FIRM STRATEGY AND KNOWLEDGE MANAGEMENT IN STRATEGIC SUPPLY CHAIN RELATIONSHIPS: A KNOWLEDGE BASED VIEW

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    SUPPLY CHAIN RELATIONSHIPS: A KNOWLEDGE BASED VIEW

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I would like to thank members of my family and many of my friends for their support and encouragement through many trying moments. Special mention must be made of my cousin Arvind who taught and coached me during some of the most pressing times of my life. My friend Nachiket assisted me with many dissertation related tasks, Tal put up with my dissertation-related disorganization and messiness for two years as my office mate, and Sandra provided me with support and encouragement through the ups and downs that characterize a doctoral dissertation. I am thankful for having such people.

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Using the knowledge-based view, this study seeks to understand the relationship between firm strategic orientation and interorganizational knowledge management in strategic supply chain alliances of high technology firms. Unique to prior literature, this study relates three dimensions of strategic orientation (alliance, leadership, and learning) with two modes of interorganizational knowledge management (knowledge creation and knowledge acquisition) and measures the impact of knowledge management on firm performance. Data was collected through self-response survey completed by top executives of high-technology firms. Multiple regression analysis was used to test the theoretical hypotheses.
CHAPTER 1
INTRODUCTION

In the past few years, scholars have paid increasing attention to the role of knowledge in gaining competitive advantage leading to the emergence and development of the knowledge-based view of strategic management (Eisenhardt & Santos, 2002). The discussion on knowledge management arises from a growing recognition of the importance of knowledge in the ‘new knowledge economy’ and its impact on organizational competitiveness¹. An important premise of the vast literature on knowledge management is that organizations exist within a ‘network’ of information & knowledge relationships (Kogut, 2000) and it is the effective management of information & knowledge ‘flows’ at these organizational boundaries that significantly influences organizational competitiveness.

In recent years, an increasing number of organizations are entering into relationships with other organizations to create value through continuous knowledge management (Hagedoorn, 1993; Robertson & Yu, 2001). Such interorganizational knowledge management has been proposed as a fundamental strategic process and an important means by which organizations may achieve sustainable competitive advantage in the future (Contractor & Lorange, 2002; Inkpen, 2002; Podolny & Page, 1998; Powell & Brantley, 1992; Powell, Koput, & Smith-Doerr, 1996). In fact, some scholars have argued knowledge management to be the very raison d’etre of interorganizational relationships (Salk & Simonin, 2003: 253).

¹ Knowledge management refers to the generation, capture, and dissemination of knowledge (Argote, McEvily, & Reagans, 2003; Coakes, Bradburn, & Sugden, 2004; Hussi, 2004; Poh-Kam, 2000).
An organization’s relationships with its supply chain partners are perhaps the most important of its relationships (Ketchen & Giunipero, 2004; Wathne & Heide, 2004). Though multiple theoretical lenses have been used to study supply chain relationships (e.g. Transaction Cost Economics, Resource Dependence Theory, Resource Based View), the knowledge-based view has emerged as a particularly appealing theoretical framework for examining issues related to supply chain relationships (Desouza, Chattaraj, & Kraft, 2003; Hult, Ketchen, & Slater, 2004). While knowledge management between supply chain partners is acknowledged to be important to firm performance and improved outcomes (Hult, 2003; Ketchen & Giunipero, 2004), how a firm’s strategy relates to interorganizational knowledge management and how knowledge management across organizational boundaries contributes to firm performance is not yet clear. Thus, understanding the relationship between organizational strategy and interorganizational knowledge management and how this knowledge management impacts firm performance is an important, yet under-researched, topic.

1.1 Towards a Research Question

There seems to be a general consensus among researchers and practitioners alike, that strategic interorganizational relationships with supply chain partners are central to gaining and sustaining competitive advantage in fast-changing global markets (Hult, Ketchen, & Nichols, 2002). The success of Dell Computers is attributed, in part, to its strategic alliances with its important suppliers. Walmart and Proctor & Gamble, both leaders in their industry, have a close, collaborative supply chain relationship that has helped both firms create new value and is mutually beneficial. M. Rajakannu, General Manager at Wipro Technologies, a leading global IT firm, recently declared “If we don’t
collaborate with our customers we are not going to survive in this business. ... This is the reality we are facing day to day. In fact, it is a matter of survival for a company like Wipro…” (Chatzkel, 2004: 13). Top managers in organizations of different sizes and nationalities see alliances with their supply chain partners as a “core necessity” to compete successfully and globally. It is believed that interorganizational knowledge management improves a firm’s ability to offer new products, innovate its processes, deepen its competitive competencies, and positively influences sustained organizational success.

Different strategic management theories provide unique and valuable insights into the management of strategic supply chain alliances (Ketchen & Giunipero, 2004). The knowledge-based view is one such strategic management theory that has the potential to contribute to a greater understanding of interorganizational knowledge management in strategic supply chain alliances. Unlike other, more developed strategic management theories, the knowledge-based view is still emerging as a distinct theoretical paradigm (Eisenhardt & Santos, 2002) and has recently been used to understand strategic interorganizational relationships (Choi & Lee, 1997; Ding & Peters, 2000; Grant & Baden-Fuller, 2004). According to the knowledge-based view, in a world of accelerated technological change and heightened uncertainty, organizations should form alliances with their suppliers and customers to gain new knowledge and compete more effectively (Podolny & Page, 1998; Poh-Kam, 2000).

1.2 Research Objective

There is a large body of literature under the broad umbrella of the knowledge-based view (Eisenhardt & Santos, 2002). In the knowledge-based view of strategic alliances
(Choi & Lee, 1997), organizations gain access to knowledge in two ways (Podolny & Page, 1998): First, they gain new knowledge by acquisition of knowledge from other organizations (knowledge acquisition perspective). Second, they gain new knowledge by creating knowledge de novo through their relationships with other organizations (knowledge creation perspective).

Templeton and Snyder (2000) suggest that knowledge management between organizations is enabled by strategic organizational factors and is also influenced by contextual factors (such as the alliance environment). In turn, interorganizational knowledge management is related to positive outcomes like firm performance. Fig 1.1 is a simple depiction of this cause-effect relationship.

**Insert Figure 1.1 about here**

This study adopts a close adaptation of the above general cause-effect model as a starting point and digs deeper to understand interorganizational knowledge management better. The framework in this study incorporates (i) strategic orientation of the firm and (ii) inter-firm diversity between alliance partners to explain knowledge creation and knowledge acquisition through strategic alliances and examines the relative impact of the two modes of interorganizational knowledge management on firm performance. The complexity of the knowledge base of the industry in which the firm competes is included as a moderator variable influencing the relationship between interorganizational knowledge management and firm performance.

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2 It is noted that other typologies incorporate elements of the knowledge creation/knowledge acquisition distinction in varying degrees. Mowery, Oxley, and Silverman (1996) suggested that over time in some alliances firms are able to imitate and internalize the knowledge skills of their partners, while in other alliances firms are able to specialize and develop new knowledge skills by building on their existing knowledge. Grant and Baden-Fuller (2004) argue that some alliances are vehicles for acquiring and absorbing partners’ knowledge, while other alliances provide partners access to each others knowledge to generate new knowledge. Though these scholars use different labels for the types of alliances, the common idea is of alliances as either for new knowledge creation or for acquiring partner’s knowledge.
The objective of this research is to increase our understanding of the relationship between firm strategy and knowledge management in strategic supply chain relationships and the influence of interorganizational knowledge management on firm performance.

1.3 Relevance of Research

Though the generation of new knowledge for research and practice has been “an enduring mission” of the Academy of Management (Van de Ven, 2002), a considerable gap exists between management research and actual management practices in organizations (Pfeffer, 1998). Managers and executives find little value in research findings and researchers seldom value the insights of managers in setting their research questions or interpreting their results (Rynes, Bartunek, & Daft, 2001). The inspiration for this research project came from interactions with top executives in the IT industry who reported strategic alliances with their customers as important for gaining competitive advantage and competing effectively in their industry.

It has been suggested that a major reason for this is the lack of agreement between academicians and practitioners about the importance and relevance of a particular topic (McFarlin & Chelle, 2005). Given the scholarly and practitioner interest in the general area of this dissertation (knowledge-based view of strategic alliances in the supply chain), there are several ways in which this research will be of interest to both research scholars and managerial practitioners. Because knowledge-based view is an emerging theoretical framework, many of the most significant theoretical and managerial questions in the area
of knowledge management in strategic alliances have neither been asked nor addressed in the literature (Inkpen, 2002).

1.3.1 Relevance for Theory

In the last few years the knowledge-based view (KBV) has slowly emerged as a credible and legitimate theoretical lens to aid our understanding of how firms survive and compete in today’s economy (Eisenhardt & Santos, 2002; Choi & Lee, 1997). Knowledge management in supply chain relationships is seen as crucial to firm performance (Ding & Peters, 2000). Unfortunately, despite the volume of work published on knowledge management, there is little empirical research that relates knowledge management to firm strategy or organizational performance. The limited numbers of academic studies that address these relationships are generally characterized by restricted scope in terms of both theory and measurement.

On the theoretical side, there has been limited understanding of how firm strategy is related to knowledge management and how knowledge management is related to organizational performance (Inkpen, 2002; Teece, 1998). The relationship between firm strategy and knowledge management has not been adequately hypothesized or empirically investigated. The growing body of literature in the area of knowledge management in strategic alliances is largely focused on knowledge management as the end itself, rather than the means to enabling superior firm performance. Additionally, measurement of knowledge management is limited to product innovation measures or measures of patent activity (e.g. Mowery, Oxley, & Silverman, 2002). Thus, existing

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3 Levin, Klevorick, Nelson, and Winter (1987) enumerate a range of reasons why in most industries, especially high technology industries, patent counts may not be a valid or reliable measure of performance: (1) In many industries, imitators can legally copy ‘around’ the patented technology, as it is generally difficult to prove that the imitator has made a copy (e.g. complex electronic systems), (2) Some innovations
studies lack well-defined variables related to each other in a nomological network, testable with statistical techniques and suited to predict specific outcomes.

The unique characteristic of strategy field’s perspective on knowledge management, one that distinguishes it from other disciplines, is the field’s focus on the link between knowledge management, firm strategy and performance. Strategic management’s distinctive contribution to the understanding of knowledge management is the suggestion that firm strategy should be related to knowledge management and that knowledge management should be judged by its impact on organizational performance (Eisenhardt & Santos, 2002). Thus, the limited nature of prior work represents a serious gap for the field of strategic management. A better understanding of the relationship between firm strategy, knowledge management, and organizational performance would be relevant to the field of strategic management.

This research builds on recent work on interorganizational knowledge management and the extant literature on organizational strategy and strategic alliances to present a nomological network that relates organizational strategy to interorganizational management in strategic supply chain alliances. Locating variables in a well-specified network with clear relationships with antecedents and consequences is important to the development of any new theory. Organizational strategy is the corner stone of the strategic management literature and supply chain management is an important field of inquiry that sees firms as embedded in a network of upstream (seller) and downstream (seller) relationships. Thus, this study makes an important contribution to the field of
strategy and supply chain alliances by using the emerging knowledge-based view to understand interorganizational knowledge management in strategic supply chain relationships.

1.3.2 Relevance for Practice

If there is one uncontested piece of advice for management practitioners that most management scholars would enthusiastically agree upon, it is this: An organization’s competitiveness in today’s economy depends more than anything on knowledge (Eisenhardt & Santos, 2002; Ichijo, von Krogh, & Nonaka, 1998; Nonaka, 1991; Sanchez, 2001). According to Nonaka and Takeuchi (1995):

In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge... Successful companies are those that constantly create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products.

In the current hyper-competitive knowledge-based global economy, an organization’s relationships with its strategic partners comprise an important part of its overall strategy (Contractor & Lorange, 2002; Faulkner & De Rond, 2000; Venkatraman & Subramaniam, 2002).

It is no wonder then that knowledge management has emerged as a key issue for practitioners interested in creating value through interorganizational relationships (Sharkie, 2003). Even though it is believed that knowledge management in strategic alliances is under managerial control (Kidd, 1998), management scholars have largely failed to provide “reliable, deep, and broad insights as well as practical tools” to guide and support practitioners working in this area (von Krogh & Roos, 1996: 227). Foss and
Mahkne (2003) criticize the extant literature on knowledge management as being useless for practitioners as it does not provide “much in the nature of firm guidance” (p. 79).

As this study seeks to further our understanding of knowledge management in strategic alliances, it will be potentially valuable to management practitioners. It will help managers better understand knowledge management in strategic alliances, its relationship with firm strategic orientation, and its impact on firm performance.

The results of this research will be shared with managers of companies who participate in the study by offering them a practitioner report. Scholars have suggested that sharing our findings with practitioners may be more effective when done in ways other than publishing in top-tier research journals (Boland, Singh, Salipante, Aram, Fay, & Kannawattanachai, 2001). Participants who are not included in the sample will benefit from publication of articles based on this research in practitioner-oriented journals which are already beginning to publish work in this area (e.g. *Harvard Business Review, California Management Review, Journal of Knowledge Management*). Publication in journals read by practitioners is more likely to reach a wider audience in the practitioner community (Spencer, 2001). It is hoped that combining these multiple methods of knowledge sharing will help make this research more meaningful and useful for managers and executives.

In the last few years, knowledge management has virtually exploded as a research topic and also emerged as one of the most influential new organizational practices (Foss & Mahkne, 2003). Interesting research questions and practitioner concerns arise because managing knowledge within an alliance is inherently complex. Thus, knowledge management in strategic alliances is one of those (rare) areas which are of
interest to academics and executives. Thus, this study is considered relevant for both theorists and practitioners.

This study proceeds in the following order. The next chapter reviews the extant literature on firm strategy and the knowledge-based view in strategic alliances. The third chapter proposes hypotheses relating interorganizational knowledge management to strategic orientation and firm performance. The fourth chapter describes the sample, the research methodology, and the measures to test the hypotheses. The fifth chapter discusses the analyses and results of this study. The last chapter discusses the findings and implications of this study, acknowledges limitations, and provides recommendations for future research.
CHAPTER 2
LITERATURE REVIEW

The present chapter reviews relevant literature to understand the impact of firm strategy on knowledge management in strategic alliances and the impact of interorganizational knowledge management on firm performance. It has three main sections. The first section provides a review of the literature on organizational strategic orientation. It builds on a vast body of literature to present a multidimensional, comparative approach to understand organizational strategic orientation. The second section provides a review of the knowledge-based view. It starts with an introduction to the knowledge-based view of strategic management followed by a brief comparison of knowledge-based view of strategic alliances with other theoretical frameworks looking at the same phenomenon. An extensive review of the literature related to the two modes of knowledge management, knowledge acquisition and knowledge creation, follows. The last section reviews the literature on the relationship between knowledge management and firm performance.

2.1 Strategic Orientation

Strategic orientation is an overarching concept that describes the philosophy of an organization’s management towards understanding and managing its internal and external forces for a more favorable alignment (Gatingon & Xuereb, 1997; Manu & Sriram, 1996). It reflects and determines the relative strategic emphasis of an organization towards its various stakeholders (customers, competitors, partners, employees). It encompasses a broad set of principles which influence organizational competitiveness. It enables organizations to adopt a strategic posture that its management believes will
facilitate superior performance. It determines the organizational culture and provides norms for behavior both inside and outside the organization. It provides a ‘unified direction’ to the organization which is of primary importance in competing effectively (Dess, 1987). As such, strategic orientation is at the heart of the strategic management discipline (Hitt, Dacin, Tyler, & Park, 1997; Venkatraman, 1989). In the following pages, I review the extant literature on strategic orientation.

Strategic orientation is an organization’s fundamental way of doing things (Noble, Sinha, & Kumar, 2002). It reflects the top management’s perspective of their organization (Mintzberg & Westley, 1992). Strategic orientation defines the personality of the organization as it is the predisposition of top managers in an organization to behave in a particular manner with respect to the factors that are of concern to them. Organizations may change their strategic orientation but change is very infrequent and will depend on how deep-seated or fundamental the orientation is to the organization’s identity (Alzira & Easterby-Smith, 1994). Thus, even though change is possible, strategic orientation is relatively enduring and stable across time and situations.

Over the years various approaches have been used to examine and understand organizational strategic orientation. Past research on strategic orientation can be divided

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I recognize that Market Orientation (MO) is widely used, especially in the strategic marketing literature, to explain why some organizations perform better than others. However, MO is a limited concept—First, it deals primarily with the marketing activities of the firm. This is evident in the marketing bias in its various definitions. For example, Kohli & Jaworski (1990) define it as “a philosophy of business management, based upon a company-wide acceptance of the need for customer orientation, profit orientation, and recognition of the important role of marketing in communicating the needs of the market to all major corporate departments” (p. 3). Second, it ignores the creative potential that is the reason for the success of many firms. It focuses on the discovery of latent needs and ignores the organizational ability to create new needs (Kaldor, 1971; Kara, Spillan, & DeShields, 2005). Thus, strategic marketing’s focus on marketing orientation ignores many other important aspects of organizations—It completely overlooks the supply side of organizations (Robertson & Yu, 2001) and also ignores the relationships an organization develops with other organizations (Hunt & Lambe, 2000). Unlike strategic orientation that influences all aspects of an organization including its culture, MO is one aspect of an organization’s culture (Heiens, 2000) and hence limited in its influence on firm behavior.
into three broad types (Morgan & Strong, 1998; Venkataraman, 1989): The narrative approach that emphasizes verbally describing the holistic nature of strategy in its context (e.g. Andrews, 1971; Huntsman, 1994). This often involves employing qualitative methodologies like case studies. The classificatory approach that suggests that organizations can be grouped on a priori conceptual grounds or derived categorizations according to the nature of strategy they emphasize (McKelvey, 1975). A vast majority of research in strategic management has taken this approach and employed conceptual classifications (i.e. typologies such as Miles & Snow (1978) and Mintzberg (1973)) and empirical classification (i.e. taxonomies such as Miller & Friesen, 1978) to explain organizational strategy. The comparative approach identifies and measures the key dimensions of strategy that together reflect an organization’s orientation towards the variety of forces that affect its performance (Venkataraman, 1989). The focus here is less on categorization into one particular cell (as in typologies and taxonomies) but on measuring the differences along a set of dimensions that collectively describe the strategy construct. Comparative approaches, by definition, are multidimensional and better capture the key aspects of organizational strategy. These approaches allow inter-firm comparison even in the same strategic group, a major shortcoming of the other approaches. Unfortunately, the comparative approach has seldom been employed in the strategic management literature and so there is limited guidance on how many and what dimensions of strategy may be considered important.

2.1.1 Strategic Orientation as a dimensional construct

As the identification of appropriate dimensions is a necessary starting point for adopting a comparative approach, an extensive literature review was undertaken. Based
on a literature review of strategic management articles published in top-tier journals and practitioner journals, it was felt that three major strategic orientations of the firm can be identified from the factors that significantly impact organizational competitiveness and performance: alliances (relationships), leadership, and learning.

The first dimension relates to the notion of interorganizational relationships as an important part of competitive strategy (Contractor & Lorange, 2002). As organizational strategy has evolved from product-market positioning in individual businesses or industries to competing through forming relationships with other organizations (Porter, 1985; Venkatarman & Subramaniam, 2002), an important issue for both researchers and practitioners is to understand organizational preference for the type of interaction in their alliances (Spekman, Forbes, Isabella, & MacAvoy, 1998). Does an organization prefer “stormy open marriages” (Roehl & Truitt, 1987) or would it rather have “harmonious relationship” with its partners (Zeng & Chen, 2003)? This dimension is referred to as alliance orientation. The second dimension deals with the behavioral style of the people who formulate, implement and alter organizational strategies, what is referred to as organizational leadership, strategic leadership (Hambrick & Pettigrew, 2001), top management team (Davis & Useem, 2002), dominant coalition (Prahalad & Bettis, 1986), or the upper echelons (Hambrick & Mason, 1984). This dimension is referred to as the leadership orientation of the organization. The third dimension deals with the learning style adopted by the organization. Organizations are believed to be cognitive enterprises (Argyris & Schon, 1978) actively trying to make sense of events in and around themselves (Weick, 1995). Different organizations have different ways of making sense
of their context, that is different firms have different learning styles (Fiol & Lyles, 1985).

This dimension is the learning orientation of an organization.

These three dimensions were settled on for a variety of reasons:

1. In reading the diverse literature streams, it appeared that these three dimensions capture key elements of many business strategy approaches. For example, customer orientation (Gatingon & Xuereb, 1997) and market orientation (Kohli & Jaworski, 1990) that are fundamental to the marketing literature would be subsumed within the alliance (relationship) orientation dimension here. Technological orientation (Grewal & Tanushaj, 2001) would be subsumed primarily under leadership orientation and, to a lesser extent, under learning orientation. Cost orientation (Song & Xie, 1995) will be a small, but important, part of the leadership orientation here. Thus, the three dimensions, which are conceptually unique, seem collectively to capture much of the breadth of a firm’s strategic orientation.

2. The identification of the three dimensions of strategic orientation significantly overlaps with the work of Hitt and colleagues (Hitt, Ireland, Camp, & Sexton, 2001; Ireland, Hitt, Camp, & Sexton, 2001) and Dess and Lumpkin (2001) discussing the domain of strategic activities that organizations need to engage in to compete effectively. According to these scholars, inter-organizational relationships, top management style of governance, and organizational learning have a strong influence on an organization’s ability to compete in competitive industries and gain competitive advantage. Similarly, if firm strategy refers to the process of making sense of the activities inside and outside the organization (Mintzberg, Lampel, & Ahlstrand, 1998), then the three dimensions of strategic orientation significantly overlaps with
Weick’s (1995) work on relationships, actions, and beliefs as the basis of sense-making.\(^5\)

Organizations are often attributed human characteristics- for example, aggressive, determined, imaginative, responsible, and secretive (Walsh & Ungson, 1991). This tendency to anthropomorphize non-human phenomena is quite common and accepted in organizational literature (Balmer & van Riel, 1997; Glynn, 1996; Moorman & Miner, 1997). Thus, if strategic orientation is seen as a reflection of “what the organization really is”, the study of strategy can progress by recent advances in the study of human personality which studies “what the person really is” (Bromley, 2001). This is because (a) psychological attributes are commonly used to describe organizations- business firms, educational institutions, and other types of organizations- in media, daily conversations, and research literature and (b) organizational personality shows the same distribution of attribute frequency in free response data as found for individual personality, reflecting the existence of shared views about the entity in question (Chun, 2001). The study of human personality has been significantly advanced by reducing a large number of personality characteristics into five broad factors commonly known as the Big Five (Digman, 1990; Wiggins & Pincus, 1992). The probability of using a similar approach to understand firm strategy offers an interesting, provocative, and potentially useful way to advance the state of theory in this field. The three dimensions- alliance, leadership, and learning- are proposed here as the Big Three of firm strategy.

\(^5\) It is relevant to mention here that leadership orientation and learning orientation as explained here map on to Weick’s (1995) detailed discussion of action-driven and belief-driven sense-making fairly well. However, the explanation of alliance orientation here is only informed by Weick’s discussion of relationships as important to sense-making, and in fact, significantly departs from Weick’s work.
One of the most important objectives of research is to understand the phenomena of interest “by sinking shafts, as it were, at a few critical points” (Galton, 1890: 380; Lubinski, 2000). The approach adopted here sinks a manageable number of “deep shafts” at three critical points. Organization leadership has always been accepted as an important influence on organizational performance by strategy scholars. In the last decade, learning has also come to be recognized as an important influence on performance in the management and marketing literature. In more recent times, relationships or alliances has become the “third leg in strategy theory”, joining the older two legs of leadership and learning (Contractor, Kim, & Beldona, 2002: 493).

Theoretically, these legs are distinct because they face very different managerial problems and tasks. Further, though all three legs are vital to the competitiveness and performance of an organization, the relative importance of the three vary based on the organization and the industry it competes in. In other words, though the three dimensions are components of a firm’s strategic orientation, each individual dimension independently influences firm behavior and performance separately. Furthermore, each of these dimensions can be seen as continuum, the two ends of which influence organizational competitiveness in different ways (see Day (2000) for relationship orientation as a continuum, Covin (1991) and Miller & Friesen (1982) for leadership orientation as a continuum, and Wijen (2002) for learning orientation as a continuum).

It is important to acknowledge here that the terms alliance orientation, leadership orientation, and learning orientation are not new. The general notions of these three dimensions are quite common in extant literature in various disciplines. However, no single framework was found that integrates all three dimensions. It is notable that the
literature associated with different disciplinary streams of work tends to emphasize, and similarly to disregard, particular dimensions. The marketing literature (e.g. Journal of Marketing) commonly addresses aspects of relationships with customers, sometimes addresses aspects of organizational learning, and seldom addresses relationships with suppliers (upstream relationships). The supply chain management literature (e.g. Journal of Supply Chain Management) addresses aspects of relationships with suppliers and customers, periodically addresses aspects of new product innovation, and generally does not address firm leadership. The management literature (e.g. Strategic Management Journal) routinely discusses firm leadership and learning, sometimes discusses relationships with customers (upstream relationships) and seldom discusses relationships with suppliers (upstream relationships). In presenting the three dimensions as a set, these diverse literatures and thought-streams are integrated into a single, workable, generalizable framework that helps to understand and compare firm strategy.

2.1.2 Alliance Orientation

Organizations that choose to enter into strategic alliances do so to gain competitive advantage that can not be gained by the firm “in isolation and can only be created” through the relationship between the partners (Dyer & Singh, 1998: 662; Muthusamy & White, 2005). The benefits of an alliance relationship exceed those that could be gained from either going alone or other forms of inter-organizational relationships such as spot transactions (Barringer & Harrison, 2000; Tallman, 2000). These benefits include reducing the risk inherent in new product development, overcoming budgetary constraints, and gain access to resources not otherwise available to them (Muthusamy & White, 2000).
Organizations that are alliance oriented, rather than independent oriented, are willing to forego the freedom of viewing each transaction as a ‘discrete exchange’ that can be decided based on transaction costs alone (Parkhe, 1993). Independence-oriented organizations avoid being dependent on other firms and carry out some functions themselves and outsource other functions through hands-off relationships with other organizations (Mitchell & Singh, 1996). They believe in “one-shot deals in which costs are everything” (Uzzi, 1997: 41). They are also more likely to vertically integrate, funding activities with internal resources to avoid relationships with firms in their supply chains (Rothaermel & Deeds, 2004). On the other hand, alliance-oriented organizations believe that market competitiveness can be improved by establishing relationships with other organizations, rather than going alone in the market. They believe, like the 18th century New England theologian Jonathan Edwards, that the nature of being is relational rather than individual. As firms in the same industry can either have an independent approach or an alliance-oriented approach (Mitchell & Singh, 1996), firms that have the latter are not forced by industry-level factors but instead chose to be relational rather than independent. Thus, alliance orientation refers to an organization’s willingness to find, develop, and manage alliances (Lambe, Spekman, & Hunt (2002) call it ‘alliance competitiveness’; Kale, Dyer, & Singh (2002) term it ‘alliance capability’).

Organizations with an alliance orientation are more willing to enter into strategic alliances with other organizations compared to those that lack such an alliance.

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6 Competing in the market through forming alliances may not only be better and more effective than competing alone, but under the right conditions, it may also be easier.
Organizations can either adopt a cooperative or a competitive orientation towards their alliance partners\(^7\) (Kogut, 1989; Madhok, 2000; Zeng & Hennart, 2002). Viennese philosopher Martin Buber described these two ways of forming relationships as I-Thou and I-It respectively. In the former, we treat others with mutuality and togetherness (in business terms, “we are in this together and we will sink or swim together”), and in the latter we treat others as a means to an end (in business terms, “how can I get what I need from this organization?”). Organizational orientation towards their alliance partner significantly influences the evolution of the relationship throughout its life as well as its outcome (Das & Rahman, 2002).

A cooperative alliance orientation involves pursuing mutual interests and harmonious interdependence in alliances. Organizations with such an orientation prefer to form alliance relationships that are characterized by close information, social, and process linkages, and mutual commitments (Day, 2000; Dyer & Singh, 1998). These organizations are willing to look at the alliance relationships as a way of expanding the pie (Jap, 1999), such that organizational outcomes and joint outcomes benefit both the partnering organizations. Instead of a ‘them and us’ approach, these organizations try to develop a ‘collegiate’ pattern that can be beneficial to both organizations (McAdam, 2000). They emphasize collective interests, common benefits, and win-win for both

\(^7\) In reality, these two ways of relating to your partners (cooperative & competitive) may not be as black and white. An organization with a cooperative orientation towards its partner may also have some competitive elements and a competitive oriented organization may have a cooperative side. Nonetheless, one way of relating generally predominates and the two may be treated as opposite poles of a continuum. The ideas presented and developed here resonate with the ideas of other alliance scholars in the literature. Koza & Lewin (1998) emphasize organizational motivation as an important determinant of its tendency to form cooperative or competitive alliances. Salk & Simonin (2003) discuss an organization’s collaborative orientation and distinguish between participatory and antagonistic modes of collaboration roughly paralleling the distinction between cooperative and competitive modes of collaboration above. Madhavan, Gynawali, & He (2004) propose and identify clustering and countering as two modes of alliance networking based on the cooperative and competing motive of partnering respectively.
partners, reflecting an underlying belief in collaboration and relational connectedness. They believe in “integrative arrangements” where they can pool resources with their partners and promote mutually beneficial solutions (Uzzi, 1997: 50). For example, Cargill has formed close relationships with many of its customers enabling the former to combine its capability in developing sugar replacements with the customers capabilities in making chocolates to develop products for more health conscious customers.

In adopting a cooperative orientation, organizations proactively plan to combine their resources with resources of their partners to expand the joint capabilities of both the partnering organizations (Borys & Jemison, 1989). Because organizations can not possess all the resources necessary to compete effectively, dependence on alliance partners is seen as a way of accessing valuable resources without an intention to ‘hollow out’ the partner (Grant & Baden-Fuller, 2000). Firms are able to access the resource base of their partner firms and build on those resources and capabilities to develop new resources and capabilities. Cooperatively oriented organizations allow their partners to access their important activities so as to have access to the present or future contributions of their partners (Zeng & Hennart, 2002).

A cooperatively oriented firm always emphasizes involving their alliance partners at various levels in the organizations. Partners are invited to join in the firm’s strategy formulation and implementation. Their experiences, foresight, and suggestions about the business are given high importance and considered at the strategic level (Jap, 1999). Cooperatively oriented organizations place strategic emphasis on understanding the contributions their partners can make to their processes and vice-versa (Polonsky,
Schuppisser, & Beldona, 2002). Moreover, these contributions need to be sustained and not episodic (Doz & Baburoglu, 2002). For example, informants in Fuji Xerox observe:

“We ask our suppliers to come to our factory and start working together with us as early in the development process as possible. The suppliers also don’t mind our visiting their plants. … Early participation on the part of the supplier enables them to understand where they are positioned within the entire process. Furthermore, by working with us on a regular basis, they [see] how to bring in precisely what we are looking for, even if we only show them a rough sketch” (Imai, Nonaka, & Takeuchi, 1985).

Such a close cooperation requires significant affective and resource commitments on the part of an organization (Johnson, 1999). Because organizations have limited resources, even the most cooperatively oriented organizations can have really cooperative alliances with only a few other organizations.

A cooperative orientation allows organizations to effectively leverage the alliance management know-how that they have gained from managing their previous alliances. Organizations that have been in cooperative alliances in the past are confident and experienced in their ability to recognize and cooperate with other appropriate organizations. Past experiences with collaborative alliances positively influence the cooperative orientation of an organization (Anand & Khanna, 2000). Experience and alliance-related knowledge gained through these close relationships further reinforces the cooperative orientation of the firm, making it more favorably inclined towards such relationships.

Organizations with a cooperative orientation work with their partner so that they can earn higher economic rents than they could on their own at the same time that their partners can also earn higher rents than they could on their own (Kogut, 2000). These
organizations believe that their unique orientation enables them to create a network, a
‘spider-web’ (Peters, 1992) of alliances that help them to identify new, valuable
synergies. The network with the cooperative oriented organization at the center creates a
distinct stream of rent known as Coleman rents that are available to each of the partnering
organizations (though may be to varying degrees). This network is such that rents accrue
not only because of the relationship between the cooperatively oriented organization and
its partners but also because of the relationship that these partner organizations form
between themselves due to the unique orientation of the cooperative organization. This
unique characteristic of cooperative oriented organizations, termed tertius iugens (latin
for ‘third who joins’), reflects their willingness to connect their alliance partners by either
bringing together previously disconnected actors or facilitating new coordination between
already connected actors (Obstfield, 2005). In a supply chain context, this can be done by
connecting different suppliers and/or different customers with each other as well as
connecting various suppliers and customers with each other. A very visible example of
such a network is Toyota’s network of relationships with its partners (Dyer & Nobeoka,
2000). Toyota has a cooperative orientation which enables it to work with its network
partners in such a way that both Toyota and its partners realize substantial benefits from
working together. Simultaneously, Toyota has been able to create an interconnected
network that has strong linkages between its partners too. With its philosophy of
‘coexistence and co-prosperity’, Toyota has convinced its partners that their performance
is intricately tied to the continued performance of Toyota and other partners in the
network.
A competitive alliance orientation views the relationship as a zero-sum game where one organization wins at the expense of the partner organization (Day, 2000). They see themselves as competing with their partners for a fixed-size pie that has to be shared between partners (Gulati & Wong, 2003; Jap, 1999). This is a typical win-lose situation. If one organization gains something, the other loses and vice versa. Whenever one partner manages to increase its share of the pie, it diminishes the share of one or more of the other partners. Competitively oriented organizations believe it is their job, their duty, to win, to gain as large a share of the pie that they possibly can. They seek to maximize their share of the pie as they emphasize private benefits for themselves from the relationship (Gulati, Nohria, & Zaheer, 2000). The alliance becomes a ‘battlefield’ (Tsang, 1999: 212) and the competitive oriented organization wants to win the war and take the largest slice of the pie. These organizations believe in “distributive arrangements” that aim for zero-sum solutions (Uzzi, 1997: 51).

Competitive alliance oriented organizations believe in behaving opportunistically—“self interest seeking with guile” (Williamson, 1975). Organizations behave opportunistically whenever they believe such behavior to be beneficial after considering any potential steps that the affected organization may take through legal retaliation or other types of retaliatory behavior (Das & Rahman, 2002). Competitive alliance oriented organizations tend to behave opportunistically and deceive their partners. They are always looking for ways to act dishonestly, cheat on their partner and/or shirk from their responsibility towards their partner. Examples of opportunistic behavior include, but are not limited to, withholding or distorting information, failing to fulfill promises or
obligations, late payments, delivery of substandard products, falsification of reports, bait-and-switch tactics, and violation of agreements (Das & Rahman, 2002).

Competitive alliance oriented organizations seek to hold their partner organizations hostage by trying to increase their asset specificity— the degree to which assets are specific and specialized— to the relationship (Kogut, 1988). They do so by getting their partners to make investments in specialized tooling, equipment, or procedures (Stump & Heide, 1996). At the same time, they underinvest in alliance-specific assets/skills to avoid being held hostage by their partners (Zeng & Chen, 2003). They carefully limit their contribution to the alliance while making maximum efforts to have their partners contribute significantly to the alliance (Zeng & Hennart, 2002). They also believe in maximizing their receptivity to the resources of their partner while limiting the transparency of their own organization (Hamel, Doz, & Prahalad, 1989). This creates an environment of suspicion and distrust in the alliance (Donaldson, 1990).

Competitive alliance oriented organizations view strategic alliances as a vehicle to acquire their partners’ resources unilaterally. The alliance is a sort of ‘Trojan Horse’ (Hennart, Roehl, & Zietlow, 1999: 15) which enables the competitively oriented organization to enter the castle of the other organization and research its resources (namely the resources the partner is bringing to the alliance). This means that such organizations are always in a race with their partners to acquire the majority of the resources as fast as they can and then get out of the alliance. Their interest is in applying the acquired resources to areas in which the organization can reap benefits that accrue only to it, and not to its partner (‘the leakage problem’; Hamel, 1991). They actively
compete with their partners to acquire the majority of the resources, apply them to areas of self-interest and improve their own competitiveness (Kogut, 2000).

Organizations with a competitive orientation believe in competing with their partners so that they can earn rents that accrue only to them and not to their partners. They arbitrate the relationship between firms that they partner with but that only have a loose relationship with each other at the best. They earn a distinct stream of rents, known as Burt rents, because they occupy unique positions in the network that enables them to leverage the resources and capabilities of their partners for their own benefit without having to bring them together (Kogut, 2000). This unique characteristic of competitively oriented organizations, termed *tertius gaudens* (Latin ‘for own purpose’), reflects their willingness to either keep their partners separated from each other or to play them off against each other as long as it serves their own interest. The proclivity for this type of action is evident in Burt’s (1992) work on structural holes where he argues that by occupying unique, structural holes these actors position themselves between two disconnected parties to manipulate or exploit them for the actor’s own benefit. Digital Equipment Corporation was an example of such a firm that partners with suppliers and customers but only to the extent that it can appropriate rents that accrue from the alliance only for itself without much regard to the needs or desires of its partners.

Studies have found that organizations can be either competitively oriented or cooperatively oriented and both types of orientations helps firms meet their market objectives. Hamel (1991) found that many organizations in his sample were clearly competitive alliance oriented. These organizations saw alliances as a ‘short circuit’ to
fulfill their interests. Many other organizations had a cooperative alliance orientation and saw alliances as important for creating mutual value.

2.1.3 **Leadership Orientation**

Leadership orientation refers to the way organizational leadership makes decisions and acts to lead by engaging in innovative activities, undertaking risky ventures, and competing proactively in the market (Barringer & Bluedorn, 1999; Covin & Slevin, 1991; Stevenson & Jarillo, 1990). Organizational leadership refers to the top management or dominant coalition in any organization. The leadership of any organization, big or small, is responsible for giving purpose to the collective effort of organizational members, and causing willing effort to be expended to achieve that purpose (Jacoba & Jacques, 1990). Leaders are continuously involved in making sense of what people are doing together so that people will commit and volitionally act in the interest of their organization (Weick, 1995; Drath & Palus, 1994). Leaders that favor change and innovation to obtain a competitive advantage for their organization, demonstrate inclination to take business-related risks, and believe in proactively competing with other firms will be more successful than others, especially in competitive environments. Leaders employ leadership style unique to the circumstances of their organization and its competitive environment (Jago, 1982; Lowe, Kroeck, & Sivasubramaniam, 1996) and because top management people have a dominant style for handling certain situations, differences among organizational leaders on leadership orientation has important implications for the market competitiveness of their organization. This means that though leaders may be innovative, proactive, and take risks, different leadership styles will involve different approaches to innovate, compete proactively, and take risks.
Strategic management literature suggests *entrepreneurial leadership orientation* and *managerial leadership orientation* as two distinct styles of leadership (Michael, Storey, & Thomas, 2002; Rowe, 2001). Entrepreneurial leadership involves a different style, a different set of reasoning, thinking, and behaving processes called effectuation while managerial leadership involves causation (Sarasvathy, 2001a). Managerial leaders think and act differently than entrepreneurial leaders (Busenitz & Barney, 1997; Sarasvathy, Simon, & Lave, 1998). Entrepreneurial leaders use heuristics in their decision-making more extensively than managerial leaders (Busenitz & Barney, 1997). They are also more likely to make important decisions based on limited (and insufficient) information (Keh, Foo, & Lim, 2002). Consequently, entrepreneurial leaders often make significant leaps in their thinking leading to ideas that are not always very linear and factually based. Thus, an entrepreneurial mindset is different from a managerial mindset and impacts organizational competitiveness in different ways (McGrath & Macmillan, 2000).

Entrepreneurial leaders simultaneously experiment with multiple alternatives to a generalized end goal (Sarasvathy, 2001a) using a flexible ‘real options’ approach (McGrath, 1999). This approach involves starting with an ‘umbrella’ vision (e.g. King Gillette’s initial idea of selling something that customers would want to buy repeatedly) (Mintzberg et al., 1998), followed by ‘testing the waters’ by first committing small amounts of resources to discover whether further investment in a particular option is justified. If the initial investment leads to a favorable outcome, then they commit more resources to the pursued option, otherwise this options is either modified or shelved and alternatives options are pursued. Alternative options are pursued and given up, revised and recast, through action and interaction, with other stakeholders throughout the process.
Entrepreneurial leaders demonstrate proactive behavior in the market by creating opportunities where none seem to exist. They significantly influence the structure of the industry (e.g. Herb Kelleher at Southwest) and create new needs and wants (or anticipate needs and wants that even consumers are not aware of) (Kumar, Scheer, & Kotler, 2000). They are continuously engaged in creative imagination (Chiles, Bluedorn, & Gupta, 2005; Sarasvathy, 2001b) followed by dynamic interaction and negotiation with other market players (e.g. Steve Jobs dream of the digital music market) in an effort ‘to take us from the world we live in to the world we want to live in’ (Sarasvathy, 2001b). They are involved in the creation of new opportunities and markets through their path creation activities (Garud & Karnoe, 1995; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003), i.e. organizations with entrepreneurial leadership are ‘market-driving’ (a.k.a the market for overnight document delivery or the market for one-way moving trucks) (Kumar & Scheer, 1998).

Entrepreneurial leaders take risks by launching “their boats into the haze of an uncertain market, hoping to win pioneering advantage” (Millins & Forlani, 2005: 52). They are explorers by nature, willing to venture where no one has gone before and can not wait to get there before others (e.g. phone credit cards launched by Sam Pitroda’s C-Sam). Their biggest fear is to ‘miss the boat’ (Dickson & Giglierano, 1986), i.e. they are afraid to end up waiting too long before they act, lest someone else has already mapped the unknown by reaching there before them (“I feared regret more than I feared failure” says entrepreneurial leader Taryn Rose, CEO of the $20 million Taryn Rose International...
They face great survival risk due to market and technological uncertainties as reflected in memorable phrases like “the pioneer is the one with the arrows in its back” and “the first to market is the first to fail” (Robinson & Min, 2002). In being the first to launch their boat in previously unchartered waters, entrepreneurial leaders are guided primarily by their intuition and gut feeling (Kumar, Scheer, & Kotler, 2000; Mitchell, Friga, & Mitchell, 2004). They believe that risk is an inherent part of doing business and believe in succeeding through will-power and persistence, investing what someone has called “brave equity”, even when others consider their idea to be too risky or even unfeasible (Sarasvathy et al., 1998).

In short, entrepreneurial leaders strive to create new opportunities through their creative imagination and introduce new products and technologies that anticipate the future needs of the customers. They follow their ‘gut feel’ and are constantly trying to push the existing frontiers ‘a little more’. They ‘stretch’ their organizational capabilities as well as leverage resources and capabilities from other organizations and individuals in their network as they try to ‘go where no one has gone before’. Thus, organizations with an entrepreneurial leadership often exhibit characteristics of a ‘prospector’ organization (Miles & Snow, 1978).

Managerial leadership orientation refers to a leadership style that engages in and supports a market-focused, ‘customer-value centered’ strategy to enhance the financial performance of the organization (e.g. Kevin Rollins at Dell) (Rowe, 2001; Vorhies & Harker, 2000). Managerial leaders rely on simple, backward-looking decision heuristics and commit slack organization resources to research and innovate in the neighborhood of their existing technologies and practices (Miller & Arikan, 2004). They develop cultures,
processes, and structures that support and encourage a stream of innovations in a select technological domain. They thoroughly analyze each opportunity in advance to ensure they make optimum investments (Ansoff, 1994).

Managerial leaders demonstrate proactive behavior by continuously scanning the environment to discover opportunities and take pre-emptive action in response to the discovered opportunity (Lumpkin & Dess, 1996). Their proactive behavior is driven by the demands of the market (‘You have to ask questions, actively listen, and then act”, says one CEO (Overholt, 2005: 74)), i.e. firms with managerial leaders are market-driven (Jaworski, Kohli, & Sahay, 2000; Narver, Slater, & MacLachlan, 2004) or ‘customer-led’ (Slater & Narver, 1998, 1999). They search for opportunities in current markets (e.g. Dell’s move to sell printers to its existing customer base) as well as enter new markets with current products (Dess, Ireland, Zahra, Floyd, Janney, & Lane, 2003). They discover existing opportunities (Kirzner, 1973) and exploit them by combining existing resources in new ways (Schumpeter, 1942) (e.g. P.K. Scheerle, President and CEO of American Nursing Services who saw a shortage of trained nurses and started a staffing agency that provides hospitals with well trained nurses (Overholt, 2005)). Thus, managerial leaders exhibit proactive behavior that is path-dependent (Garud & Karnoe, 2000).

Managerial leaders take risks by committing resources to projects under uncertain conditions. Because they make large and risky resource commitments that can result in costly failures, they are concerned with trying to minimize the magnitude of their risk and do not wish to ‘sink the boat’ (e.g. John Sculley of Apple Computers). When committed

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8 A leading Scandinavian PC manufacturer in Holmqvist’s (2004) study reported that their product innovation is based on “customers’ real needs and demands”. Customers phoned, faxed, or emailed the manufacturer’s support department to “make complaints or suggest improvements to existing products”. This information is documented and then “discussed at meetings with employees from the development department, which was directly responsible for product development” (p. 77).
to risky projects they consider all possible contingencies (Cooper, 2000) to make sure that they have thought of ways in which the magnitude of failure can be minimized (Dickson & Giglierano, 1986). Thus, their approach is to minimize the size of the boat they may sink, in case things do not turn out as planned (Dickson & Giglierano, 1986; Millins & Forlani, 2005).

In short, managerial leadership excels at uncovering existing opportunities, identifying existing customer needs, and offering goods and services to meet these existing needs. They place a strong emphasis on market sensing, listening to customers, and learning about competitors. They understand the superior capabilities of their organization well and leverage these distinctive capabilities to gain competitive advantage in the market (Day, 1994). Thus, organizations with a managerial leadership often exhibit the characteristics of the ‘analyzer’ organization (Miles & Snow, 1978).

Though leadership orientation can have universal positive performance implications (firms with innovative leadership that is willing to compete proactively and take risks will perform better than firms whose leadership does not), the performance of entrepreneurial and managerial leadership orientation is context specific, so that the relationship between the type of leadership orientation and organizational outcomes also depends on the characteristics of the external environment (Miller & Friesen, 1982). For example, managerial leadership orientation can have a positive association with firm performance when the environment is more stable (Priem, Rasheed & Kotulic, 1995), while entrepreneurial leadership orientation can improve firm performance when the environment is less stable (Lumpkin & Dess, 1996). Even in the same industry (e.g. computers), entrepreneurial and managerial leadership orientation can have a different
impact on firm performance because of firm-specific factors. For example, HP was relatively unsuccessful under an entrepreneurial leader like Carleton ‘Carly’ Fiorina while it appears to be more successful with a managerial leader like Mark Hurd. On the other hand, Apple computers success can primarily be attributed to its entrepreneurial leader Steve Jobs while managerial leader John Scully was booted out of Apple due to his failure to lead the company effectively.

2.1.4 Learning Orientation

Learning orientation refers to the willingness of an organization to bring about relatively stable changes in their way of thinking about the strategic issues and challenges facing the organization (Chaston, Badger, & Sadler-Smith, 2000; Baker & Sinkula, 1999). All organizations are guided by the ‘mental schemas’ shared by their members (Weick, 1995). The dominant mental schema shared by most members, also referred to as the ‘dominant logic’ of the organization (Prahalad & Bettis, 1986), provides organizational members a simple and powerful way of thinking about the issues and challenges confronting the organization. The dominant logic functions as a filter for scanning data, a lens for interpreting data, and an integrating framework for the existing organizational knowledge (Tsoukas & Vladeimirou, 2001). It determines most organizational thinking and underlies the different arguments, implicit models and underlying narratives throughout the organization (von Krogh & Grand, 2000; Weick, 1995). It produces an ‘intrinsic harmony’ within the organization such that ideas that do not fit in may be reconfigured or rejected outright (Dougherty, 1992).

Over time, the dominant logic becomes reinforced in the organization. The capability of thoughtful independent action slowly atrophies and organizational decisions become
increasingly automatic and habitual (Bettis & Wong, 2003). The continuous reinforcement of the dominant logic and the inability to change fossilizes the organization, turning it into a “rigid physical imprint of something that was once alive” (Bettis & Wong, 2003). This makes it important for organizations to be able to make changes to their existing dominant logic through engaging in learning processes (Fiol & Lyles, 1985; Slater & Narver, 1995).

According to organizational scholars (Weick, 1995; Senge, 1990), learning processes can occur in one of two ways, generative learning or adaptive learning. A generative learning orientation involves taking a ‘double look’ at the organization by questioning the relevance of existing organizational norms while adaptive learning involves detecting and correcting errors in relation to a given set of existing norms (Morgan, 1991). All learning systems have a specific learning orientation that reflects the values and practices that determines the what, where and how of learning (Kim, 1998). There is no ideal learning orientation; both generative and adaptive learning orientation may be equally effective depending on organizational conditions and the external environment. The differences between the two learning styles are due to their underlying differences on mental maps, open-mindedness, and reflection. Mental maps are a graphical display of causal

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9 The discussion here uses Senge’s (1990) conceptualization of learning orientation as generative learning and adaptive learning. The literature on learning is replete with such dualistic conceptions of learning such as radical and incremental learning (Miner & Mezias, 1996), higher-level learning and lower-level learning (Fiol & Lyles, 1985), deep and surface learning (Brown, 2000), and double-loop and single-loop learning (Argyris, 1977 and Argyris, 1992). Senge’s conceptualization appears to be more widely used in the business literature (e.g. Gibb, 1995; Slater & Narver, 1995; Sadler-Smith & Badger, 1998; Sinkula, Baker, & Noordewier, 1997). It is also worth mentioning that Argyris & Schon (1978) had originally introduced the idea of a learning organization to the business literature and distinguished between three ways in which organizations learn- detection and correction of error (single-loop), modification of existing norms, procedures & objectives in the light of new information (double loop) and learning how to learn (Deutro learning).

10 George Bateson is the intellectual father of the literature on the different styles of learning (Visser, 2003). Based on a series of experiments and his deep interest in cybernetics, Bateson came to believe that all biological systems (organisms and their social or ecological organizations) are capable of learning.
inferences embedded in managerial thinking (Fiol & Huff, 1992). Open-mindedness refers to the willingness to question the beliefs that organizational members hold. Reflection is the process of framing a problem situation with a view to understand it better.

Mental maps are graphic representations that locate people in relation to their information environments (Fiol & Huff, 1992). They provide a frame of reference for what is known and believed inside an organization. Fiol & Huff (1992) distinguish between ‘strip maps’, which are a simple representation of the competitive landscape of the organization and ‘context maps’, which also includes detailed information about the context surrounding the different points in the landscape. As the competitive landscape changes, the cognitive maps need to be changed. Sometimes only the strip maps need to be changed, at other times the contexts maps change too. The process of changing cognitive maps may also involve discarding old maps (un-mapping) and developing new maps (re-mapping).

Making changes in maps requires changing one’s beliefs. Not all organizational members are equally open to making changes in their beliefs. In all organizations, there are two types of beliefs- core beliefs and peripheral beliefs (Lyles & Schwenk, 1992). Core beliefs are abstract and lack detail but still provide a common ground for agreement among organizational members. They form the most basic of the firm’s purpose and goals. Peripheral beliefs are more specific and are beliefs about the goals (or ends) and about behaviors appropriate for achieving them (means). Organizational willingness to alter beliefs is referred to as open-mindedness (Baker & Sinkula, 1999). Peripheral beliefs are more conducive to change as compared to core beliefs. Learning organizations
also differ in their relative encouragement of change in core beliefs and peripheral beliefs.

Central to learning is the process of reflection. Reflection is a generic term for those intellectual and affective activities in which people engage to explore their experiences in order to understand and appreciate them (Atkins & Murphy, 1993). Organization can either reflect-in-action or reflect-on-action. Reflection-in-action means to think what one is doing while one is doing it. Reflection happens in ‘real time’ and is typically simulated by surprise of coming across something that was not expected (Lumpkin & Lichtenstein, 2005). In an effort to make sense of the situation, organizations reflect on what has happened differently than expected and how it can be corrected. The basic understanding may be surfaced, probably restructured, but remains embodied in future action. The basic assumptions that have influenced action remain unchanged. Reflection-on-action, on the other hand, involves a ‘cognitive post-mortem’ (Greenwood, 1993), where organizations review the basic understanding that led them to take a particular action. What has happened and how things could be different is considered from multiple alternatives. Though similar to the ‘what if’ way of thinking (‘counter-factual thinking in Baron (2004)’s terms), reflection-on-action is cognitively more profound. It can fundamentally change basic assumptions and lead to creation of entirely new assumptions (Cope, 2003). This requires a willingness to ask disturbing questions, break through defensive routines and uncover hidden assumptions (Argyris, 1993; Argyris & Schon, 1978).

A generative learning orientation involves organizational willingness to question long-held assumptions about its mission and capabilities. Such an organization is continuously reconfiguring its perceptions of its competitive neighborhood as it gains
new and different understanding of the environment (Senge, 1990). The organization culture in such organizations requires members to be open-minded about challenging their core beliefs. This enables organizations to challenge the organizational norms and beliefs that guide its behavior based on their interpretation of environmental challenges, no matter how different they are from the current interpretations (Argyris, 1993). Members are encouraged to individually and collectively reflect on the assumptions, rules, and theories that guide the organization. New information from and of the competitive environment leads to changes in context maps through a process of un-mapping and re-mapping. A generative learning orientation involves examining and then altering the variables that guide organizational action. It involves significant organizational commitment because even though it helps organizations challenge existing technologies and create the knowledge domains of the future, it has the potential to be disadvantageous in the short run (Lukas & Ferrell, 2000).

An adaptive learning orientation reflects the organizational willingness to detect performance gaps and take steps to eliminate them within the constraints of its existing norms. As managers gain more information about the competitive effect of their actions, they make changes to their strip maps to help them compete effectively. Adaptive-oriented organizations interpret environmental responses to their actions and update their beliefs about cause-effect relationships in their market. The core beliefs are treated as sacred and changes are made to the peripheral beliefs, beliefs about the means adopted to achieve organizational goals (Argyris, 1993). Organizational members are encouraged to reflect-in-action and search for alternative ways to attain organizational goals (Greenwood, 1998). As managers try to make sense of the situation, they reflect on the
appropriateness of their means for achieving the chosen goal. Solutions are sought in previously understood and tested ways. Failure to achieve desired goals forces managers to adopt new courses of action. Though adaptive learning may have long-term consequences, the focus is on the immediate effect on a particular activity or aspect of the organization (Fiol & Lyles, 1985).

Both adaptive learning orientation and generative learning orientation can be desirable for organizations (Miner & Mezias, 1996). For example, Morgan (1997) and Senge (1990) illustrate how organizations are able to adjust to environmental changes by ‘sticking close to the knitting’ (Peters & Waterman, 1988) as in adaptive learning or by redefining themselves as in generative learning (Argyris & Schon, 1978). Even in real-life, IBM when faced with severe crises in the early 1990s engaged in generative learning to reclaim its success, while Walmart has maintained its success due to its adaptive learning orientation.

To summarize the preceding discussion of strategic orientation, three dimensions make up the construct of strategic orientation. These three dimensions are alliance, leadership, and learning. Each of these dimensions is a polar construct. This means that the three dimensions have two distinct styles each- cooperative and competitive for alliance orientation, entrepreneurial and managerial for leadership orientation, generative and adaptive for learning orientation. All organizations can be compared to each other based on their strategic orientation according to their propensity for competing or cooperating with their alliance partners, adopting an entrepreneurial or managerial style to compete in the market and willingness to engage in generative or adaptive learning.

2.2 Knowledge-Based View
The knowledge-based view has begun to emerge as a powerful and unique theoretical framework in strategic management. Any strategic management theory has to answer two questions: “Why firms exist?” (Coase, 1937) and “Why firms differ?” (Nelson, 1991; Penrose, 1959). According to the knowledge-based view, firms exist because they provide generalized institutional capabilities that allow them to create, share, exploit, and protect knowledge more effectively than the limited and costly legal institutions that are available in the market (Grant & Baden-Fuller, 2004; Liebeskind, 1996). Firms are “social communities” in which dispersed knowledge is transformed “into economically-useful products and services by the application of a set of higher-order organizing principles” (Kogut & Zander, 1992: 384). They have superior mechanisms that make them better at generating, integrating, and applying knowledge to business activities. Thus, it comes as no surprise that scholars consider knowledge to be an essential part of explaining the existence of firms (Hayek, 1988). In the knowledge-based view, what make firms different are interfirm variations in the management of knowledge. The fundamental problem all firms face is how to best utilize the knowledge that its employees possess but which is not given to any one individual in totality (Hayek, 1945). In other words, firm heterogeneity is a consequence of interfirm variations in leveraging widely dispersed knowledge available to the firm (Tsoukas, 1996). Firms that are superior at managing knowledge gain competitive advantage by exploiting their knowledge to earn economic rents. To summarize, the knowledge-based view of strategic management views firms as special, deliberate organizations that outperform markets in their ability to manage knowledge and compete with each other to leverage knowledge more effectively to gain competitive advantage.
Three ideas are critical to understanding the knowledge-based view. First, Kogut & Zander (1996: 503) argue that “a firm (should) be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge.” The philosophical *locus classical* for this is G.L.S. Shackle’s argument that “so far as humans are concerned, *being* consists in continual and endless fresh *knowing*” (1972: 156). Firms are seen as deliberate organizations with emergent and self-organizing properties that derive from the interactions of its semi-autonomous elements with one another and with other actors in the environment. The focus is on the process of knowing (von Krogh, Roos, & Slocum, 1994), how knowledge is constructed socially and meaning is created in ongoing social interactions between various actors (Brown & Duguid, 2001). Nonaka (1991) and Crossan, Lane, and White (1999) are important contributions in this area as they seek to understand the process through which knowledge at one level is converted into knowledge at another level (e.g. knowledge at individual level to organizational knowledge).

Second, firms grow by recombining their existing capabilities in new ways (Kogut & Zander, 1992). The philosophical *locus classical* for this is Hayek’s (1945) argument that “we not only know different things, we know things differently.” Within organizations and across organizational boundaries, economic actors possess knowledge that is different from each other and is also organized in different ways. Firms use their ‘combinative capabilities’ to combine dispersed knowledge in new ways (Nahapiet & Ghoshal, 1998). It is these combinative capabilities that enable firms to recognize the value of new knowledge, assimilate it and exploit it for commercial gains (Szulanski, 1996).
Third, knowledge is the most strategic asset of the firm (Winter, 1987). The philosophical *locus classical* of this is Polanyi’s (1966) distinction between ‘know how’ (performative) and ‘know what’ (declarative). Because ‘know how’ tends to be relatively immobile and difficult to imitate, it becomes a challenge to move it within and across organizational boundaries (Brown & Duguid, 2001). On the other hand, ‘know what’ travels easily across firms and forms the basis for organizational routines (or ‘best practices’) that are common across firms competing in the same industry (Eisenhardt & Martin, 2000).

In the last few years, a large number of scholars have been attracted to the knowledge-based view. Even as it is impossible to do a traditional literature review of the academic work on this topic (because of the breadth of the topic and the heterogeneity of contributions), the framework presented in Fig 2.1, partially based on Argote, McEvily, and Reagans (2003) and Cummings (2003), can be used to organize the extant research:

**Insert Figure 2.1 about here**

An extensive review of theoretical and empirical papers in the knowledge-based view reveal two central premises of the KM literature: One premise is that organizational performance is primarily influenced by the way in which organizations manages knowledge within their boundaries. The other premise is that organizations exist within a ‘network’ of information & knowledge relationships and it is the efficient management of information & knowledge ‘flows’ at these organizational boundaries that significantly influences the organizational competitiveness. While knowledge management encompasses a broad spectrum of managerial concerns and activities (Argote et al., 2003), this study is primarily concerned with interorganizational knowledge
management, the management of knowledge across organizational boundaries in strategic interorganizational relationships.

2.2.1 The Knowledge-Based View of Strategic Alliances

In the last few years interorganizational strategic alliances have increased rapidly around the world as more and more companies are beginning to consider the advantages of forming relationships with other organizations (Beamish & Delios, 1997; Contractor & Lorange, 2002). The popularity of strategic interorganizational relationships has led scholars to link the phenomenon to various theoretical frameworks (Gray & Wood, 1991; Kogut, 1988). Various disciplines have contributed to our understanding of strategic alliances and so it is no surprise that the literature on the topic is highly fragmented (Barringer & Harrison, 2000).

Over the last few years, the knowledge-based view has begun to emerge as an integrative and distinct theoretical framework to explain and understand strategic interorganizational alliances. It builds on and goes beyond the major existing theories that explain strategic alliances- transaction cost economics (TCE), resource dependence theory (RDT), and resource-based view (RBV). It both incorporates and rejects major elements from each of the three widely used theories that explain strategic interorganizational alliances.

As in other theories of strategic alliances, the firm’s ultimate objective to form strategic interorganizational relationships in a knowledge-based approach is to enhance their competitiveness and create new value (Doz & Hamel, 1998; Gray, 2000; Gulati &

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11 Podolny and Page (1998) argue that organizations form strategic inter-organizational relationships primarily to derive benefits- alleviating sources of external constraints or uncertainty, minimize total cost of production and transaction, and gain access to valuable and rare resources. These benefits are explained by RDT, TCE, and RBV respectively.
Zajac, 2000). Firms are believed to enhance their competitive position through superior management of knowledge (Grant, 1996; Kogut & Zander, 1992; Nonaka, 1994; Spender, 1996). Strategic alliances and collaborative relationships are seen as powerful organizational arrangements that expose organizations to knowledge they did not possess earlier (Choi & Lee, 1997; Grant & Baden-Fuller, 2004). Organizations gain competitive advantage through strategic alliances by effective management of knowledge across organizational boundaries (Coakes, Bradburn, & Sugden, 2004; Ding & Peters, 2000; Grant & Baden-Fuller, 1995).

Thus in a knowledge-based view, organizations are able to successfully compete because of access to new knowledge through their strategic alliances with other organizations (Choi & Lee, 1997; Powell & Brantley, 1992). The open systems view of RDT is, therefore, at the heart of a knowledge-based view of strategic alliances. Like RDT, the knowledge-based view is rooted in an open systems framework that argues that organizations must engage in relationships with other organizations around them (Scott, 2003). However, the knowledge based view does not adhere to the RDT view of organizations as being “inescapably bound up with the conditions of their environment” (Pfeffer & Salancik, 1978: 1). Where RDT is environmentally deterministic, KBV sees organizations actively making strategic choices to compete effectively. Also central to KBV is the view, key to RBV, that firms differ (Barney, 1991). The notion that firms are fundamentally heterogeneous is at the heart of both KBV and RBV. Both RBV and KBV also believe that firms can enhance their performance and earn economic rents by combining their valuable capabilities with others’ capabilities that are not perfectly tradable in the market nor easily developed internally by organizations (Das & Teng,
However, in the RBV framework, firms earn Ricardian rents, rents that accrue to scarce resources (Barney, 2001; Lewin & Phelan, 2000), while in the KBV framework firms earn Fetterian rents, rents that are earned because of the embodiment of knowledge in new products and services (Lewin & Phelan, 2000). Though both KBV and TCE deal with why firms exist, only KBV seeks to understand how firms can grow and earn economic rents. Lastly, KBV recognizes, as does TCE, the problem of ‘appropriability’, how to fairly ‘share the pie’ between the partnering organizations (Kogut, 1988; Williamson, 1979), yet KBV rejects TCE’s “narrow and particular model” of economic actors as “cheats and idlers”, “embezzlers and bank robbers” always seeking to advance their interest by stealing from others (Donaldson, 1990: 398; Moran & Ghoshal, 1996: 60). Where KBV stresses the qualitative advantages (e.g. more communication, higher information exchange) of strategic alliances, TCE views economic costs as the primary benefit of interorganizational relationships (Tallman, 2000, Madhok, 2000).

Insert Table 2.1 about here

In summary, as Table 2.1 illustrates, a knowledge-based view both incorporates and rejects major elements of each of the three widely used theories of strategic alliances\(^\text{12}\). Thus, the knowledge-based view is an integrative theoretical framework that builds on major existing theories and entails a new way of understanding strategic alliances that go beyond any of the existing theories.

According to the knowledge-based view, interorganizational knowledge management is a dynamic process where organizations continually interact with their alliance partners

\(^{12}\) For empirical research using RDT, RBV, and TCE lens to study strategic inter-organizational relationships, the reader is referred to Stearns, Hoffman, & Heide (1987), Park, Mezias, & Song (2004), and Hennart (1988) respectively.
to generate, imitate, or share knowledge (Choi & Lee, 1997). It is not a “one act drama … but an ongoing process” (Nonaka & Takeuchi, 1995). The large diversity of research on issues related to interorganizational knowledge management can be broadly divided into two groups (Song, van der Bij, & Weggeman, 2005; Poh-Kam, 2000): the large body of literature on the acquisition of knowledge in interorganizational relationships (e.g. Inkpen & Beamish, 1997; Lyles & Salk, 1996; Simonin, 2004; Yli-Renko, Autio, & Sapienza, 2001), and the relatively less researched topic of knowledge creation through interorganizational relationships (e.g. Phan & Peridis, 2000). In this way, it is emphasized that an organization’s choice to enter into a strategic interorganizational relationship can be distinguished in terms of its motivation to acquire partners’ knowledge or to create new knowledge.

Within knowledge acquisition alliances, the main purpose is to gain competitive advantage for one’s organization through knowledge acquisition, a process in which an organization primarily acquires its partner’s knowledge in various domains (Hamel, 1991) to gain competitive advantage. For example, a reputed Japanese car-maker slowly acquired its supplier’s knowledge of automotive electronics and set up its own division to manufacture automotive electronics components in direct competition to its partner (Lincoln, Ahmedjian, & Mason, 1998). Knowledge creation alliances, on the other hand, create new knowledge. The focus is on the process of creation of new knowledge through the interaction of partnering organizations in a relationship (Poh-Kam, 2000). In this kind of alliance, the main objective is the generation of new knowledge that does not exist yet. For example, organizations with knowledge in their respective domains of

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13 This study focuses on supply chain dyads rather than networks of relationships in the supply chain. Others (e.g. Kogut, 2000) have noted that firms manage knowledge within their networks to gain competitive advantage.
microelectronics, software, telecommunications, and miniaturization came together to introduce the Personal Digital Assistants (Grant & Baden-Fuller, 2004), a product that represented the creation of new knowledge domain that did not exist earlier (Madhavan & Grover, 1998).

### 2.2.2 Knowledge Acquisition

A great majority of studies in interorganizational knowledge management have adopted a knowledge acquisition perspective, assuming that organizations seek to acquire knowledge from their relationships with other organizations (Podolny & Page, 1999). According to this perspective, organizations enter into interorganizational relationships because they believe that the most convenient way to gain new knowledge is by acquiring it from other organizations. For instance, in the international alliance literature, organizations from developing markets enter into relationships with reputed multinational companies from established markets so they can acquire relatively advanced technological and managerial knowledge from their bigger partners and organizations from developed countries seek such relationships to acquire their local partner’s knowledge of local market, customs, and ways of doing business (Inkpen & Beamish, 1997).

Knowledge acquisition is not a one-time act, but an extended process through which one organization exchanges knowledge (emphasizing the acquisition of knowledge) from other organizations (Argote & Ingram, 2000). Knowledge acquisition across organization boundaries occurs through the outright acquisition or imitation of any or a combination of repositories in which organizational knowledge resides (Szulanski, 2000). According to Walsh and Ungson (1991), organizational knowledge is stored in five knowledge
repositories: (a) organizational members, (b) roles and organization structures, (c) standard organizational procedures and practices, (d) organizational culture and (e) physical workplace structure. Interorganizational knowledge transfer involves identification and absorption of desired and useful knowledge repositories. Song, Almeida and Wu (2003) found that organizations acquire their partner’s knowledge by hiring employees from other organizations. Likewise, technological routines and physical workplace structures may be copied from one organization to another. Organizational culture can also be replicated (though not perfectly) through communication and training. Thus, organizations acquire knowledge from their partners by acquiring their relevant knowledge repositories.

An important concept related to knowledge transfer and organizational learning is that of absorptive capacity. Absorptive capacity refers to an organization’s ability to recognize valuable external knowledge, assimilate it, and apply it to commercial purposes (Cohen & Levinthal, 1990). Organizations with higher level of absorptive capacity are likely to acquire knowledge from other organizations better than organizations with lower absorptive capacity. Knowledge acquisition from other organizations is contingent on an organization’s absorptive capacity relative to its partners organizations (Lane & Lubatkin, 1998). Organizations acquire knowledge better from other organizations when partnering organizations have overlapping knowledge domains and compatible norms and values (Lane, Salk, & Lyles, 2001). The greater the distance between the knowledge domains of alliance partners, the more difficult it is for them to understand and make sense of each other’s knowledge. A large distance between the knowledge domains of partnering organizations has the advantage of novelty but the problem of
incomprehensibility (Nooteboom, 2000). Organizations possessing dissimilar knowledge are unable to make sense of each other’s knowledge because prior related knowledge is needed to make sense of acquired knowledge (Cohen & Levinthal, 1990). Thus, interorganizational knowledge acquisition tends to be path dependent - organizations are more effective at acquiring knowledge from partners close to their current knowledge domain. Relative absorptive capacity varies along two dimensions (van den Bosch, van Wijk & Volberda, 2003). Organizations can differ on their specialization in their knowledge domain, the depth of their absorptive capacity, or they can differ in their knowledge in domains closely related to what they currently know, the breath of their absorptive capacity. Thus, the depth and breadth of current knowledge positively influences an organization’s propensity to acquire knowledge from its strategic partners.

Knowledge acquisition process can be explicit or implicit (Argote & Ingram, 2000). When an organization communicates with its partner about a standard operating procedure that improves production quality, the transfer process is primarily explicit. Knowledge acquisition is primarily implicit when an organization acquires knowledge of improving production quality without being able to articulate how the acquired knowledge improved the quality of production. It is the causal ambiguity of knowledge that determines the explicitness or implicitness of knowledge transfer. When knowledge of cause-effect is ambiguous, knowledge transfer is implicit whereas when such knowledge is unambiguous, knowledge transfer is explicit.

Knowledge acquisition can be laborious, time consuming, and problematic (Galbraith, 1990; Szulanski, 2000). Transfer of knowledge from one organization to another, rather than being fluid, can often be ‘sticky’ or difficult to achieve (von Hippel,
When stickiness is an intrinsic property of knowledge, knowledge is ‘difficult to acquire, transfer, and use in a new locus’ because it is inseparably related to the process of doing a particular task (Hoopes & Postrel, 1999; von Hippel, 1999). When stickiness is characteristic of the process of knowledge acquisition, like friction, it does not have an existence of its own, but only comes into play when an organization tries to acquire knowledge from another organization by moving knowledge repositories from one place to another (Jensen & Szulanski, 2004; Szulanski, 2000).

Knowledge acquisition often leads to a race between partners to acquire each other’s knowledge faster than the other can acquire theirs (Hamel, Doz, & Prahalad, 1989). Such races are frequently seen in international collaborative relationships where firms compete to acquire knowledge and skill set of their partners: Local firms seek to acquire technological and managerial knowledge of their MNC partner while the MNC partner is interested in acquiring the knowledge to compete in the local market from their local partner (Hamel, 1991). As the partners meet their goals of acquiring knowledge to varying degrees, over time the bargaining power of the partner shifts, partner interdependency changes and the relationship is destabilized (Inkpen & Beamish, 1997; Yan & Gray, 2001). Senior managers in many American and European firms acknowledge that relationships with Japanese organizations often result in races which the latter won most of the time (Lei, 1997). An inter-organizational alliance between one of the largest software manufacturers in the world and a relatively smaller European computer systems firm with a strong competitive position in its niche segment gave rise to suspicions within the latter that it would be ‘sucked dry’ (Child, 2001). Indeed, Lei (1997) warns that managers who do not see their relationships with other organizations
are likely to find that inter-organizational relationships turn out to be ‘a dangerous vehicle’ by which their partners acquire and ultimately internalize their organizations’ unique knowledge base and skills.

2.2.3 Knowledge Creation

A relatively unexplored topic in interorganizational knowledge management in strategic alliances is the creation of new knowledge that did not exist earlier, i.e. ex-nihilo creation across organizational boundaries. This perspective directs attention to a form of interorganizational knowledge management in which each member works with its partner in order to create knowledge that neither of them possessed in their own organization earlier (Phan & Peridis, 2000). It occurs through a dynamic and cyclic process of converting tacit knowledge to explicit knowledge across various levels.

Explicit knowledge refers to knowledge that can be articulated in a form that can be made available to at least some other people in the form of oral or written statements, stories, drawings, diagrams, or other representations and can be stored in tangible sources such as databanks, manuals, journals, publications etc. to exchange through various means of online or offline transmission. For example, home-page trafficking software collects inputs from various sources and combines them to create knowledge (e.g. path and log analysis) that is not available elsewhere (Nonaka, Reinmoller, & Toyama, 2001) and does not exist before being created by the relevant softwares (McFadyen & Cannella, 2004). However, “knowledge that can be expressed in words and numbers only represents the tip of the iceberg of the entire body of possible knowledge” (Nonaka, 1994: 16), what Polanyi (1966) famously phrased as “we know more than we can tell”. This component of knowledge, the “circle of the unexpressed” according to German
philosopher Hans Lipps, can not be articulated or codified because it is impossible to be accurately expressed in language. It can be knowledge based on experience (e.g. knowledge of playing a piano or riding a bicycle) (Polanyi, 1966) or knowledge that is context-specific (e.g. knowledge of proper behavior in a wedding is deeply tied to the time and place of the ceremony) (Hayek, 1945). Tacit knowledge constitutes a vast and endless part of individual knowledge and includes the entire background of one’s experiences, a large and possibly infinite number of unarticulated assumptions and unconscious thoughts (Kikoski & Kikoski, 2004) leading German philosopher Hans-Georg Gadamer to call it ‘the infinity of the unsaid’.

Nonaka’s Knowledge Creation Framework

Nonaka (1994) and Nonaka and Takeuchi (1995) build on the distinction between explicit and tacit knowledge to explain the creation of new knowledge. They argue that tacit and explicit knowledge are not mutually exclusive, but that new knowledge is created through a continuous interplay between tacit and explicit knowledge as knowledge is systematically converted from one form to another. Interacting individuals with different types and contents of knowledge quantitatively and qualitatively expand tacit and explicit knowledge (Nonaka & Takeuchi, 1995). As more and more actors become involved in the knowledge conversion process, the interactions become larger in scale and faster in speed (Inkpen, 1996). Thus, knowledge creation is a spiraling process of ‘social conversion’ (Nonaka & Takeuchi, 1995), where knowledge spirals upwards in the organization (Inkpen, 1996). Knowledge is enriched and extended as social actors at different levels interact with each other and with their environment. Nonaka (1994)
proposed a 2 x 2 grid of knowledge creation. Figure 2.2 shows the characteristics of the four modes of knowledge conversion.

Insert Figure 2.2 about here

During the four stages of the knowledge creation process, explicit and tacit knowledge complement each other. The interaction between the two types of knowledge is amplified through the four modes of knowledge conversion (socialization, externalization, combination, and internalization). The four stages of the model are explained briefly below:

I. Socialization: At this stage, tacit knowledge is converted into tacit knowledge. Knowledge creation processes are initiated when individuals share their thoughts and experiences. Joint activities, such as being together, spending time, living in the same environment, observation and practice are important, no written or verbal instructions and other formal communication channels (Nonaka & Konno, 1998). The informality of the situation relaxes everyone, and allows deeper communion. Nonaka & Takeuchi (1995) note the off-campus meeting to ‘brainstorm’ to solve difficult problems held by Honda where people seek harmony by sharing life experiences- drinking, eating, generally chatting, and taking communal baths in a hot spring.

II. Externalization: This involves converting individual tacit knowledge to explicit knowledge. Analogies, metaphors, hypotheses, and models are used to articulate tacit knowledge (Nonaka & Takeuchi, 1995). People know more than they can tell (Polanyi, 1966). As people try to bridge the gap between what they know and what they can express, they reflect on the potential reasons for the difference by searching for something in terms of something else. Attributes of one domain are used to better
understand some aspects of another domain (Beatty, 2004). For example, Senator John Kerry’s comparison of CEOs of companies outsourcing jobs to other countries to Benedict Arnold immediately brings to mind the image of some one who is willing to compromise their country for selfish reasons. Metaphors are laden with rich symbolism and make abstract concepts more concrete by borrowing from a familiar domain. Intuition is combined with deduction and induction to generate a concept that is meaningful and practical at the same time. Thus, externalization combines the use of metaphors, analogy, and model to create new explicit knowledge from tacit knowledge. Knowledge conversion, at this stage, is a social process where the shared perception is articulated into concepts in an ongoing dialogue (Hussi, 2004). Intangible, tacit knowledge is converted to tangible, explicit knowledge which can now be shared with other organizational members in an easily understandable form.

III. Combination: This mode involves the conversion of explicit knowledge into more complex sets of explicit knowledge (Nonaka & Konno, 1998). Thus, the key issues at this stage are communication, diffusion, and systemization of knowledge. New concepts generated in the previous stage are communicated to organizational members who can then combine it with their existing knowledge to organize it into larger knowledge structures (Hussi, 2004). Telephones, emails, meetings, and other groupware resources are used to communicate and combine discrete explicit knowledge. Recipients then reconfigure knowledge through sorting, adding, combining, and categorizing of their knowledge. Knowledge created in formal education and training at schools is an example. Thus, it comes as no surprise that
leading companies like McDonalds, Infosys, etc. have their own management training
schools where they run short courses for their employees.
The combination mode is also seen when middle level managers break down and
interpret the grand visions of top management to operationalize them, creating new
systemic knowledge in the process (Hussi, 2004). For example, at Wipro, Azim
Premji, CEO expressed his vision for the company which was then developed into a
detailed model by the middle level managers. This included a step-by-step road map
which would take the organization from where it is to where it wants to be (Chatzkel,
2004).
IV. Internalization: This mode involves implementing and practicing the newly integrated
knowledge until it becomes organizational tacit knowledge. Explicit knowledge in the
form of documentation, manuals, written and oral stories are internalized via
‘learning by doing’ processes such as simulations or experiments (Nonaka & Konno,
1998). Explicit knowledge shared throughout the company is converted into tacit
knowledge by organizational members (Hussi, 2004). Individual members access the
knowledge base of their group and the entire organizations, motivating them to reflect
on their knowledge and find themselves in a larger entity (Nonaka & Konno, 1998).
When most of the members possess certain tacit knowledge, it becomes part of the
organization’s culture (Nonaka & Takeuchi, 1995). Internalization is facilitated by the
explicitness of knowledge. It helps if knowledge is documented in written manuals or
‘oral stories’. Wipro Technologies, for example, has an explicit knowledge repository
and a tacit knowledge repository. The former are “specific repositories which address
the needs of explicit knowledge that is captured in the form of documents which were
published”. These documents are organized and indexed systematically and when somebody looks for particular knowledge, documents that match the criteria will show up in the search for them. The latter are yellow pages, discussion groups, and chat rooms that connect knowledge seekers with people who have the knowledge. People can ask each other questions and try to tap into other’s tacit knowledge. This process of tacit knowledge exchange is also captured to increase the richness of the repository.

Though all the four modes are important for knowledge creation in organization, on their own each individual mode is only partially useful. The four modes together facilitate sustained knowledge creation by taking the organization on a spiral path to the next phase of tacit-explicit interaction. Knowledge is created through a series of self-transcendental processes, amplifying the interaction between tacit and explicit knowledge (Nonaka & Konno, 1998). Thus, the SECI model describes a dynamic process of knowledge creation in which explicit and tacit knowledge are exchanged and transformed as people redefine the boundaries of their self by acquiring a new view of the world, a new way of thinking (Hussi, 2004).

Nonaka and Konno (1998) propose the Japanese concept of “Ba” as a common space where individuals are encouraged to exchange and integrate knowledge. This space can be physical (e.g. office, executive lounges), virtual (e.g. e-mail, list serves, chat rooms), mental (e.g. shared experiences, executive retreats), or any combination of them (Nonaka & Toyama, 2003). Ba enables organizations to collect knowledge from different areas and integrate it (Nonaka & Konno, 1998). As knowledge is closely tied to individual senses and previous experience, individual come to create the world in ways that are
unique to them (von Krogh, 1998). *Ba* is a platform to get involved in organizational knowledge and transcend one’s own limited knowledge (Nonaka & Konno, 1998). People possessing knowledge come together and share knowledge organizationally to expand the knowledge base of the company. The following quote from M. Rajakannu, Head KM Initiative at Wipro highlights how such a common space facilitates knowledge conversion:

> Tacit knowledge remains in people’s head…. How do I connect the person who needs knowledge with the person who has that knowledge sitting in his head. … This knowledge … is something that the person alone has acquired or cultivated because of his or her past experience. It is impossible for us to capture the entire experience and put it into explicit document repository. Much more valuable is how we connect these two people. That is where we have yellow pages and discussion groups, as well as chat rooms. These yellow pages and discussion groups are quite popular because they are a platform where somebody can post their query, or go hunt for people who are experts. If, for example, I am looking for information on a particular technology, part from getting some technical documents on that technology. I can download the document and read it if I have time, or I have contact information of experts in that area and I can directly contact them and pose my problem to them. I can get a solution much faster because that person’s experience will be helping me resolve the problem.

The process of people exchanging tacit knowledge is also captured so that tomorrow someone who has the same problem does not even have to go to the expert. He goes to the archived exchange and he sees the entire tacit knowledge exchange being captured there. This is also classified with the help of the same taxonomy. The repository is becoming richer day-by-day by capturing this tacit knowledge.

*Ba* provides a physical, mental, or virtual context for individual conversion and to move along the knowledge spiral. It is the context shared by interacting social actors, who during such interactions evolve through self-transcendence to generate knowledge (Nonaka, Toyama, & Nagata, 2000).

Though Nonaka and Konno (1998) conceived *Ba* as primarily individual level, Nonaka, Toyama, and Nagata (2000) extended the ontological domain to other levels. *Ba*
exists at multiple levels and many of these levels can be connected to form a greater \textit{ba} (known as \textit{basho}) (Nonaka & Konno, 1998). The self transcends itself when an individual enters the team \textit{ba}. Just as individuals form the \textit{ba} of team, organization is the \textit{ba} of teams. A firm is a collection of \textit{ba}, which interact with each other dynamically, amplifying the process of knowledge creation (Nonaka et al., 2000). In other words, organizational knowledge creation is a process “whereby the knowledge held by individuals is amplified and internalized as part of an organization’s knowledge base” (Inkpen, 1996: 124).

Nonaka’s work has focused on intra-organizational knowledge creation. Kidd (1998) empirically tested Nonaka’s model for interorganizational knowledge creation in the context of Italian-Japanese ventures. He found that the basic principles of Nonaka’s model sustain well even in inter-organizational relationships. Organizations create internal and external \textit{ba}. Where internal \textit{ba}, that is the shared space within organizational boundaries, promotes intra-organizational knowledge creation, external \textit{ba}, that is the shared space between organizations, promotes interorganizational knowledge creation. Partnering organizations not only know different things, they also know things differently (Burns & Stalker, 1966; Hayek, 1948). Interorganizational \textit{ba} promotes dialectic process among organizational members as it enables them to see particular phenomena from multiple points simultaneously (Nonaka & Toyama, 2003). It encourages partners to ‘come out’ and openly share their existing knowledge. It also helps partner organizations to access each other’s knowledge base and bring existing knowledge to bear on emergent problems (Dyer & Nobeoka, 2000), creating new knowledge in the process (Nickerson & Zenger, 2004). Organizational members transcend the boundary of their own
organization’s ba by participating in inter-organizational ba, and further transcend the interorganizational ba, when it is connected to the other organization’s ba. Organizational members strive to synthesize various ba, inside, outside and between organizations to generate new knowledge (Nonaka & Toyama, 2004). Eventually, the organization’s ba is not just the accumulation of knowledge possessed by it or accessible by it, rather it possesses the dynamism to continually create new knowledge by building on shared ba (Nonaka & Konno, 1998).

2.2.3.1 Knowledge-based view: From looking in the rear view mirror to looking ahead

Most extant literature on knowledge management considers knowledge to be socially constructed based on subjective interpretation of past events or activities. It has recognized the subjective and socially constructed nature of knowledge. People interpret past events differently and so have different knowledge of what has transpired. This leads to negotiation and compromises in a process of social construction of knowledge. However, knowledge develops over time not only because of an increased understanding of what has already transpired but also because of creatively imagining the future (Rollier & Turner, 1994). For example, the development of consumer VCR industry can not only be attributed to the scientist’s familiarity with existing knowledge domains but also to the creative imagination of knowledge domains of the future (Lardner, 1987). Early exploratory research related to VCR’s was partly based on extant knowledge of audio tape recording and partly motivated by General Sarnoff’s (CEO of RCA) imaginative idea of “a television picture recorder that would record the video signals of television on an inexpensive tape” (Lardner, 1987: 54). The knowledge that influences our present actions consists of not only what we have already learned but also our expectations of the
future. Knowledge refers not only to acquired knowledge of the past but also comprises of expectations for the future. In a world characterized by uncertainty and an unknown, unknowable future, individual actors imagine possible future and make subjective choices to deal with it. These “flights of fancy” (Ford, 2002: 643) are not necessarily grounded in past experiences but are based on imagination related to envisioning unprecedented future scenarios. People engage in “thought trials”, imagining future alternatives and mentally exploring the possibilities they may lead to (Campbell, 1960). Knowledge comes to include an inherently creative component, an act of creative imagination (Lachmann, 1986). It is the forward-looking process of creatively imagining the future that allows actors to transcend the limits of knowledge rooted in interpretations of the past (Ford, 2002). Creatively imagining the future creates expectations of alternative futures, most of which tend to be tacit, but some may also be explicit. In the last few years there has been a rapid growth in the introduction and adoption of technical tools that aim to improve our understanding of the possible future states of the world. Organizations are increasingly using forecasting, technology assessment, scenario analysis etc. as a way to creatively deal with the uncertainties surrounding the future (Rotheli, 1998).

The view of knowledge as including future expectations allows us to make a paradigm shift from the idea of path dependence (Arthur, 1985; Bargett & Burgelman, 1996) to path creation (Garud & Karnoe, 2001). The notion of path-dependency connects organizational knowledge to specific knowledge trajectories developed over time. Knowledge management is seen as a temporal process such that ‘temporally remote’ experiences (which are considered insignificant when they occurred) play a key
role in the development of organizational knowledge. These experiences gain
significance post-hoc (Patriotta, 2004). Proponents of a path-dependence perspective
celebrate ‘where the firm has been’ to explain current organizational knowledge base
(Nelson & Winter, 1982). Human agency can be seen as one of managers looking in the
rearview mirror and driving forward (Garud & Karnoe, 2001). Firms learn in the
‘neighborhood’ of their existing knowledge (Gavetti & Levinthal, 2000; Kogut & Zander,
1992), limiting the discovery of new knowledge close to existing knowledge domains.
Inability to move beyond local search prevents organizations from gaining knowledge in
areas that differ significantly from their existing knowledge that may lead to ‘competency
trap’ (Levitt & March, 1988) or ‘learning myopia’ (Levinthal & March, 1993). Though
there are advantages of gaining experience in a particular knowledge domain,
organizational routines may slowly become rigid (Leonard-Baton, 1992; Nelson &
Winter, 1982) and no longer useful for competing in the future.

The path creation perspective, on the other hand, is a radical departure from the
notion of path-dependency. Knowledge management is seen as a dynamic process where
history is malleable- open to revisions that make it conform to current needs and
perceptions, and the future is imaginable, unknown but not unimaginable. Organizational
knowledge is a combination of “a current view of the past” and current views of the
future (Gioia, Corley, & Fabbri, 2002). Human agency involves “proactively revising
history” and “project[ing] desired future images” (Gioia et al., 2002: 624) in an effort to
confront a complex flow of events in the kaleidic world (Chiles, Gupta, & Bluedorn,
2006; Lachmann, 1986). Path creation processes are set in motion in real time,
acknowledging that these may be creating inefficiencies in the present, but with the
awareness that embarking on these new paths is required to create new futures (Garud & Karnoe, 2001). Organizations are motivated to create new knowledge in anticipation of or when current knowledge may be deemed inadequate (Ford, 2002), either due to changes in the demand side (e.g. change in customer needs) or change in the supply side (e.g. convergence of distinct technological fields).

To summarize the previous discussion, the ability of knowledge-based view to provide insight into the nature, circumstances, and management of interorganizational strategic alliances is greatly enhanced when knowledge management is seen as two different processes of knowledge acquisition and knowledge creation. Moreover, the inclusion of future expectations as knowledge allow for the development of a knowledge-based theory of interfirm relationships that stresses the role of alliances in the introduction of novelty in the world around us. This brings the understanding of alliances closer to and consistent with the observations concerning contemporary alliance activity in the business world. It is commonly observed that many firms have alliances where partners compete to acquire each other’s knowledge while other firms have alliances where partners work together to introduce new innovations. The knowledge based view of strategic interorganizational relationships as knowledge acquisition alliances and knowledge creation alliances provides for a suitable theoretical lens to understand contemporary knowledge-based alliances.

2.3 Knowledge Management and Organizational Performance

For the field of strategic management, making the link between knowledge and performance should be one of the most important contributions of the knowledge-based view. Yet, this is precisely the area where current research leaves the most desired
Most researchers either do not address performance at all or simply state that certain knowledge management activities (such as knowledge creation and knowledge acquisition) will improve firm performance and help gain the firm competitive advantage.

Using a questionnaire to measure perceptions of respondent executives (Managing directors, KM officers, or HR directors) from the Spanish manufacturing sector, Ordonez de Pablo (2005) found that depending on their knowledge management strategy top managers evaluated their performance differently using a multivariate measure of perceived performance (industry leadership, future perspective, response to rivals, overall success, as well as several perceptual financial measures). Similarly, Gold, Malhotra, and Segars (2001) measured the relationship between top management’s perceptions of their organization’s knowledge management and performance. They found that top executives’ perception of their firm’s knowledge management capabilities related positively to their perception of their organization’s ability to identify new business opportunities, coordinate development efforts across organizational units, commercialize new innovations rapidly, respond quickly to change, increase efficiency, and other factors of organizational performance.

Yli-Renko et al. (2001) examined knowledge acquired by 180 young high-tech firms through their downstream strategic relationships. They found that knowledge acquisition had a positive correlation with multiple measures of organizational outcomes: greater success in new product development, increased technological development, and reduced sales costs. Where Yli-Renko et al. (2001) used objective measures of performance, Tippins & Sohi (2003) collected data on respondents’ perceptions of performance factors
such as firm profitability, ROI, customer retention, and sales growth relative to rivals. They found that knowledge management in downstream relationships had a positive relationship with subjective measures of performance.

Tanriverdi and Venkatraman (2005) study knowledge management, not in supply chain relationships, but across units in multinational corporations. They conceptualize knowledge content in three domains (product, customer, and managerial), and measure these using questionnaire items. Archival measures of both accounting-based and market-based performance (ROA, ROE, and Tobin’s Q respectively) were used (primarily because the sample consisted of Fortune 1000 firms). Consistent with the findings of other related published articles (Tanriverdi, 2005), knowledge content had a positive relation with organizational performance.

Overall, one might conclude that these studies, taken in the aggregate, indicate general support for a positive relationship between knowledge management and firm performance. At the same time, it is to be noted that though both common sense and evidence suggests that knowledge management may be positively related to firm performance, there is lack of empirical research on whether and to what extent knowledge creation and knowledge acquisition in strategic alliances influence firm performance differently. The limited empirical research has limited itself to examining the influence of knowledge management in general on firm innovation outcomes, ignoring the possible differences between the influence of knowledge creation and knowledge transfer on the performance of the firm.

In summary of the previous section, it appears that the knowledge management literature (broadly defined) offers theoretical models and arguments that distinguish
between the two alternative modes of knowledge management in interorganizational relationships, but lack a compelling connection (theoretical and empirical) with firm performance. Moreover, as the first section of this review demonstrates, the relationships between firm strategic orientation and knowledge management have not been a topic of discussion among strategy scholars. This lack of emphasis on the relationship between firm strategy and interorganizational knowledge management and between knowledge management in strategic supply chain relationships and firm performance is surprising given that both of these sets of relationships are central to strategic management research (Eisenhardt & Santos, 2002).

The next chapter uses the literature reviewed in this chapter to derive a research model and hypotheses that comprehensively address the research questions. It presents a theoretical model that summarizes the hypothesized relationships between firm strategy, knowledge management, and firm performance.
This chapter presents the hypotheses developed to understand the relationship between firm strategy and knowledge management in strategic alliances as well as the impact of knowledge management on firm performance. The hypotheses presented here build on prior research in the areas of firm strategy and inter organizational knowledge management reviewed in the previous chapter.

Figure 3.1 presents the framework that explains the nature of relationships between interorganizational knowledge management and its precursors, contexts, and consequences. More specifically, the model incorporates (i) firm strategy and (ii) alliance organization environment to explain knowledge creation and knowledge acquisition through strategic alliances as well as examines the impact of the two modes of knowledge management on firm performance moderated by complexity of the knowledge base of the industry.

Insert Figure 3.1 about here

3.1 Alliance Orientation and Knowledge Management

Alliance orientation refers to an organization’s desire to form strategic alliances with other organizations. Organizations can either be high in cooperative orientation or they can be high in competitive orientation. Organizations high in cooperative orientation believe in expanding the pie by creating mutually beneficial outcomes for both the partners while those higher in competitive orientation seek to maximize the size of their share of the pie without any regard to their partner (Gulati & Wong, 2003).
Organizations high on cooperative orientation are willing to provide their partners with access to important research work being done in their own organization (Hagedoorn & Osborn, 2002) and are willing to ‘teach’ their partners about the core aspects of their business (DeLong & Fahey, 2000). They do so by taking small but meaningful steps, such as sharing the resume of their R&D engineers with their partners and letting them choose who they want to work closely with (Gulati, Khanna, & Nohria, 1994), that signal their desire to encourage cooperation in the alliance. Unilateral commitments serve to credibly convey the good intentions of the firm, removing partner’s doubts about sharing its knowledge (Gulati et al., 1994).

Cooperative organizations also emphasize and encourage informal socialization between partnering organizations- for example, face-to-face meetings and Friday evening beer get-togethers (Doz, 1996). Informal socialization between employees from partnering organizations increases trust between them which makes them more willing to share ideas and information that would not have been usually shared in the ordinary course of business (Gerwin, 2004). Indeed, Larson (1992) observed that the greater the social interaction between partnering organizations, the more intense the exchange of business-related information. Joshi & Sharma (2004) note that social interaction provides better access to and understanding of customer’s needs and more effective means of communicating with the customer.

Organizations high on cooperative orientation display care, defined as “serious attention (heed), a feeling of concern and interest” (von Krogh, 1998), towards alliance partners. They engage in extensive dialogue to understand their partners’ problems and offer constructive ideas and suggestions to help their partners (Seshadri & Shapira, 2003).
This gives rise to active empathy making it possible for organizations to proactively seek out instances where they can be of help to their partners. Such organizations are interested in working with their partners to identify and understand their needs and propose solutions to satisfy them. For example, organizations that have care and affection for their partners form alliances with their key customers (von Krogh, 1998) that can be a useful source of unique and innovative products (Kristensson, Gustafsson, & Archer, 2004).

Thus, cooperative oriented organizations are able to create new knowledge through the alliances. In the supply chain context, close relationships between organizations high on cooperative orientation and their supply chain partners enables these organizations to act as a knowledge bridge between different suppliers and/or customers that may not have come together otherwise\textsuperscript{14}. Upstream and downstream partners may not have been well aware of each other’s knowledge domains. Their unique status in the supply chain provides them with exposure to knowledge domains that they or their partners may not have been familiar with earlier (Hargadon & Sutton, 1997) and help them work closely with the partners to develop knowledge in new domains (von Hippel, 1988). Because cooperative alliance oriented organizations have close relationships with partners on both sides they are able to bring them together in a common forum and coordinate efforts to expand the size of the pie.

However, because of their cooperative orientation these organizations are unable to make aggressive competitive moves that may harm their partners. They are unable to view their alliances as “competitive collaborations” (Zeng & Chen, 2003) and increase

\textsuperscript{14} As mentioned in chapter 2, cooperative organizations may act as a knowledge bridge between multiple suppliers (upstream) or multiple customers (downstream) or suppliers and customers (between upstream and downstream).
their share of the pie at the expense of their partners (Lado, Boyd, & Hanlon, 1997). They also tend to feel uncomfortable relying heavily on formal governance mechanisms such as legal contracts to discourage free-riding in alliances (Das & Teng, 2000). Because cooperative organizations, by definition, do not see themselves as competing with their partners they do not perform well in knowledge acquisition alliances that are geared towards acquire partners’ knowledge as fast as possible.

On the other hand, organizations with a competitive alliance orientation are better able to acquire knowledge for their own benefit from knowledge acquisition alliances. They have institutionalized systems, such as ‘transfer groups’, to carefully monitor and record the acquisition of knowledge from their partners (Simonin, 1999). These groups are constantly questioned as to the knowledge they have brought back from interaction with the partners. They also have ‘technological gatekeepers’ who are responsible for limiting the outflow of knowledge from inside the organization (Hamel, 1991). These gatekeepers are responsible for creating an illusion of transparency so that competitive organizations can access their partners’ knowledge domains but shield their own knowledge domains. Thus, competitive oriented organizations maximize their receptivity to their partners’ knowledge, while limiting the transparency of their own (Hamel et al., 1989).

Competitive oriented organizations seek to acquire the knowledge repositories of their partners through various means. For example, they try to hire ‘knowledge workers’, employees who are working on important knowledge domains, from their partner organizations (Song et al., 2003). They also try to get access to operation manuals or information technology systems that provide them with details of their partners’
operating and technological knowledge without having to make investments in developing them.

Thus, competitive oriented organizations are able to acquire knowledge from their alliance partners. In an in-depth survey of eleven companies engaging in international alliances, Hamel (1991) found that managers in some competitive oriented companies regularly tracked knowledge acquisition through their alliances by asking their employees how much knowledge they had acquired from their partner. In the supply chain context, such organizations occupy unique positions that enable them to build on knowledge acquired from their relationships with their suppliers and customers and leverage it for their own benefit (Burt, 1992; Kogut, 2000). They seek to maintain their own alliances with their supply chain partners, but are not interested in bringing different suppliers and/or customers together. In fact, they are often willing to make their partners compete against each other for their own benefit.

However, because of their competitive orientation these organizations are unable to create new knowledge that can be beneficial to both partners. Competitive oriented organizations tend to be suspicious of their partners’ motives, decreasing the quality of their alliance relationships (Griffith, Harvey, & Lusch, 2006). Because of lack of norms of reciprocal fairness in low-quality alliances, there is a reluctance to share knowledge freely and to take risks to engage in joint innovation (Larsen, 1992). Competitive orientated are likely to have market reputation as a ‘hit and run’ organization (Khanna, Gulati, & Nohria, 1998) which decreases their trustworthiness. Partners do not feel a strong sense of commitment in alliances with firms that are not trustworthy (Morgan & Hunt, 1994), which discourages them from investing in knowledge creation activities.
that, by definition, need more commitment and time. Competitively oriented organizations tend to be paranoid about the future behavior of their partners and rely on formal mechanisms to enforce non-opportunistic behavior. However, governance mechanisms that rely on third-party enforcement are not conducive to the type of free knowledge sharing between partnering organizations that is important for creation of new knowledge (Dyer & Singh, 1988). Indeed, using a comprehensive data base of supplier relations in the automotive industry, Mudambi and Helper (1998) found that when supplier-customer relations are ‘close but adversarial’ they are characterized by low trust and formal governance mechanisms such that the “buyer will take advantage of competitive weakness of the suppliers to reap short-term gain” (p. 786).

In summary, some organizations have an organizational culture that encourages cooperation with other organizations. Such cooperative oriented organizations occupy unique positions in the supply chain that enables them to work closely with the partners to develop knowledge in new domains for mutual benefit. Though they are not effective at competing in knowledge acquisition races, cooperative organizations are effective at working with suppliers and/or customers to create new knowledge that can used by the partnering organizations. Competitive oriented organizations, on the other hand, have an organizational culture that encourages seeking private gains even at the expense of partner organizations. They tend to occupy unique positions in supply chains that enable them to benefit from the knowledge acquired from their supply chain alliances without sharing those benefits with their partners. Because of their tendency to accumulate the knowledge gained from their supply chain partners for themselves, such organizations are
effective at knowledge acquisition alliances but are not effective at creating new knowledge together with their partners.

Thus, it is hypothesized:

**H1: Alliance orientation will be related to knowledge management in non-equity strategic alliances such that as organizations become more cooperative knowledge creation increases and knowledge acquisition decreases in both upstream and downstream alliances.**

### 3.2 Leadership Orientation and Knowledge Management

The top management of an organization plays an important role in facilitating the management of knowledge (Lahteenmaki, Toivonen, & Mattila, 2001; Michel & Hambrick, 1992). Though both entrepreneurial leaders and managerial leaders can manage knowledge effectively so as to gain competitive advantage for the organization (Levinthal & March, 1993), they impact knowledge management in different ways.

Entrepreneurial leaders create a vision for the future and lead their firm to strive to achieve that vision. They engage in activities that drive the market by combining their market focus with their creative imagination without being constrained by existing technological and other limitations (Kumar et al., 2000). They place strong emphasis on developing new product, process and/or technological innovations that provide their customers a significant leap in value over what was available to them previously. They make substantial platform investments, that is, investments which explicitly create new paths for further proactive options for the future (Kogut & Kulatilaka, 1994). For example, Thomke and von Hippel (2002) describe how some semiconductor companies worked closely with their supply chain partners and invested in creating do-it-yourself
tool kits that enable their customers to design their own chips as per their own needs, thereby creating a $15 billion market for custom integrated circuits ex-nihilo.

Entrepreneurial leaders act as a knowledge enabler by establishing procedures and policies that facilitate the generation of new knowledge (Ichijo, von Krogh, & Nonaka, 1998). They encourage new cross-functional and cross-organizational teams to leverage the information and knowledge dispersed among employees in both of the partnering organizations (Crampton, 2001). These teams are responsible for coming up with multiple alternative options that entrepreneurial leaders may chose to influence the competitive environment in the future. As entrepreneurial leaders exercise their options and commit more resources to some ideas while abandoning others (McGrath, Ferrier, & Mendelow, 2004), teams are continuously created and disbanded. Members with varying experience come together, work together (formally and informally) for some time, and are then regrouped into different teams. By cross-fertilizing ideas across time and space within the organization and across partnering organizations, entrepreneurial leaders help in connecting multiple knowledge areas (De Long & Fahey, 2000). In fact, using data collected from European, Asian, & U.S. computer firms Eisenhardt and Tabrizi (1995) found that multifunctional teams help address downstream problems earlier in the process and facilitate the embodiment of new knowledge in innovative products. Peterson, Handfield, and Ragatz (2003) used data collected from in-depth case studies and mass survey to propose and confirm that firms that form cross-functional teams with members from supplier organizations are able to reduce problems associated with new product development and improve outcomes, especially when technological uncertainty is high.

In summary, entrepreneurial leaders have a unique ability to understand and bring
together diverse knowledge domains. They experiment with multiple options at the same
time and combine the knowledge generated in these experiments in time and across time
to create new knowledge. Their visionary nature coupled with their willingness to explore
uncharted waters leads them to work in knowledge domains that people are not yet
familiar with. Their ability to involve their relationship partners in the pursuit of their
vision in meaningful ways (Gupta et al., 2004) facilitates cross-fertilization of ideas and
helps them become knowledge enablers. For example, in the innovation literature Brown
and Eisenhardt (1995) find that such leaders play an especially important role in
facilitating new product innovation by maintaining a disciplining vision that integrates
multiple perspectives and manages complex technological alternatives. Thus,
entrepreneurial leadership fosters new knowledge creation through strategic alliances.

While entrepreneurial leaders foster knowledge creation, such an orientation will not
be conducive to knowledge acquisition through alliances. Entrepreneurial leaders tend to
be more interested in creating the markets of the future by rewriting the rules for
competing in their industry (Kumar et al., 2000), rather than ‘piggy back riding’ on their
partners to acquire their existing knowledge. New knowledge that redefines the existing
paradigm is not likely to come from fine-tuning existing knowledge (Tushman &
Anderson, 1986) acquired from other organizations. In fact, Eisenhardt and Tabrizi
(1995) found that for uncertain projects in industry segments involving new knowledge
creation, alliances that sought to acquire technological knowledge from the suppliers so
as to reduce the time required to introduce new innovative products, were negatively
related to multiple design iterations (or prototyping) that is so essential to introducing
new products in the market.
It seems reasonable to believe that entrepreneurial leaders will not favor investing resources in knowledge domains that are already providing other organizations with a competitive advantage. This may be especially true in the high-tech sector where the pace of innovation can be so fast that the knowledge that is providing competitive advantage today is likely to become the cause of “core rigidities” of tomorrow (Leonard-Barton, 1992). Though there is no known empirical evidence for the negative relationship between entrepreneurial orientation and knowledge acquisition, the discussion here suggests that entrepreneurial leadership orientation will be negatively related to knowledge acquisition.

Managerial leaders excel at finding existing opportunities, determining existing customer needs, and developing goods and services to meet those needs. Several scholars have argued that organizations that focus on serving existing needs tend to be constrained within existing knowledge domains and excel at adapting existing knowledge to meet those needs (Slater & Narver, 1998). Indeed, Lukas & Ferrell (2000) found that firms that are focused on what their customers want are more likely to introduce innovations that are incremental adaptations of existing technological knowledge. Thus, it is expected that managerial leaders will place a higher priority on investing resources in acquiring already existing knowledge from external sources and exploiting it more efficiently than others. In a sample of high-technology firms, Yli-Renko et al., (2001) found that efficient exploitation of knowledge acquired from the major customer helps firms decrease overall sales costs.

Managerial leaders emphasize the development of stable routines that support and encourage a continuous stream of product introductions in current markets as well as
existing products in new markets (Dess et al., 2003). Because managerial leaders prefer to explore what they are familiar with, rather than venture into unfamiliar knowledge domains, they usually work in knowledge domains closely related to their existing knowledge. They are likely to be attracted to the knowledge domains in which their suppliers and customers are already working in because of their perceived familiarity with these knowledge domains. This leads managers to focus on acquiring new knowledge for their firm from their alliance partners. Indeed, Yli-Renko et al. (2001) found that relationships with a large number of customers expose high-technology firms in their sample to new knowledge and helps them acquire knowledge that is close to their existing knowledge.

While managerial leaders encourage knowledge acquisition through their interorganizational relationships, they are likely to discourage creation of new knowledge. Creation of new knowledge can often destroy existing competencies and fundamentally alter the skills and abilities required to compete in the industry (Tushman & Anderson, 1986). Because managerial leaders prefer to be cautious and introduce new innovations only when the knowledge underlying it is fairly developed (Covin & Slevin, 1989), they are often hesitant to invest in the creation of new knowledge that can destroy their existing competencies. They prefer to invest in either incrementally improving the existing knowledge or duplicating the new knowledge by acquiring it from other firms. This is consistent with the reality that whereas some firms routinely create new knowledge and introduce innovations that can be competence-destroying, it is often other firms that ultimately commercialize it profitably (Kumar & Scheer, 1998).
Further, new knowledge creation often requires considerable investment over a long period of time (Nonaka, 1994). Investment in creating new knowledge is also costly as it involves ‘wasting’ precious resources in experimentation and ‘mistakes’ (Nonaka, 1991). However, managerial leaders are mostly short-term oriented and are often reluctant to invest in projects that have a long incubation period (Miller, 2002). Managerial leaders also tend to be cost-oriented and prefer to compete through cutting costs, increasing efficiency, and improving financial performance (Rajagopalan, 1996). They are not only hesitant, but actively discourage, investing time and resources in creating new knowledge as it is a highly uncertain and tedious path through foggy and shifting markets and technologies.

Thus, it is hypothesized:

**H2: Leadership orientation has an impact on knowledge management in non-equity strategic alliances such that as leadership becomes more entrepreneurial knowledge creation increases and knowledge acquisition decreases in both upstream and downstream alliances.**

### 3.3 Learning Orientation and Knowledge Management

Learning orientation may have an important influence on knowledge management in supply chain relationships (Meyers & Athaide, 1991). Organizations can either be high on generative learning or adaptive learning and their learning orientation will impact knowledge management in different ways.

Organizations gain access to many original, valuable, and feasible ideas from their supply chain partners (Hult, 2003). Many of these ideas tend to be in knowledge domains that are very far from the knowledge domains that organizations may be working in
(Tatikonda & Stock, 2003). The level and type of knowledge required by the organization to understand and come up with applications for these ideas may be very different from the type and level of knowledge that the organization actually possesses. Organizations high on generative learning orientation are able to make potentially useful connections based on these ideas because of their ability to think in new and different ways (Kristensson et al., 2004). This type of learning orientation is more suitable to radically changing underlying beliefs, thoughts, and processes that guide an organization (Gersick 1991). It helps organizations explore new knowledge domains that are inconsistent with its existing mental models by facilitating detailed post-mortems by project teams of the basic assumptions that have led the organization to its current position (Baker & Sinkula, 2002; Greenwood, 1993). A business development manager at such a company reported that “we hold a postmortem with all the involved parties [other organizations]. We look at the original objectives, the implementation, what went right what went wrong” (Lambe et al., 2002: 153). Thus, organizations with a generative learning orientation are able to leverage new ideas to come up with new alternatives that are combined with previously established mental models in innovative ways to create new knowledge (Kristensson et al., 2004). Calantone, Cavusgil, and Zhao (2002) find preliminary evidence that willingness to continually question existing beliefs and assumptions is positively related to new innovations.

Working with supply chain partners is not easy. As firms get exposed to a large variety of ideas and suggestions, there is increasing decision complexity and confusion (Sethi, 2000). In an effort to handle such problems, organizations usually resort to simplifying heuristics, ignoring several alternatives, or avoiding in-depth processing of
alternatives (Kelley & Staelin, 1987; Weick, 1995). Organizations high on generative learning orientation are able to resist these ‘traps’ by creating favorable conditions to generate new knowledge from new and radical ideas through a process that von Krogh & Grand (2000) call justification. Firms that use justification recognize the existence of alternate world views within and across organizations (Moorman & Miner, 1997). Individuals or groups with minority views are provided various avenues to make their alternatives explicit in the form of concepts, terms, and narratives to allow these to be shared with others more effectively (Nonaka & Takeuchi, 1995). For example, in many organizations that exhibit generative learning, employees are allowed to spend a significant percent of their time generating new ideas, discussing them with others within the firm and with partner firms, and getting others to buy into these ideas (Martins & Terblanche, 2003). Members of partnering organizations collectively interpret these expectations, reason their thinking behind these expectations, and justify their thinking and expectations (von Krogh & Grand, 2000). The process of justification forces individual expectations to go through the spiral conversion of the SECI model (reviewed in Chapter 2) creating new knowledge. This does not mean that the organization discards the dominant logic or the existing knowledge structures, but that over time the dominant logic shifts towards a new logic, gradually making way for newly created knowledge.

Firms that are high on generative learning intentionally develop ‘knowledge managers’ (Ichijo et al., 1998). These knowledge managers are autonomous leaders who are scattered in various parts of the organization and are responsible for encouraging the sharing of tacit ideas and expectations. They can be front line employees who interact with suppliers and customers to learn their tacit needs and expectations of the future (von
Hippel, 1994) or they can be back-office managers who ‘manage by wandering around’ and encouraging others to share their tacit ideas within the organization (Nonaka & Takeuchi, 1995). What differentiates these managers from other managers is their willingness and eagerness to engage in extra-role behavior (Crant, 2000). Because explicating tacit knowledge involves a high level of trust and understanding between organizational members, these managers go out of their way to forge special relationships with their colleagues. They collect dispersed bits of information; interpret it by relating it to their rich experience, and act almost as “walking archives” (Nonaka & Takeuchi, 1995). They are empowered to encourage members of the firm and its supply chain partners to share their knowledge with each other within guidelines by purposefully introducing ‘creative chaos’\(^{15}\) (McAdam, 2000). Creative chaos is intentionally generated ‘to stimulate artificial fluctuations … that create breakdowns in the routines, habits, or cognitive frameworks of organizational members and may lead to the re-framing of events…” (Johnson, 2002: 394). Generative learning organizations have specific guidelines for their knowledge managers that help them focus their intervention and ensure that chaos has a positive impact on knowledge creation.

Despite the conceptual discussion of positive impact of generative learning orientation on knowledge creation through alliances as discussed above, there is little empirical research on this topic. However, the relationship between generative learning and knowledge acquisition through alliances is even less discussed. March (1991) had cautioned that firms with a generative learning orientation may suffer the costs of experimentation, without gaining many of its benefits. This is because such firms, by definition, do not have high degree of shared mental models (Klimoski & Mohammed, \(^{15}\) Judge, Fryxell, and Dooley (1997) describe it as ‘chaos within guidelines’.\)
1994). Shared mental models are a prerequisite to acquiring new knowledge from external sources and converting the acquired knowledge into new products (Madhavan & Grover, 1998). They have been found to have a positive impact on firm performance by improving the firm’s ability to acquire market knowledge (Baker & Sinkula, 1999). Thus, because of lack of a high degree of shared mental models generative learning orientation is not conducive to acquiring knowledge from external sources, including partner organizations.

An adaptive learning orientation is “a process of inquiry (often in response to errors or anomalies)” through which errors are detected and corrected such that the organization carries on with its present way of thinking (Argyris & Schon, 1978; Friedman, Lipshitz, & Overmeer, 2001: 757). Organizations with such an orientation continually adjust to changes and make incremental adaptations to their existing beliefs and values. These organizations prefer to engage in activities that require incremental effort, such as working in knowledge domains the organization is intimately familiar with (Kyriakopoulos & Moorman, 2004). Not surprisingly, scholars have argued that adaptive learning orientation is suitable for incremental innovation that typically involves making small changes to existing knowledge (Miner & Mezias, 1996). This encourages organizations to invest in acquiring knowledge from other organizations and making minor changes to it. Thus, adaptive learning orientation is positively related to knowledge acquisition.

Adaptive learning oriented organizations focus on their existing knowledge bases. They are comfortable in building on what they currently know. The tendency of adaptive learning organizations to stay in their existing knowledge domains increases their
absorptive capacity (Nooteboom, 2000). This is because absorptive capacity develops cumulatively and builds on the knowledge the organization already possesses (Zahra & George, 2002). Absorptive capacity has a large influence on the quality and quantity of knowledge that a firm acquires from outside the firm (Cohen & Levinthal, 1990). Knowledge acquisition from alliance partners is an important part of knowledge acquired from external sources (Lane & Lubatkin, 1998). Organizations with an adaptive learning orientation have higher absorptive capacity which improves their chances of identifying and acquiring externally available knowledge that is potentially valuable (Zahra & George, 2002). In a study of Hungarian joint ventures, Lyles & Salk (1996) found that higher absorptive capacity led to higher knowledge acquisition from the foreign parent. Tsai (2001) studied knowledge management between multiple units of two large multinationals and found that organizational units that have higher absorptive capacity acquire more knowledge from other units which increases their innovation activity as reflected in the new products introduced in a particular year. Thus, adaptive learning orientation is positively related to knowledge acquisition from external sources.

Even as adaptive learning orientation is conducive to knowledge acquisition, it discourages knowledge creation. Knowledge creation requires the firm to combine different streams of knowledge to generate new knowledge (Nerkar, 2003). However, adaptive learning organizations tend to be most comfortable making incremental changes to existing knowledge, rather than creating new knowledge that could make their existing knowledge obsolete. Though no empirical studies could be found that related to adaptive learning to knowledge creation, there is some suggestion in the literature that high absorptive capacity is not suitable for creation of new knowledge especially in fast-paced
environments like the high-technology sector (Garud & Nayyar, 1994). This is because absorptive capacity focuses the firm’s attention on internalizing and imitating knowledge available from other organizations (Cohen & Levinthal, 1990). Thus, adaptive learning orientation will be negatively related to knowledge creation in strategic alliances.

Thus, it is hypothesized:

**H3: Learning orientation will be related to knowledge management in non-equity alliances such that as organizations become more generative knowledge creation increases and knowledge acquisition decreases in both upstream and downstream alliances.**

### 3.4 Moderation Effect of Interfirm Diversity

In the preceding pages, the relationships between firm strategy and knowledge management in strategic alliances have been hypothesized. This is in line with the work of a number of scholars (e.g. Kale et al., 2002; Saxton, 1997) who argue in favor of the important role of organizational strategic factors in determining the benefits that firms derive from their strategic alliances. However reasonable, this argument ignores the fact that though firms form strategic alliances with multiple organizations, not all alliances perform equally well. Some alliances involving the same firm and flowing from the same organizational strategic orientation perform better than others.

For instance, Das and Teng (2002: 732) argue that alliances are also influenced by the alliance environment, i.e. the various aspects of the organizational, competitive, and institutional environment of the alliance. Though all three aspects of the alliance environment are important, Das & Teng (2002) suggest that aspects of the alliance organizational environment have an especially prominent influence on the alliance and its
outcomes. Alliance organizational environment refers to the diversity (or similarity) between the partnering firms. Following Parkhe (1991) this study looks at two dimensions of alliance organization environment\textsuperscript{16}: resource diversity (Harrison, Hitt, Hoskisson, & Ireland, 2001; Overby & Ozcan, 2006) and cultural diversity (Aulakh & Madhok, 2002; Pangarkar & Klein, 2001). Interfirm diversity has been found to have a significant influence on the quality of the relationship (Sarkar, Cavusgil, & Evirgen, 1997) and a life-long impact on the alliance (Niederkofler, 1991).

Resource diversity deals with the resource configuration between partnering organizations and relates to the relative dissimilarities across their resources and capabilities. The resource configuration of partnering organizations is one of the most important factors that need to be considered in initial planning to achieve good alliance performance (Harrison et al., 2001). From a resource-based view (Barney, 1991), unique and rare resources are a source of competitive advantage. One of the best ways in which a firm can access resources that it does not have is through partnering with another firm that has different resources. Thus, from a resource-based view, resource diversity provides firms with access to resources that they do not currently have and has a positive influence on value creation through alliances. The knowledge-based view focuses on the implications of this resource dissimilarity on the knowledge management activities of the firm.

Cultural diversity refers to the cultural differences between the partnering organizations. Culture influences peoples’ aspirations and behaviors and because

\textsuperscript{16} Different scholars identify other aspects of alliance organizational environment as important. For example, Das & Teng (2002) propose market, competitive positioning, and reputation as other key aspects of alliance organizational environment. Overby & Ozcan (2006) propose difference between the principal industry that the partner firms belong to as also important. Sarkar et al. (2001) mention operational compatibility as the third factor in addition to resource and cultural compatibility.
alliances are “socially contrived mechanisms for collective action” (Ring & Van de Ven, 1994: 96), culture can have an important influence on the dynamics of an alliance. Cultural diversity between partnering organizations has been found to decrease partners’ satisfaction with the relationship (Pothukuchi, Damanpour, Choi, Chen, & Park, 2002) and negatively impact alliance performance (Mohr & Puck, 2005). The knowledge-based view focuses on the implications of this cultural dissimilarity on the knowledge management activities of the firm.

3.4.1 Moderation Effects of Resource diversity

According to the resource-based view, firms possess resources that can be a source of competitive advantage when they are valuable, rare, difficult to imitate and not easily substituted by other resources (Barney, 1991). When resource diversity is low, partnering organizations tend to have similar resources and capabilities whereas when resource diversity is high, partnering organizations are exposed to a large pool of resources and capabilities that were earlier unknown or inaccessible to them (Hitt, Dacin, Levitas, Arregle, & Borza, 2000).

Taking a knowledge-based view, resource diversity is likely to moderate the relationship between cooperative alliance orientation and knowledge creation. Although cooperative alliance orientation is expected to be positively related to knowledge creation in the alliance as proposed in Hypothesis 1, this relationship is expected to depend on the level of resource diversity between the partnering organizations. Firms with high cooperative alliance orientation should be able to create more knowledge compared to firms that have low cooperative alliance orientation, but actual knowledge creation will depend on the firm being able to identify synergies between partnering organizations for
mutual benefit. Firms with a cooperative alliance orientation willingly and happily make
their resources available to their partners. This unilateral commitment serves to test the
commitment of the partner. When a partner reciprocates, this encourages norms of
cooporation and patience in the relationship. The partner may reciprocate the gesture by
allowing access to their resources and capabilities. This has an amplifying effect on
contributions made by individual partners to the alliance and on partner goodwill. Firms
that are interested in encouraging cooperation in their alliances try to create synergies
with partners that bring different resources to the table (Stafford, 1994). However, when
resource diversity is low resource redundancy exists. Thus, potentially useful resources
are not utilized to their full potential. As resource diversity increases, there is less
resource redundancy in the alliance leading to higher utilization of partners’ resources
(Das & Teng, 2000). This provides more opportunities for creating synergies at higher
resource diversity. Indeed, Harrison et al. (1991) found that greater resource diversity
among merging firms provided more opportunities to create synergies and ultimately led
to improved firm performance post-merger as reflected in return on equity. Thus, as
resource diversity increases, cooperative oriented firms will be able to create more
knowledge in their alliance because they actively utilize more synergies between the
partners’ resources.

Thus, it is hypothesized:

H4(a): Resource diversity moderates the relationship between cooperative alliance
orientation and knowledge creation such that at lower levels of diversity there will
be a weaker positive relationship between cooperative alliance orientation and
knowledge creation and at higher levels of diversity there will be a stronger positive
relationship between cooperative alliance orientation and knowledge creation for both upstream and downstream alliances.

This hypothesis can be restated by looking from the opposite ends of alliance orientation and interorganizational knowledge management. Resource diversity is likely to moderate the relationship between competitive alliance orientation and knowledge acquisition in strategic alliances. Although competitive alliance orientation is expected to be positively related to knowledge acquisition as implied in Hypothesis 1, the relationship will depend on the level of resource diversity in the alliance. Firms that have a high competitive alliance orientation should be able to acquire more knowledge from their partners compared to firms that have a low competitive alliance orientation, but actual knowledge acquisition will depend on the relative opportunity to acquire knowledge from the alliance. At low resource diversity, both organizations bring similar resources to the table and it is difficult to distinguish between partners’ resources. In such a situation, the competitive oriented organization may be able to ‘push’ through with its agenda, at least in the short-term, because the other firm will not want to jeopardize the alliance by insisting upon a potentially divisive argument over the benefits from partnering (Gerwin & Ferris, 2004). However, as resource diversity increases and each organization’s resources become more easily distinguishable, the other organization will tend to push toward early implementation of an equity principle to decide the benefits from the alliance\(^{17}\) (Jap, 2001). Once implemented, this will make it difficult for the competitively oriented organization to get maximum asymmetric benefits for itself from the alliance. Thus, as resource diversity increases the opportunities to acquire knowledge

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\(^{17}\) Equity rule specifies that each member’s payoffs are a function of its contribution to the alliance. This is different from an equality rule where each party receives an equal share of the payoffs- a 50/50 split (Jap, 2001).
for self-benefit will decrease and competitively oriented organization will find it difficult to acquire knowledge from the alliance. Without a simultaneous consideration of its’ competitive alliance orientation and resource diversity in the alliance, a firm is likely to encounter a situation in which despite its proclivity to acquire the knowledge, it is not able to do so.

Thus, it is hypothesized:

**H4(b): Resource diversity moderates the relationship between competitive alliance orientation and knowledge acquisition such that at lower levels of diversity there will be a stronger positive relationship between competitive alliance orientation and knowledge acquisition and at higher levels of diversity there will be a weaker positive relationship between competitive alliance orientation and knowledge acquisition for both upstream and downstream alliances.**

Resource diversity is also likely to moderate the relationship between entrepreneurial leadership orientation and knowledge creation. Although entrepreneurial leadership orientation is expected to be positively related to knowledge creation in the alliance as noted in Hypothesis 2, this relationship tends to depend on the level of resource diversity between the partnering organizations. Firms with high entrepreneurial leadership orientation have the potential to create more knowledge compared to firms that have low entrepreneurial leadership orientation, but actual knowledge creation will depend on the firm being able to pursue and innovatively combine new technological and product options. Entrepreneurial leaders have an all-consuming passion for the creation and pursuit of new opportunities without much regard to the resources they control (Stevenson, 1985). They are adept at flexible resource deployment which allows them to
pursue multiple strategic options simultaneously. Strategic alliances provide entrepreneurial leaders with access to resources from other organizations which they can use or leverage as they consider appropriate. When resource diversity is low and there is more redundancy in resources of partnering organizations, entrepreneurial leaders will have access to fewer new resources, than when resource diversity is high and there is low redundancy (Das & Teng, 2000). As resource diversity increases and a larger array of resources become available to the firm, entrepreneurial leaders will be motivated to embark on even more new project options and seek partner assistance in assessing and implementing those options. Scholars have suggested that knowledge creation will be enhanced when more strategic project options are pursued (McGrath & Nerkar, 2004). Thus, as resource diversity increases the relationship between entrepreneurial leadership and knowledge creation will become even stronger.

Thus, it is hypothesized:

**H5(a): Resource diversity moderates the relationship between entrepreneurial leadership orientation and knowledge creation such that at lower levels of diversity there will be a weaker positive relationship between entrepreneurial leadership orientation and knowledge creation and at higher levels of diversity there will be a stronger positive relationship between entrepreneurial leadership orientation and knowledge creation for both upstream and downstream alliances.**

This hypothesis can be restated by looking from the perspective of the opposite ends of leadership orientation and interorganizational knowledge management. Resource diversity is likely to moderate the relationship between managerial leadership orientation and knowledge acquisition in strategic alliances. Although managerial leadership
orientation is expected to be positively related to knowledge acquisition as implied in Hypothesis 2, the relationship may depend on the level of resource diversity in the alliance. Firms that have a high managerial leadership orientation are expected to acquire more knowledge from their partners compared to firms that have a low managerial leadership orientation, but actual knowledge acquisition will depend on the efficiency with which knowledge can be acquired. This is because managerial leaders seek targeted knowledge the firm does not yet possess in order to efficiently build and develop products that can meet customers’ existing needs. Managerial leaders need to enhance their firms’ knowledge base quickly and can do so more easily when they partner with firms that have similar resources and capabilities and who are believed to possess knowledge the firm needs to fill the gaps in its knowledge. Indeed, low resource diversity between partners helps reduce coordination costs between partners (Eisenhardt & Schoonhoven, 1996). As resource diversity increases, the cost of acquiring partners’ knowledge will increase as it becomes harder to both recognize the targeted knowledge and to extract it from its unique context and apply it in a new resource context. Thus, it will no longer be economically efficient to compete through knowledge acquisition (Gerwin & Ferris, 2004). This is consistent with the idea that alliances that provide firms with “inappropriate resources” (those beyond the current scope of the firm’s interests) increase the burdens on management and increase the cost of partnering (Deeds & Hill, 1996: 47).

Thus, when firms high on managerial leadership orientation partner with organizations that have low resource diversity, they will acquire more targeted knowledge from the alliance. When such firms partner with organizations that have high
resource diversity, they will acquire less targeted knowledge from the alliance. Without a simultaneous consideration of its’ managerial leadership orientation and resource diversity in the alliance, a firm is likely to encounter a situation in which it is unable to efficiently acquire the knowledge that it wants.

Thus, it is hypothesized:

**H5(b): Resource diversity moderates the relationship between managerial leadership orientation and knowledge acquisition such that at lower levels of diversity there will be a stronger positive relationship between managerial leadership orientation and knowledge acquisition and at higher levels of diversity there will be a weaker positive relationship between managerial leadership orientation and knowledge acquisition for both upstream and downstream alliances.**

Resource diversity is likely to moderate the relationship between generative learning orientation and knowledge creation. Although generative learning orientation is expected to be positively related to knowledge creation in the alliance based on Hypothesis 3, this relationship tends to depend on the level of resource diversity between the partnering organizations. Firms that have high generative learning orientation can create more knowledge compared to firms that have low generative learning orientation, but actual knowledge creation will depend on the firm being able to question its time-honored assumptions about its business. Firms with a generative learning orientation believe in questioning long-held assumptions about their mission, customers, capabilities, or strategy and adopting a new way of looking at the world (Slater & Narver, 1995). When they partner with firms that have low resource diversity, they are exposed to technological and market approaches knowledge that are not much different from their
own. Due to the similarity of knowledge, there is less questioning of the firms’ current way of thinking. Thus, the relationship between generative learning orientation and knowledge creation is expected to be weak at low resource diversity. However, when there is large resource diversity between the partners, organizations are exposed to resources or capabilities that they did not imagine before. This may lead them to rethink their existing assumptions about how products and services in their market are offered (e.g. books via internet rather than bookstores) or about production processes and technologies.

When generative learning is encouraged and firms have a solid basis to challenge their assumptions because of the high resource diversity in their alliance, they explore and experiment with knowledge domains further from their existing ‘comfort zones’ and creating new knowledge in the process (Katila & Ahuja, 2002). Disagreements between partners and within the firm is likely because generative learning can be psychologically painful to participants because of the greater challenge experienced and the stress that can result (Csikszentmihalyi, 1990). Thus, firms that pursue generative learning through resource diverse alliances must become highly skilled at channeling these disagreements and stress in productive ways. As participants’ capabilities, stress will reduce and employees will take great satisfaction in the knowledge created

Thus, it is hypothesized:

**H6(a): Resource diversity moderates the relationship between generative learning orientation and knowledge creation such that at lower levels of diversity there will be a weaker positive relationship between generative learning orientation and knowledge creation and at higher levels of diversity there will be a stronger positive**
relationship between generative learning orientation and knowledge creation for both upstream and downstream alliances.

This hypothesis can be restated by looking from the perspective of the opposite ends of learning orientation and interorganizational knowledge management. Resource diversity is likely to moderate the relationship between adaptive learning orientation and knowledge acquisition. Although adaptive learning orientation is expected to be positively related to knowledge acquisition in the alliance as implied by Hypothesis 3, this relationship may depend on the resource diversity between the alliance partners. Firms that have high adaptive learning orientation should be able to acquire more targeted knowledge which they lack from other organizations compared to firms that have low adaptive learning orientation. However, actual knowledge acquisition will depend on whether it can identify and recontextualize knowledge that needs to be acquired. When firms high on adaptive learning orientation partner with organizations that have similar resources and/or capabilities, they can more readily acquire knowledge from the partner. This is because knowledge acquisition is enhanced when prior knowledge is “closely related to the new knowledge to facilitate assimilation” (Cohen & Levinthal, 1990: 136). These scholars argue that organizational memory is self-reinforcing in that the more knowledge an organization has of a particular domain, the more readily it can acquire more knowledge in the same domain. Thus, adaptive learning organizations with their tendency to reinforce their existing knowledge domains will find it easier to acquire knowledge from partners with similar resources and capabilities.

When firms high on adaptive learning orientation partner with organizations that have different resources and/or capabilities, they find it difficult to identify and acquire the
relevant knowledge of their partner. This is because when resource diversity is high, the prior knowledge of these firms is less related to the knowledge of their partners. The less the new knowledge is related to the prior knowledge, the more difficult the firm finds to acquire it (Cohen & Levinthal, 2002). For example, a firm with a prior knowledge base in offering computer products (e.g. Dell) will find it difficult to acquire the knowledge of transporting and delivering computers to individual buyers from its supply chain partner (e.g. UPS). Even if the firm has high adaptive learning orientation, the high resource diversity will make it difficult for the firm to acquire the knowledge from its partner because the new knowledge will be unrelated to its prior knowledge (Zahra & George, 2002). Without a simultaneous consideration of its adaptive learning orientation and resource diversity in the alliance, a firm is likely to encounter a situation in which it is unable to identify the knowledge that it can acquire. Firms with higher adaptive learning orientation are most effective at knowledge acquisition at low levels of resource diversity.

Thus, it is hypothesized:

**H6(b): Resource diversity moderates the relationship between adaptive learning orientation and knowledge acquisition such that at lower levels of diversity there will be a stronger positive relationship between adaptive learning orientation and knowledge acquisition and at higher levels of diversity there will be a weaker relationship between adaptive learning orientation and knowledge acquisition for both upstream and downstream alliances.**

### 3.4.3 Moderation Effect of Cultural diversity

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A large body of literature on interorganizational relationships and strategic alliances argues that culture significantly influences alliance dynamics and has an important influence on the success or failure of an alliance. When partnering organizations have similar cultures, cultural diversity is low, but when partnering organizations have different cultures, cultural diversity is high.

Cultural diversity is likely to moderate the relationship between cooperative alliance orientation and knowledge creation. Although cooperative alliance orientation is expected to be positively related to knowledge creation in the alliance as noted in Hypothesis 1, this relationship tends to depend on the level of cultural diversity between the partnering organizations. Firms with high cooperative alliance orientation should be able to create more knowledge compared to firms that have low cooperative alliance orientation, but actual knowledge creation will depend on the firm being able to maintain the ‘creative spark’ in its alliance. This is because a cooperative alliance orientation often leads to the development of friendly and fairly stable interorganizational routines between partners over time (Zollo, Reuer, & Singh, 2002). Routines are “recurrent interaction patterns” that are “repetitive, collective, self-actuating, context-dependent, … shaped by history and path dependent” (Becker, 2003). When interaction is guided by such friendly stable routines managers and employees of both organizations hesitate to criticize each other and disrupt the friendly status quo (Beech, MacIntosh, MacLean, Shephard, & Stokes, 2002).

Culture is a generic term used to refer to the collective ‘mental programming’ of people in any group. The effect of culture on alliances can be through societal culture (e.g. Black culture, Hispanic culture), national culture (e.g. American culture, Japanese culture), corporate culture (e.g. the ‘GE’ way of doing things), and business-level culture (e.g. the culture of SW airlines). This study primarily looks at culture at the business level.
At low cultural diversity characterized by similar values and beliefs in both organizations, there is little reason to disturb the friendly routines. However, as cultural diversity increases and values and beliefs become more dissimilar, the status quo is disrupted more often. The stable routines for managing knowledge between partners are likely to be shaken-up requiring new routines to be gradually created. The more often the status quo is disrupted, the more often old routines must be discarded, leading to new insights that were hidden by previous assumptions. More generation of new knowledge should occur (Davenport & Prusak, 2000). This is consistent with Gersick and Hackman’s (1990) finding that the habitual routines that emerge in task groups when people work together can hinder creativity if they are not disrupted and replaced by new routines. Thus, as cultural diversity increases cooperative oriented firms will be able to take advantage of more creative sparks in the alliance and generate more knowledge.

Thus, it is hypothesized:

**H7(a): Cultural diversity moderates the relationship between cooperative alliance orientation and knowledge creation such that at lower levels of diversity there will be a weaker positive relationship between cooperative alliance orientation and knowledge creation and at higher levels of diversity there will be a stronger positive relationship between cooperative alliance orientation and knowledge creation for both upstream and downstream alliances.**

This hypothesis can be restated by looking from the perspective of the opposite ends of alliance orientation and interorganizational knowledge management. Cultural diversity is likely to moderate the relationship between competitive alliance orientation and knowledge acquisition in strategic alliances. Although competitive
alliance orientation is expected to be positively related to knowledge acquisition as implied in Hypothesis 1, the relationship will likely depend on the level of cultural diversity in the alliance. Firms that have a high competitive alliance orientation can acquire more targeted knowledge from their partners compared to firms that have a low competitive alliance orientation, but actual knowledge acquisition will depend on their ability to understand the knowledge possessed by their partner. When cultural dissimilarity is low, competitive oriented organizations find it easier to acquire their partners’ knowledge because knowledge is grounded, or embedded, in an organization’s culture or established way of doing things. Indeed, it is the embeddedness of valuable knowledge, especially tacit knowledge that is the ultimate source of sustainable competitive advantage (Spender, 1996). However, when cultural diversity is high and the other firms’ way of thinking about things appears strange and unfamiliar, competitive alliance oriented firms find it difficult to acquire knowledge from their partner because they are not willing to invest the time and effort it takes to understand the new culture. This is consistent with research in international business where it is frequently seen that developed market firms (e.g. MNCs from the US) who are interested in acquiring knowledge of customers, local markets, and local government policies and regulations (Hitt et al., 2000) prefer alliances with partners that have a similar culture (Parkhe, 1991). Geringer (1991) reports that interviews with 40 Canadian and Mexican executives revealed that Canadian companies entering into alliances with Mexican companies to gain knowledge of the Mexican market and consumer preferred firms with similar values and goals (e.g. future objectives). Ample evidence suggests that low cultural diversity is helpful when firms are unwilling to make the investment to understand the culture of
their partner organization. It is no surprise, then, that alliances between competitive oriented organizations tend to collapse quickly when cultural differences between organizations are high (Shenkar, 2001). Thus, as cultural diversity increases, knowledge acquisition by competitive oriented firms decreases.

Thus, it is hypothesized:

**H7(b): Cultural diversity moderates the relationship between competitive alliance orientation and knowledge acquisition such that at lower levels of diversity there will be a stronger positive relationship between competitive alliance orientation and knowledge acquisition and at higher levels of diversity there will be a weaker positive relationship between competitive alliance orientation and knowledge acquisition.**

Cultural diversity is likely to moderate the relationship between entrepreneurial leadership orientation and knowledge creation. Although entrepreneurial leadership orientation is expected to be positively related to knowledge creation in the alliance as implied in Hypothesis 2, this relationship tends to depend on the level of cultural diversity between the partnering organizations. Firms with high entrepreneurial leadership orientation can create more knowledge compared to firms that have low entrepreneurial leadership orientation. However, the actual knowledge creation will depend on the ability of entrepreneurial leaders to innovatively combine knowledge across time and space. When there is low cultural diversity in the alliance, there will be less opportunity for entrepreneurial leaders to cross-pollinate different ideas across time and space. This is because low cultural diversity constrains the variety and novelty of ideas to which entrepreneurial leaders will be exposed. As cultural diversity increases,
there will be a wider variety of ideas floating around that can be combined in new ways. Entrepreneurs encourage the cross-pollination of these ideas through active experimentation to test for relative value. They encourage others to see and act as connections that did not exist before. However, this is a dangerous situation as it can easily turn chaotic when organizations with different cultural values are brought together to create new knowledge. Entrepreneurs have a ‘disciplining vision’ that helps specify limits to the chaos and that reduces the potentially paralyzing effect of the chaos by converting it into ‘creative chaos’ for useful outcomes (Nonaka & Takeuchi, 1995). Research in the product innovation literature finds that product champions who can clearly specify constraints and absorb the uncertainty of the chaotic situation facilitate innovation (Shane, 1994). Thus, as cultural diversity increases entrepreneurial leaders get more opportunities to act to engage in recombine knowledge in new ways. This often results in knowledge creation.

Thus, it is hypothesized:

**H8(a): Cultural diversity moderates the relationship between entrepreneurial leadership orientation and knowledge creation such that at lower levels of diversity there will be a weaker positive relationship between entrepreneurial leadership orientation and knowledge creation and at higher levels of diversity there will be a stronger positive relationship between entrepreneurial leadership orientation and knowledge creation for both upstream and downstream alliances.**

This hypothesis can be restated in an identical way by looking from the perspective of the opposite ends of leadership orientation and knowledge management. Cultural diversity is likely to moderate the relationship between managerial leadership orientation
and knowledge acquisition in strategic alliances. Although managerial leadership orientation is expected to be positively related to knowledge acquisition as implied in Hypothesis 2, the relationship may depend on the level of cultural diversity in the alliance. Firms that have a high managerial leadership orientation can acquire more knowledge from their partners compared to firms that have a low managerial leadership orientation. However, the actual knowledge acquisition will depend on the level of investment that managerial leaders will need to make to acquire that knowledge. The strength of managerial leaders is in thorough environmental scanning followed by careful analyses to set achievable goals in advance.

When cultural diversity is low and both partners have similar beliefs and goals, the coordination between partners is simple. They share similar strategic goals and beliefs about the present and future of the industry which keeps coordination costs low and facilitates acquisition of knowledge. This is consistent with Rothaermel & Deeds’s (in press) argument that biotech companies find it easier to acquire knowledge from other biotech companies because of low coordination costs due to cultural similarity. Similarly, it has been argued that firms that focus on serving existing markets find it easier to acquire knowledge from downstream relationships with firms that share similar beliefs about the industry compared to relationships with firms that do not share the same beliefs (Christensen & Bower, 1996).

As cultural diversity increases, partners’ goals and beliefs diverge, and coordination costs increase. Managers can no longer easily acquire knowledge as it is not clear if the knowledge is germane to the immediate goals they have set for their firm. The knowledge that is being acquired needs to be examined to see if it is compatible with and useful to
the firm’s goals. If it is not, managerial leaders are not interested in assimilating it in their
firm because it is not apparent if it will be of much use to compete in the near future.
Thus, as cultural diversity increases, the required investment to acquire knowledge
increases for managerial leaders faster than the perceived value of such knowledge.

Thus, it is hypothesized:

H8(b): Cultural diversity moderates the relationship between managerial leadership
orientation and knowledge acquisition such that at lower levels of diversity there
will be a stronger positive relationship between managerial leadership orientation
and knowledge acquisition and at higher levels of diversity there will be a weaker
positive relationship between managerial leadership orientation and knowledge
acquisition.

Cultural diversity is likely to moderate the relationship between generative learning
orientation and knowledge creation. Although generative learning orientation is expected
to be positively related to knowledge creation in the alliance as noted in Hypothesis 3,
this relationship is likely to depend on the level of cultural diversity between the
partnering organizations. Firms that have high generative learning orientation can create
more knowledge compared to firms that have low generative learning orientation.
However, actual knowledge creation will depend on the firm being able to challenge its
own existing beliefs and assumptions. When cultural diversity is low and there are few
value differences between partners, generative learning oriented firms are able to
challenge their core beliefs and taken-for-granted assumptions in a more limited way.
However, as cultural diversity increases, there is an increase in “requisite variety” of
knowledge structures to match the cultural complexity of the alliance environment. This
provides generative learning organizations with access to a larger, more complex pool of ideas and values to work with (Davenport & Prusak, 2000). Contradictions to existing assumptions about what people want or their preferences must now be considered by the firm. This may lend added strength to existing minority views in the organization and cause those to be considered more seriously than in the past (Weick, 1995). Thus, higher cultural diversity provides the generative learning oriented organization more opportunities to engage in higher order learning and create new knowledge.

Thus, it is hypothesized:

**H9(a): Cultural diversity moderates the relationship between generative learning orientation and knowledge creation such that at lower levels of diversity there will be a weaker positive relationship between generative learning orientation and knowledge creation and at higher levels of diversity there will be a stronger positive relationship between generative learning orientation and knowledge creation for both upstream and downstream alliances.**

This hypothesis can be restated by looking from the perspective of the opposite ends of learning orientation and interorganizational knowledge management. Cultural diversity is likely to moderate the relationship between adaptive learning orientation and knowledge acquisition. Although adaptive learning orientation is expected to be positively related to knowledge acquisition in the alliance as implied in Hypothesis 3, this relationship may depend on the cultural diversity between the alliance partners. Firms that have high adaptive learning orientation can acquire more new knowledge from other organizations compared to firms that have low adaptive learning orientation. However, actual knowledge acquisition will depend on whether the firm is able to understand and
process the knowledge that may be acquired. When firms high on adaptive learning orientation partner with organizations that have a similar language and culture, it is easier for them to acquire knowledge of their partner. Adaptive learning organizations tend to filter all external knowledge based on their existing values and assumptions. If new knowledge appears unrelated to existing knowledge, adaptive learning organizations will tend to simply filter it out. When there is low cultural diversity not much translation is required to understand partner’s knowledge and assimilate it with the existing knowledge. This is consistent with Lane and Lubatkin (1998) argument that when firms ‘get close’ and understand each other’s culture- the social context in which knowledge is embedded, the relative absorptive capacity of the adaptive oriented firm with its partners increases, and they will be more effective at acquiring knowledge from the partner firm. As cultural diversity between firm’s increases, partner’s knowledge appears increasingly unrelated to the prior knowledge of the firm. The translation required for knowledge acquisition will be more difficult. Lane and Lubatkin (1998) argue that as cultural diversity increases, it becomes more difficult to understand the social context in which knowledge is grounded in the other firm, the relative absorptive capacity will decrease and adaptive learning oriented firm will find it more difficult to acquire knowledge, particularly tacit knowledge, from its partner. In a study of Hungarian joint ventures, Lyles and Salk (1996) found that misunderstandings due to cultural differences between parent firms moderated the relationship between firm’s capacity to acquire knowledge (absorptive capacity) and the amount of knowledge acquired from the alliance. Thus, cultural diversity will moderate the positive relationship between adaptive learning orientation and knowledge acquisition such that as cultural diversity increases relative absorptive
capacity decreases, thereby reducing knowledge acquisition for adaptive learning organizations.

Thus, it is hypothesized:

**H9(b): Cultural diversity moderates the relationship between adaptive learning orientation and knowledge acquisition such that at lower levels of diversity there will be a stronger positive relationship between adaptive learning orientation and knowledge acquisition and at higher levels of diversity there will be a weaker positive relationship between adaptive learning orientation and knowledge acquisition for both upstream and downstream alliances.**

### 3.5 Interorganizational Knowledge Management and Firm Performance

In a recent critique, Eisenhardt and Santos (2002) lamented that despite the increasing popularity of the knowledge-based view, its impact on firm performance has not been empirically examined. This is an important criticism as the final test of any strategic management theory is its influence on firm performance (Pettigrew, Thomas, & Whittington, 2002). Despite the emphasis on knowledge as the most important source of a firm’s competitive advantage (Spender, 1996) in the knowledge-based view, the relationship between knowledge and performance has been accepted as an article of faith, rather than extensively investigated empirically. This omission is probably because knowledge management has been proposed to influence other firm-level outcomes such as enhancing new product development (Madhavan & Grover, 1998), contributing new product success (Yang, Yu, & Lee, 2002), increasing new technological expertise (Russ & Camp, 1997), and decreasing costs by improving productivity (Dyer & Noebeka, 2000). These outcomes have been shown to have a positive influence on firm
performance in other studies. This study examines the direct impact of the two modes of knowledge management in strategic alliances on firm performance.

With respect to knowledge creation, Appleyard (2002) examined the interaction between three semiconductor firms and their suppliers and found that these firms frequently initiated equipment modification projects with their suppliers that led to creation of new knowledge in the industry. Rothaermal and Deeds (2004) examined the impact of ‘exploration alliances’- alliances that a firm enters into with the motivation to discover something new- on new product development in a sample of biotechnology firms. They found support for their hypothesis that a firm’s exploration alliances are significant in predicting the level of new product development.

Yli-Renko et al. (2001) studied knowledge acquisition from key customer relationships for high-tech firms and found it to have a positive relationship with new product development and a negative relationship with sales costs. Lyles and Salk (1996) looked at knowledge acquisition from parent companies for Hungarian joint ventures (equity-based strategic alliances) and found it to have a positive impact on firm performance as measured by increasing business volume, market share, and profitability.

These findings suggest that both knowledge creation and knowledge acquisition in non-equity supply chain alliances will have a direct positive influence on firm performance. A number of scholars contend that alliances should either primarily involve knowledge creation or knowledge acquisition (Ding & Peters, 2000; Grant & Baden-Fuller, 2004). Strategic alliances that are ‘stuck in the middle’ and are not clearly knowledge creation or knowledge acquisition will be less effective and may even be detrimental to firm performance. This is because knowledge creation and knowledge
acquisition are expected to demand correspondent firm strategies as hypothesized above. It is hypothesized that firms that are unable to choose a consistent strategic orientation for interorganizational knowledge management will be ineffective at both knowledge creation and knowledge acquisition because of inappropriate combinations of incompatible organizational design and reward system elements.

Thus, it is hypothesized:

**H10: Primary emphasis on either knowledge creation or knowledge acquisition will be more positively related to firm performance than mixing knowledge creation and knowledge acquisition in the alliance.**

### 3.5.1 Moderation Effect of Industry Knowledge Complexity

Industries tend to vary in the complexity of their knowledge base. For example, although knowledge may be important for both the computer chip and the potato chip industry, the complexity of knowledge required to compete in the two industries is vastly different because of differences in the amount, type, novelty, and sophistication of knowledge between industries. Systematic industry-level variation in knowledge may be substantial due to fundamental differences in markets, technologies, and the expertise deployed in each industry (Coff, 1999). Thus, the level of knowledge complexity of the industry is expected to influence whether interorganizational knowledge creation or acquisition will have a higher positive influence on organizational performance.

In industries characterized by high knowledge complexity, typically there are alternative knowledge domains that may impact products and technologies. Each of these domains will involve different knowledge components (Grant & Baden-Fuller, 2004). This leads to increased uncertainty vis-à-vis the future knowledge requirements of current
products and technologies, expertise and skills in that industry. Firms need to be able to integrate different knowledge domains to compete effectively when knowledge complexity is high. For example, firms making cell phones need to integrate knowledge from more domains compared to firms making simple phones. When knowledge complexity is high, it is not easy for an outsider to enter the industry and compete effectively because of the experience and accumulated knowledge required to understand the current developments in the industry. The knowledge of such industries can not be easily articulated in manuals and procedures, making it difficult for firms to compete by simple acquiring knowledge. It becomes risky for firms to invest in strategic alliances that are targeted at acquiring the existing knowledge of their partner firms. Thus, in industries characterized by high knowledge complexity investment in knowledge creation alliances will have a more positive impact on firm performance.

However, creating new knowledge is not inexpensive (Nonaka, 1994). Knowledge creation is an inherently time consuming process that requires sustained investment of firm resources because of long incubation periods. For this reason, it is likely that the costs and incentives of knowledge creation alliances for firms competing in industries that have low knowledge complexity will differ from those that are in industries that have high knowledge complexity. In industries characterized by low knowledge complexity, firms can easily acquire the necessary knowledge from external sources. Important knowledge can be articulated easily and recorded in tangible mediums such as records and manuals. For example, in the last few decades the technological knowledge of VCRs has become commonly available. New firms can easily enter such industries as knowledge of different products and technologies is commonly available. The integration
of different knowledge domains is quite simple and involves knowledge of fewer areas. Firms competing in such industries can expect to compete effectively by using the knowledge that has been developed by others. For example, a firm wishing to enter the VCR industry today does not need to create new knowledge, it can simply partner with firms that are familiar with manufacturing VCRs and acquire the knowledge from them. In such industries, rather than invest in creating new knowledge, it is much more efficient for firms to form knowledge acquisition alliances to gain knowledge relatively quickly. Thus, in industries characterized by low knowledge complexity knowledge acquisition alliances will have a more positive influence on firm performance.

**H11: Industry knowledge complexity will have a moderating influence on the relationship between interorganizational knowledge management and firm performance such that at higher levels of industry complexity knowledge creation will have a stronger positive relationship with firm performance and at lower levels of industry complexity knowledge acquisition will have a stronger positive relationship with firm performance.**

To summarize, this chapter presents the hypotheses to examine the relationship of two modes of interorganizational knowledge management with firm strategy and performance. It is hypothesized that the three dimensions of strategic orientation (alliance, leadership, and learning) will have direct impact on knowledge creation and knowledge acquisition. Further, the interfirm diversity between alliance partners is believed to moderate the relationship between the three dimensions of strategic orientation and the two modes of interorganizational knowledge management. It is also hypothesized that knowledge creation and knowledge acquisition alliances will have a
more positive impact on firm performance compared to alliances that mix both knowledge creation and acquisition. Further, the knowledge complexity of the industry is believed to moderate the relationship between the two modes of interorganizational knowledge management and firm performance.

The next chapter describes the sample, the research methodology, and the measures used for this study.
CHAPTER 4
RESEARCH METHODOLOGY

The purpose of this chapter is to describe the methodology used to answer the research questions: (1) How does firm strategy affect management of knowledge in the strategic supply chain relationships? and (2) How does knowledge management affect firm performance? A good research design is “an important prerequisite” to organization studies and can advance our understanding of the many “complex” questions of this field (Grunow, 1995: 94). The importance of a good research design becomes even more salient in studies of knowledge management because most published research studies in this field are either theoretical contributions or practitioner oriented articles while considerably less attention has been given to empirical investigation (Hall & Adriani, 1999). Inkpen (2002) argues that before any advancement can be made in understanding interorganizational knowledge management, researchers need to operationalize knowledge-based strategic alliances, something that has been largely avoided in extant research. In recent years, some scholars (e.g. Rothaermel & Deeds, 2004; Simonin, 1997) have empirically examined knowledge exchanges in strategic alliances though they do not explicitly use the knowledge-based view as a theoretical lens.

This chapter proceeds as follows. The first section of this chapter describes how the sample of firms was drawn from the target population. The data collection methods are described in the next section. The measures used by this study are discussed in the subsequent section. The chapter closes with a brief summary.

4.1 Sample
Because the purposes of this study are to examine the influence of firm strategy on interorganizational knowledge management and the relationship between interorganizational knowledge management and firm performance, the hypotheses need to be tested in industries in which interorganizational alliances are common and in which knowledge management is expected to be an important factor in alliances. The high-technology sector meets this criterion. Interorganizational alliances are very common in the high-technology sector (Almeida, Phene, & Grant, 2003). It is almost imperative for high-tech firms to form strategic alliances with other organizations because a large part of innovative activity in high-tech industries occurs through alliances (Hagedoorn, 1993; Rothaermel & Deeds, 2004). Typically, strategic alliances in the high-tech sector are not equity-based (Mowery et al, 1996), thus making firms in this industry particularly suitable for our study.19

The high-technology sector has a “special place” in both entrepreneurship and strategic management research (Autio, 2000: 330) because high-technology firms (1) tend to inhabit new and emerging industry sectors, (2) are the source of most innovative activity in the economy and (3) have been considered as drivers of regional economic growth not only in the US (e.g. Silicon Valley in California and Route 128 around Boston) but also in other countries (e.g. Bangalore and Hyderabad in India, Hertzelia and Tel Aviv in Israel).

19 The definition of strategic alliances adopted in this study is widely accepted in the literature: Long term inter-organizational relationships that remain short of full integration of identities, cultures, and capabilities (Mitchell & Singh, 1996; Tallman, 2000; Tsang, 1999). Only alliances in which partnering organizations remain independent entities are considered ruling out equity partnerships (Mitchell & Singh, 1996). Equity alliances are highly formal and more structured with partner responsibilities and authority clearly specified, making them qualitatively different from non-equity alliances in which partner roles are flexible and malleable (Osborn & Baughn, 1990). Other scholars (e.g. Wathne & Heide, 2004) in the supply chain area have also adopted a similar definition of strategic alliances, confirming that in the unique context of supply chain relationships it is useful to consider non-equity alliances as distinct from equity alliances.
The high technology sector has also been a focus of research from a knowledge-based view in recent years (e.g. Yli-Renko et al, 2001). This is because the high-tech sector has been recognized as having some of the most difficult strategic issues, such as rapid market changes, fast pace of technological development, and innovation through alliances rather within organizations (Shan, Walker, & Kogut, 1994; Williamson, 1999). The rapidly emerging theoretical framework of the knowledge-based view with its unique focus on knowledge is capable of dealing with these issues and advancing our knowledge of how high-technology companies innovate and compete.

In electing to focus on strategic alliances in the high technology sector, this dissertation combines some benefits of both single industry and multi-industry studies. Single-industry studies are higher than multi-industry studies in internal validity and reliability while multi-industry studies are higher than single-industry study on external validity and generalizability (Mulligan, 2002). This is because single-industry studies help avoid confounding by industry type (e.g. avoids comparing computer chip manufacturers with potato chip manufacturers) and avoid the mixing of industry-specific externalities that may work differently or in opposite directions in different industries (Baum, Locke, & Smith, 2001). Multi-industry studies offer an examination of which effects are statistically significant across studies, and consequently are more applicable across a range of industries (Dess, Ireland, & Hitt, 1990). A single industry study helps to increase the reliability of knowledge management measures by assuring a more homogeneous pool of knowledge management activities. The high-tech sector represents a constrained multi-industry sample sharing common industry characteristics (such as rapid market change, high innovation activity). This allows for leveraging the above
noted benefits of single-industry and multi-industry studies. Based on the distinctive characteristics of the high-tech sector, it is judged that the pool of knowledge management activities would be sufficiently homogeneous to outweigh the gains that could have been possible from doing this study with only one high technology industry. Conversely, it was judged that a more broad-based industry sample would threaten the reliability of the measures because of the different types of knowledge management activities in each industry.

For the purpose of this dissertation, high technology firms are defined as those in computers, telecommunication equipment, electronics, industrial instruments, and software, a definition drawn from the American Electronics Association (American Electronics Association, 1999). This includes firm in industries with three-digit SIC codes 357, 366, 367, 382, and 737 respectively.20

A random sample of 2500 firms in the above-noted five 3-digit SIC codes was generated using the electronic version of the CorpTech Directory of Technology Companies. CorpTech is a database of technology companies spanning a number of SIC codes. The database has extensive information on 95,553 business organizations. Due to the large number and variety of business organizations in the database it was important to develop a systematic protocol that would help select firms that closely matched the selection criteria. In the first step, firm ownership was used as a selection criterion. The CorpTech database lists business organizations as private, public, partnership, unit of public, unit of private, unit of partnership, not-for-profit, unit of not-for-profit, unit of government, government, and unit of foreign companies. Companies that were

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20 This definition of high-tech excludes firms in other industries that may be considered high-technology such as biochemistry, pharmaceutical, and alternative fuel engines.
subsidiaries of other companies, non-profit companies, and government organizations were eliminated leaving 81,672 businesses with public, private, or partnership ownership in the dataset. It was believed that companies with private, public, and partnership ownership would differ from government organizations, non-profits, and subsidiaries. Non-profit companies and government organizations tend to concentrate less on revenue and profitability and subsidiaries of large corporations have relatively less autonomy compared to private, public, and partnership firms.

In the second step, firms were screened based on size. This was done in two parts based on number of employees and total sales. All firms that had less than 10 employees or more than 500 employees or declined to report their employee strength in the database were eliminated leaving 59,451 businesses in the database. Then, all firms with annual sales less than one million dollars and more than 500 million dollars were eliminated. This helped eliminate very small and very large firms from the dataset leaving 24023 firms in the dataset. Eliminating very small and very large firms from the sample was important because such firms tend to differ considerably in resource endowments, organizational structure, and strategic issues from the averaged-size firms. Also, as it was considered important to focus on single business firms rather than diversified firms, the upper limit of 500 employees and $500 million sales volume were considered important to eliminate most diversified firms from the sample.

Next, all firms that reported SIC codes 357, 366, 367, 382, and 787 were selected. As the CorpTech database records SIC codes at a 4-digit level, all firms that reported their 4-digit SIC code as falling under any of these five 3-digit SIC codes were selected. In total, firms in thirty four 4-digit SIC codes were selected, reducing the dataset to 9006
organizations. Appendix 4.1 provides details of the four-digit SIC codes included in this study.

In the last step, all companies that reported non-US ownership were eliminated because foreign firms operate in considerably different institutional and cultural environment than domestic firms. The final sample of 8944 firms was used to randomly select 2500 firms that were further divided into two samples: The main sample of 1800 firms and a hold-out sample of 700 firms to be contacted in case of low response rate.

4.2 Method

The use of managerial perceptions of firm-level variables like strategy is quite common in management research (Lyon, Lumpkin, & Dess, 2000; Naman & Slevin, 1993) and can be measured in two different ways using a Likert scale. The first method, used commonly in business research, requires managers to report their perception of relevant firm-level variables on unipolar items that describe their firm in a particular way (e.g. “We help our customers anticipate developments in their markets” used by Narver et al. (2004) and “Our products/services have many unique features” used by Barney, Busenitz, Fiet & Moesel (1996)). The second method, used relatively less in business research, requires managers to respond to bipolar items (each item is a pair of opposite statements) arranged in forced choice format (the two opposite statements in each item are divided by a Likert scale). For example, Barringer & Bluedorn (1995) used a 7-point Likert scale to divide bipolar items measuring management style (such as, “The top managers of my firm favor low risk projects with normal and certain rates of return” versus “The top managers of my firm favor high-risk projects with changes of very high returns”).
The study was conducted in two stages, an academic phase and a practitioner phase, using a discovery-oriented approach (Menon, Bharadwaj, Adidam, & Edison, 1999). A discovery oriented approach involves supplementation of theoretical perspective (academic phase) with a field-based perspective (practitioner phase) involving senior executives (Zander & Kogut, 1995). Scale development started with a literature review from which a pool of items was generated for each of the constructs. These initial items were refined and adapted through conversations with the faculty expert supervising this research.

An initial survey (Appendix 4.2) was administered to a limited number of academic scholars interested in business issues. Of 26 academicians were given the opportunity to participate, 14 respondents provided usable responses. Two main objectives of this phase were to (1) establish discriminant validity of the strategic orientation measures and knowledge management measures and (2) establish that statements believed to be opposite to each other were, in fact, opposites. Accordingly, key constructs were defined followed by a request to indicate the extent to which items measured the key construct. Each item was a pair of statements arranged adjacent to each other based on their perceived opposition and respondents were requested to indicate the degree of opposition between the two statements. The survey consisted of 19 alliance orientation items, 15 leadership orientations items, 11 learning orientation items, and 7 knowledge management items. Quantitative feedback was collected through the survey instrument which was designed to capture views on the validity and appropriateness of items. Qualitative feedback was collected through one-on-one meetings with a subset of respondent scholars (about 50% of the total respondents). These scholars were
encouraged to think aloud and verbalize the logic they followed when answering the items. Two important findings from the academic phase were that (1) some items appeared to be measuring two or more constructs, and (2) some items in the same item set did not appear to be opposite to each other. The research instrument was modified on the basis of the qualitative and quantitative feedback received. The data collected at this stage were analyzed only visually and items were dropped, modified, or combined based on the feedback received. Three alliance orientation items, two leadership orientation items, and one learning orientation item were dropped because they could not be classified unambiguously under one construct. Please refer to Table 4.1 for items deleted at this phase.

In stage two, the survey instrument was pre-tested on a limited sample of key executives who were either currently or had previously been at responsible managerial positions in business organizations. The purpose of this phase was to examine (1) whether the executives perceived the two statements in each item to be opposite, (2) whether the knowledge management measures appeared legitimate, and (3) if the alliance orientation measures showed the same pattern for both supplier and customer relationships. Two versions of the survey were administered (see Appendix 4.3 a & b for a copy of the survey), one with questions about strategic alliances on the customer side and other with the supplier side. 16 usable responses (11 customer side and 5 supplier side) were received. Most of the respondents (13 of 16) were Caucasian males with an average age of about 47 years and work experience of about 23 years, half of them in high-technology companies.
In examining whether the executives perceived correlations between the two statements in each item to be opposite, the correlations ranged from -0.327 to -0.807 for alliance orientation (16 items), from .083 to -0.763 for leadership orientation (13 items), and -0.037 to -0.839 for learning orientation (10 items). Correlation analyses revealed that some items had low correlation for the pair of opposite statements. Four alliance orientation items, three leadership orientation items and two learning orientation items were dropped because of low correlation. One knowledge management item was dropped because it was believed to be redundant with the other items measuring knowledge management. Please refer to Table 4.1 for items deleted at this phase.

Some items were rephrased or reworded based on feedback to make them more understandable. After dropping these items the correlations ranged from -0.429 to -0.827 for alliance orientation, -0.246 to -0.763 for leadership orientation, and -0.455 to -0.839 for learning orientation.

A valuable finding from the practitioner phase was that though practitioners saw strategic orientation scales as forced choice as expected, they did not perceive knowledge creation and knowledge acquisition statements which were framed to refer to the same knowledge domain as polar opposites (correlations ranged from -0.229 to 0.296). Thus, for the actual survey the strategic orientation items were reframed as forced-choice but the knowledge management items were retained as single pole items.

When the pattern of correlation between opposite statements of each item was compared between suppliers and customers visually, the pattern was found to be similar suggesting no major differences between supplier and customer alliances on alliance
orientation. Thus, alliance orientation items were asked once as generic to both supplier and customer alliances rather than separately for each type of alliance.

Adopting the two-stage discovery oriented approach facilitated improved face and content validity of the measures. It helped increase confidence that respondents understood instructions, questions, and response scales in intended ways. The final instrument was sent to two retired senior business executives to get feedback on face validity. They suggested minor changes to improve readability that were incorporated in the final survey (e.g. more white space between text lines on the last page of the survey). Appendix 4.4 provides the final survey.

The target recipients of the survey in this study were senior executives. The strategic nature of the survey’s content, the focus on interorganizational issues such as knowledge management, and the probing of firm performance necessitates the choice of top executives, whose understanding and fields of action pertain to overall organizational issues (Eisenhardt & Schoonhoven, 1996; Simonin, 1997). Further, they are also the most qualified to direct the questionnaire to other individuals in the organizations who are competent on the subject. Use of key informants in survey research dealing with perceptions of top executives regarding strategic (e.g. Brews & Hunt, 1999; Farrell & Oczkowski, 2002; Lumpkin & Dess, 1995; Moorman & Miner, 1995), alliance (Rindfleisch & Moorman, 2001; Wathne & Heide, 2004) or knowledge management (e.g. Johnson, 2002) issues is common. Alliance researchers have found that when informants are assured anonymity, their responses about their own organization and their conduct in the alliance tend to be frank and honest (Kandemir, Ghauri, & Cavusgil, 2002; Sakakibara, 1997).
It was decided that potential informants would be contacted in two waves- 1800 firms in the first wave, the balance of 700 in the second if the response from the first wave was not sufficient. The procedure recommended and adopted by Sarkar, Echambadi, and Harrison (2001) and Kandemir et al. (2002) was followed initially. A letter and return envelope was sent to CEOs requesting participation and asking for the contact details of senior-level executives knowledgeable about the company’s strategic processes and activities (the CEO could identify himself/herself). In exchange for their participation, firms were promised a summary of the research findings. A response rate of about 10% was expected which Hambrick, Geletkanycz, and Fredrickson (1993) indicate is typical for mail surveys with a top management population. This letter was to be followed by mailing the survey to firms that agreed to participate.

It was also decided to collect data from a second key informant in the respondent firm. A high correlation in responses from two key informants (a primary informant and a secondary informant) would give more confidence that the data collected reflects the perception of the firm rather than of a single individual within the firm. Thus, about two weeks after data collection from the primary informants was concluded they were sent another email requesting them to forward the survey to another informant in their firm. This survey was the same survey that they had completed a few weeks back.

4.3 Measures

The purpose of this section is to introduce the dependent, independent, and control variables used in this study. While some of the scale items are based on past research, others have not been employed previously. All measures used in this dissertation are perceptual. The use of perceptual responses of key decision makers is quite common in
knowledge management research in the interorganizational context (e.g. Lane, Salk, & Lyles, 2001; Simonin, 1999). All items were scored on a 5-point Likert scale.

4.4.1 Dependent Variables

The dependent variables in this study are related to organizational performance and knowledge management in strategic alliances. There are a total of three dependent variables—firm performance, knowledge acquisition and knowledge creation.

Measuring firm performance, the dependent variable of this study, is a major challenge for researchers (Li & Simerly, 1998) because of its broad potential domain (Venkataraman & Ramanujam, 1987). Most academics and practitioners agree that the long-term survival of the company requires attention to a wide range of performance measures, instead of the limited and myopic focus on short-term value creation (Kerssens-Van Drongelen & De Weerd Nederhof, 1999).

Thus, a multidimensional model of business performance was used in this study. Such a measure reflects the degree of performance across several important aspects. Meyer & Gupta (1994: 309) note that unidimensional measures of performance (such as accounting-based return on assets) tend to “run down or lose their capacity to discriminate good from bad performance, [and] trigger ongoing creation of new performance measures different from and therefore weakly related with existing measures”. Thus, researchers and practitioners must pay attention to various aspects of a firm’s conduct. This is especially important when dealing with high-level constructs like strategic orientation and knowledge management as outcomes may be favorable in some dimensions but not in others (Lumpkin & Dess, 1996).
Thus, firm performance was measured with a concise version of an instrument originally developed by Gupta and Govindarajan (1984) and modified by Covin (1991). Respondents were requested to rate their current performance, relative to their competitors, on various aspects of a firms’ performance (profitability, market share, revenue growth, stock price, and product development activities) on a 5-point Likert scale. This motivates top executives to focus their firms’ performance comparison on competitors that they consider important (Porac, Thomas, & Baden-Fuller, 1989), rather than restricting their response frame to researcher-directed specification of a particular comparison group (e.g. ‘your largest group’). Respondents were asked to report firm performance as both achieved performance (in the last three years) and expected performance (over the next five years). They were also asked to indicate the importance of all five aspects of firm performance separately.

Weighted performance was calculated for each firm for achieved performance and expected performance. This will be done by summing the product of the importance of each aspect of performance (profitability, market share, revenue growth, stock price, and product development activities) with the perceived achieved (or expected) performance relative to its competitors. The aggregate was then divided by five for public firms and four for private firms (Only four of the five performance aspects are important to private firms whereas all 5 are important to public firms).

Interorganizational knowledge management was measured using items that measure knowledge acquisition and knowledge creation. In the past, technological knowledge has

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21 Gupta and Govindarajan (1984) developed a 12-dimensional performance measure for SBU performance which Covin (1991) modified to measure nine aspects of firm financial performance. Longer measures can result in respondent fatigue and so this study measured five aspects of performance of which only three were financial (profitability, revenue growth, and stock price).
dominated the research on knowledge management in alliances (Mowery et al., 2002). For this reason, in addition to technological knowledge, this study also included other aspects of knowledge management, such as administrative techniques, marketing knowledge, manufacturing and production processes, and R & D knowledge, when measuring knowledge acquisition and knowledge creation (Salk & Simonin, 2003).

To measure knowledge acquisition, the items used by Lyles and Salk (1996) were adapted. New items were added to measure other aspects of knowledge management as noted above. Respondents were asked to indicate on a Likert scale of 1 to 5 their perception of knowledge acquired from their alliance partner in various domains. Sample items include respondents’ perception of (1) technological expertise acquired from partner, (2) marketing expertise acquired from partner, and (3) knowledge of useful managerial techniques acquired from partner. Lyles and Salk (1996) found their scale to have a Cronbach alpha of 0.88.

To measure knowledge creation, the items used by He and Wong (2004) were adapted. These items ask respondents to indicate on a Likert scale of 1 to 5 their perception of knowledge created in the alliance in various domains. Sample items include (1) Our relationship with this partner has allowed us to introduce a new generation of products that were not available in the market earlier, (2) Our relationship with this partner opened up new markets for us that we were both not serving earlier, and (3) Our relationship with our partner has allowed us to enter into new technological fields that none of us was working in earlier. He and Wong (2004) found the Cronbach alpha for their knowledge creation scale to be 0.81.
Pretest of the knowledge management measures with practitioners suggested that knowledge creation and knowledge acquisition were not seen as opposite to each other as noted earlier and so both scales were included in the final survey as measured by single pole items. Table 4.1 presents the knowledge management items included in the final survey (the non-italicized items) as well as how they were obtained from existing literature.

Insert Table 4.1 about here

4.4.2 Independent Variables

To measure strategic orientation, multi-item scales were drawn from the literature. Some of the items used were from published studies in the business literature while other items were generated based on theoretical arguments in the literature (Table 4.1 presents the strategic orientation items and their origins in the existing literature).

Firm strategic orientation consisted of three dimensions- alliance orientation (12 items), leadership orientation (10 items), and learning orientation (8 items). Forced-choice scales were used to measure the three orientations. The two ends of the scale measured opposite orientations, such that the alliance orientation scale measured cooperative orientation on the low end and competitive orientation on the high end, leadership orientation scale measured entrepreneurial orientation on the low end and managerial on the high end, and learning orientation scale measured generative on the low end and adaptive on the high end. The scales were reverse scored for the analysis so that higher values reflected cooperative alliance orientation, entrepreneurial leadership orientation, and generative learning orientation, while lower values reflected competitive alliance orientation, managerial leadership orientation, and adaptive learning orientation.
Though others scholars (e.g. Barringer & Bluedorn, 1995; Covin, 1991; Miller & Friesen, 1982) have used forced choice scales to measure firm strategy, none of the scales used in this dissertation have been used before.

4.4.3. **Moderator Variables**

The organizational environment of the alliance is reflected in Parkhe’s (1991) inter-firm diversity in alliances. Measures for resource diversity and cultural diversity were adapted from Sarkar et al. (2001) and Aulakh and Madhok (2002).

The complexity of the knowledge base of the respondents’ industry was measured using a four item scale adapted from Zander and Kogut (1995). Respondents were asked to report the characteristics of the knowledge that firms require to compete in their industry.

4.4.4 **Control Variables**

Data were collected on a number of control variables that may have an important influence on knowledge management and organizational performance.

**Firm age**: The age of the firm may have an influence on the firm’s management of knowledge in its strategic alliances (Zahra, Ireland, & Hitt, 2000). Older firms may be better able to manage different aspects of knowledge because of their larger resource endowments, while younger firms may be forced to seek knowledge outside their firm. Therefore, firm age was included as a control variable.

**Firm size**: The size of the firm may influence knowledge management and organizational performance (McGrath, 2001). Larger organizations may have more resources to devote to their alliances. Firm size was measured as the current number of employees.
Industry growth: The growth of the industry in which the respondent firm is operating will influence knowledge management in strategic alliances in that industry. Firms which are operating in high-growth industry environments are more likely to engage in interorganizational knowledge management than firms in environments with lower growth potential (Lei, 1997). Therefore, industry growth was included as a control variable and measured using a 2-item scale – (1) the growth of demand for product/services; (2) opportunities for growth and expansion (Dess & Beard, 1984).

Environmental uncertainty: The nature of the environment in which the respondent firm is competing influences its strategy, knowledge management, and performance. Environmental uncertainty refers to the rate of change, absence of pattern and unpredictability of the environment (Dess & Beard, 1984). Firms can be in more or less uncertain environments. Therefore, environmental uncertainty was included as a control variable by asking the respondents about the rate of change for product/services and opportunities for growth and expansion in their principal industry (Miller & Droge, 1986).

CEO Tenure: Strategic management scholars argue that CEO tenure, the duration of time the CEO has been in-charge of the organization, has a strong influence on organizational strategy and performance (Hambrick & Fukutomi, 1991). Thus, CEO tenure will be controlled by asking respondents to indicate, in years, the tenure of the CEO of their organization.

4.4.5 Other Variables
Alliance Status: To examine the impact of the key strategic alliances on the firms’ business, respondents were asked to indicate how core the alliance was to their firm and whether or not a large portion of their business was impacted by this alliance. The purpose of this 2-item scale was to measure the variation between supplier and customer alliances on this measure.

To summarize, this chapter presents the sample, methodology, and measures used in this research study. Because supply chain alliances involve relationships at two levels (1) between a seller and a (downstream) customer or user and (2) between the seller and an upstream (supplier), data was collected from firms concerning both a key supplier alliance and key customer alliance. Top executives of high-technology firms were requested to complete measures of strategic orientation for their firm, and inter-firm diversity and knowledge management measures for a strategic alliance with a key supplier (or potential supplier) alliance and a key customer (or potential customer) alliance. They were also asked to complete performance measures that included deciding the relative importance of five aspects of firm performance aspects as well as their achieved and expected performance relative to their competitors over the last three years and the next five years respectively. Lastly, they were also asked to report their perception of the uncertainty, growth and complexity of the knowledge base of their industry.
This chapter presents the analyses and results of this research study. As mentioned in Ch. 4, data was collected from top executives on their firms’ strategic orientation, knowledge management activities in key supply chain alliances, and performance. Because the objective was to capture primary data, rather than secondary data, self-response surveys were believed to be an effective way to collect data.

5.1 Informant Description

Potential informants were contacted in two waves- 1800 firms in the first wave, the balance of 700 in the second. The contact protocol for the two waves was similar and is summarized in Table 5.1. The only difference in the two waves was that in the first hand signed, personally addressed letters were mailed to one top executive (President or CEO) in each company inviting them to participate in this research project (Kandemir et al., 2001; Sarkar et al., 2001). The postal mail approach generated low response (24 responses or 1.3% of the 1800 firms in the first wave) after 5 weeks. The low response rate was probably because secretaries and/or personal assistants who serve as ‘gatekeepers’ restricted access to top executives.

Insert Table 5.1 about here

Firms were then contacted through email. Though some email addresses were collected from the CorpTech Directory, most email addresses were generated from company websites. Visiting company websites also helped eliminate firms that did not fit with the criteria (e.g. firms with more than 500 employees, online bazaars that did not have sales to other businesses, or local community portals and virtual meeting places that
did not make or sell high-tech commercial products or services directly to other businesses). In all, 2142 firms were contacted over the two waves. Table 5.2 summarizes the reasons for eliminating 358 firms from the complete sample.

**Insert Table 5.2 about here**

The first email inviting companies to participate was followed by another email after 4-6 weeks repeating the request to participate. Companies that agreed to participate were sent the survey followed by two reminders to complete the survey, if they had not responded back within 2-3 weeks. Companies that declined to participate were removed from the mailing list. Respondents were encouraged to ask questions if they had any and were answered via phone or email. For most firms, emails were sent to one e-address though in situations where multiple email addresses were available, emails were sent to more than one address to increase the probability of response.\(^{22}\)

Data collection started in the third week of November with the mass mail-out of request letters in the third week of November 2005. The first email contact was established in the third week of December 2005. In all, about 6,000 emails were sent between December 2005 and March 2006. 102 completed surveys were received, but because 2 surveys were from different respondents in the same firm, 101 unique firms completed the survey. 1 of the 101 firms was dropped from the analysis because it had 1600 employees (maximum firm size for this study was 500 employees and this firm had more than 500 employees for some time). Thus, the final sample was 100 firms with a response rate of 4.7% of the 2142 sampled firms that appeared to meet all sampling criteria.

\(^{22}\) In response to emails to multiple addresses, two completed surveys were received from 1 firm. Data provided by the first survey received was the only one of the two analyzed for this study. The second survey was considered as completed by the secondary informant.
Analysis of informant profile information revealed that 30 informants were the senior-most executive in the firm, 54 informants appeared to be direct reports to the senior-most executive, and 14 informants were other senior executives but probably not direct reports to the senior-most executive. Table 5.3 summarizes the informant profile. It should be noted that most of these 14 informants had been nominated by the top management to complete the survey questionnaire and/or reported completing the survey in consultation with the top management which increased confidence that the data collected from them reflects the perceptions of the top management (Huber & Power, 1985).

Insert Table 5.3 about here

As mentioned in Chapter 4, an effort was made to obtain a completed survey from a second informant in the respondent firms. Email contact was made with the first informant towards this objective. Of the 99 firms contacted (2 completed surveys had already been received from one firm as mentioned earlier), only two completed surveys were received. Thus, a total number of 3 surveys were received from a second informant. Though this sample is too small to use in statistical analysis, it is interesting to note other scholars (e.g. Heide & John, 1990) have encountered the same problem when attempting to collect data from a second informant. Contact with the primary informants revealed that this problem may be due to time constraints imposed on top executives’ time due to their busy schedule.

As all survey research involves potential non-respondent bias (Golden, 1992), a check for differences between responding and non-responding firms was conducted. Archival data on age, sales volume, and number of employees were provided by CorpTech.
CorpTech collects this data from a combination of survey, archival, and estimation modeling approaches. For this reason, all data on age, sales volume, and number of employees was as reported for the end of fiscal year 2004. The 100 firms that completed the survey were compared with the total sample to check if the respondent sample differed from the total sample on firm age, sales, and employees.

Before running the t tests for comparing the two groups, the Levene’s Test for equality of variance was conducted. Levine’s Test indicated that the two groups have equal variances on age (F = .44, ns), but unequal variances on sales (F = 6.47, p < .05) and employees (F = 8.99, p < .01). Thus, the t-test for comparing responding firms with non-responding firms involved comparison for groups with equal variances on age and unequal variances on sales and employees. The t-test for age (t = .42, ns) and sales (t = -1.20, ns) were found to be insignificant, but that for number of employees was found to be marginally significant (t = -1.86, p < .1).

Non-respondents did not appear to differ in variance or means from responding firms based on age. There appear to be clear differences in variation on size measures (with respondents being more variable in size than non-respondents) but once unequal variance on size was taken into account, mean differences in size were either only marginally significant (employees) or insignificant (sales) in the direction of greater size for responding firms.

The two samples were also compared on ownership and primary SIC Codes. 89% of the firms in the total sample were privately held which is very similar to the 90% share of privately held firms among responding firms. The respondent sample had slightly higher
percentage of software (63.5% compared to 58%)\textsuperscript{23} and computers (10.4% compared to 8.0%) firms (SIC codes 357 and 737 respectively), slightly lower percentage of telecommunication (6.3% compared to 8.4%) and instrumentation (10.4% compared to 16.3%) firms (SIC codes 366 and 382 respectively), and an almost equal percentage of electronics (9.3%) firms (SIC code 366).

Thus, it appears that the primary difference between the two samples is in size as measured by the number of employees. The respondent firms have more employees on average than the firms in the total sample. More specifically, the 100 firms that provided data for this study are similar to the total sample on age, sales, ownership, and primary SIC code but differ on number of employees. The firms that provided data had more employees (mean = 84.7) than the 2142 firms in the total sample (mean = 64.05).

5.2 Preliminary Analyses

Strategic Orientation items were subjected to a limited simulation factor analysis to establish discriminant validity of the strategic orientation scales. A limited simulation, instead of a full factor analysis, was chosen because the sample size did not allow including all 30 items simultaneously in the factor analysis. Thus, ten factor analyses (with varimax rotation) were run with 5 items each from alliance orientation, leadership orientation, and learning orientation. When unconstrained, six factor analyses had a four factor solution (four factors with eigen values greater than 1.0) while the other four factor analyses had a three factor solution (three factors with eigen values greater than 1.0). For the six factor analyses that had a four factor solution, a 3-factor solution was constrained.

\textsuperscript{23} There appears to be a large number of software firms in the CorpTech sample and consequently in the sample used in this study. It is possible that the high proportion of software firms in the CorpTech high-technology database may reflect a bias towards sampling software firms, but it is also possible that it is due to the high proportion of software firms in the 21st century economy in general. In either case, the findings of this study may be more generalizable to software firms than other types of high technology firms.
The resultant 450 factor loadings were analyzed for adequate loading (Table 5.3). The criteria were a loading of at least 0.55 on the primary factor and maximum 0.40 on a secondary factor. It was found that only 16 factor loadings (3.5% of the total 450 loadings) did not meet the criteria. The factor analyses involved in these aberrant factor loadings are highlighted in Table 5.3. These loadings were analyzed individually. It was observed the aberrant loadings were limited to 4 of the total 18 items. Two of these items only had one or two aberrant loadings restricted to a single factor analysis and were not considered to be problematic in general. Two items (one leadership orientation item and one alliance orientation item) were identified for further consideration. It was observed that only the one alliance orientation item had inconsistent loadings across all factor analyses. This item also appeared to be primarily responsible for the fourth factor in four of the six factor analysis that had four factors with eigen values greater than 1.0. Correlation analysis confirmed that this alliance orientation item did not correlate consistently with other alliance orientation items whereas no such problem was observed for the leadership orientation item. Therefore, the aberrant alliance orientation item was dropped but the leadership orientation item was retained. Eliminating this one alliance orientation item decreased the number of aberrant loadings by 50%. The remaining items for each construct were averaged to form the final scale value. The Cronbach alpha for the 11-item alliance orientation scale, the 10-item leadership orientation scale, and the 8-item learning orientation scale were found to be .84, .90, and .89 respectively\textsuperscript{24}.

\textsuperscript{24} All three constructs are bipolar in nature. Due to this high values on alliance orientation correspond to cooperative alliance orientation while low values correspond to competitive alliance orientation. Similarly, high values on leadership orientation correspond to entrepreneurial leadership while low values correspond to managerial leadership. High values on learning orientation correspond to generative learning while low values correspond to adaptive learning.
Thus the factor analyses demonstrated good discriminant validity between the three dimensions (Table 5.4) even though the correlations between the three strategic orientation scales were found to be weak to moderately positive ranging from .10 to .43 (as shown later in table 5.4).

**Insert Table 5.4 about here**

As noted in chapter 4, the expectation that a forced-choice bipolar measure would be supported for knowledge management ranging from emphasis on knowledge acquisition on one end and emphasis on knowledge creation on the other end was disconfirmed in both the pre-test phases. Hence, knowledge creation and knowledge acquisition were measured as distinct, unipolar scales. Knowledge creation and knowledge acquisition items were factor analyzed separately for key supplier and customer alliance. Varimax rotation was used to rotate the factor solution. Surprisingly, instead of the hypothesized two factors the items loaded on three factors (eigen values greater than 1.0). It was found that the last six items, intended to include three knowledge creation items and three knowledge acquisition items, loaded on one factor that appeared distinct from knowledge creation and knowledge acquisition. The last six items which were developed for the first time for this study as noted in the previous chapter were, therefore, combined into a separate variable called General Knowledge Management and were not analyzed further for purposes of directly testing hypothesized relationships\(^{25}\). The first six items were classified as knowledge creation and knowledge acquisition, with items 1, 3, and 5 as knowledge creation and 2, 4, and 6 as knowledge acquisition. Thus, the knowledge creation and knowledge acquisition scales used for data analysis were nearly identical.

\(^{25}\) Analyses using the new variable, General Knowledge Management, will be discussed later in the post-hoc analyses.
(except for minor word changes that can be noted in Table 4.1) to the scales previously used by Lyles and Salk (1996) and He and Wong (2004) as noted in the previous chapter. Cronbach alpha revealed good scale reliability for the two measures, 0.79 and 0.71 for knowledge creation and knowledge acquisition respectively on the supplier side, and 0.77 and 0.84 for knowledge creation and knowledge acquisition respectively on the customer side. The reliability of the knowledge creation and knowledge acquisition scales found here compares well with the reliability of .88 and .81 respectively found by other researchers as reported in the previous chapter. The variability in the reliability of the knowledge acquisition measure across the two supply chain alliance contexts is worth noting although it reached acceptable levels of reliability in both contexts.

Factor analysis of inter-firm diversity items with varimax rotation revealed that only two items for resource diversity (product and manufacturing technologies and R & D expertise) and three items for cultural diversity (values and social norms, organizational culture, and personnel management practices) loaded together well. Thus, three items for resource diversity and two items for cultural diversity had to be dropped for poor loading. The resultant two item resource diversity scale had an inter-item correlation of 0.62 and 0.76 for suppliers and customers respectively. The resultant three-item cultural diversity scale had a Cronbach alpha of 0.88 and 0.87 for the supplier and customer respectively. The greater variability in the reliability of resource diversity across the two supply chain alliance contexts is worth noting.

The two item industry growth and environmental uncertainty scales were analyzed next. It was observed that the two scales held together well. Inter-item correlation for the two item measure for industry growth was 0.84 and for environmental uncertainty was
0.73. The four item knowledge complexity scale was found to have a Cronbach alpha of 0.82. The inter-item correlation for alliance status was 0.77 for the key supplier alliance and 0.81 for the key customer alliance.

### 5.3 Results

Table 5.5 provides the descriptive statistics and correlations for all the variables of interest included in the study.

**Insert Table 5.5 about here**

Examination of the correlations reveals that learning orientation is significantly positively related to leadership orientation and to alliance orientation although leadership and alliance orientation are not significantly related to each other. Though alliance orientation, leadership orientation, and learning orientation are conceptualized as three distinct dimensions of strategic orientation, it is reasonable to believe that, in practice, they will be somewhat positively related to each other as found in the correlation table.

It was also found that the correlations between resource diversity and cultural diversity are not significant for both the key supplier \( r^2 = .04 \) and the key customer \( r^2 = -.10 \), confirming that these two are distinct moderators. Further, there was a stronger relationship between key supplier and customer alliance for cultural diversity \( r^2 = .41 \) than for resource diversity \( r^2 = .22 \) though both relationships are significant.

It was also found that the correlation for knowledge creation and knowledge acquisition is positive and significant for both the key supplier alliance \( r^2 = .29 \) and the key customer alliance \( r^2 = .50 \). Further, it was observed that there is a significant correlation between knowledge creation across the key supplier and customer alliance
(r²=.33) as well as knowledge acquisition across the key supplier and customer alliance (r²=.53).

As expected, there was a high correlation between achieved firm performance in the last 3 years and expected performance over the next 5 years. The Pearson correlation between perceived achieved and expected performance was .78.

Analysis of means revealed that the strategic alliances reported by firms were not uniformly ‘core’ to them. The mean value for the supplier side on alliance status, ‘how core the reported relationship is to the firm’, was 2.77 while that for the customer side was 3.29. Thus, on average the key supplier alliance reported by firms tends to be less ‘core’ to them than the key customer alliance (t (1, 83) = -2.10, p < .05). Moreover, alliance status had a significant positive relationship with knowledge creation on the supplier side and with knowledge acquisition on the customer side.

Industry growth is found to be significantly negatively correlated with the age of the firm and the tenure of the present CEO. This suggests that perceived growth of the firm’s principal industry decreases as the firm gets older and the CEO’s tenure increases. Industry growth is also found to be significantly positively correlated to environmental uncertainty and with number of employees. This suggests that industries perceived to grow at a high rate are also perceived to have high environmental uncertainty. It also appears to suggest that as the firm’s industry grows, the firm grows with it increasing its employment.

To confirm that supplier and customer alliance did not difference on knowledge creation or knowledge acquisition, two paired sample T tests were conducted. No significant difference was found for knowledge creation in key supplier alliance and key customer alliance (t (1, 83) = -1.16, ns) as well as for knowledge acquisition in key supplier and key customer alliance (t (1, 83) = -1.57, ns). These findings provide confidence that key supplier and customer alliance do not statistically differ in knowledge creation as well as knowledge acquisition.
Before examining whether the data supports the hypotheses described in Chapter 3, it is important to ensure that the data is clean and ready to analyze. As some companies did not provide data on control variables like age (four missing), number of employees (five missing), and CEO tenure (seven missing), mean values were substituted for missing values on these variables. Also, because of the large range on the age and employee variable, a log transformation was used to transform the two variables toward greater normality. To detect interaction effects, the main variables were centered and their product term calculated to reduce multicollinearity as suggested by Cronbach (1987), Jaccard, Turrisi, and Wan (1990) and Tabachinik and Fidell (2001).

It was also considered important to check for possible multicollinearity problems. Variance inflation factors were found to range from 1.1 to 1.3 across all reported regressions. Chatterjee, Hadi, and Price (2000) suggested that multicollinearity is not a problem when the VIF are below 10 and all the VIFs are close to 1. Thus, multicollinearity does not appear to be a problem for the three strategic orientation measures as well as the knowledge management measures in any of the regression analyses.

All control variables (firm age (log), number of employees (log), CEO tenure, industry growth, environmental uncertainty) were included in all the analyses described below although most were not found to be significantly related to knowledge creation or knowledge acquisition for either the supplier or customer alliance. Main effects of leadership orientation, alliance orientation, and learning orientation on knowledge creation and knowledge acquisition on both key supplier and the key customer alliance were examined first, followed by moderated effects (Table 5.6 a & b). The influence of
knowledge creation and knowledge acquisition from both alliances on firm performance and the moderating effect of industry knowledge were examined last (Table 5.7).

To examine the main effects of alliance orientation, leadership orientation, and learning orientation on knowledge creation and knowledge acquisition in key supplier or customer alliance, four hierarchical multiple regression tests were conducted. In all the four tests, the control variables were entered first as a block, followed by the three main variables of alliance orientation, leadership orientation, and learning orientation as well as the main effect of resource diversity and cultural diversity (Table 5.6 a & b).

Insert Table 5.6 (a) & (b) about here

5.3.1 Main Effects Analysis on Knowledge Creation and Knowledge Acquisition

For the main effect of alliance orientation (H1), it was found that alliance orientation did not have a significant influence on knowledge creation ($\beta = -.02, t = -.19, ns$) and knowledge acquisition ($\beta = .06, t = .52, ns$) in the key supplier alliance as well as knowledge creation ($\beta = .14, t = 1.25, ns$) or knowledge acquisition ($\beta = .16, t = 1.47, ns$) in the key customer alliance. Thus, H1 was not supported by the data in any of the four tests.

For the main effect of leadership orientation (H2), it was found that leadership orientation did not have a significant impact on knowledge creation ($\beta = .05, t = .43, ns$) or knowledge acquisition ($\beta = .11, t = .90, ns$) in the key supplier alliance but had a significant impact on knowledge creation ($\beta = .32, t = 2.959, p < .01$) and knowledge acquisition ($\beta = .27, t = 2.55, p < .05$) in the key customer alliance. The impact of leadership orientation on knowledge creation in the key customer alliance is positive which is in the direction hypothesized, i.e. as leadership orientation becomes more
entrepreneurial, knowledge creation increases. However, the positive relationship between leadership orientation and knowledge acquisition in the key customer alliance is opposite to that hypothesized, i.e. as leadership orientation becomes more entrepreneurial, knowledge acquisition increases. Thus, H2 was only supported in one of the four tests.

For the main effect of learning orientation (H3), it was found that learning orientation did not have a significant impact on knowledge creation ($\beta = .02, t = .21, ns$) or knowledge acquisition ($\beta = -.08, t = -.65, ns$) in the key supplier alliance as well as on knowledge acquisition ($\beta = -.18, t = 1.58, ns$) in the key customer alliance. It did have a marginally significant impact on knowledge creation ($\beta = -.22, t = -1.89, p < .1$) in the key customer alliance. However, the marginally significant impact of learning orientation on knowledge creation in the key customer alliance is negative, which is opposite to that hypothesized. In other words, it was found that as learning orientation becomes more generative, knowledge creation decreases. Thus, H3 was not supported in any of the four tests.

Thus, of the main effects hypothesized between the strategic orientation dimensions and knowledge creation and knowledge acquisition, only the relationship between leadership orientation and knowledge creation was partially supported by the data. Moreover, this main effect was only supported for the key customer alliance and not the key supplier alliance.

5.3.2 Moderator Analyses on Knowledge Creation and Knowledge Acquisition

It was also observed that the main effect of resource diversity was significant in all the four tests, while the main effect of cultural diversity was significant only for supplier knowledge creation and marginally significant for customer knowledge acquisition. The effect was found to be negative in all the tests. However, because no main effect of the two diversity variables was hypothesized they are not discussed here.
To examine if inter-firm diversity moderates the relationship between the three strategic orientation dimensions (leadership, alliance, and learning) and knowledge creation and knowledge acquisition, interaction terms were created and entered individually in separate moderated hierarchical regressions (Table 5.6 a & b).

For the moderating influence of resource diversity on the relationship between alliance orientation and knowledge creation (H4a), it was found that resource diversity did not moderate the relationship between alliance orientation and knowledge creation in the key supplier alliance ($\beta = .13, t = 1.29, \text{ns}$) or between alliance orientation and knowledge creation in the key customer alliance ($\beta = .12, t = 1.22, \text{ns}$). Thus, H4(a) was not supported by the data in either test.

For the moderating influence of resource diversity on the relationship between alliance orientation and knowledge acquisition (H4b), it was found that resource diversity did not moderate the relationship between alliance orientation and knowledge acquisition in the key supplier alliance ($\beta = -.07, t = -.65, \text{ns}$) or the relationship between alliance orientation and knowledge acquisition in the key customer alliance ($\beta = -.05, t = -.55, \text{ns}$). Thus, H4(b) was not supported by the data in either test.

For the moderating influence of resource diversity on the relationship between leadership orientation and knowledge creation (H5a), it was found that resource diversity had a significant influence on the relationship between leadership orientation and knowledge creation in key supplier alliance ($\beta = .28, t = 2.88, p < .01$), but did not moderate the relationship between leadership orientation and knowledge creation in key customer alliance ($\beta = -.52, t = -.51, \text{ns}$). Fig 5.1 (a) and (b) compare the interaction found in the data for the effect of resource diversity on the relationship between leadership
orientation and knowledge creation in the key supplier alliance with the pattern of interaction hypothesized. It is observed that the relationship between knowledge creation and leadership orientation is inconsistent with that hypothesized in Hypothesis 5(a). Leadership orientation is found to have a stronger relationship with knowledge creation at low resource diversity compared to high resource diversity which is opposite to the hypothesized relationship. Moreover, even though the direction of relationship between entrepreneurial leadership orientation and knowledge creation is in the hypothesized direction at high resource diversity, it is in the opposite direction at low resource diversity.

**Insert Fig 5.1 (a) & (b) about here**

For the moderating influence of resource diversity on the relationship between leadership orientation and knowledge acquisition (H5b), it was found that resource diversity did not moderate the relationship between leadership orientation and knowledge acquisition in the key supplier alliance (\(\beta = .09, t = .80, ns\)) or the relationship between leadership orientation and knowledge acquisition in the key customer alliance (\(\beta = .02, t = .18, ns\)) in the key customer alliance. Thus, H5(b) was not supported by the data in either test.

For the moderating influence of resource diversity on the relationship between learning orientation and knowledge creation (H6a), it was found that resource diversity did not moderate the relationship between learning orientation and knowledge creation in the key supplier alliance (\(\beta = .15, t = 1.56, ns\)) but has a marginally significant influence on the relationship between learning orientation and knowledge creation in the key customer alliance (\(\beta = .19, t = 1.81, p < .1\)). Fig 5.2 (a) and (b) compare the interaction
found in the data for the influence of resource diversity on the relationship between learning orientation and knowledge creation in the key supplier alliance with the pattern of interaction hypothesized. It is observed that the relationship between learning orientation and knowledge creation found in the data is inconsistent with that hypothesized in Hypothesis 6(a). Learning orientation has a stronger relationship with knowledge creation at low resource diversity than at high resource diversity. Moreover, the direction of relationship between learning orientation and knowledge creation at both low and high resource diversity is in the direction opposite to that hypothesized. Thus, H6(a) was not supported by the data in either test.

Insert Fig 5.2 (a) & (b) about here

For the moderating influence of resource diversity on the relationship between learning orientation and knowledge acquisition (H6b), it was found that resource diversity did not moderate the relationship between learning orientation and knowledge acquisition in the key supplier alliance (β = -.09, t = -.82, ns) or between learning orientation and knowledge acquisition in the key customer alliance (β = .07, t = .69, ns). Thus, H6(b) was not supported by the data in either test.

For the moderating influence of cultural diversity on the relationship between alliance orientation and knowledge creation (H7a), it was found that cultural diversity did not moderate the relationship between alliance orientation and knowledge creation in the key supplier alliance (β = .05, t = .48, ns) or between alliance orientation and knowledge creation in the key customer alliance (β = -.07, t = -.70, ns). Thus, H7(a) was not supported by the data in either test.
For the moderating influence of cultural diversity on the relationship between alliance orientation and knowledge acquisition (H7b), it was found that cultural diversity did not moderate the relationship between alliance orientation and knowledge acquisition in the key supplier alliance ($\beta = -.02, t = -.15, ns$) or between alliance orientation and knowledge acquisition in the key customer alliance ($\beta = -.09, t = -.91, ns$). Thus, H7(b) was not supported by the data in either test.

For the moderating influence of cultural diversity on the relationship between leadership orientation and knowledge creation (H8a), it was found that cultural diversity did not moderate the relationship between leadership orientation and knowledge creation in the key supplier alliance ($\beta = -.04, t = -.35, ns$) or between leadership orientation and knowledge creation in the key customer alliance ($\beta = -.04, t = -.37, ns$). Thus, H8(a) was not supported by the data in either test.

For the moderating influence of cultural diversity on the relationship between leadership orientation and knowledge acquisition (H8b), it was found that cultural diversity did not moderate the relationship between leadership orientation and knowledge acquisition in the key supplier alliance ($\beta = .16, t = 1.29, ns$) or between leadership orientation and knowledge acquisition in the key customer alliance ($\beta = -.09, t = -.91, ns$). Thus, H8(b) was not supported by the data in either test.

For the moderating influence of cultural diversity on the relationship between learning orientation and knowledge creation (H9a), it was found that cultural diversity did not moderate the relationship between learning orientation and knowledge creation in the key supplier alliance ($\beta = -.05, t = -.47, ns$) or between learning orientation and
knowledge creation in the key customer alliance ($\beta = .05, t = .44, \text{ns}$). Thus, H9(a) was not supported by the data in either test.

For the moderating influence of cultural diversity on the relationship between learning orientation and knowledge acquisition (H9b), it was found that cultural diversity did moderate the relationship between learning orientation and knowledge acquisition in the key supplier alliance at a moderate level of significance ($\beta = .20, t = 1.70, p < .1$) but did not moderate the relationship between learning orientation and knowledge acquisition in the key customer alliance ($\beta = .14, t = 1.46, \text{ns}$). Fig 5.3 (a) and (b) compare the interaction found in the data for the influence of cultural diversity on the relationship between learning orientation and knowledge acquisition in the key supplier alliance with the pattern of interaction hypothesized. It is observed that the relationship between learning orientation and knowledge acquisition is partially consistent with that hypothesized. Learning orientation has a stronger relationship with knowledge acquisition at low cultural diversity than at high cultural diversity which is consistent with that hypothesized. However, the direction of the relationship between learning orientation and knowledge acquisition is in the hypothesized direction at low cultural diversity (where differences in learning orientation had a more substantive effect on knowledge acquisition) but in the opposite direction at high cultural diversity (where smaller differences between learning orientation had been expected). Thus, H9(b) was only partially supported by the tests.

Insert Fig 5.3 (a) & (b) about here

5.3.3 Main Effects of Knowledge Creation and Knowledge Acquisition on Performance
To examine the impact of knowledge creation and knowledge acquisition in key supplier and customer strategic alliance on firm performance, hierarchical multiple regression analysis was conducted. The control variables were entered together, followed by the main variables supplier knowledge creation, supplier knowledge acquisition, customer knowledge creation, and customer knowledge acquisition with either achieved or expected firm performance as the dependent variable in each separate analysis (Table 5.7).

**Insert Table 5.7 about here**

The first analysis was to examine the impact of knowledge creation and knowledge acquisition on firm performance (H10). It was found that neither knowledge creation ($\beta = -.08, t = -.67, ns$) nor knowledge acquisition ($\beta = -.22, t = -1.69, ns$) in key supplier alliance had a main effect on achieved firm performance. Similarly, neither knowledge creation ($\beta = .17, t = 1.32, ns$) nor knowledge acquisition ($\beta = .00, t = .03, ns$) in customer alliance had a main effect on achieved firm performance. Similar results were found for expected firm performance. Specifically, neither knowledge creation ($\beta = -.16, t = -1.32, ns$) nor knowledge acquisition ($\beta = -.20, t = -1.54, ns$) in key supplier alliance had a main effect on expected firm performance. In the key customer alliance, neither knowledge creation ($\beta = .19, t = 1.50, ns$) nor knowledge acquisition ($\beta = -.10, t = -.67, ns$) had a main effect on expected firm performance. In other words, neither knowledge creation nor knowledge acquisition had an impact on firm performance in either the key supplier or key customer alliance. Thus, H10 was not supported by the data.

**5.3.4 Moderator Analysis on Firm Performance**
To examine whether the complexity of the knowledge base of the industry influences the relationship between knowledge creation and firm performance or between knowledge acquisition and firm performance (H11), interaction effects were included in the analyses.

On the supplier side, it was found that knowledge complexity did not influence the relationship between knowledge creation and achieved firm performance ($\beta = .07, t = .65, ns$) or the relationship between knowledge acquisition and achieved firm performance ($\beta = .08, t = .66, ns$). Similar results were found for expected firm performance. Knowledge complexity did not influence the relationship between knowledge creation and expected firm performance ($\beta = -.04, t = -.35, ns$) or between knowledge acquisition and expected firm performance ($\beta = .08, t = .70, ns$) on the supplier side.

On the customer side, it was found that knowledge complexity significantly influenced the relationship between knowledge creation and achieved firm performance ($\beta = .33, t = 2.85, p < .01$). Fig 5.4 (a) and (b) compare the interaction found in the data with the pattern of interaction hypothesized. It is observed that the relationship between knowledge creation and firm performance is in the hypothesized direction at high industry knowledge complexity but in the opposite direction at low industry knowledge complexity.

**Insert Figure 5.4 (a) & (b) about here**

However, knowledge complexity did not influence the relationship between knowledge acquisition and achieved firm performance ($\beta = .02, t = .14, ns$). Further, although moderating effect of knowledge complexity was found for the relationship between knowledge creation and achieved firm performance in key customer alliance as
noted above, knowledge complexity did not moderate the relationship between knowledge creation and expected firm performance ($\beta = .13, t = 1.09, ns$). Similarly, knowledge complexity did not moderate the relationship between knowledge acquisition and expected firm performance ($\beta = .05, t = .44, ns$). Thus, H11 was only partially supported.

5.4  Post-hoc Analyses

In informal discussions with some software firms that had been contacted for this study, the respondents mentioned that their company did not have any supplier alliances and so the survey was not relevant to them. For this reason it was decided to examine if software firms differed from other firms in the sample on the importance of the key supplier and customer alliance. It was found that for software firms the key supplier alliance was significantly less important to their business compared to non-software firms ($t = 2.52, p < .05$). The mean importance of key supplier alliance was 2.52 for software firms and 3.37 for non-software firms. No such difference was found between software firms and non-software firms on their key customer alliance ($t = .033, ns$).

Because software and non-software firms were found to be statistically different on the importance of their key supplier alliance, further post-hoc analyses was conducted to determine if the type of firm has any influence on knowledge creation and knowledge acquisition in key supplier alliance. Type of firm (software versus non-software) was added as a main effect after all the other main effects had been examined for knowledge creation and knowledge acquisition. It was found that the type of firm (software versus non-software) had no significant effect on knowledge creation or knowledge acquisition in key supplier alliances.
This was followed by examining if the interaction of type of firm and interfirm diversity between partners influences knowledge creation or knowledge acquisition in the alliance. In other words, moderated hierarchical regression analysis was conducted to check for an interaction effect of type of firm (software versus non-software) and resource diversity or cultural diversity on knowledge creation and knowledge acquisition in key supplier alliance. An interaction effect was found only for type of firm (software versus non-software) with cultural diversity on knowledge creation in key supplier alliance ($\beta = .89$, $t = 2.18$, $p < .05$). Plotting this relationship (Figure 5.5) revealed that non-software firms have higher knowledge creation in key supplier alliance compared to software firms. It was found that at low cultural diversity non-software firms had high knowledge creation in their key supplier alliance. As cultural diversity increases, knowledge creation decreases for non-software firms though non-software firms have higher knowledge creation than software firms even at high cultural diversity. Thus, for non-software firms increase in cultural diversity between firms is not conducive to knowledge creation in the key supplier alliance.

**Insert Fig 5.5 about here**

This finding was limited to cultural diversity in key supplier alliance and did not generalize to resource diversity in the same alliance. Moreover, it was limited to knowledge creation in the key supplier alliance and was not found for knowledge acquisition in the same alliance.

Additional analysis was conducted to examine if the addition of an interaction between the type of firm (software versus non-software) and cultural diversity would affect any of the hypothesized relationships involving cultural diversity in key supplier alliance.
alliance. It was found that the type of firm did not show any systematic influence on the results reported earlier in the main analyses.

Further, moderated hierarchical regression analyses was conducted to examine if alliance status interacted with the main effect of knowledge creation and knowledge acquisition in key supplier and customer alliance on firm performance. It was found that alliance status did not influence the impact of knowledge creation and knowledge acquisition in both supplier and customer alliance on firm performance. Thus, it is possible to compare both knowledge creation and knowledge acquisition in a wide variety (degree of importance) of supplier and customer alliance and its impact on firm performance.

As mentioned earlier, a general knowledge management measure was created by combining items 7 through 12 of knowledge management items on both supplier and customer alliances. These items were originally expected to constitute three knowledge creation items and three knowledge acquisition items but the factor analysis indicated that they belonged in a separate single factor as reported earlier. The Cronbach alpha for the general knowledge management scale for the supplier and customer side was .86 and .82 respectively. The correlation between this new general knowledge management scale and knowledge creation and knowledge acquisition scales used for the main analyses were .50 and .39 for the key supplier alliance and .57 and .61 for the key customer alliance. The variability of the correlation between the general knowledge management scale and knowledge acquisition across the supply chain alliance context should be noted.

All tests as reported in the main section were repeated with the general knowledge management measure for key supplier alliance and key customer alliance. Accordingly,
the first test was to examine main effects of the three strategic orientation dimensions. Alliance orientation was not found to have a main effect on knowledge management in strategic alliance with either the key supplier ($\beta = -.02$, $t = -.19$, $ns$) or the key customer ($\beta = -.11$, $t = -1.05$, $ns$). Leadership orientation was not found to influence knowledge management in strategic alliance with the key supplier ($\beta = .18$, $t = 1.66$, $ns$) but had a significant influence on knowledge management with a key customer ($\beta = .36$, $t = 3.50$, $p < .01$). Learning orientation was not found to have a significant influence on knowledge management in strategic alliance with a key supplier ($\beta = .10$, $t = .89$, $ns$) and a key customer ($\beta = -.13$, $t = -1.21$, $ns$). Thus, according to the post-hoc analyses only leadership orientation has a direct influence on knowledge management and only in the key customer alliance. This relationship is positive which is consistent with that found in the main analyses for both knowledge creation and knowledge acquisition.

To examine the possible moderator effect of inter-firm diversity in the post-hoc analyses, interaction effects of resource diversity and cultural diversity with leadership orientation were entered. It was found that neither resource diversity ($\beta = .13$, $t = 1.22$, $ns$) nor cultural diversity ($\beta = .06$, $t = .53$, $ns$) influenced knowledge management in the key supplier alliance. Similarly, neither resource diversity ($\beta = -.02$, $t = -.21$, $ns$) nor cultural diversity ($\beta = .15$, $t = 1.59$, $ns$) do not influence the relationship between leadership orientation and knowledge management in the strategic alliance with a key customer.

Similar analyses were conducted for alliance orientation and learning orientation. For the former, it was found that neither resource diversity ($\beta = -.02$, $t = -.19$, $ns$) nor cultural diversity ($\beta = .07$, $t = .61$, $ns$) had no influence on the relationship between alliance
orientation and knowledge management in strategic alliances with a key supplier. Also, neither resource diversity ($\beta = .07, t = .71, ns$) nor cultural diversity ($\beta = .08, t = .79, ns$) had no influence on the relationship between alliance orientation and knowledge management in strategic alliances with a key customer. For the latter, it was found that resource diversity did not influence the relationship between learning orientation and knowledge management in strategic alliances with a key supplier ($\beta = .01, t = .12, ns$), but cultural diversity had a significant influence ($\beta = .21, t = 2.05, p < 0.05$) on the relationship between learning orientation and knowledge management with a key supplier. The relationship is plotted in Figure 5.6. The graph reveals that the moderating influence of cultural diversity on the relationship between learning orientation and knowledge acquisition in the key supplier alliance found in the main analyses is generally replicated here for knowledge management in the key supplier alliance. (It should be noted that the slope of the relationship at low cultural diversity is less while that at high cultural diversity is more compared to that in the main analysis).

**Insert Figure 5.6 about here**

In the customer alliance, resource diversity had a marginally significant influence on the relationship between learning orientation and knowledge management in strategic alliances with a key customer ($\beta = .17, t = 1.73, p < .1$). The relationship is plotted in Figure 5.7. The graph reveals that the moderating influence of resource diversity on the relationship between learning orientation and knowledge creation in the key customer alliance in the main analysis is replicated here for the relationship between learning orientation and knowledge management in the key customer alliance.

**Insert Figure 5.7 here**
Further, cultural diversity had a significant moderating influence on the relationship between learning orientation and knowledge management in the key customer alliance ($\beta = .20, t = 2.22, p < .05$). The relationship is plotted in Fig 5.8. The graph reveals that the moderating influence of cultural diversity in this customer alliance was not found earlier for knowledge creation and knowledge acquisition but does reinforce the moderation effect found for general knowledge management in key supplier alliance as noted earlier in this section.

**Insert Figure 5.8 here**

Further, post-hoc analyses revealed that knowledge management (as reflected in this new measure) in the strategic alliances with a key supplier ($\beta = -.37, t = -2.83, p < .01$) and customer ($\beta = .32, t = 2.63, p < .01$) is significantly related to achieved firm performance. Similarly, knowledge management in the strategic alliance with the key supplier ($\beta = -.44, t = -3.37, p < .01$), and customer ($\beta = .34, t = 2.76, p < .01$) is significantly related to expected firm performance. Thus, general knowledge management in key supplier alliance has a negative impact on firm performance while general knowledge management in key customer alliance has a positive impact on both actual and expected firm performance.

To reexamine the moderation effect of complexity of the knowledge base of the industry with general knowledge management, interaction effects were added. Results revealed that industry knowledge does not moderate the relationship between knowledge management in supplier alliances with either achieved ($\beta = .07, t = .68, ns$) or expected ($\beta = .02, t = .19, ns$) firm performance. Similarly, industry knowledge did not moderate the relationship between general knowledge management in customer alliances with either
achieved ($\beta = .01, t = .09, ns$) or expected ($\beta = .00, t = .01, ns$) firm performance. Thus, the complexity of the knowledge base of the industry did not appear to moderate the relationships between general knowledge management and firm performance.

To summarize, the findings reported here are based on self-report data collected from top executives in 100 high-technology firms. It suggests that strategic orientation is a three dimensional construct having weak to moderate correlations between the dimensions of alliance, leadership, and learning orientation. The significant, positive correlation between knowledge creation and knowledge acquisition suggests that key strategic supply chain alliances (with the key customer and supplier) tend to involve both creation and acquisition of knowledge, suggesting that alliances that focus primarily on knowledge creation or knowledge acquisition are not typical among high-tech firms.

Hierarchical multiple regression analyses suggests that for the key customer alliance, leadership orientation has a significant, positive relationship with knowledge creation and knowledge acquisition while learning orientation has a marginally significant, negative relationship with knowledge creation. Further, resource diversity marginally influences the relationship between learning orientation and knowledge creation in this alliance.

Moderated hierarchical multiple regression analyses reveal that for key supplier alliance resource diversity moderates the relationship between leadership orientation and knowledge creation in the supplier alliance. Further, cultural diversity marginally influences the relationship between learning orientation and knowledge acquisition in this alliance.

Lastly, analyses also reveal that although knowledge creation and knowledge acquisition in key supplier and customer alliance have no direct impact on firm
performance, the complexity of the knowledge base of the industry moderates the relationship between knowledge creation in the customer alliance and achieved firm performance. However, similar results were not found for expected firm performance.

Post-hoc analyses reveal the similarities and differences in effects involving a third knowledge management variable, labeled as general knowledge management, in both supplier and customer analyses. All hypothesized relationships were investigated with this new variable. The post-hoc analyses confirmed the positive relationship between leadership orientation and knowledge management in a key customer alliance. It also revealed a positive relationship between knowledge management in a key customer relationship and firm performance and a negative relationship between knowledge management in a key supplier alliance and firm performance. Thus, the post-hoc analyses with the new general knowledge management variable replicated many of the findings with the original analyses but also revealed some new distinct findings that might be further explored in the future.

The next chapter will discuss the implications of these findings as well as suggest directions for future research based on these findings.
Despite the growing body of literature in the area of knowledge management, empirical research examining the relationship between firm strategic orientation and knowledge management in strategic alliances or the impact of interorganizational knowledge management on firm performance has been scarce. This research study was designed to understand the influence of firm strategic orientation on knowledge creation and knowledge acquisition in non-equity strategic alliances of high-tech firms and the impact of these two modes of interorganizational knowledge management in these alliances on firm performance.

It is important to note that this study only looked at non-equity alliances. Following Mitchell and Singh (1996) and Wathne and Heide (2004), among others, non-equity alliances refer to close interorganizational relationships between independent firms. These alliances are different from equity alliances as they provide firms with potentially non-trivial benefits of partnering (such as sharing resources and capabilities, legitimacy and prestige, access to new knowledge) while still retaining their separate identities (Singh, 1997).

This research study focused on the business level of the firm. As such, the discussion of strategic orientation, knowledge-based view, and firm performance throughout this study is best understood at the business level. The sample of this study was also practically limited to single-business firms. No attempt is made in this study to

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28 This was achieved through several ways. Firms that appeared to be multi-business from their websites were not included. A cap of 500 employees was imposed to exclude large multi-business corporations.
generalize theoretical arguments or empirical findings to the corporate level for multi-business firms (e.g. GE). However, as the different divisions of a multi-business firm such as GE tend to behave like single-business firms in many ways, some of the theory and data presented here may generalize to the division-level of multi-business corporations.

A number of relationships were hypothesized based on the knowledge-based view of the firm. These were investigated using data collected from top executives of 100 high-tech firms. Some hypotheses were supported by the data while many failed to be confirmed. Accordingly, there are a number of important findings of this study. The lack of support for many hypotheses demonstrates the need for more detailed theoretical work connecting firm strategy to knowledge creation and acquisition as well as the relationships of knowledge creation and acquisition with firm performance. The results of this study provide some helpful guidance for future research on this topic by narrowing the range of strategic orientations that may be most productive to explore. The findings also highlight the need for more theoretical and empirical work on mediation and moderation effects in knowledge management. This chapter discusses the important findings and limitations of this study and provides recommendations for future research in this area.

6.1 Discussion

6.1.1 Strategic Orientation

This study adopted a comparative approach to firm strategic orientation. The marketing literature has a tradition of using a comparative approach to understand the

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Firms that were subsidiaries of multi-business firms were also excluded by selecting them out using the CorpTech search engine.
marketing strategy of the firm (e.g. Gatignon & Xuereb, 1997; Narver & Slater, 1990; Noble, Sinha, & Kumar, 2002). As discussed in chapter 2, a comparative approach can be more useful than other approaches to strategic orientation for comparing firms as it allows scholars to compare firms in the same strategic group with each other. For example, the Miles and Snow (1978) typology classifies firms into four strategic groups (prospector, defender, analyzer, and reactor) allowing inter-group comparison (e.g. between prospectors and reactors) but not intra-group comparison (e.g. between two prospector firms or two analyzer firms). Comparative approaches, however, enable intra-group comparison of firms along key dimensions of strategy. For example, analyzer firms can be compared with each other on their customer orientation and competitor orientation, two important dimensions of marketing strategy (Lukas & Ferrell, 2000). Though comparative approaches tend to be less parsimonious, they are better able to detect nuances associated with various aspects of competitive strategy that other approaches miss (Morgan & Strong, 1998). Thus, it would be helpful for the management literature to have a comparative approach to firm strategic orientation. This study took a first step in this direction.

In this study, there was at least moderate variation among high-tech firms on each of the three dimensions of strategic orientation as shown in Table 5.4. It was also found that the correlations between the three dimensions were weak to moderate which confirmed that the three dimensions are relatively independent of each other. Another unique characteristic about the three dimensions is their bipolar orientation. In other words, alliance orientation can range from cooperative to competitive, leadership orientation from entrepreneurial to managerial, and learning orientation from generative to adaptive.
Forced choice scales were developed in this study to measure the three dimensions and were found to have good reliability (Cronbach alpha for the 11-item alliance orientation scale, the 10-item leadership orientation scale, and the 8-item learning orientation scale were found to be .84, .90, and .89 respectively). Though the items in the scales were taken from existing scales that commonly use single pole measures, the complete scales developed here for the three dimensions have not been used before. Although the reliability estimates for the scales found in this study are encouraging, more research needs to be done to establish the reliability and validity of the scales. Research linking the three dimensions of strategic orientation to the antecedents and consequences of firm strategy needs to be done before these scales can gain wider acceptance in the literature.

Though relating firm strategy to its antecedent variables was not an objective of this study, several probable antecedents were measured and included as controls. Selected environmental factors including industry growth and environmental uncertainty were measured and controlled. One measure of top management experience (CEO tenure) and two measures of firm characteristics (age and size) were also measured and controlled. Finally, complexity of the knowledge base of the industry was measured and used as a moderator variable for some of the hypotheses. Table 5.4 reveals weak to moderate correlations between the three strategic orientation dimensions and these variables. As may be expected, leadership orientation had a significant positive correlation with environmental uncertainty and industry growth such that in industries with high growth rate and higher uncertainty, firms were higher on entrepreneurial leadership orientation. Further, learning orientation had a significant positive correlation with industry growth such that when growth rate of the industry was high, firms were higher on generative
learning orientation. Lastly, firm age was found to have a negative significant correlation with leadership orientation and learning orientation such that older firms had a managerial leadership orientation and an adaptive learning orientation. All other correlations were weak but in the expected direction. It would be useful for future research to examine the influence of these variables on firm strategy in studies appropriately designed to measure their antecedent effects.

It is important for any strategic orientation variable to show direct or indirect impact (through strategic actions that are believed to help the firm gain competitive advantage) on firm performance (Gatignon & Xuereb, 1997; Venkataraman, 1989). In this study, no direct performance effects were hypothesized for the three strategic orientation dimensions. It would be useful for future research to look at how the three dimensions of strategic orientation proposed in this study influence firm performance. Also, this study used a multidimensional approach to measure firm performance. Future research should look at the impact of the three dimensions of strategic orientation on different aspects of firm performance (such as new product development, market share, profitability) separately.

6.1.2 Knowledge Creation and Knowledge Acquisition in Supply Chain Alliances

Another important, though surprising, contribution of this research is the finding that knowledge creation and knowledge acquisition have a moderate positive correlation with each other. Several prior studies have recognized two types of knowledge-based strategic alliances. Mowery et al (1996) suggested that over time in some alliances firms are able to imitate and internalize the knowledge skills of their partners, while in other alliances firms are able to specialize and develop new knowledge skills by building on their
existing knowledge. Many other scholars (Powell & Brantley, 1992 and Grant & Baden-Fuller, 2004) argue that some alliances are vehicles for acquiring and absorbing partners’ knowledge, while other alliances provide partners access to each others knowledge to generate new knowledge. Koza and Lewin (1998) classified alliances into ‘learning alliances’ in which firms acquire knowledge from their partner for self benefit and ‘business alliances’ in which partners combine their complementary knowledge for mutual benefit. Though these scholars use different labels for the types of alliances, the common idea is of alliances as either for new knowledge creation or for acquiring partner’s knowledge. Thus, it was expected that strategic alliances will either be knowledge creation alliances or knowledge acquisition alliances. In fact, the possibility of using forced choice measures for knowledge creation and knowledge acquisition was explored in the pre-test phase but was rejected because of positive correlations between items of the two scales. This led to the use of single-pole scale for both knowledge creation and knowledge acquisition.

The self-report data collected in this study fails to find evidence that the two types of knowledge-based strategic alliances are completely independent of each other. The mean level of knowledge acquisition and knowledge creation (on a scale of 1-low to 5-high) is 2.10 and 2.75 respectively in key supplier alliances and 2.30 and 2.94 respectively in key customer alliances. This suggests that strategic alliances involve moderate levels of both knowledge creation and acquisition. Thus, strategic management scholars need to devote more attention to understanding the complex nature of how firms act to both create and acquire knowledge through these alliances. Moreover, in both key supplier and customer alliances the mean level of knowledge creation is higher than knowledge acquisition.
Though it is possible that these key alliances have been in place for quite some time enabling firms to engage in more knowledge creation compared to knowledge acquisition, the higher mean of the relatively more difficult knowledge creation compared to the relatively easier knowledge acquisition is still surprising and demands more research attention.

If business executives do not see alliances as exclusively for either knowledge creation or knowledge acquisition but for both knowledge creation and acquisition, strategic management researchers need to be aware of the dual nature of such alliances and explore complementarities and conflicts between the two modes of knowledge management in alliances. For example, the dialectic view of strategic alliances suggests that both knowledge acquisition and creation happen simultaneously in these alliances (de Rond & Bouchikhi, 2004). It becomes important to understand what happens in such alliances when the approach used to acquire knowledge conflicts with the approach used to create knowledge. On the other hand, the life-cycle view of strategic alliances claims that organizations start with acquiring knowledge from their partners for their own purposes and gradually move to creating knowledge together with their partners for common purposes through the alliance (de Rond & Bouchikhi, 2004). If alliances do pass through these phases, it becomes important to understand how firms move from perceiving knowledge management approaches as contradicting to perceiving them as complementary. The findings of this study suggest that informants of most of the sampled firms did see knowledge creation and knowledge acquisition as complementary. Extant research does not offer us much help in determining which of these two theories explain the dynamic processes of strategic alliances in the high-tech sector.
This study tested the antecedents and consequences of interorganizational knowledge management in both supplier alliances and customer alliances. The focus on both supplier and customer alliances as opposed to either supplier alliances or customer alliances is a significant and important departure from most extant research. An overwhelming majority of empirical research on non-equity supply chain alliances examines only supplier alliances (e.g. Jap, 1999; Kumar, Scheer, & Steenkamp, 1995) or customer alliances (e.g. Joshi & Sharma, 2004; Yli-Renko et al., 2001). Though there are some studies that do not exclusively focus on supplier alliances or customer alliances (e.g. Lambe et al., 2002; Sivadas & Dwyer, 2000), they tend to pool both types of alliances ignoring possible differences between supplier and customer alliances. One of the objectives of this study was to validate the expected similarity of the hypothesized relationships in the key customer alliance to those in the key supplier alliance. It was believed that if identical relationships were found on both sides, it would increase confidence in the generalizability of the findings to all non-equity supply chain relationships in high-tech firms. If, however, relationships were found to be different across key supplier and customer alliances, it would suggest as-yet unrecognized differences between the two types of supply chain alliances.

Data collected from firms on their key supplier and customer alliances revealed that relationships with significant empirical support were unique in every case to either the key supplier alliance or the key customer alliance. This was a very surprising finding and suggests the need for more studies comparing firm’s upstream (supplier) and downstream (customer) alliances. This was the first study known to make this contrast. Perhaps, lack of research studies comparing upstream supplier alliances with downstream customer
alliances is because of data collection issues (such as respondent time and fatigue) involved in collecting data on both upstream and downstream alliances from the same firm. Though collecting data on both upstream supplier alliances and downstream customer alliances from the same firm is certainly more difficult than collecting data on just either downstream or upstream alliance, the benefits of comparing the two types of alliances probably outweigh the cost of data collection. Such an effort will allow for the integration of two related, though disconnected, literatures- the literature on upstream and downstream alliances.

Asymmetry in supply chain relationships is an important reason for expecting differences between a firm’s supplier and customer alliances (Kumar et al., 1995). In traditional supply chains relative power of partners tends to decrease from upstream to downstream\(^{29}\) (Griffith et al., 2006). Thus, firms may have supplier alliances with more partners that have more power and customer alliances with partners that have less power. This difference in power can have an important impact on a firm’s supply chain relationship.

The findings of this study also seem to suggest that the primary industry in which the firm competes may also influence its alliances with suppliers and customers. For example, in this study it was found that firms in the software industry differed from other high technology firms in the importance of their key supplier alliance but were comparable to other high tech firms in the importance of their key customer alliance. As mentioned in Chapter 5, the mean importance of key supplier alliance was 2.52 for software firms and 3.37 for other firms while no such difference was found between

\(^{29}\) Obvious exceptions exist as in discount retailing for dominant discount retailers (e.g. Walmart and Target) and their suppliers.
software firms and other firms on their key customer alliance. Thus, future studies looking at alliances in different industries need to be cognizant of the fact that importance of supplier versus customer alliances may also vary across industries.

Next, the key customer alliances that firms report are moderately ‘core’ to the firm, i.e., the mean importance of the key alliance on the firm’s business is moderate. On a scale of 1 to 5 (1-low and 5-high), the mean status rating of the key customer alliance that firms reported on was 3.29 (standard deviation 1.70). Frequency analysis of customer alliance status revealed that 7 firms reported it as 2 or less, 26 firms reported between 2 and 4, and 49 firms reported 4 or higher. This suggests that when firms are asked to report about their strategic alliance with a key customer they do not necessarily report their largest or most important customer. This finding is consistent with the recent discussion in the marketing and management literature that firms gain new knowledge through alliances with customers of varying importance to the firm. For example, Slater and Narver (1999) argue that alliances with both small and large customers can be a source of new knowledge for firms. New knowledge from downstream partners can come from either large or small customers provided they are interested in pushing the existing frontier and developing new innovations for the future (von Hippel, 1988).

The above noted finding that firms can gain knowledge from alliances with customers that vary in their importance for the firm is also replicated for alliances with suppliers. The mean status rating (on a scale of 1-low to 5-high) of the key supplier alliance that firms reported on was 2.77\(^{30}\) (standard deviation 1.53). Frequency analysis of supplier alliance status revealed that 21 firms reported it as 2 or less, 35 firms reported between 2 and 4, and 52 firms reported 4 or higher. It should be noted here that, as mentioned earlier, the large number of software firms in the data was responsible for decreasing the mean rating of the key supplier alliance. The mean status rating of the key supplier alliance was 2.52 for software firms and 3.37 for non-software firms.
and 4, and 30 firms reported 4 or higher. This suggests that just as organizations do not
necessarily gain new knowledge from their largest and most important customer, they
also do not necessarily gain new knowledge exclusively from their largest, most
important supplier. When asked to report about knowledge gained from their key
supplier, firms often appeared to report on an alliance other than with their largest
supplier.

The above discussion of key customer and supplier alliances underscores an
important contribution of this study. The few empirical studies that have looked at
knowledge management in strategic alliances have been about customer alliances (e.g.
Yli-Renko et al., 2001), ignoring the important issue of supplier alliances. Given that
high-tech firms in this study report gaining equivalent level of knowledge from both key
customers and key suppliers as mentioned earlier in this chapter, future research should
examine knowledge management between firms and their key suppliers in more depth.
Empirical studies using the knowledge-based view can help understand knowledge
management issues in upstream supplier alliances. For example, extant research has
shown that in many industries (such as automobiles) close relationships with suppliers
can be a source of competitive advantage (Dyer & Noboeka, 2000). Firms in such
industries characterized by high activity of upstream (supplier) alliances (e.g. Toyota’s
extensive network of alliances with its suppliers) can be asked to report on their key
supplier alliances. Such research will help understand knowledge management in
upstream alliances as well as the impact of knowledge management in these alliances on
the firm’s ability to introduce new products, adopt new technologies, and reduce
production costs.
6.1.1 Three dimensions of strategic orientation and two modes of interorganizational knowledge management

This study empirically examined the direct relationships between each of the three dimensions of firm strategic orientation and both knowledge creation and knowledge acquisition in strategic supply chain alliances. Some basic ideas in the knowledge-based view are that firm strategy should influence knowledge management, some types of strategic actions have much greater implications for knowledge management than others, and the factors that encourage knowledge acquisition may differ from those that influence knowledge creation (Grant & Baden-Fuller, 2004; Zeng & Hennart, 2002). This study developed measures to empirically test the basic ideas by testing the relationship between firm strategic orientation and interorganizational knowledge management.

Of the three strategic orientation dimensions proposed, leadership orientation appears to have the greatest influence on interorganizational knowledge management. It was found that leadership orientation had a significant positive relationship with knowledge creation and knowledge acquisition in the key customer alliance. This finding is replicated in the post-hoc analyses for general knowledge management in the key customer alliance. It should be mentioned here that the positive relationship between leadership orientation and knowledge creation found in the data is consistent with the hypothesized relationship, while the positive relationship between leadership orientation and knowledge acquisition found in the data is opposite to that hypothesized. In other words, this study finds that as the firm’s leadership orientation becomes more entrepreneurial, knowledge creation and acquisition through key customer alliance increases.
This finding is consistent with that of Eisenhardt and Schoonhoven (1996) who used the resource-based view to study alliances in the semiconductor industry and found that the leadership of the firm had an important influence in its ability to use strategic alliances to exchange technical knowledge with their partners to develop new products. The results of the present study confirm their findings and demonstrate that it is firms with an entrepreneurial leadership orientation that engage in more knowledge management in their alliances. Scholars have argued that an entrepreneurial leadership provides a future-oriented vision that involves envisioning and creating a scenario of possible opportunities that the firm can seize to compete effectively (Gupta et al., 2004) in the kind of rapidly changing situations in which firms in the high-tech industry frequently find themselves (Brown & Eisenhardt, 1997). Such leaders are better able to manage knowledge that might be used later without knowing precisely what future demands will be. They do this by simultaneously pursuing multiple options (Miller, 2002). This study suggests that firms with an entrepreneurial leadership orientation are better at managing knowledge through alliances as compared to firms with a managerial leadership orientation. This finding appears to justify the greater expense which would be required for process-based research to better understand the process by which an entrepreneurial leadership team creates and acquires knowledge in strategic alliances with customers. The practical and logistical problems associated with getting access to alliances at initiation and following them over time has been major deterrent to process research on strategic alliances.

Further, it was found that leadership orientation did not have a significant impact on knowledge creation or knowledge acquisition in the key supplier alliance. It is surprising
that though leadership orientation had a significant positive impact on knowledge creation and acquisition in key customer alliances, there was no support for a direct impact in key supplier alliances. This is a very surprising finding because there is no evidence in extant research to suggest that a firm’s leadership orientation will have a positive impact on knowledge management in downstream alliances but not in upstream alliances. Future researchers are urged to examine in-depth the effect of leadership orientation on knowledge management in supplier alliances. Perhaps, qualitative research involving open-ended interviews with top management may be needed to better understand how entrepreneurial and managerial leadership orientation differently influences knowledge management in supplier alliances.

The lack of support for the hypotheses involving the direct impact of alliance orientation on knowledge creation and knowledge acquisition in the key alliances was surprising. This study failed to find any evidence that a cooperative or competitive alliance orientation towards supply chain partners has an influence on knowledge management (creation or acquisition) in strategic alliances. It is possible that the lack of support for this hypothesis was because alliance orientation was measured as common to all the alliances of the firm, rather than specific to particular alliances. Though the measurement of alliance orientation as common to all alliance of the firm is consistent with Kandemir et al. (2002), the dominant approach in the alliance literature has been to ask firms about one alliance and provide perceptual information on relationship-specific variables (e.g. bilateral communication, trust, commitment) with respect to that alliance. It is possible that alliance orientation is not common to all alliances of the firm and varies across alliances. For example, firms may be highly cooperative with one partner and
highly competitive with another. Thus, when asking for details about two alliances (supplier and customer) future researchers may find it useful to measure alliance orientation for each specific alliance.

Another surprising finding was the lack of support for the hypothesized relationship involving the direct impact of learning orientation on knowledge creation and knowledge acquisition in the key alliances. This study fails to find any evidence that learning orientation has a direct positive impact on knowledge creation or a direct negative impact on knowledge acquisition strategic alliances. It is possible, as Kandemir et al. (2002), suggest that the impact of learning orientation on alliance outcomes is not direct, but rather is through other relation-specific variables like relationship quality. This study did not measure relational characteristics like relationship quality, satisfaction or level of social interaction (Griffith et al., 2006; Yli-Renko et al., 2001) as it focused on the direct relationship between learning orientation and knowledge creation and acquisition in alliances. Future researchers are encouraged to measure relationship-specific characteristics and link them to learning orientation as well as knowledge creation and acquisition in these relationships. It may also be useful to adopt a comparative modeling approach and contrast models of direct relationship between learning orientation and knowledge outcomes in alliances with those where this relationship is mediated by relationship-specific variables.

6.1.2 Moderator Analyses on Knowledge Creation and Knowledge Acquisition

Learning Orientation was found to have a marginally significant impact on knowledge creation in the key customer alliance. The negative direction of this relationship, i.e. as learning orientation becomes more generative knowledge creation in the alliance decreases, was opposite to that hypothesized. However, this relationship was not replicated in either the key supplier alliance or the post-hoc analysis using general knowledge management. Thus, it is not interpreted further.
A number of moderator hypotheses had been proposed regarding the influence of resource diversity and cultural diversity on the relationship between strategic orientation and knowledge management in alliances. Though limited evidence was found for the moderating influence of resource diversity and cultural diversity, a surprising finding was the pervasive main effect of resource diversity on knowledge creation and knowledge acquisition in both key supplier and customer alliances. Resource diversity was found to have a negative, statistically significant relationship with both knowledge creation and knowledge acquisition in key strategic alliances. In other words, it was found that as resource diversity between partnering firms’ increases, knowledge creation and knowledge acquisition in key strategic alliances decreases. The negative impact of resource diversity on knowledge creation appears to support Phan and Peridis (2000)’s theoretical proposition that as resource similarity between firms increase, knowledge creation in the alliance will increase. This is counter to the large body of literature rooted in the resource-based view that suggests resource diversity in alliances provides firms with access to new and different resources that encourages innovation (Das & Teng, 2002; Eisenhardt & Santos, 2002). It was also found that cultural diversity had a negative, significant relationship with knowledge creation in the key supplier alliance. In other words, it was found that as cultural diversity between partnering firms increases, knowledge creation in key supplier alliance decreases. Phan & Peridis (2000) suggest that high cultural diversity discourages effective communication between partners, thereby decreasing knowledge creation. Together, the main effects of resource and cultural diversity found here suggest that firms will generally have higher knowledge management in alliances with partners that have low resource and cultural diversity.
Thus, if firms choose to form alliances with partners with high resource and cultural diversity, they may be doing so for reasons other than interorganizational knowledge management. In other words, the knowledge-based view appears to suggest that firms will generally have higher knowledge creation and acquisition when they form alliances with partners that have similar resources and capabilities and similar culture. This is an important suggestion as it helps to distinguish the knowledge-based view from the general resource-based view which suggests that resource diversity and culture diversity in alliances encourages innovation and forms the basis for gaining competitive advantage.

None of the relationships hypothesized with resource diversity as the moderator variable between strategic orientation dimensions and the two modes of knowledge management was entirely supported by the data in the predicted direction. Resource diversity did appear to have a significant moderating influence on the relationship between leadership orientation and knowledge creation in the key supplier alliance. It was found that firms with a managerial leadership orientation are less effective in creating knowledge through their key supplier alliance when there is high resource diversity between partners. Further, resource diversity does not have much influence on knowledge creation through key supplier alliances for firms with entrepreneurial leadership orientation. Thus, it appears that firms with a managerial leadership orientation need to form strategic alliances with suppliers that have similar resources and capabilities to create knowledge, while for firms with entrepreneurial leadership orientation resource diversity may not have much influence on the level of knowledge created.
Resource diversity also seemed to have marginally significant influence on the relationship between learning orientation and knowledge creation in the key customer alliance. It was found that firms with an adaptive learning orientation are more effective in creating knowledge through their alliance when there is low resource diversity between partners. Thus, it appears that firms with adaptive learning orientation need to form strategic alliances with customers that have similar resources and capabilities to create knowledge, while for firms with generative learning orientation, resource diversity does not appear to influence the level of knowledge creation much.

For cultural diversity, partial support was found for the moderating influence of cultural diversity on the relationship between learning orientation and knowledge acquisition in key supplier alliance. As hypothesized, firms with an adaptive learning orientation were found to be more effective in acquiring knowledge through their alliance when there is low cultural diversity between partnering firms. However, for firms with a generative learning orientation cultural diversity with key supplier did not make any difference to knowledge acquisition in these alliances. Thus, firms with an adaptive learning orientation need to form strategic alliances with suppliers that have a similar culture to acquire knowledge from them.

Together the moderating influence of resource diversity and cultural diversity found in the data suggests that, from a knowledge-based view, firms may be more effective in interorganizational knowledge management if they form strategic alliances with partners that have similar resources and culture.

6.1.3 Knowledge creation, knowledge acquisition, and firm performance
Another objective of this study was to examine the direct impact of knowledge creation and knowledge acquisition on firm performance. It was found that neither knowledge creation nor knowledge acquisition in key supplier or customer alliance had a statistically significant relationship with perceived firm performance. The lack of support for the relationship between the two modes of knowledge management and firm performance is important to note in view of Eisenhardt and Santos (2002)’s critique that there is as-yet no compelling evidence of the positive impact of knowledge management on firm performance. Though knowledge management has been empirically linked to alliance performance (Inkpen, 2002), its relationship with firm performance has been taken as a matter of faith in extant literature and not empirically demonstrated. It is possible that the impact of knowledge creation and knowledge acquisition on firm performance is through other variables like number of patents and new product introductions that contribute to improved firm performance.\(^{32}\) Scholars have already begun to examine the impact of knowledge management on innovation. For example, Yli-Renko et al. (2001) look at two measures of innovation, technological distinctiveness and new product development, as part of the dependent variable knowledge exploitation of knowledge acquired from key customer alliances. It would be useful to extend such a model to include actual firm performance as measured by market share, profitability, or stock price.

This should not be interpreted to mean that knowledge management in supply chain alliances will not have a direct influence on firm performance. The post-hoc finding that general knowledge management in key supplier and customer alliances had a significant

\(^{32}\) Even in the data collected for this study, the average correlation of knowledge creation with performance increased by about .15 and that of knowledge acquisition with performance increased by about .10 when only the new product dimension of performance was considered.
influence on achieved and expected firm performance provides hope that evidence can be found for the direct impact of knowledge management on firm performance. However, it is important to mention here that the impact of general knowledge management on performance was negative for the key supplier alliance and positive for the key customer alliance. This suggests that knowledge management with a key supplier may have a negative impact on firm performance, while knowledge management with a key customer may have a positive impact on firm performance. There is a significant body of literature that suggests that traditionally supply chain relationships tend to be asymmetric with the more upstream partner being more powerful (Kumar et al., 1995; Griffith et al., 2006). The more powerful partner in supply chain relationships tends to control the decisions or behavior of the less powerful partners and direct the relationship in its own favor so as to capture most value for itself (Anderson & Weitz, 1989; Gaski, 1984) If this is indeed the case, then it is possible that an alliance with a key supplier has a negative impact on performance for the downstream partner, while an alliance with a key customer has a positive impact on performance for the upstream partner as found in this study.

Results also reveal that complexity of the knowledge base of the industry influences the relationship between knowledge creation in key customer alliance and achieved firm performance. It was found that higher knowledge creation in key customer alliance is positively related to firm performance only when the knowledge base of the industry is highly complex. This finding is evidence that in industries where the knowledge base is more complex, knowledge creation in customer alliances helps firms improve their performance. It was also found that in industries where the knowledge base of the industry is not as complex, knowledge creation in key customer alliance has a negative
influence on firm performance. Thus, firms need to be aware of the complexity of knowledge required to compete in their industry and engage in strategic alliances with key customers accordingly. These findings are consistent with a life-cycle view of industries that in the early stages of the industry when the knowledge base of the industry is more complex, new knowledge creation is more important for firm performance. As industries become more mature and the knowledge base of the industry becomes less complex, new knowledge creation is not as important for competing effectively and may even be detrimental for performance. Creating new knowledge, by definition, is expensive. Thus, firms need to carefully weigh the costs and benefits of engaging in knowledge creation with their key customers depending on the complexity of the knowledge base of the industry.

It was also seen that knowledge complexity of the industry did not impact the relationship between knowledge acquisition and firm performance. The data failed to support the hypothesized relationship that at low level of complexity, knowledge acquisition will have a higher influence on performance. Thus, the impact of knowledge acquisition on firm performance does not appear to vary by knowledge complexity of the industry. This suggests that the firms’ acquisition of knowledge through its key supply chain alliances need not be contingent on the knowledge complexity of the industry (and by implication, the life stage of the industry). In the absence of other empirical studies looking at the impact of industry knowledge on knowledge acquisition through strategic alliances, there does not appear to be much to be gained from further examining the moderating influence of industry knowledge on the relationship of knowledge acquisition with firm performance. Future researchers may want to investigate if the relationship
between knowledge acquisition and firm performance is moderated by other factors like age of the alliance and the ability of firm to exploit the acquired knowledge.

6.2 Limitations

This section discusses six key limitations of this study.

The form of the knowledge creation and knowledge acquisition scales differed somewhat from expectations. Three items each in the measures of knowledge creation and knowledge acquisition had to be dropped from the main scale because they loaded on an unexpected factor which was labeled general knowledge management. Despite the increasing attention to interorganizational knowledge creation and knowledge acquisition in extant literature, no reliable scale exists to measure these constructs. The knowledge creation scale used in this study was adapted from He and Wong’s (2000) explorative innovation scale and the knowledge acquisition scale was adapted from Lyles and Salk’s (1996) knowledge acquisition from a foreign parent scale. An attempt was made in this study to adapt these scales to develop multi-item knowledge creation and knowledge acquisition measures that would include various knowledge domains (e.g. product, market, technological, managerial, work processes). However, only product, market, and technological knowledge on each of the two scales loaded well together. Other knowledge domains tended to load together whether the partner already possessed such knowledge (as in knowledge acquisition) or neither firm possessed such knowledge (as in knowledge creation). Thus, there is an urgent need to consider in-depth examination of interorganizational knowledge creation and acquisition and to develop suitable scales for measuring these constructs. Much work needs to be done in this area including developing more reliable and valid scales for interorganizational knowledge creation and
knowledge acquisition and establishing their correlations not only with alliance
performance measures (as has been done in the past) but also with important firm-level
variables including performance and innovation.

Another limitation arises from the methodology used to test the hypotheses. Survey
research does not allow observation of knowledge management in real time. Though this
study assumes causal linkages between firm strategic orientation and interorganizational
knowledge management and knowledge management and firm performance, cross-
sectional studies can not establish causality unambiguously. Certainly, longitudinal
studies that capture alliance interactions and knowledge management dynamics would be
a good way to examine and confirm the hypotheses made in this study and to uncover
detailed mechanisms and patterns related to knowledge creation and acquisition
processes. The present research used self-response measures to assess the creation or
acquisition of new knowledge through the alliance. Thus, future studies should look at
studying alliances and interorganizational knowledge management in real time. This
limitation, however, needs to be balanced against the recent recognition of potential
reliability shortcomings of longitudinal research. Reliable longitudinal data, argued
Anderson (1995), may be an illusion:

First, consider the mechanics of such an undertaking. An enormous amount of sustained
cooperation is required by managers acting as key informants over time. The “right sizing”
movement, which appears to be continuing despite warnings about its potential shortcomings
(Hamel & Prahalad, 1994) produces tremendous upheaval in firms and increasing demands on
the remaining managers. The first consequence leads to sample attrition over time as whole
units disappear, whereas the second leads to greater unwillingness to participate in academic
research, particularly repeatedly (p. 439).
Also, the study used data from only the focal firm for both key customer and supplier alliances. Though this is in line with other alliance researchers (e.g. Lambe et al, 2002 in marketing and Sarkar et al., 2001 in management), obtaining data from both parties in a dyadic relationship may be better than data from one side of the dyad. Partners’ perceptions of the state of affairs of a relationship routinely vary and it is possible that where one partner sees cooperation, the other sees competition and where one sees joint creation of knowledge, the other sees acquisition of knowledge. Collecting data from both sides of the key customer and supplier alliance was beyond the scope and resources of this study. Future research should try to collect data from both parties in the relationship to examine the convergence in perception of relational activities. One potential difficulty in collecting information from both dyad partners may be the high level of trust that the key informants need to have in the researcher/s to disclose the detailed identity of their partners. It is important that informants feel comfortable disclosing the full identity of their alliance partners to the researcher/s. When informants of this study were asked about their partners, less than 20% provided meaningful identity information for their partners.

Another limitation of the study involves the possible presence of a retrospective bias. Survey research that requires respondents to report about events that have happened in the past, especially the distant past, is likely to suffer from such bias. Informants in this study were asked to focus on ongoing supplier and customer alliances. Performance data was collected for achieved performance over the past three years as well as expected performance over the next five years. Thus, informants were asked to report recent facts or events, rather than recall those from the distant past (Huber & Power, 1985; Miller,
Cardinal, & Glick, 1997). Further, because this study compared knowledge creation and knowledge acquisition, retrospective bias does not appear to be a plausible explanation for the results. It is possible that measuring firm performance after measuring knowledge outcomes (creation and acquisition) may have tainted the influence of knowledge creation and acquisition on firm performance. However, the lack of significant finding for the relationship between knowledge outcomes and performance suggests that retrospective bias did not influence the results of this study. Thus, even as retrospective bias does not seem to be a possible explanation for the results of this study, this limitation needs to be kept in mind when interpreting the results (Golden, 1992).

This study has a limited sample size of 100 firms. Though 2142 of the original 2500 firms qualified for the study, only 193 agreed to participate and only 100 provided usable responses. It is possible that a larger sample could be more representative of the high-tech firms in general. Though there was no significant difference in means between respondents and non-respondents (except for a relatively small practical difference in number of employees), the small sample size of this study should be kept in mind when generalizing the results of this study to the larger set of high-tech firms.

Finally, while a sample drawn from the US does not seem to pose any systematic problems with the study, future efforts could utilize a broad-based international sample and explore any differences that may exist across countries that have a large high-tech sector. Strategic alliances are shaped by societal, economic, cultural, and institutional contexts in which firms and its actions are embedded and these forces determine strategic orientation towards alliance partners as well as outcomes in alliances. The role of national
culture in determining knowledge creation and knowledge acquisition would be an interesting research avenue.

6.3 Conclusion

This study started with the objective of increasing current understanding of the relationship between firm strategy and knowledge management in strategic supply chain alliances as well as of the influence of knowledge management on firm performance. Survey data was collected from top executives of 100 high-tech firms in five industries (based on 3-digit SIC codes). Firms in the high-tech sector were selected as it was believed that it would be a relatively homogeneous sample. However, it appears that firms belonging to SIC code 737 (software) are at least somewhat different in their perceptions of alliances from other high-tech firms in the sample. Though the difference between the two types of firms did not threaten the validity of the findings of this study, it underscores the need for careful sampling in future research involving high-tech firms.

This study also found some evidence for the relationship between firm strategy and interorganizational knowledge management in key supply chain relationships. Leadership orientation, an important component of firms’ strategic orientation, had a positive significant direct impact on knowledge creation and knowledge acquisition in key customer alliances such that firms with an entrepreneurial leadership orientation were more effective in creating and acquiring knowledge through the alliance. It was also found that generally firms are more effective at interorganizational knowledge management when they partner with suppliers and customers that have similar resources and culture. Though evidence was not found for the direct impact of knowledge creation and knowledge acquisition on firm performance, post-hoc analysis of the relationship
between general knowledge management and firm performance provided hope that it is possible to find direct performance effects for interorganizational knowledge management.

In an influential critique of the knowledge-based view, Eisenhardt and Santos (2002) argued that the “implications [of knowledge-based view] for strategy remain distant” (p. 161) because extant research has been unable to link knowledge management to firm strategy and firm performance. The findings of this study make a positive and non-trivial contribution to the knowledge-based view as a theory of strategic management. It is hoped that future researchers will build on the findings of this study and advance current understanding of knowledge management in strategic supply chain alliances.
REFERENCES


Table 2.1

Comparison of Knowledge-based View to three widely used theories of strategic alliances

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Dependence Theory</td>
<td>Open systems view- all organizations must engage in relationships with other organizations in the environment.</td>
</tr>
<tr>
<td></td>
<td>Environmental determinism.</td>
</tr>
<tr>
<td>Resource Based View</td>
<td>Combining capabilities that are not perfectly tradable in the market nor easily developed internally by organizations. Firm heterogeneity.</td>
</tr>
<tr>
<td></td>
<td>Rents earned from resources that are scarce and in fixed supply.</td>
</tr>
<tr>
<td>Transaction Cost Economics</td>
<td>Problem of ‘appropriability’. Why firms exist?</td>
</tr>
<tr>
<td></td>
<td>Discrete exchanges based on economic cost-minimization. Dark side of human nature. How do firms earn economic rents?</td>
</tr>
</tbody>
</table>
Table 4.1
Strategic Orientation and Knowledge Management Items with source citations

<table>
<thead>
<tr>
<th>Strategic Orientation measures in final form</th>
<th>Original Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alliance Orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1 Encourages us to have as much concern for our partners’ interests as our own interests.</td>
<td>Encourages us to think about our organization first and foremost when dealing with our partners.</td>
<td>Our Japanese partner always looks out for our interest in this alliance</td>
</tr>
<tr>
<td>A13a We believe in maintaining strong, healthy relationships with our partners.</td>
<td>We do not believe that we can have strong, healthy relationships with our partners.</td>
<td>We must maintain a strong, healthy relationship with this partner to be able to implement our strategic plan</td>
</tr>
<tr>
<td>A10 Tries to achieve a close alignment between our strategic plans and that of our partner organizations.</td>
<td>Decides our strategic plans without any particular attention to our partner organizations.</td>
<td>When we develop our strategic plans, our partner firm is a large part of the picture</td>
</tr>
<tr>
<td>A12 Encourages employees to care about what happens to our partners.</td>
<td>Does not encourage employees to care about what happens to our partners</td>
<td>In this relationship, we feel like our Japanese partner cares what happens to us</td>
</tr>
<tr>
<td>A14b Are always frank and truthful in our dealings with our partner organization.</td>
<td>Try to be secretive and deceptive in our dealings with our partner organization.</td>
<td>Our Japanese partner is always frank and truthful in its dealings with us</td>
</tr>
<tr>
<td>A15c Our organization encourages employees to go out of their way to make sure that our partners are not damaged or harmed in our relationship.</td>
<td>Our organization discourages employees from trying to protect our partners from damage or harm from their relationship with us.</td>
<td>Our Japanese partner would go out of its way to make sure our firm is not damaged or harmed in this relationship</td>
</tr>
<tr>
<td>A8 Makes important business decisions through discussions with our partner organizations.</td>
<td>Makes important business decisions entirely on our own without consultation with our partners.</td>
<td>Decisions regarding the project were made unanimously in joint meetings with managers from both firms</td>
</tr>
<tr>
<td>A9</td>
<td>Is usually willing to dedicate whatever people and resources it takes to make our relationships a success.</td>
<td>Is usually watchful and careful about dedicating more people and resources than the minimum necessary to keep the relationship going.</td>
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<tr>
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</tr>
<tr>
<td>A2</td>
<td>Encourages us to be ‘giving’ in our relationships with our partners so that they can benefit from the relationship too.</td>
<td>Encourages us to ‘get’ as much as possible from our partner as fast as possible so that only we can benefit from the relationship.</td>
</tr>
<tr>
<td>A11</td>
<td>Is willing to forgive or overlook minor mistakes and problems on the part of our partners.</td>
<td>Tries to hold our partners responsible for any mistakes or problems on their part.</td>
</tr>
<tr>
<td>A16a</td>
<td><em>Our organization does not want us to engage in actions that may be harmful for our partner even if those actions are beneficial for our organization.</em></td>
<td><em>Our organization wants us to maximize the benefits available to our organization even if our actions are detrimental to our partner.</em></td>
</tr>
<tr>
<td>A6</td>
<td>Emphasizes a high sense of unity between us and our partner organizations.</td>
<td>Does not consider it important to feel a sense of oneness between us and our partners.</td>
</tr>
<tr>
<td>A17a</td>
<td><em>Employees in our organization are encouraged to devote more time to our partner organization if and when our partner needs help.</em></td>
<td><em>Employees in our organization are discouraged from devoting more time to our partner organization than the minimum necessary to keep the relationship going.</em></td>
</tr>
<tr>
<td>A18a</td>
<td><em>We expect our alliance relationship to last a long time.</em></td>
<td><em>We do not expect our alliance relationship to last a long time.</em></td>
</tr>
<tr>
<td></td>
<td>We try to develop close relationships with our partners</td>
<td>We do not try to have close relationships with our partners</td>
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<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>A5</td>
<td>Encourages us to interact with employees of our partner organizations in informal settings even outside of work.</td>
<td>Wants us to interact with employees of our partner organizations only in formal, official settings.</td>
</tr>
<tr>
<td>A7</td>
<td>Does not try to monitor our relationship with our partner organizations.</td>
<td>Closely monitors every aspect of our relationship with our partner organizations.</td>
</tr>
<tr>
<td>A4</td>
<td>Encourages us to think that we and our partner organizations share a common future.</td>
<td>Encourages us to think that our future is distinct from the future of our partner organizations.</td>
</tr>
<tr>
<td>A3</td>
<td>Emphasizes balancing the future needs of our organization with the future needs of our partners.</td>
<td>Emphasizes the future needs of our organization more compared to that of our partners’ future needs.</td>
</tr>
</tbody>
</table>

### Leadership Orientation

<table>
<thead>
<tr>
<th></th>
<th>Mostly competes through the creation of new products/technologies/markets that do not exist yet.</th>
<th>Mostly competes through improving our existing products/technologies in our current markets</th>
<th>In making strategic decisions, we constantly seek to introduce new brands or new products in the market</th>
<th>Tan &amp; Litschert, 1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3</td>
<td>Takes bold decisions and then tries to deal with the risk through their determination and will power.</td>
<td>Makes decisions that are associated with the least risk after careful analysis.</td>
<td>We search for big opportunities, and favor large, bold decisions despite the uncertainty of their outcomes</td>
<td>Tan &amp; Litschert, 1994</td>
</tr>
<tr>
<td>G6</td>
<td>Tries to act quickly to avoid overlooking, missing, or losing an attractive opportunity.</td>
<td>Waits before acting on any opportunity to reduce risk even if it means missing some opportunities in the process of waiting.</td>
<td>We seek opportunities that have shown to be promising</td>
<td>Tan &amp; Litschert, 1994</td>
</tr>
<tr>
<td></td>
<td>G11</td>
<td>Tries to compete mostly by pushing out the very boundaries of existing products and/or technologies.</td>
<td>Tries to compete mostly by making small improvements to existing products and/or technologies.</td>
<td>Changes in product or service lines have mostly been of a minor nature vs Changes in product or service lines have usually been quite dramatic.</td>
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<tr>
<td>G2</td>
<td>Tries to introduce a new, acceptable product quickly to beat rivals to the market.</td>
<td>Tries to introduce a carefully, developed product even if it leads to delays relative to competitors.</td>
<td>In dealing with its competitors, my firm is very often the first to introduce new products/services, administrative techniques, operating technologies, etc.</td>
<td>Covin &amp; Slevin, 1989; Naman &amp; Slevin, 1993</td>
</tr>
<tr>
<td>G10</td>
<td>Primarily driven by the chance to create new technologies, products, and/or markets not yet known to people.</td>
<td>Primarily driven by the chance to introduce known &amp; safe technologies, products and/or markets serving existing needs.</td>
<td>The top managers of my firm favor tried and true products or services</td>
<td>Covin &amp; Slevin, 1989; Naman &amp; Slevin, 1993</td>
</tr>
<tr>
<td>G4</td>
<td>Tries to introduce new products or new markets even when in the face of great uncertainty.</td>
<td>Adopts a cautious 'wait and see' policy to minimize the uncertainty around the product or market.</td>
<td>Typically adopts a cautious, &quot;wait and see &quot; posture in order to minimize the probability of making costly decisions</td>
<td>Covin &amp; Slevin, 1989; Naman &amp; Slevin, 1993</td>
</tr>
<tr>
<td>G5</td>
<td>Tries to be the first to introduce new, breakthrough innovations in products, technologies, markets, and/or processes.</td>
<td>Tries to move into new products, technologies, markets, and/or processes only after other firms have already entered there.</td>
<td>Is very often the first business to introduce new products/services, administrative techniques, operating technologies etc.</td>
<td>Covin &amp; Slevin, 1989; Naman &amp; Slevin, 1993</td>
</tr>
<tr>
<td>G8</td>
<td>Begins to pursue opportunities quickly hoping that it will be able to mobilize the resources in stages.</td>
<td>Plans &amp; lines up resources before beginning to pursue an opportunity.</td>
<td>Since we do not need resources to commence the pursuit of an opportunity, our commitment of resources may be in stages</td>
<td>Brown, Davidsson, &amp; Wiklund, 2001</td>
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<tr>
<td></td>
<td>Learning Orientation</td>
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<tr>
<td>G9</td>
<td>Always have many more promising ideas than our time &amp; resources allow us to pursue.</td>
<td>Finds it difficult to come up with a sufficient number of promising ideas to utilize our resources</td>
<td>We have many more ideas than we have time and the resources to pursue</td>
<td></td>
</tr>
<tr>
<td>G14</td>
<td>We never experience a lack of ideas that we can convert into profitable products/services</td>
<td>We have limited ideas that we can convert into profitable products/services</td>
<td>We never experience a lack of ideas that we can convert into profitable products/services</td>
<td></td>
</tr>
<tr>
<td>G12</td>
<td>Primarily emphasizes effectiveness through introducing as many new product/technological/process introduction as possible.</td>
<td>Primarily emphasizes efficiency through achieving the lowest costs possible.</td>
<td>Our firm emphasizes efficiency-related strategies-reduction of operating costs, reduction of fixed costs, improvements in generating plant efficiency, and improvements in overall productivity and efficiency</td>
<td></td>
</tr>
<tr>
<td>G13</td>
<td>Have a broad vision based on their dream and imagination which does not contain a specific, detailed action plan that the firm is expected to implement.</td>
<td>Have a carefully developed vision which details, on a step-by-step basis, a number of specific actions and programs the firm is implementing or will implement in order to achieve its objectives.</td>
<td>Effectuation vs Causation</td>
<td></td>
</tr>
<tr>
<td>G15</td>
<td>We are always trying to create new technologies or products/services to introduce in the market</td>
<td>We are cautious about any new technology or product/service that we introduce to the market</td>
<td>Over the past three years, this company has introduced a large number of new products to the market</td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>Competes mostly by being flexible and pursuing multiple strategic alternatives at the same time.</td>
<td>Competes mostly by conducting a detailed analysis of available alternatives and devotedly pursuing one of them.</td>
<td>Real Options Literature</td>
<td></td>
</tr>
</tbody>
</table>

Brown, Davidsson, & Wiklund, 2001

Brown, Davidsson, & Wiklund, 2001

Rajagopalan, 1996

Sarasvathy, 2001

Zahra, 1996

McGrath, 1999

McGrath, 1999
| L1 | Is open to making radical changes to its existing values, beliefs, and assumptions, if needed. | Considers its existing values, beliefs, and assumptions as ‘chiseled in stone’ so they can be changed only slightly. | There is a clear and consistent set of values in this organization that governs the way we do business | Dess, Lumpkin, & Covin, 1997 |
| L4 | Is open to making changes to the way in which it defines itself. | Is resistant to making changes to the way in which it defines itself. | The way we do things in this organization is well suited to the business we are in | Dess, Lumpkin, & Covin, 1997 |
| L5 | Encourages employees to share their opinion even if it does not agree with what the top executives think. | Encourages employees to share their opinion as long as it is broadly consistent with what the top executives think. | People with unpopular views are given a fair hearing in this organization | Dess, Lumpkin, & Covin, 1997 |
| L6 | Believes that disagreement or confrontation of ideas between employees can be beneficial to the organization. | Believes that disagreement or confrontation of ideas between employees can not be beneficial to the organization. | Conflict in this organization is often suppressed rather than dealt with openly | Dess, Lumpkin, & Covin, 1997 |
| L3 | Values ‘open-mindedness’ and encourages employees to think in new and different ways. | Values compliance and encourages employees to stick to tried and tested ways. | Our business unit places a high value on open-mindedness | Baker & Sinkula, 1999 |
| L7 | Allows employees to question the ‘world view’ of top executives. | Allows employees to ask questions about the ‘world view’ of top executives but not question it. | Managers in this business unit do not want their "world view" to be questioned | Baker & Sinkula, 1999 |
| L8 | Believes that once we stop questioning, we endanger our future. | Believes that questioning destroys the unity of our organization endangering its future. | The collective wisdom in this enterprise is that once we quit learning, we endanger our future | Baker & Sinkula, 1999 |
| L11a | Believes in doing in-depth critical reflection of the way we do business and make drastic changes based on the reflection. | Is willing to reflect on the way we do business as long as it is within their current way of doing things | We are not afraid to reflect critically on the shared assumptions we have about the way we do business | Baker & Sinkula, 1999 |
After every failure or success, our organization conducts surface inspection to figure out quick fix solutions to our problems and issues.

**Knowledge Management Items in final form**

<table>
<thead>
<tr>
<th>Knowledge Creation Items</th>
<th>Original Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>Introduce new products, the majority of which were not available in the market earlier</td>
<td>Introduce new generation of products</td>
</tr>
<tr>
<td>K3</td>
<td>Extend our product range into new areas, majority of which neither of us were working in earlier</td>
<td>Open up new markets</td>
</tr>
<tr>
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<td>Enter into new technological fields, majority of which neither of us were working in earlier</td>
<td>Enter into new technological fields</td>
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<td>Gain knowledge of domains that both of us were not familiar with earlier</td>
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<td>K9</td>
<td>Gain new administrative and managerial knowledge, majority of which neither of us had earlier</td>
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<tr>
<td>K11</td>
<td>Generate new knowledge that neither of us had earlier</td>
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<td>K13</td>
<td>Generate knowledge about new processes, the majority of which neither of us possessed before</td>
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**Knowledge Acquisition Items**
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<th>K2</th>
<th>Enter into new technological fields, majority of which only our partner was working in earlier</th>
<th>To what extent have you learned from your foreign parent, new technological expertise</th>
<th>Lyles &amp; Salk, 1996</th>
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<td>K4</td>
<td>Gain new administrative and managerial knowledge, majority of which our partner had earlier</td>
<td>To what extent have you learned from your foreign parent, managerial techniques</td>
<td>Lyles &amp; Salk, 1996</td>
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<td>K6</td>
<td>Extend our product range into new areas, majority of which our partner was serving earlier</td>
<td>To what extent have you learned from your foreign parent, new marketing expertise</td>
<td>Lyles &amp; Salk, 1996</td>
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<td>Gain knowledge of domains that only our partner was familiar with earlier</td>
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<td>Introduce new products, the majority of which only our partner was working in earlier</td>
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<td>K12</td>
<td>Acquire knowledge from our partner</td>
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<td>K14</td>
<td>Acquire knowledge about new work processes, the majority of which our partner had earlier</td>
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Italicized items are not included in the final survey

* Items dropped after academic survey

b Items dropped after practitioner survey
### Table 5.1

Company contact calendar

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<th>Description</th>
<th>Postal letter</th>
<th>First Email Contact</th>
<th>First Email Reminder</th>
<th>Second Email Reminder</th>
<th>Second Email Contact</th>
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<td>12/22/05 - 01/07/06</td>
<td>01/18/06 - 01/23/06</td>
<td>01/31/06 - 02/02/06 (willing respondents from first contact)</td>
<td>02/06/06 - 02/12/06</td>
<td>2/26/06 (willing respondents from second contact)</td>
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<td>Second set of firms</td>
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<td>01/24/06 - 1/28/06</td>
<td>02/11/2006 (willing respondents)</td>
<td>02/21/2006 (willing respondents from first contact)</td>
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<td>3/6/2006 (willing respondents from second contact)</td>
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Table 5.2

Details of Companies Deleted

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<td>1-800-Attorney, ebags.com</td>
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Table 5.3

Informant Detail

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*When factor analyzed without constraining the number of factors, 4 factors were found to have eigen values greater than 1. So, the number of factor were constrained to 3.

**Key:**
- G1-G10 are 10 leadership orientation items
- A1-A12 are 12 alliance orientation items
- L1-L8 are 8 learning orientation items

*Shaded values had aberrant factor loadings based on the rules applied.*
### Table 5.5

**Descriptives and Correlations**

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<th>AO</th>
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<td>0.10</td>
<td>0.03</td>
<td>-0.28</td>
<td>-0.25</td>
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<td>0.53</td>
<td>0.05</td>
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<td>-0.42</td>
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</tr>
<tr>
<td>CSA</td>
<td>3.30</td>
<td>1.70</td>
<td>r²</td>
<td>0.03</td>
<td>-0.11</td>
<td>0.02</td>
<td>-0.04</td>
<td>-0.15</td>
<td>0.11</td>
<td>0.11</td>
<td>0.11</td>
<td>0.02</td>
<td>0.04</td>
<td>0.16</td>
<td>-0.05</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.25</td>
<td>0.01</td>
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<td>N</td>
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<tr>
<td>AP</td>
<td>13.93</td>
<td>4.53</td>
<td>r²</td>
<td>0.00</td>
<td>0.21</td>
<td>0.19</td>
<td>0.19</td>
<td>0.15</td>
<td>0.09</td>
<td>-0.02</td>
<td>-0.16</td>
<td>0.02</td>
<td>0.19</td>
<td>-0.12</td>
<td>0.06</td>
<td>-0.21</td>
<td>0.12</td>
<td>0.13</td>
<td>-0.27</td>
</tr>
<tr>
<td>N</td>
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<td></td>
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<td></td>
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<tr>
<td>EP</td>
<td>15.60</td>
<td>4.60</td>
<td>r²</td>
<td>-0.10</td>
<td>0.21</td>
<td>0.02</td>
<td>0.14</td>
<td>0.22</td>
<td>0.14</td>
<td>0.07</td>
<td>-0.12</td>
<td>0.07</td>
<td>0.17</td>
<td>0.12</td>
<td>0.10</td>
<td>-0.22</td>
<td>0.06</td>
<td>0.03</td>
<td>-0.19</td>
</tr>
<tr>
<td>N</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Mean and Standard Deviations are reported for absolute values. Correlations are reported for natural log transformations.
Key:

Age: Age of firm
NEmp: Number of current employees in the firm
CEO Tenure: Tenure of current CEO (in years)
EU: Environmental Uncertainty
IG: Industry growth
IK: Knowledge complexity of the industry
GO: Leadership Orientation (1-5 scale: 5 is entrepreneurial and 1 is managerial)
AO: Alliance Orientation (1-5 scale: 5 is cooperative and 1 is competitive)
LO: Learning Orientation (1-5 scale: 5 is generative and 1 is adaptive)
SRD: Supplier Resource Diversity (Resource diversity between firm and key supplier)
SCD: Supplier Cultural Diversity (Cultural Diversity between firm and key supplier)
SKC: Supplier Knowledge Creation (Knowledge creation in key supplier alliance)
SKA: Supplier Knowledge Acquisition (Knowledge acquired through key supplier alliance)
SS: Importance of key supplier alliance to firm
CRD: Customer Resource Diversity (Resource diversity between firm and key customer)
CCD: Customer Cultural Diversity (Cultural Diversity between firm and key customer)
CKC: Customer Knowledge Creation (Knowledge creation in key customer alliance)
CKA: Customer Knowledge Acquisition (Knowledge acquired through key customer alliance)
CS: Importance of key customer alliance to firm
AP: Achieved performance (in last three years)
EP: Expected Performance (over next five years)
Table 5.6

(a) Regression analyses for knowledge creation and knowledge acquisition in key supplier alliance

<table>
<thead>
<tr>
<th></th>
<th>Knowledge Creation</th>
<th>Knowledge Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td>β</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (log)</td>
<td>0.058</td>
<td>0.463</td>
</tr>
<tr>
<td>Nemp (log)</td>
<td>0.010</td>
<td>0.086</td>
</tr>
<tr>
<td>CeoTen</td>
<td>0.387</td>
<td>0.667</td>
</tr>
<tr>
<td>IG</td>
<td>0.144</td>
<td>0.566</td>
</tr>
<tr>
<td>EU</td>
<td>0.085</td>
<td>-0.037</td>
</tr>
<tr>
<td>GO</td>
<td>0.046</td>
<td>0.432</td>
</tr>
<tr>
<td>AO</td>
<td>0.020</td>
<td>-0.155</td>
</tr>
<tr>
<td>LO</td>
<td>0.024</td>
<td>0.509</td>
</tr>
<tr>
<td>SRD</td>
<td>0.430</td>
<td>-4.497</td>
</tr>
<tr>
<td>SCD</td>
<td>0.291</td>
<td>-2.854</td>
</tr>
<tr>
<td>GO x SRD</td>
<td>0.024</td>
<td>2.864</td>
</tr>
<tr>
<td>AO x SCD</td>
<td>0.129</td>
<td>1.286</td>
</tr>
<tr>
<td>LO x SCD</td>
<td>0.061</td>
<td>-0.471</td>
</tr>
<tr>
<td>R²</td>
<td>0.381</td>
<td>3.420</td>
</tr>
<tr>
<td>F-Test</td>
<td>0.056</td>
<td>5.486</td>
</tr>
</tbody>
</table>

Note:
* p < .1  
X p < .05  
XX p < .01
### (b) Regression analyses for knowledge creation and knowledge acquisition in key customer alliance

<table>
<thead>
<tr>
<th>Knowledge Creation</th>
<th>Knowledge Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>Step 2</strong></td>
</tr>
<tr>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>Age (log)</td>
<td>-0.056</td>
</tr>
<tr>
<td>Nemp (log)</td>
<td>0.037</td>
</tr>
<tr>
<td>CeoTen</td>
<td>0.059</td>
</tr>
<tr>
<td>IQ</td>
<td>0.059</td>
</tr>
<tr>
<td>EU</td>
<td>0.088</td>
</tr>
<tr>
<td>GO</td>
<td>0.320</td>
</tr>
<tr>
<td>AO</td>
<td>0.135</td>
</tr>
<tr>
<td>LO</td>
<td>0.220</td>
</tr>
<tr>
<td>CRD</td>
<td>0.092</td>
</tr>
<tr>
<td>CCD</td>
<td>0.158</td>
</tr>
<tr>
<td><strong>GO x CRD</strong></td>
<td>-0.052</td>
</tr>
<tr>
<td><strong>GO x CCD</strong></td>
<td>0.067</td>
</tr>
<tr>
<td><strong>AO x CRD</strong></td>
<td>0.121</td>
</tr>
<tr>
<td><strong>AO x CCD</strong></td>
<td>0.072</td>
</tr>
<tr>
<td><strong>LO x CRD</strong></td>
<td>0.148</td>
</tr>
<tr>
<td><strong>LO x CCD</strong></td>
<td>0.045</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>0.024</td>
</tr>
<tr>
<td><strong>F-Test</strong></td>
<td>0.044 (5.88)</td>
</tr>
<tr>
<td><strong>F Test for R</strong></td>
<td>0.018</td>
</tr>
</tbody>
</table>

**Note:**

+ p < .1

x p < .05

** XX p < .01
### Table 5.7

Regression analyses for achieved and expected firm performance

<table>
<thead>
<tr>
<th></th>
<th>Achieved Firm Performance</th>
<th>Expected Firm Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>Age (log)</td>
<td>-0.059</td>
<td>-0.594</td>
</tr>
<tr>
<td>Nemp (log)</td>
<td>0.305</td>
<td>2.044X</td>
</tr>
<tr>
<td>CeoTen</td>
<td>0.282</td>
<td>2.584X</td>
</tr>
<tr>
<td>IG</td>
<td>0.192</td>
<td>1.594</td>
</tr>
<tr>
<td>EU</td>
<td>-0.073</td>
<td>-0.706</td>
</tr>
<tr>
<td>SKC</td>
<td>-0.079</td>
<td>-0.698</td>
</tr>
<tr>
<td>SKA</td>
<td>-0.219</td>
<td>-1.685</td>
</tr>
<tr>
<td>CKC</td>
<td>0.169</td>
<td>1.315</td>
</tr>
<tr>
<td>CKA</td>
<td>0.004</td>
<td>0.030</td>
</tr>
<tr>
<td>IK</td>
<td>0.095</td>
<td>0.886</td>
</tr>
<tr>
<td>SKC x IK</td>
<td>0.072</td>
<td>0.652</td>
</tr>
<tr>
<td>CKA x IK</td>
<td>0.329</td>
<td>2.854XX</td>
</tr>
<tr>
<td>CKC x IK</td>
<td>0.016</td>
<td>0.135</td>
</tr>
<tr>
<td>R²</td>
<td>0.122</td>
<td>0.192</td>
</tr>
<tr>
<td>F-Test</td>
<td>2.621XX</td>
<td>5.94X</td>
</tr>
<tr>
<td>F Test for ΔR²</td>
<td>1.338</td>
<td>0.435</td>
</tr>
</tbody>
</table>

**Note:**

- + p < .1
- X p < .05
- XX p < .01
General cause-effect model of interorganizational knowledge management that explains the nature of the relationships between firm strategy, knowledge management in alliances, and firm performance.
General framework for extant research in knowledge management
Nonaka’s knowledge creation framework

Figure 2.2

Tacit

Explicit

Socialization

Joint activities
Informal activities
Shared experiences

Use of metaphors
and analogies
Model building

Externalization

Critically reflection
Action programs
Simulation & experiments

Organizational communication through
telephone, emails etc.
Corporate management training programs

Internalization

Combination

Joint activities
Informal activities
Shared experiences

Use of metaphors
and analogies
Model building

Critically reflection
Action programs
Simulation & experiments

Organizational communication through
telephone, emails etc.
Corporate management training programs
Figure 3.1

Hypothesized Model
Figure 5.1
Leadership Orientation and Knowledge Creation moderated by Supplier Resource Diversity (SRD)

(a) Relationship found in the data

(b) Hypothesized Relationship

Note:

1. Graph 5.1 (a) is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both leadership orientation and supplier resource diversity.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership Orientation</td>
<td>2.77</td>
<td>3.46</td>
<td>4.15</td>
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<tr>
<td>Supplier Resource Diversity</td>
<td>2.29</td>
<td>3.56</td>
<td>4.83</td>
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</table>
Figure 5.2
Learning Orientation and Knowledge Creation moderated by Customer Resource Diversity (CRD)

(a) Relationship found in the data

(b) Hypothesized relationship

Note:

1. Graph 5.2 (a) is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both learning orientation and customer resource diversity.

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<tr>
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<th>High</th>
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</thead>
<tbody>
<tr>
<td>Learning Orientation</td>
<td>2.70</td>
<td>3.46</td>
<td>4.22</td>
</tr>
<tr>
<td>Customer Resource Diversity</td>
<td>2.31</td>
<td>3.47</td>
<td>4.63</td>
</tr>
</tbody>
</table>
Figure 5.3
Learning Orientation and Knowledge Acquisition moderated by Supplier Cultural Diversity (SCD)

(a) Relationship found in the data

(b) Hypothesized Relationship

Note:
1. Graph 5.3 (a) is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both learning orientation and supplier cultural diversity.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Orientation</td>
<td>2.70</td>
<td>3.46</td>
<td>4.22</td>
</tr>
<tr>
<td>Supplier Cultural Diversity</td>
<td>2.30</td>
<td>3.32</td>
<td>4.34</td>
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</tbody>
</table>
Figure 5.4
Knowledge Creation and Achieved Firm Performance moderated by knowledge complexity (IK) of the industry

(a) Relationship found in the data

(b) Hypothesized relationship

Note:
1. Graph 5.4 (a) is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both customer knowledge creation and industry complexity.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Knowledge Creation</td>
<td>1.69</td>
<td>2.94</td>
<td>4.19</td>
</tr>
<tr>
<td>Industry Knowledge</td>
<td>3.53</td>
<td>4.19</td>
<td>4.85</td>
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</table>
Figure 5.5
Relationship between Supplier Cultural Diversity and Knowledge Creation for software (SW) versus non-software firms as found in the data

Note:

1. Graph 5.5 is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for supplier cultural diversity.

<table>
<thead>
<tr>
<th>Supplier Cultural Diversity</th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.30</td>
<td>3.32</td>
<td>4.34</td>
</tr>
</tbody>
</table>
Learning Orientation and Knowledge Management in Key Supplier Alliance moderated by Supplier Cultural Diversity (SCD)

Note:
1. Graph 5.6 is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both learning orientation and supplier cultural diversity.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Orientation</td>
<td>2.70</td>
<td>3.46</td>
<td>4.22</td>
</tr>
<tr>
<td>Supplier Cultural Diversity</td>
<td>2.30</td>
<td>3.32</td>
<td>4.34</td>
</tr>
</tbody>
</table>
Figure 5.7

Learning Orientation and Knowledge Management in Key Customer Alliance moderated by Customer Resource Diversity (CRD)

Note:

1. Graph 5.7 is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both learning orientation and customer resource diversity.

<table>
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<th></th>
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<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Orientation</td>
<td>2.70</td>
<td>3.46</td>
<td>4.22</td>
</tr>
<tr>
<td>Customer Resource Diversity</td>
<td>2.31</td>
<td>3.47</td>
<td>4.63</td>
</tr>
</tbody>
</table>
Figure 5.8
Learning Orientation and Knowledge Management in Key Customer Alliance moderated by Customer Cultural Diversity (CCD)

![Graph 5.8](image)

Note:

1. Graph 5.8 is plotted for values corresponding to one standard deviation below the mean (low) and 1 standard deviation above the mean (high) for both learning orientation and customer cultural diversity.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Mean</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Orientation</td>
<td>2.70</td>
<td>3.46</td>
<td>4.22</td>
</tr>
<tr>
<td>Customer Cultural Diversity</td>
<td>2.23</td>
<td>3.26</td>
<td>4.29</td>
</tr>
</tbody>
</table>
Appendix 4.1

List of SIC Codes

- 3571 Electronic Computers
- 3572 Computer Storage Devices
- 3575 Computer Terminals
- 3577 Computer Peripheral Equipment, Not Elsewhere Classified
- 3578 Calculating and Accounting Machines, Except Electronic Computers
- 3579 Office Machines, Not Elsewhere Classified

- 3661 Telephone and Telegraph Apparatus
- 3663 Radio and Television Broadcasting and Communications Equipment
- 3669 Communications Equipment, Not Elsewhere Classified

- 3671 Electron Tubes
- 3672 Printed Circuit Boards
- 3674 Semiconductors and Related Devices
- 3675 Electronic Capacitors
- 3676 Electronic Resistors
- 3677 Electronic Coils, Transformers, and Other Inductors
- 3678 Electronic Connectors
- 3679 Electronic Components, Not Elsewhere Classified

- 3821 Laboratory Apparatus and Furniture
- 3822 Automatic Controls for Regulating Residential and Commercial Environments and Appliances
- 3823 Industrial Instruments for Measurement, Display, and Control of Process Variables; and Related Products
- 3824 Totalizing Fluid Meters and Counting Devices
- 3825 Instruments for Measuring and Testing of Electricity and Electrical Signals
- 3826 Laboratory Analytical Instruments
- 3827 Optical Instruments and Lenses
- 3829 Measuring and Controlling Devices, Not Elsewhere Classified

- 7371 Computer Programming Services
- 7372 Prepackaged Software
- 7373 Computer Integrated Systems Design
- 7374 Computer Processing and Data Preparation and Processing Services
- 7375 Information Retrieval Services
- 7376 Computer Facilities Management Services
- 7377 Computer Rental and Leasing
- 7378 Computer Maintenance and Repair
- 7379 Computer Related Services, Not Elsewhere Classified
Appendix 4.2

Initial survey to academic experts

In the following pages, you will find the definitions of three dimensions of strategic orientation followed by pairs of statements. The statements describe various aspects of organizational strategy. We would like you to read the definitions and statements and tell us:

1. which set of statement corresponds to which dimension of strategic orientation. Please write the corresponding dimension acronym in column 1 of each row
2. the extent to which you think the two statements in the pair are opposite ends of the same dimension

Alliance Orientation (AO)

Alliance orientation refers to the organizational posture towards its partners in interorganizational relationships.

Leadership Orientation (GO)

Leadership orientation refers to the way the top management of an organization makes decisions and acts to lead by engaging in innovative activities, undertaking risky ventures, and competing proactively in the market.

Learning Orientation (LO)

Learning orientation refers to the willingness of an organization and its management team to bring about relatively stable changes in their way of thinking about the strategic issues and challenges facing the organization

Knowledge Management (KM)

Knowledge Management refers to the creation and transfer of knowledge across a variety of areas, including product development, and management techniques.
Please write AO, GO, LO or KM in column 1 and rank each set of statements on a scale of 1-5 to the extent that you think the two statements in the pair are opposite ends of the same dimension

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not opposite</th>
<th>Sufficiently opposite</th>
<th>Completely opposite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our organization competes by being flexible and encouraging multiple strategic options</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our organization competes by conducting a detailed analysis of available alternatives and sticking to one which offers the best returns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The introduction of new technologies or new products is always an iterative process for our organization</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The introduction of new technologies or new products is a well-defined process for our organization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The top management of our organization assesses the means that it can mobilize and sets abstract goals for the future that allow it to adapt to changing conditions creatively</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization sets clear goals and tries to figure out a clear path that will take it there</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The top management of our organization tries to proactively create new product markets that do not exist yet</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization tries to compete by improving our performance in our existing markets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The top management of our organization tries to introduce new products and enter new markets even when it is uncertain about the outcome</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization adopts a cautious ‘wait and see’ posture so as to minimize the probability of making costly decisions when faced with uncertainty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The top management of our organization actively seeks new ideas that push out the boundaries of current product concepts</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization tries to stick to our current strategy by making improvements to our existing products and services</td>
<td></td>
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</tr>
<tr>
<td>The top management of our organization tries to be the first to introduce new, breakthrough innovations, products/services, technologies etc. to the market</td>
<td>1</td>
<td>3</td>
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</tr>
<tr>
<td>The top management of our organization tries to avoid being the first mover in a new product or market</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The existing values, beliefs, and assumptions of our organization can be redefined, if need be</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The existing values, beliefs, and assumptions of our organization are ‘set in stone’ and can not be changed</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The top management of our organization believes in doing in-depth critical reflection of the way we do business and make drastic changes based on the reflection</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization is willing to reflect on the way we do business as long as it is within their current way of doing things</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Statement</td>
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<tr>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Employees in our organization are encouraged to question the very way they perceive the business we are in.</td>
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<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management believes that the way we see our business is well suited to the business we are in.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our management places a high value on open-mindedness and encourages employees to ‘think outside the box’.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our top managers emphasize holding fast to tried and true management principles.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our organization places a strong emphasis on adapting freely to changing circumstances without too much concern for how things were done in the past.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our organization allows adaptation to market change as long as it is compatible with the way things were done in the past.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>After every failure or success, the top management of our organization conducts a detailed ‘post-mortem’ and tries to understand what can be learned from having failed or succeeded.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our top management focuses on figuring out the reasons for failure and not repeating them in the future.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our top management is open to changing the very definition of our organization.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our top management is resistant to change in the definition of our organization.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our organization rewards top managers and employees to have as much concern for our partner organizations as for our own.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>In dealing with partner organizations, our employees are encouraged to think about our organization first and foremost.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top managers of our organization believe that we must create value for both our organization and our alliance partners.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Employees in our organization are encouraged to ‘get’ much as possible from our partners as fast as possible.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We expect our alliance relationships to last a long time.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We do not expect our alliance relationships to continue for a long time.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our top managers believe that our organization and our partners share a common future.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top managers of our organization believe that the future needs of our organization take precedence over those of our alliance partners.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our top management encourages us to interact with employees of our partner organization in informal settings even outside of work.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our top management restricts our interaction with employees of our partner organization to formal, official settings.</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top managers of our organization do not want us to engage in actions that may be harmful for our alliance.</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
</tbody>
</table>
partners even if those actions are beneficial for our organization
The top managers of our organization believe that we must maximize the benefits available to our organization even at the cost of our alliance relationships

<table>
<thead>
<tr>
<th>Description</th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our top managers encourage us to devote more time to our alliance partners when they need help</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Our top managers discourage us from devoting more time to our partners than the minimum necessary</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We believe that there should be a high sense of unity between us and our partners</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We do not believe in having a feeling of oneness between us and our partners</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top management of our organization encourages employees to share their opinion even if it does not agree with that of the top management</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top management of our organization encourages employees to share their opinion but only if it is not opposite to that held by the top management</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top management of our organization believes that disagreements or confrontation of ideas (no personal attacks) between employees can be useful for the organization</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top management of our organization does not believe that disagreement among employees can be beneficial</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top management of our organization allow their “view of the world” to be questioned</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The top managers of our organization do not allow their “view of the world” to be questioned</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The collective wisdom in our organization is that once we stop questioning, we endanger our future</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>The collective wisdom in our organization is that consensus is necessary for future survival</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We try to develop close relationships with our partners</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We do not try to have close relationships with our partners</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We try to achieve a very high level of understanding between us and our partners</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We believe in monitoring every aspect of transaction with our partners to ensure that we are not being looted</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We try to make many business decisions together with our partners</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We make all our business decisions entirely on our own without consultation with our partners</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We believe that we should treat our partner fairly and justly</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We believe that we need to be very cautious and careful in dealing with our partners</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We feel that we are always willing to dedicate whatever people and resources it takes to make our collaborative efforts with our partners a success</td>
<td>Not opposite</td>
<td>Sufficiently opposite</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>We are always watchful about the people and resources</td>
<td></td>
<td>3</td>
<td>Completely opposite</td>
</tr>
<tr>
<td>Statement</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
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<tr>
<td>--------------------------------------------------------------------------</td>
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<tr>
<td>We are willing to invest in any of our collaborative efforts</td>
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<tr>
<td>We try to achieve a close alignment between our strategic plans and that</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
</tr>
<tr>
<td>of our alliance partners</td>
<td></td>
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<tr>
<td>We decide our strategic plans without any particular attention to our</td>
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<tr>
<td>partners</td>
<td></td>
<td></td>
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<tr>
<td>We believe in maintaining strong, healthy relationships with our</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
</tr>
<tr>
<td>partners</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>We do not believe that we can have strong, healthy relationships with</td>
<td></td>
<td></td>
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<tr>
<td>our partners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We are always frank and truthful in our dealings with our partners</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
</tr>
<tr>
<td>We try to be secretive and deceptive in our dealings with our partners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We encourage our employees to care about what happens to our partners</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
</tr>
<tr>
<td>We do not encourage our employees to care about what happens to our</td>
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<td></td>
</tr>
<tr>
<td>partners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We encourage our employees to go out of their way to make sure that our</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>partners are not damaged or harmed in our relationship</td>
<td></td>
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<tr>
<td>We discourage our employees from trying to protect our partners from</td>
<td></td>
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<tr>
<td>damage or harm from our relationship</td>
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<tr>
<td>We have introduced a new generation of products that were not available</td>
<td></td>
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<tr>
<td>in the market earlier by working together with our partner</td>
<td></td>
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<tr>
<td>We have introduced products similar to those that were being sold by</td>
<td></td>
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<tr>
<td>our partner due to our relationship with them</td>
<td></td>
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<tr>
<td>Our relationship with this partner has allowed us to extend our product</td>
<td></td>
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</tr>
<tr>
<td>range into areas that none of us were working in earlier</td>
<td></td>
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<tr>
<td>Our relationship with this partner has allowed us to expand our product</td>
<td></td>
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</tr>
<tr>
<td>range into areas that only our partner was serving earlier</td>
<td></td>
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<tr>
<td>Our relationship with our partner has allowed us to enter into new</td>
<td></td>
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<tr>
<td>technological fields that none of us was working in earlier</td>
<td></td>
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<tr>
<td>We have been able to acquire valuable technological expertise from our</td>
<td></td>
<td></td>
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<tr>
<td>partner</td>
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<tr>
<td>We work closely with this partner to explore new knowledge domains that</td>
<td></td>
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<tr>
<td>both of us were not familiar with earlier</td>
<td></td>
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<tr>
<td>We have been able to acquire valuable knowledge from our partnership</td>
<td></td>
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<tr>
<td>with this firm</td>
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<tr>
<td>We have been able to develop knowledge of new managerial techniques</td>
<td></td>
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<tr>
<td>through our partnership with this firm</td>
<td></td>
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</tr>
<tr>
<td>We have been able to acquire valuable knowledge of useful managerial</td>
<td></td>
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<tr>
<td>techniques from our partnership with this firm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our relationship with our partner generates new</td>
<td>1 Not opposite</td>
<td>3 Sufficiently opposite</td>
<td>5 Completely opposite</td>
</tr>
<tr>
<td>Knowledge that can be used by both of us for mutual benefit</td>
<td>opposite</td>
<td>opposite</td>
<td>opposite</td>
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</tr>
<tr>
<td>Our relationship with our partner is a way to acquire knowledge that will be useful for our organization</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our relationship with our partner has helped us generate knowledge about new work processes that we did not know existed earlier</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our relationship with our partner has helped us acquire knowledge of their work processes</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization takes bold decisions and then tries to deal with the risk through their determination and will power</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization tries to minimize the risk associated with their decision before they decide which path to follow</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization is primarily concerned with overlooking, missing, or losing an attractive opportunity if they do not act on it in time</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization is primarily concerned with minimizing the risk associated with an opportunity if things go wrong</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization is driven by their imagination and is not constrained by the resources they possess</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The top management of our organization is most concerned with the best utilization of the resources we control</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our top management does not need resources to commence the pursuit of an opportunity allowing us to commit resources in stages</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Since our objective is to make the best use of our resources, we usually invest heavily and rapidly</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Our organization has many more promising ideas than what our time and resources allow us to pursue</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We find it difficult to find a sufficient number of promising ideas to optimally utilize our resources</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We never experience a lack of ideas that we can convert into profitable products/services</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We have limited ideas that can be converted into profitable products/services</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We are always trying to create new technologies or products/services to introduce in the market</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>We are cautious about any new technology or product/service that we introduce to the market</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>What drives us is the chance to create new technologies, new products, and new markets that are not yet known to people</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>What drives us is the long-term survival of our organization through taking well-calculated risks</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix 4.3

Survey administered to practitioners

(a) Customer Alliance

The Project on Business Strategy in the 21st Century
College of Business
University of Missouri-Columbia

Hello,

In today’s hyper competitive world, companies are being forced to continuously innovate to stay competitive. We are conducting a program of research to understand top executive’s perceptions of their firm’s competitive activity. The enclosed survey asks you to tell us how descriptive some statements are about your firm.

The survey should take about 40-50 minutes to complete. All information collected will be kept strictly confidential and will be grouped together with the information collected from other business executives so that your responses can not be identified.

We know that you are taking time from your busy day to complete this survey, so we have tried to make it as short as possible.

A NOTE ON CONFIDENTIALITY

All information collected will be kept strictly confidential. Only members of the University research team will have access to your information. After all the information has been collected, identifying information will be deleted and your information will be entered into a database. Please note that (a) your participation is voluntary, (b) you are free to withdraw from this study at any time, and (c) you do not have to answer a question if you do not wish to do so.

Please retain this consent letter for your records. Please note that completion of the enclosed questionnaire is reflective of your agreement to participate in this study. If you have questions regarding your rights as a participant in research, please feel free to contact the University of Missouri-Columbia Campus Institutional Review Board at (573) 882-9585.

Thank you in advance for participating in this study. If you have any questions, please contact us.

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Associate Professor of Management
University of Missouri-Columbia
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We would like you to think of an organization that you have worked for in the past or are currently working in (at a strategic top executive level). The following items describe various aspects of an organization’s strategy. Some of these statements may describe your organization’s strategy while others may not; that is, there are no right or wrong answers. We would like you to use these statements to describe your organization’s strategy. Please rate each statement in terms of how characteristic it is of your organization using the following scale:

5 - Characteristic of my organization
4 - Somewhat characteristic of my organization
3 - Neither characteristic nor uncharacteristic of my organization
2 - Somewhat uncharacteristic of my organization
1 - Not characteristic of my organization

Place the number (1, 2, 3, 4, or 5) which most closely represents your judgment next to each statement.

1. The following items refer to the way the top management of an organization makes decisions and acts to lead by engaging in innovative activities, undertaking risky ventures, and competing proactively in the market

___ The top management of our organization competes mostly by being flexible and pursuing multiple strategic alternatives at the same time.
___ The top management of our organization competes mostly by conducting a detailed analysis of available alternatives and devotedly pursuing one of them
___ The top managers of our organization prefer adopting an iterative, trial and error process when introducing new technologies and/or products
___ The top managers of our organization prefer adopting a carefully defined, well thought plan to introduce new products and technologies
___ The top managers of our organization have a broad vision based on their dream and imagination which does not contain a specific, detailed action plan that the firm is expected to implement
___ The top managers of our organization have a carefully developed vision which details, on a step-by-step basis, a number of specific actions and programs the firm is implementing or will implement in order to achieve its objectives
___ The top management of our organization mostly competes through the creation of new products/technologies/markets that do not exist yet
___ The top management of our organization mostly competes through improving our existing products/technologies/markets in our current markets
___ The top management of our organization mostly tries to introduce new products or new markets even when there is great uncertainty about the nature and/or outcome of the product and/or market
The top management of our organization mostly adopts a cautious ‘wait and see’ when deciding about new product/market introductions so as to minimize the uncertainty around the product or market.

The top management of our organization tries to compete mostly by pushing out the very boundaries of existing products and/or technologies.

The top management of our organization tries to compete mostly by making small improvements to existing products and/or technologies.

The top management of our organization tries to be the first to introduce new, breakthrough innovations in products, technologies, markets, and/or processes.

The top management of our organization tries to move into new products, technologies, markets, and/or processes only after other firms have already entered there.

The top management of our organization takes bold decisions and then tries to deal with the risk through their determination and will power.

The top management of our organization makes decisions that are associated with the least risk after careful analysis.

The top management of our organization is always trying to minimize overlooking, missing, or losing an attractive opportunity if they do not act on it in time.

The top management of our organization tries to wait before acting on any opportunity to reduce risk even if it means missing some opportunities in the process of waiting.

Our top management does not need resources to commence the pursuit of an opportunity allowing us to mobilize and commit resources in stages.

Our top management mobilizes all the necessary resources before it acts on exploiting an opportunity.

The top management of our organization always has many more promising ideas than our time and resources allow us to pursue.

The top management of our organization find it difficult to come up with a sufficient number of promising ideas to utilize our resources.

The top management of our organization primarily emphasizes effectiveness through introducing as many new product/technological/process introductions as possible.

The top management of our organization primarily emphasizes efficiency through achieving the lowest costs possible.

The top managers of our organization are primarily driven by the chance to create new technologies, products, and markets that are not yet known to people.

The top managers of our organization are primarily driven by the chance to introduce known and ‘safe’ technologies, products, and markets that will serve existing needs.
2. The following items refer to organizational willingness to bring about changes in the way of thinking about the organization and the strategic challenges it faces.

___ Our organization is open to making radical changes to its existing values, beliefs, and assumptions, if need be.
___ Our organization considers its existing values, beliefs, and assumptions as ‘chiseled in stone’ such that they can be changed only slightly
___ Our organization believes that all employees can and should question the very way we perceive the business we are in so that we do not become obsolete
___ Our organization believes that our employees should not question our perception of our business because the way we see our business is compatible with the business we are in
___ Our organization values ‘open-mindedness’ and encourages employees to think in new and different ways
___ Our organization values compliance and encourages employees to stick to tried and tested ways
___ Our organization allows radical change without too much concern for how things have been done till now
___ Our organization allows only minor change because the way things have been done till now is considered really important
___ After every failure or success, our organization conducts a detailed ‘post-mortem’ to understand in depth the lessons that can be learned from having failed or succeeded
___ After every failure or success, our organization conducts surface inspection to figure out quick-fix solutions to our problems and issues
___ Our organization is generally open to making changes to the way in which it defines itself
___ Our organization is generally resistant to making changes to the way in which it defines itself
___ In our organization employees are encouraged to share their opinion even if it does not agree with what the top executives think
___ In our organization employees are encouraged to share their opinion as long as it is consistent with what the top executives think
___ In our organization it is believed that disagreement or confrontation of ideas (no personal attacks) between employees can be beneficial to the organization
___ In our organization it is believed that disagreement or confrontation of ideas between employees can not be beneficial to the organization
___ In our organization, employees are allowed to question the ‘world view’ of top executives
___ In our organization employees can ask questions about the ‘world-view’ of the top executives but not question it
In our organization we believe that once we stop questioning, we endanger our future.

In our organization, we believe that questioning destroys the unity of organization endangering its future.

We would now like you to think of a customer or user with which your organization has or had a strategic alliance that helped your organization gain knowledge about products/processes/technologies etc. This alliance should have had a life of at least six months. It is important that you have been sufficiently involved with this alliance (directly or indirectly) to have good knowledge about it.

Place the number (1, 2, 3, 4, or 5) which most closely represents your judgment next to each statement.

5 - Characteristic of my organization
4 - Somewhat characteristic of my organization
3 - Neither characteristic nor uncharacteristic of my organization
2 - Somewhat uncharacteristic of my organization
1 - Not characteristic of my organization

3. The following items refer to the posture that organizations may adopt towards their strategic alliance partner. This posture is reflected in the way the organization treats its partner and expects its employees to treat the partner organization.

___ Our organization encourages us to have as much concern for our partner as for our own
___ Our organization encourages us to think about our organization first and foremost when dealing with our partner
___ Our organization encourages us to be ‘giving’ in our relationships with our partner so that they can benefit from the relationship too
___ Our organization encourages us to ‘get’ as much as possible from our partner as fast as possible so that only we can benefit from the relationship
___ In our organization we are expected to give equal importance to the future needs of our organization as well as our partner organization
___ In our organization we are expected to give more importance to the future needs of our organization compared to the future needs of our partner organization
___ Our organization encourages us to think that we and our partner share a common future
___ Our organization encourages us to think that our future is distinct from the future of our partner organization
___ Our organization encourages us to interact with employees of our partner organization in informal settings even outside of work
___ Our organization restricts our interaction with employees of our partner organization to formal, official settings
___ Our organization does not want us to engage in actions that may be harmful for our partner even if those actions are beneficial for our organization
___ Our organization wants us to maximize the benefits available to our organization even if our actions are detrimental to our partner
___ Employees in our organization are encouraged to devote more time to our partner organization if and when our partner needs help
___ Employees in our organization are discouraged from devoting more time to our partner organization than the minimum necessary to keep the relationship going
___ Our organization emphasizes a high sense of unity between us and our partner
___ Our organization does not consider it important to feel a sense of oneness between us and our partner
___ Our organization does not try to monitor our relationship with our partner
___ Our organization closely monitors every aspect of our relationship with our partners
___ Our organization makes important business decisions together with our partners
___ Our organization makes important business decisions entirely on our own without consultation with our partners
___ Our organization is always willing to dedicate whatever people and resources it takes to make our relationships a success
___ Our organization is always watchful and careful about dedicating more people and resources than the minimum necessary to make our relationship work
___ Our organization tries to achieve a close alignment between our strategic plans and that of our partner organizations
___ Our organization decides our strategic plans without any particular attention to our partners
___ Our organization is willing to forgive or overlook minor mistakes and problems in close relationships with our partners
___ Our organization tries to hold our partners responsible for any mistakes or problems on their part
___ We are always frank and truthful in our dealings with our partner organizations
___ We try to be secretive and deceptive in our dealings with our partner organizations
___ Our organization encourages employees to care about what happens to our partners
___ Our organization does not encourage employees to care about what happens to our partners
___ Our organization encourages employees to go out of their way to make sure that our partners are not damaged or harmed in our relationship
___ Our organization discourages employees from trying to protect our partners from damage or harm from their relationship with us
4. The following items refer to the management of knowledge in this alliance so as to embody it into process, product, technological, and market innovations.

___ Due to our relationship with our partner, we have been / were able to introduce new products, the majority of which were not available in the market earlier
___ Due to our relationship with our partner, we have been / were able to introduce new products, the majority of which were already being sold by our partner
___ Due to our relationship with this partner, we have been / were able to extend our product range into new areas, the majority of which neither of us were working in earlier
___ Due to our relationship with this partner, we have been / were able to extend our product range in new areas, the majority of which our partner was serving earlier
___ Due to our relationship with our partner, we have been / were able to enter into new technological fields, the majority of which neither of us was working in earlier
___ Due to our relationship with our partner, we have been / were able to enter into new technological fields, the majority of which only our partner was working in earlier
___ The majority of the knowledge gained from our relationship with this partner has been / was in knowledge domains that both of us were not familiar with earlier
___ The majority of the knowledge gained from our relationship with this partner has been / was in knowledge domains that our partner was working in earlier
___ Due to our relationship with our partner, we have been / were able to gain new administrative and managerial knowledge the majority of which neither of us had earlier
___ Due to our relationship with our partner, we have been / were able to gain new administrative and managerial knowledge the majority of which our partner had earlier
___ Our relationship with our partner generates new knowledge that can be used by both of us for mutual benefit
___ Our relationship with our partner is a way to acquire knowledge that will be useful primarily for our organization
___ Our relationship with our partner has helped us generate knowledge about new work processes, the majority of which neither of us possessed before
___ Our relationship with our partner has helped us generate knowledge about new work processes, the majority of which our partner possessed before
Please tell us about yourself to help us understand you better:

I am 1. Male  2. Female

My age: (in years) __________

My ethnic background is (If other please specify your ethnicity below “other”):

African American/Black  American Indian  Asian/Pacific Islander  Caucasian/White  Latino/Hispanic  Other
1  2  3  4  5  6

My highest level of education is:
1. High School (or equivalent)  2. Bachelors  3. Masters  4. PhD or beyond

I have worked for __________ years

I have mostly worked in the following industry (If other please specify the industry type below “other”):

Automotive  Aviation  Insurance  High-Technology  Pharmaceutical  Restaurant  Academic  Other
1  2  3  4  5  6  7  8

THANK YOU FOR YOUR TIME
Hello,

In today’s hyper competitive world, companies are being forced to continuously innovate to stay competitive. We are conducting a program of research to understand top executive’s perceptions of their firm’s competitive activity. The enclosed survey asks you to tell us how descriptive some statements are about your firm.

The survey should take about 40-50 minutes to complete. All information collected will be kept strictly confidential and will be grouped together with the information collected from other business executives so that your responses can not be identified.

We know that you are taking time from your busy day to complete this survey, so we have tried to make it as short as possible.

A NOTE ON CONFIDENTIALITY

All information collected will be kept strictly confidential. Only members of the University research team will have access to your information. After all the information has been collected, identifying information will be deleted and your information will be entered into a database. Please note that (a) your participation is voluntary, (b) you are free to withdraw from this study at any time, and (c) you do not have to answer a question if you do not wish to do so.

Please retain this consent letter for your records. Please note that completion of the enclosed questionnaire is reflective of your agreement to participate in this study. If you have questions regarding your rights as a participant in research, please feel free to contact the University of Missouri-Columbia Campus Institutional Review Board at (573) 882-9585.

Thank you in advance for participating in this study. If you have any questions, please contact us.

Vishal K. Gupta
Department of Management
University of Missouri-Columbia
573-882-7660
vkgn7@mizzou.edu

Dr. Douglas Moesel
Associate Professor of Management
University of Missouri-Columbia
573-884-0926
moeseld@missouri.edu

We would like you to think of an organization that you have worked for in the past or are currently working in (at a strategic top executive level). The following items describe various
aspects of an organization's strategy. Some of these statements may describe your organization's strategy while others may not; that is, there are no right or wrong answers. We would like you to use these statements to describe your organization's strategy. Please rate each statement in terms of how characteristic it is of your organization using the following scale:

5 - Characteristic of my organization
4 - Somewhat characteristic of my organization
3 - Neither characteristic nor uncharacteristic of my organization
2 - Somewhat uncharacteristic of my organization
1 - Not characteristic of my organization

Place the number (1, 2, 3, 4, or 5) which most closely represents your judgment next to each statement.

1. The following items refer to the way the top management of an organization makes decisions and acts to lead by engaging in innovative activities, undertaking risky ventures, and competing proactively in the market

___ The top management of our organization competes mostly by being flexible and pursuing multiple strategic alternatives at the same time.
___ The top management of our organization competes mostly by conducting a detailed analysis of available alternatives and devotedly pursuing one of them
___ The top managers of our organization prefer adopting an iterative, trial and error process when introducing new technologies and/or products
___ The top managers of our organization prefer adopting a carefully defined, well thought plan to introduce new products and technologies
___ The top managers of our organization have a broad vision based on their dream and imagination which does not contain a specific, detailed action plan that the firm is expected to implement
___ The top managers of our organization have a carefully developed vision which details, on a step-by-step basis, a number of specific actions and programs the firm is implementing or will implement in order to achieve its objectives
___ The top management of our organization mostly competes through the creation of new products/technologies/markets that do not exist yet
___ The top management of our organization mostly competes through improving our existing products/technologies/markets in our current markets
___ The top management of our organization mostly tries to introduce new products or new markets even when there is great uncertainty about the nature and/or outcome of the product and/or market
___ The top management of our organization mostly adopts a cautious ‘wait and see’ when deciding about new product/market introductions so as to minimize the uncertainty around the product or market
___ The top management of our organization tries to compete mostly by pushing out the very boundaries of existing products and/or technologies
___ The top management of our organization tries to compete mostly by making small improvements to existing products and/or technologies
___ The top management of our organization tries to be the first to introduce new, breakthrough innovations in products, technologies, markets, and/or processes
___ The top management of our organization tries to move into new products, technologies, markets, and/or processes only after other firms have already entered there
___ The top management of our organization takes bold decisions and then tries to deal with the risk through their determination and will power
___ The top management of our organization makes decisions that are associated with the least risk after careful analysis
___ The top management of our organization is always trying to minimize overlooking, missing, or losing an attractive opportunity if they do not act on it in time
___ The top management of our organization tries to wait before acting on any opportunity to reduce risk even if it means missing some opportunities in the process of waiting
___ Our top management does not need resources to commence the pursuit of an opportunity allowing us to mobilize and commit resources in stages
___ Our top management mobilizes all the necessary resources before it acts on exploiting an opportunity
___ The top management of our organization always has many more promising ideas than our time and resources allow us to pursue
___ The top management of our organization find it difficult to come up with a sufficient number of promising ideas to utilize our resources
___ The top management of our organization primarily emphasizes effectiveness through introducing as many new product/technological/process introductions as possible
___ The top management of our organization primarily emphasizes efficiency through achieving the lowest costs possible
___ The top managers of our organization are primarily driven by the chance to create new technologies, products, and markets that are not yet known to people
___ The top managers of our organization are primarily driven by the chance to introduce known and ‘safe’ technologies, products, and markets that will serve existing needs

2. The following items refer to organizational willingness to bring about changes in the way of thinking about the organization and the strategic challenges it faces.
Our organization is open to making radical changes to its existing values, beliefs, and assumptions, if need be.

Our organization considers its existing values, beliefs, and assumptions as ‘chiseled in stone’ such that they can be changed only slightly.

Our organization believes that all employees can and should question the very way we perceive the business we are in so that we do not become obsolete.

Our organization believes that our employees should not question our perception of our business because the way we see our business is compatible with the business we are in.

Our organization values ‘open-mindedness’ and encourages employees to think in new and different ways.

Our organization values compliance and encourages employees to stick to tried and tested ways.

Our organization allows radical change without too much concern for how things have been done till now.

Our organization allows only minor change because the way things have been done till now is considered really important.

After every failure or success, our organization conducts a detailed ‘post-mortem’ to understand in depth the lessons that can be learned from having failed or succeeded.

After every failure or success, our organization conducts surface inspection to figure out quick-fix solutions to our problems and issues.

Our organization is generally open to making changes to the way in which it defines itself.

Our organization is generally resistant to making changes to the way in which it defines itself.

In our organization employees are encouraged to share their opinion even if it does not agree with what the top executives think.

In our organization employees are encouraged to share their opinion as long as it is consistent with what the top executives think.

In our organization it is believed that disagreement or confrontation of ideas (no personal attacks) between employees can be beneficial to the organization.

In our organization it is believed that disagreement or confrontation of ideas between employees cannot be beneficial to the organization.

In our organization, employees are allowed to question the ‘world view’ of top executives.

In our organization employees can ask questions about the ‘world-view’ of the top executives but not question it.

In our organization we believe that once we stop questioning, we endanger our future.

In our organization, we believe that questioning destroys the unity of organization endangering its future.
We would now like you to think of a **supplier** with which your organization has or had had a strategic alliance that helped your organization gain knowledge about products/processes/technologies etc. This alliance should have had a life of at least six months. It is important that you have been sufficiently involved with this alliance (directly or indirectly) to have good knowledge about it.

Place the number (1, 2, 3, 4, or 5) which most closely represents your judgment next to each statement.

5 - Characteristic of my organization
4 - Somewhat characteristic of my organization
3 - Neither characteristic nor uncharacteristic of my organization
2 - Somewhat uncharacteristic of my organization
1 - Not characteristic of my organization

3. The following items refer to the posture that organizations may adopt towards their strategic alliance partner. This posture is reflected in the way the organization treats its partner and expects its employees to treat the partner organization.

___ Our organization encourages us to have as much concern for our partner as for our own
___ Our organization encourages us to think about our organization first and foremost when dealing with our partner
___ Our organization encourages us to be ‘giving’ in our relationships with our partner so that they can benefit from the relationship too
___ Our organization encourages us to ‘get’ as much as possible from our partner as fast as possible so that only we can benefit from the relationship
___ In our organization we are expected to give equal importance to the future needs of our organization as well as our partner organization
___ In our organization we are expected to give more importance to the future needs of our organization compared to the future needs of our partner organization
___ Our organization encourages us to think that we and our partner share a common future
___ Our organization encourages us to think that our future is distinct from the future of our partner organization
___ Our organization encourages us to interact with employees of our partner organization in informal settings even outside of work
___ Our organization restricts our interaction with employees of our partner organization to formal, official settings
___ Our organization does not want us to engage in actions that may be harmful for our partner even if those actions are beneficial for our organization
Our organization wants us to maximize the benefits available to our organization even if our actions are detrimental to our partner.

Employees in our organization are encouraged to devote more time to our partner organization if and when our partner needs help.

Employees in our organization are discouraged from devoting more time to our partner organization than the minimum necessary to keep the relationship going.

Our organization emphasizes a high sense of unity between us and our partner.

Our organization does not consider it important to feel a sense of oneness between us and our partner.

Our organization does not try to monitor our relationship with our partner.

Our organization closely monitors every aspect of our relationship with our partners.

Our organization makes important business decisions together with our partners.

Our organization makes important business decisions entirely on our own without consultation with our partners.

Our organization is always willing to dedicate whatever people and resources it takes to make our relationships a success.

Our organization is always watchful and careful about dedicating more people and resources than the minimum necessary to make our relationship work.

Our organization tries to achieve a close alignment between our strategic plans and that of our partner organizations.

Our organization decides our strategic plans without any particular attention to our partners.

Our organization is willing to forgive or overlook minor mistakes and problems in close relationships with our partners.

Our organization tries to hold our partners responsible for any mistakes or problems on their part.

We are always frank and truthful in our dealings with our partner organizations.

We try to be secretive and deceptive in our dealings with our partner organizations.

Our organization encourages employees to care about what happens to our partners.

Our organization does not encourage employees to care about what happens to our partners.

Our organization encourages employees to go out of their way to make sure that our partners are not damaged or harmed in our relationship.

Our organization discourages employees from trying to protect our partners from damage or harm from their relationship with us.

4. The following items refer to the management of knowledge in this alliance so as to embody it into process, product, technological, and market innovations.

Due to our relationship with our partner, we have been / were able to introduce new products, the majority of which were not available in the market earlier.
Due to our relationship with our partner, we have been / were able to introduce new products, the majority of which were already being sold by our partner
Due to our relationship with this partner, we have been / were able to extend our product range into new areas, the majority of which neither of us were working in earlier
Due to our relationship with this partner, we have been / were able to extend our product range in new areas, the majority of which our partner was serving earlier
Due to our relationship with our partner, we have been / were able to enter into new technological fields, the majority of which neither of us was working in earlier
Due to our relationship with our partner, we have been / were able to enter into new technological fields, the majority of which only our partner was working in earlier
The majority of the knowledge gained from our relationship with this partner has been / was in knowledge domains that both of us were not familiar with earlier
The majority of the knowledge gained from our relationship with this partner has been / was in knowledge domains that our partner was working in earlier
Due to our relationship with our partner, we have been / were able to gain new administrative and managerial knowledge the majority of which neither of us had earlier
Due to our relationship with our partner, we have been / were able to gain new administrative and managerial knowledge the majority of which our partner had earlier
Our relationship with our partner generates new knowledge that can be used by both of us for mutual benefit
Our relationship with our partner is a way to acquire knowledge that will be useful primarily for our organization
Our relationship with our partner has helped us generate knowledge about new work processes, the majority of which neither of us possessed before
Our relationship with our partner has helped us generate knowledge about new work processes, the majority of which our partner possessed before

Please tell us about yourself to help us understand you better:

I am 1. Male 2. Female

My age: (in years) __________

My ethnic background is (If other please specify your ethnicity below “other”):
African American/Black
American Indian/Asian/Pacific Islander
Caucasian/White
Latino/Hispanic
Other

My highest level of education is:
1. High School (or equivalent) 2. Bachelors 3. Masters 4. PhD or beyond

I have worked for _________ years

I have mostly worked in the following industry (If other please specify the industry type below “other”)

Automotive 1  Aviation 2  Insurance 3  High-Technology 4  Pharmaceutical 5  Restaurant 6  Academic 7  Other 8

THANK YOU FOR YOUR TIME
Appendix 4.4

Final survey

FIRM STRATEGY AND INNOVATION ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

This survey is designed to allow us to understand how strategy and inter-organizational relationships influence innovation in supply chain relationships. Due to the strategic nature of the survey, it is important that the respondent be a member of the top management team directing strategy in a high-technology company.

Please find return envelope enclosed

Return Address:
Vishal Gupta, Director
High-Technology Business Innovation Project
Department of Management,
514 Cornell Hall,
University of Missouri,
Columbia, MO 65201
(573) 882-7659
I. CEO TENURE, FIRM FOUNDING, AND SIZE

Year this firm was founded __________ Total number of employees in this firm _______

Year the current CEO took office __________

II. TOP LEADERSHIP STYLE OF THIS FIRM

Please answer the following for how characteristic they are of the top management of your organization. Circle the number that best approximates the style of your top management.

The top management of our organization …

Competes mostly by being flexible and pursuing multiple strategic alternatives at the same time. 1 2 3 4 5

Tries to introduce a new, acceptable product quickly to beat rivals to the market. 1 2 3 4 5

Mostly competes through the creation of new products/technologies/markets that do not exist yet. 1 2 3 4 5

Tries to introduce new products or new markets even when in the face of great uncertainty. 1 2 3 4 5

Tries to be the first to introduce new, breakthrough innovations in products, technologies, markets, and/or processes. 1 2 3 4 5

Takes bold decisions and then tries to deal with the risk through their determination and will power. 1 2 3 4 5

Tries to act quickly to avoid overlooking, missing, or losing an attractive opportunity. 1 2 3 4 5

Begins to pursue opportunities quickly hoping that it will be able to mobilize the resources in stages. 1 2 3 4 5

Always have many more promising ideas than our time & resources allow us to pursue. 1 2 3 4 5

Primarily driven by the chance to create new technologies, products, and/or markets not yet known to people. 1 2 3 4 5

Competes mostly by conducting a detailed analysis of available alternatives and devotedly pursuing one of them. 1 2 3 4 5

Tries to introduce a carefully, developed product even if it leads to delays relative to competitors. 1 2 3 4 5

Mostly competes through improving our existing products/technologies in our current markets. 1 2 3 4 5

Adopts a cautious ‘wait and see’ policy to minimize the uncertainty around the product or market. 1 2 3 4 5

Tries to move into new products, technologies, markets, and/or processes only after other firms have already entered there. 1 2 3 4 5

Makes decisions that are associated with the least risk after careful analysis. 1 2 3 4 5

Waits before acting on any opportunity to reduce risk even if it means missing some opportunities in the process of waiting. 1 2 3 4 5

Plans & lines up resources before beginning to pursue an opportunity. 1 2 3 4 5

Finds it difficult to come up with a sufficient number of promising ideas to utilize our resources. 1 2 3 4 5

Primarily driven by the chance to introduce known & safe technologies, products and/or markets serving existing needs. 1 2 3 4 5

III. RELATIONSHIP STYLE OF THIS FIRM

Please answer the following for how characteristic they are of your firm’s orientation towards its alliance partners. Circle the number that best approximates your response.
In dealing with our supply chain partners, our organization …

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourages us to have as much concern for our partners’ interests as our own interests.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Encourages us to be ‘giving’ in our relationships with our partners so that they can benefit from the relationship too.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Emphasizes balancing the future needs of our organization with the future needs of our partners.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Encourages us to think that we and our partner organizations share a common future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Encourages us to interact with employees of our partner organizations in informal settings even outside of work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Emphasizes a high sense of unity between us and our partner organizations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Does not try to monitor our relationship with our partner organizations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Makes important business decisions through discussions with our partner organizations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Is usually willing to dedicate whatever people and resources it takes to make our relationships a success.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Tries to achieve a close alignment between our strategic plans and that of our partner organizations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Is willing to forgive or overlook minor mistakes and problems on the part of our partners.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Encourages employees to care about what happens to our partners.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Encourages us to think about our organization first and foremost when dealing with our partners.

Encourages us to ‘get’ as much as possible from our partner as fast as possible so that only we can benefit from the relationship.

Emphasizes the future needs of our organization more compared to that of our partners’ future needs.

Encourages us to think that our future is distinct from the future of our partner organizations.

Wants us to interact with employees of our partner organizations only in formal, official settings.

Does not consider it important to feel a sense of oneness between us and our partners.

Closely monitors every aspect of our relationship with our partner organizations.

Makes important business decisions entirely on our own without consultation with our partners.

Is usually watchful and careful about dedicating more people and resources than the minimum necessary to keep the relationship going.

Decides our strategic plans without any particular attention to our partner organizations.

Tries to hold our partners responsible for any mistakes or problems on their part.

Does not encourage employees to care about what happens to our partners.

IV. LEARNING STYLE OF THIS FIRM

In the following, please circle the number that best approximates the learning style of your firm.

Our organization …
Is open to making radical changes to its existing values, beliefs, and assumptions, if needed.

Believes that all employees can and should question the very way we perceive the business we are in so that we do not become obsolete.

Values ‘open-mindedness’ and encourages employees to think in new and different ways.

Is open to making changes to the way in which it defines itself.

Encourages employees to share their opinion even if it does not agree with what the top executives think.

Believes that disagreement or confrontation of ideas between employees can be beneficial to the organization.

Allows employees to question the ‘world view’ of top executives.

Believes that once we stop questioning, we endanger our future.

Values ‘open-mindedness’ and encourages employees to think in new and different ways.

Believes that employees should not question the existing perception of our business because the way we see our business has and will work for us.

Values compliance and encourages employees to stick to tried and tested ways.

Is resistant to making changes to the way in which it defines itself.

Encourages employees to share their opinion as long as it is broadly consistent with what the top executives think.

Believes that disagreement or confrontation of ideas between employees can not be beneficial to the organization.

Allows employees to ask questions about the ‘world view’ of top executives but not question it.

Believes that questioning destroys the unity of our organization endangering its future.

**V. INDUSTRY ANALYSIS**

To what extent do the following conditions currently characterize the industry your firm is in?

The rate of obsolescence is very slow (e.g. basic metal like copper) 1 2 3 4 5 Neutral

The product/service technology is well-established and is not subject to very much change (e.g. steel) 1 2 3 4 5 Neutral

Demand for the product/services of your principal industry is growing rapidly 1 2 3 4 5 Neutral

Opportunities for growth and expansion are significantly large in your industry 1 2 3 4 5 Neutral

The rate of obsolescence is very high as in some fashion goods

The modes of production/service change often and in a major way (e.g. advanced semiconductors)

Demand for the product/services of your principal industry is not growing

Opportunities for growth and expansion are few in your industry

**VI. SUPPLY CHAIN RELATIONSHIPS OF THIS FIRM**

A. The relationship between your firm and a key supplier.
Please read the following statements with reference to your strategic alliance with a supplier or a potential supplier that helps your organization gain knowledge.

Please indicate the extent of overlap between your organization and your key supplier on the following factors:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Low</th>
<th></th>
<th></th>
<th></th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>product and manufacturing technologies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>general administrative know-how</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>marketing and distribution expertise</td>
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<tr>
<td>R &amp; D expertise</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>organizational resources and competencies</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>employee skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>future goals and objectives</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>values and social norms</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>organizational culture</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>personnel management practices</td>
<td>1</td>
<td>2</td>
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</tr>
</tbody>
</table>

To what extent has the key strategic alliance between your organization and this supplier enabled you to accomplish the following:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Low</th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>Introduce new products, the majority of which were not available in the market earlier</td>
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<td>Introduce new products, the majority of which were already being sold by our partner</td>
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<tr>
<td>Enter into new technological fields, majority of which neither of us were working in earlier</td>
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<tr>
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<td>Acquire knowledge from our partner</td>
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</table>

This supplier relationship is **core** to our firm

This supplier relationship affects a **large** portion of our business

Supplier Name: ________________________________________________________________

Business Address: ________________________________________________________________

City: _______________ State: _______ Zip: _________ Tel: ______________

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B. The relationship between your firm and a key customer.

Please read the following statements with reference to your strategic alliance with a customer or a potential customer that helps your organization gain knowledge.

Please indicate the extent of overlap between your organization and your key customer on the following factors:

<table>
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<tr>
<th>Factor</th>
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<th>3</th>
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<td>5</td>
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To what extent has the key strategic alliance between your organization and this customer enabled you to accomplish the following:

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<th>3</th>
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</tr>
</tbody>
</table>

This customer relationship is **core** to our firm

This customer relationship affects a **large** portion of our business

---

Customer Name: ________________________________________________________________

Business Address: ______________________________________________________________

City: ________________ State: _______ Zip: _________ Tel: ________________

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VII. FIRM PERFORMANCE

This section lists selected performance measures. Some may be very important to your organization, while others may be much less important or not important at all. Please use the following scale to rate the performance measures to reflect your firm’s performance priorities. If an item is not at all important for your organization, please circle the ‘not applicable’ response.

<table>
<thead>
<tr>
<th>Minimum, Least Importance</th>
<th>Average Importance</th>
<th>Maximum, Most Importance</th>
<th>Not Applicable-Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Market Share</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Revenue Growth</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Stock Price</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Product development activities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please assess your organization’s **achieved** performance on the same factors. Consider your organization’s performance over the last three years, **compared to your competitors**.

<table>
<thead>
<tr>
<th>Very much lower</th>
<th>About the same</th>
<th>Very much higher</th>
<th>Not Applicable-Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>Product development activities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please assess your organization’s **expected** performance on the same factors. Consider your organization’s expected performance over the next five years, **compared to your competitors**.

<table>
<thead>
<tr>
<th>Very much lower</th>
<th>About the same</th>
<th>Very much higher</th>
<th>Not Applicable-Don’t Know</th>
</tr>
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<tbody>
<tr>
<td>Profitability</td>
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<td>Product development activities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

VIII. INDUSTRY KNOWLEDGE

Please indicate how strongly you agree or disagree with each of the following statements about your principle industry (Please circle response)

<table>
<thead>
<tr>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

The knowledge required to compete in our industry is quite complex

The knowledge required to compete in our industry is difficult to understand for an outsider

Competing effectively in our industry requires integration of many different types of knowledge

Firms in our industry need to have a wide variety of knowledge

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We appreciate your help in completing this survey. Please provide us the following information about yourself so that we can send you a summary of the findings of this research.

Your name

Your position and title

Your phone number (     )____________________

Email

May we follow-up briefly by phone ________________

Thank You for your help. We will email you our final report.
Vishal K. Gupta was born in the town of Talwara in the state of Punjab (India). He did his initial schooling in Delhi, India. He completed his Bachelor of Engineering in Mechanical Engineering from Giani Zail Singh College of Engineering and Technology (Bathinda, Punjab), receiving his degree from Punjab Technical University in 1998. He joined the Department of Management and Marketing at the University of Nebraska – Omaha in the fall of 2006.