- Kim, W. Chan and Mauborgne, Rene ´e (2000). Knowing a Winning Business Idea When You See One. *Harvard Business Review* 78(5):129–38 (September–October).
- King, Adelaide Wilcox and Zeithaml, Carl P. (2003). Measuring Organizational Knowledge: A Conceptual and Methodological Framework. *Strategic Management Journal* 24(8):763–72.
- King, Andrew A. and Tucci, Christopher L. (2002). Incumbent Entry into New Market Niches: The Role of Experience and Managerial Choice in the Creation of Dynamic Capabilities. *Management Science* 48(2):171–86.
- Kohli, Ajay K. and Jaworski, Bernard J. (1990). Market Orientation: The Construct, Research Propositions, and Managerial Implications. *Journal of Marketing* 54(2):1–18.
- Kumar, Kamalesh (2002). Market Orientation, Organizational Competencies and Performance: An Empirical Investigation of a Path-Analytic Model. *Journal of American Academy of Business* 1(2):371–6.
- Kundu, Sumit K. and Katz, Jerome A. (2003). Born-International SMEs: BI-Level Impacts of Resources and Intentions. *Small Business Economics* 20(1):25–47.

- Larsen, Graeme and Ballal, Tabarak M. (2005). The Diffusion of Innovations within a UKCI Context: An Explanatory Framework. *Construction Management and Economics* 23(1):81–91.
- Lawless, Michael W. and Anderson, Philip C. (1996). Generational Technological Change: Effect of Innovation and Local Rivalry on Performance. *Academy of Management Journal* 39(5):1185–217.
- Li, Haiyang and Atuahene-Gima, Kwaku (2001). Product Innovation Strategy and the Performance of New Technology Ventures in China. *Academy of Management Journal* 44(6):1123–34.
- Loof, Hans and Hesmati, Almas (2002). Knowledge Capital and Performance Heterogeneity: A Firm-level Innovation Study. *International Journal of Production Economics* 76(1):61–85.
- Lukas, Bryan A. and Ferrell, O.C. (2000). The Effect of Market Orientation on Product Innovation. *Journal of the Academy of Marketing Science* 28(2):239–47.
- Lyles, Marjorie A. and Schwenk, Charles R. (1992). Top Management, Strategy and Organizational Knowledge Structures. *Journal of Management Studies* 29(2):155–74.
- Mairesse, Jacques and Mohnen, Pierre (2002). Accounting for Innovation and Measuring Innovativeness: An Illustrative Framework and an Application. *The American Economic Review* 92(2):226–30.
- Manu, Franklyn A. (1992). Innovation Orientation, Environment and Performance: A Comparison of U.S. and European Markets. *Journal of International Business Studies* 23(2):333–59.
- Manu, Franklyn A. and Sriram, Ven (1996). Innovation, Marketing Strategy, Environment, and Performance. *Journal of Business Research* 35(1):79–91.
- Marsili, Orietta and Salter, Ammong (2005). “Inequality” of Innovation: Skewed Distribution and the Returns to Innovation in Dutch Manufacturing. *Economics of Innovation and New Technology* 14 (1–2):83–102.
- Martin, Xavier and Salomon, R. (2003). Knowledge Transfer Capacity and Its Implication for the Theory of the Multinational Corporation. *Journal of International Business Studies* 34(4):356–73.
- Menon, Anil and Varadarajan, P. Rajan (1992). A Model of Marketing Knowledge Use within Firms. *Journal of Marketing* 56(4):53–71.
- Miles, Raymond E. and Snow, Charles C. (1978). *Organizational Strategy, Structure, and Process*. New York: McGraw-Hill.

- Miller, Danny, Droge, Cornelia and Toulouse, Jean-Marie (1988). Strategic Process and Content as Mediators between Organizational Context and Structure. *Academy of Management Journal* 31(3):544–69.
- Moorman, Christine and Slotegraaf, Rebecca J. (1999). The Contingency Value of Complementary Capabilities in Product Development. *Journal of Marketing Research* 36(2):239–57.
- Murray, Peter and Donegan, Kevin (2003). Empirical Linkages between Firm Competencies and Organisational Learning. *Learning Organization* 10(1):51–62.
- Nadler, David A. and Tushman, Michael L. (1990). Beyond the Charismatic Leader: Leadership and Organizational Change. *California Management Review* 32(2):77–97.
- Naman, John L. and Slevin, Dennis P. (1993). Entrepreneurship and the Concept of Fit: A Model and Empirical Tests. *Strategic Management Journal* 14(2):137–54.
- Narver, John C. and Slater, Stanley F. (1990). The Effect of a Market Orientation on Business Profitability. *Journal of Marketing* 54(4):20–35.
- Nelson, Richard R. (1991). Why Do Firms Differ and How Does It Matter? *Strategic Management Journal* 12(8):61–74 (Special Issue).
- O'Neill, Hugh M., Poudier, Richard W. and Buchholtz, Ann K. (1998). Patterns of Diffusion of Strategies across Organizations: Insights from the Innovation Diffusion Literature. *Academy of Management Review* 23(1):98–114.
- Ozsomer, Aysegul, Calantone, Roger J. and Di Benedetto, Anthony (1997). What Makes Firms More Innovative? A Look at Organizational and Environmental Factors. *Journal of Business and Industrial Marketing* 12(5–6):400–16.
- Palmer, Roger and Brookes, Richard (2002). Incremental Innovation: A Case Study Analysis. *Journal of Database Management* 10(1): 71–83.
- Peters, Thomas J. and Waterman, Robert H. Jr. (1982). In *Search of Excellence*. New York: Harper and Row.
- Pitt, Martyn and Clarke, Ken (1999). Competing on Competence: A Knowledge Perspective on the Management of Strategic Innovation. *Technology Analysis and Strategic Management* 11(3): 301–16.
- Prahalad, C.K. and Hamel, Gary (1990). The Core Competence of the Corporation. *Harvard Business Review* 68(3):79–91.
- Ritter, Thomas and Gemunden, Hans Georg (2004). The Impact of a Company's Business Strategy on Its Technological Competence, Network Competence and Innovation Success. *Journal of Business Research* 57(5):548–56.
- Rogers, Everett M. (1995). *Diffusion of Innovation*, 4th ed. New York: Free Press.

- Schlegelmilch, Bodo B., Diamantopoulos, Adamantios and Kreuz, Peter (2003). Strategic Innovation: The Construct, Its Drivers and Its Strategic Outcomes. *Journal of Strategic Marketing* 11(2): 117–32.
- Schumpeter, Joseph A. (1911). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Cambridge, MA: Harvard Business School Press.
- Sinkula, James M., Baker, William E. and Noordewier, Thomas (1997). A Framework for Market-Based Organizational Learning: Linking Values, Knowledge, and Behavior. *Journal of the Academy of Marketing Science* 25(4):305–18.
- Sivadas, Eugene and Dwyer, F. Robert (2000). An Examination of Organizational Factors Influencing New Product Success in Internal and Alliance-Based Processes. *Journal of Marketing* 64(1): 31–49.
- Slater, Stanley F. and Narver, John C. (1993). Product-market Strategy and Performance: An Analysis of the Miles and Snow Strategy Types. *European Journal of Marketing* 27(10):33–51.
- Slater, Stanley F. and Narver, John C. (1995). Market Orientation and the Learning Organization. *Journal of Marketing* 59(3):63–74.
- Smeds, Rita (2001). Implementation of Business Process Innovations: An Agenda for Research and Action. *International Journal of Technology Management* 22(1):1–12.
- Song, X. Michael, Montoya-Weiss, Mitzi and Schmidt, J.B. (1997). Antecedents and Consequences of Cross-Functional Cooperation: A Comparison of R&D, Manufacturing, and Marketing Perspectives. *Journal of Product Innovation Management* 14(1): 35–47.
- Song, X. Michael, Neeley, Sabrina M. and Zhao, Yuzhen (1996). Managing R&D–Marketing Integration in the New Product Development Process. *Industrial Marketing Management* 25(6): 545–53.
- Song, X. Michael and Parry, Mark E. (1997). A Cross-National Comparative Study of New Product Development Processes: Japan and the United States. *Journal of Marketing* 61(2):1–18.
- Subramanian, Ashok and Nilakanta, Sree (1996). Organizational Innovativeness: Exploring the Relationship between Organizational Determinants of Innovation, Types of Innovations, and Measures of Organizational Performance. *International Journal of Management Science* 24(6):631–47.
- Subramanian, Mohan and Youndt, Mark A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal* 48(3):450–63.

- Szakonyi, Robert (1994). Measuring R&D Effectiveness—II. Research-Technology Management 37(3):44–55.
- Tang, H.K. (1999). An Inventory of Organizational Innovativeness. Technovation 19(1):41–51.
- Tatikonda, Mohan V. and Montoya-Weiss, Mitzi M. (2001). Integrating Operations and Marketing Perspectives of Product Innovation: The Influence of Organizational Process Factors and Capabilities on Development Performance. Management Science 47(1):151–72.
- Teas, R. Kenneth (1994). Expectations as a Comparison Standard in Measuring Service Quality: An Assessment of a Reassessment. Journal of Marketing 58(1):132–9.
- Teece, David J., Pisano, Gary and Shuen, Amy (1997). Dynamic Capabilities and Strategic Management. Strategic Management Journal 18(7):509–33.
- Thamhain, Hans J. and Kamm, Judith B. (1993). Top-level Managers and Innovative R&D Performance. In: Handbook of Innovation Management, Part II. Anton Cozijnsen and Willem Vrakking (eds.). Oxford: Blackwell Publishers, 42–53.
- Tipping, James W., Zeffren, Eugene and Fusfeld, Alan R. (1995). Assessing the Value of Your Technology. Research Technology Management 38(5):22–39.
- Troy, Lisa C., Szymanski, David M. and Varadarajan, P. Rajan (2001). Generating New Product Ideas: An Initial Investigation of the Role of Market Information and Organizational Characteristics. Journal of the Academy of Marketing Science 29(1):89–101.
- Tushman, Michael L. (1997). Winning through Innovation. Strategy and Leadership 25(4):14–9.
- Tushman, Michael L. and O'Reilly, Charles A. III (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. California Management Review 38(4):8–30.
- Tushman, Michael L. and O'Reilly, Charles A. III (1997). Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal. Boston: Harvard Business School Press.
- Utterback, James M. and Abernathy, W.J. (1975). A Dynamic Model of Process and Product Innovation. Omega 3(6):639–56.
- Van de Ven, Andrew H., Polley, Douglas E., Garud, Raghu and Venkataraman, Sankaran (1999). The Innovation Journey. New York: Oxford University Press.
- Varadarajan, P. Rajan and Jayachandran, Satish (1999). Marketing Strategy: An Assessment of the State of the Field and Outlook. Journal of the Academy of Marketing Science 27(2):120–43.
- Varela, Jose and Benito, Leandro (2005). New Product Development Process in Spanish Firms: Typology, Antecedents and Technical/ Marketing Activities. Technovation 25(4):395–405.

- Vázquez, Rodolfo, Santos, Maria Leticia and Álvarez, Luis Ignacio (2001). Market Orientation, Innovation and Competitive Strategies in Industrial Firms. *Journal of Strategic Marketing* 9(1):69–90.
- Verona, G. and Ravasi, D. (2003). Unbundling Dynamic Capabilities: An Exploratory Study of Continuous Product Innovation. *Industrial and Corporate Change* 12(3):577–606.
- von Hippel, Eric, Thomke, Stefan and Sonnack, Mary (1999). Creating Breakthroughs at 3M. *Harvard Business Review* 77(5):47–48.
- Warren, Kim (2002). *Competitive Strategy Dynamics*. West Sussex, UK: John Wiley & Sons.
- Webster, Elizabeth (2004). Firms' Decisions to Innovate and Innovation Routines. *Economics of Innovation and New Technology* 13(8):733–45.
- Wheatley, Margaret J. (2002). We Are All Innovators. In: *Leading for Innovation and Organizing for Results*. Frances Hesselbein, Marshall Goldsmith and Iain Somerville (eds.). San Francisco: Jossey-Bass Publishers, 11–22.
- Winter, Sidney G. (2003). Understanding Dynamic Capabilities. *Strategic Management Journal* 24(10):991–5.
- Woodside, Arch G. (2005). Firm Orientations, Innovativeness, and Business Performance: Advancing a System Dynamics View Following a Comment on Hult, Hurley, and Knight's 2004 Study. *Industrial Marketing Management* 34(3):275–9.
- Worren, Nicolay, Moore, Karl and Cardona, Pablo (2002). Modularity, Strategic Flexibility, and Firm Performance: A Study of the Home Appliance Industry. *Strategic Management Journal* 23(12):1123–40.
- Zaltman, Gerald, Duncan, Robert and Holbek, Jonny (1973). *Innovations and Organizations*. New York: Wiley.
- Zhou, Kevin Zheng, Chi, Kin Yim and Tse, David K. (2005). The Effects of Strategic Orientations on Technology- and Market-Based Breakthrough Innovations. *Journal of Marketing* 69(2):42–60.
- Zien, Karen Anne and Buckler, Sheldon A. (1997). From Experience: Dreams to Market: Crafting a Culture of Innovation. *Journal of Product Innovation Management* 14(4):274–87.
- Zirger, Billie Jo and Maidique, Modesto A. (1990). A Model of New Product Development: An Empirical Test. *Management Science* 36(7):867–83.