The conversations in this volume about the role of knowledge in strategy management may be framed by seven basic questions:

1. What unique perspective does a knowledge-based view of the firm offer?
2. Should the organization focus on creating new knowledge or applying what it already knows?
3. How does an organization create new knowledge?
4. What knowledge should the firm share and transfer, and what knowledge should the firm protect?
5. Is a knowledge-based strategy the product of careful planning, or the outcome of learning and discovery?
6. What is the difference between managing knowledge and managing intellectual capital?
7. What are the main levers for designing a knowledge-based strategy?

Most of the chapters in this book directly or indirectly address these questions. We searched for concepts that would increase our understanding, in two iterations. Below we first review the main ideas presented by contributors in each of the seven parts of the book, highlighting the ways in which they connect with or differ from each other. After these sectional reviews, we draw upon the principal themes presented by the contributors in an attempt to answer the questions raised above. We conclude this introductory chapter with a framework that brings together the major elements in our discussions about strategic knowledge management.

Review of the Sections

Knowledge in Organizations

We begin part I with two chapters that examine the fundamental ways that we look at organizations. Adler (chap. 2) revisits the market and the hierarchy as mechanisms for coordination and makes the observation that a third form of coordination based on trust and community will
become more important in a knowledge-intensive economy. Moreover, this form of trust is new. Instead of being derived from tradition or loyalty, the new trust is built upon values of competence and integrity. This trust will be tempered by hierarchical rules to ensure stability, and by market competition to ensure flexibility.

Blackler (chap. 3) sees the creation and use of knowledge as the collective outcome of social practice that he labels organizational knowing. As a phenomenon, knowing is situated, mediated, provisional, pragmatic, and contested. A promising framework to analyze knowledge work would be the version of activity theory developed by Yrjo Engestrom, which views human activity systems as multiple mediated interactions between individuals, communities or groups, tools, and concepts. Boisot (chap. 4) maps the creation and sharing of organization in his information space model. His focus is on the articulation and diffusion of knowledge. The articulation of organizational knowledge requires abstraction (creating cognitive categories to make sense of events) and codification (refining the categories to simplify distinguishing between them). The more abstract and codified the knowledge, the more diffusible it is. Diffusion results in use when the new knowledge is absorbed and embedded in practice. Choo (chap. 5) combines elements from Blackler's concept of organizational knowing and Boisot's information-based analysis. Strategy is seen as the outcome of organizational sensemaking, knowledge creation, and decision making. The greater the interplay between these three information processes, the more effective the organizational learning and adaptation. The final chapter by Despres and Chauvel (chap. 6) makes a broad survey of the literature and identifies seven concepts that structure the discussion on knowledge management: time, type or forms of knowledge, social space, context, transformation or dynamics, carriers or media, and knowledge culture.

Knowledge-Based Perspectives of the Firm

Conner and Prahalad (chap. 7) begin part II by contrasting a resource-based theory of the firm with the opportunism-based model of the firm in transaction cost economics. They note that the organizational mode (market or firm) through which individuals cooperate affects the knowledge they apply to business activity. Specifically, the organizational mode affects knowledge substitution (how present knowledge is employed) and knowledge flexibility (how future knowledge is acquired). In the choice of organizational mode, opportunism-independent considerations can outweigh opportunism-based ones. When the possibility for opportunism is low, transaction cost economics predicts the choice of a market mode. However, the resource-based theory predicts that a firm organization would nevertheless be selected in low-opportunism conditions when it results in more valuable knowledge being applied to the business activity.

Grant (chap. 8) points out that we do have a number of concepts that articulate a knowledge-based view of the firm: (1) Knowledge is the most important resource for generating market value and economic rent. (2) Explicit and tacit types of knowledge vary in their transferability. (3) Knowledge is subject to economies of scale and scope, and knowledge-intensive industries may experience increasing returns. (4) Knowledge is created by human beings, who need to specialize to be efficient in knowledge creation and storage. (5) Producing a good or service typically requires the application of many types of knowledge. Based on these observations, Grant asserts that firms exist to create conditions in which multiple individuals can integrate their specialist knowledge. He identifies four integration mechanisms (rules and directives, sequencing, routines, and group problem solving and decision making) that need to be supported by a base of “common knowledge” (common language, shared meanings, overlapping knowledge).

Spender (chap. 9) also examines the “integration” theme. He distinguishes two domains of knowledge management. One presumes that knowledge is objectifiable as an asset, while the other sees knowledge as the response to uncertainty arising from management’s lack of knowledge on how to integrate what the firm knows explicitly. In the knowledge-based theory of the firm, knowledge thus has a front face that comprises knowledge about the elements of the firm’s activities, and assumes that they are inherently designable; and a back face that analyzes the uncertainties of integrating the front-face elements. As does Grant. Spender considers “common knowledge” the key to this integration.

Von Krogh and Grand (chap. 10) specify that a knowledge-based theory of the firm would need concepts to explain knowledge origin, knowledge creation, how the firm establishes coherence, revolutionary versus evolutionary changes, and the link between managerial action and knowledge.
creation leading to success. On this last criterion, they suggest that knowledge management should focus on the management of conditions enabling knowledge creation. These enabling conditions include formulating a vision, enabling new experiences among members, structuring relationships among members, changing the relationships, changing the quality of the relationships, and creating knowledge-centered activism.

Huizing and Bouman (chap. 11) introduce the concept of information transaction space as the set of possible information exchanges available to an actor at a point in time: a “market for knowledge” where information seekers, providers and brokers organize arrangements for information exchange. The object of knowledge management is then the efficient allocation of the information transaction space. Four ideal-type governance modes are presented: (1) In the market mode, information demand and supply shape exchange relationships. (2) In the organized market, knowledge management helps solve the problem of finding reliable sources. (3) In the extended organized market, the focus is on finding sources and asking relevant questions unambiguously. (4) Finally, in the firm, the information space is organized to address all three problems of finding sources, asking relevant questions, and facilitating interpretation and use.

Knowledge Strategy

In part III, both Zack (chap. 15) and Bierly and Daly (chap. 16) provide definitions of knowledge strategy. Zack sees it as competitive strategy that is built around a firm’s intellectual resources and capabilities. Bierly and Daly define it as the set of strategic choices addressing knowledge creation in an organization, which guide the development of intellectual capital and thus competitive advantage. These two chapters also present typologies of knowledge strategies that share the same pair of classificatory dimensions: the degree to which the firm creates or applies knowledge (exploration vs. exploitation), and the degree to which the firm learns or obtains knowledge internally or externally (internal vs. external). Zack suggests that aggressive knowledge strategies based on innovative knowledge that crosses boundaries would yield superior performance. Bierly and Daly describe “bimodal learners” that excel at both exploration and exploitation.

The three chapters by Winter and Szulanski (chap. 12), Sanchez (chap. 13), and Garud and Kumaraswamy (chap. 14) all elaborate on the exploitation theme of leveraging existing knowledge to derive competitive advantage. Winter and Szulanski show that the replication of organizational routines is an effective strategy for firms to exploit their knowledge assets. Moreover, firms pursuing replication are useful “laboratories” for studying differences in knowledge transfer and use. Garud and Kumaraswamy propose that in times of continuous and systemic change, firms need to take advantage of economies of substitution by reusing and retaining existing components when developing high-performing systems. To reduce the cost of component reuse, firms would need to simultaneously pursue elements normally viewed as antagonistic, for example, incremental and radical learning, markets, and hierarchies. Sanchez continues the discussion of knowledge reuse by focusing on the principle of modularity. Firms that systematically develop modular product and process architectures are specifying and articulating firm knowledge with the clarity needed to facilitate reuse, substitution, and reconfiguration of components. This in turn can promote strategic learning through leveraging current architectures as well as creating next-generation architectures.

Choi and Karamanos (chap. 17) observe that it is increasingly difficult to assess with high certainty the exchange value of knowledge-based goods. Instead of trying to value goods themselves, we rely on indices or indicators in the socioeconomic environment to identify certain actors and to certify their resources. Consequently, firms pursuing a knowledge strategy would need to understand what these indices are and how they may be managed.

Knowledge Strategy in Practice

The chapters in part IV describe and analyze knowledge management in practice in a range of settings: technology-intensive Japanese companies (Sony, Canon, NEC), Toyota Motor Company, General Motors, a highly regarded U.S. law firm, Accenture/Andersen Consulting, a venture capital company, and a Canadian government agency. Helfat and Raubitschek (chap. 18) and Knott (chap. 19) examine knowledge creation and use in the context of cycles of product development over time and across different chains or families of products. Helfat and Raubitschek show that knowledge, capabilities, and products coevolve, so the firm’s changing portfolios of products and knowledge open up strategic op-
opportunities for linking products within and across chains. Knott examines the product development history of a successful Toyota car model and found evidence that the firm had executed a knowledge strategy based on combining exploitation and exploration. Rather than mutually exclusive, exploitation and exploration are complements that reinforce each other. Barabba et al. (chap. 20) apply a systems approach to knowledge management and present a design of a learning and adaptation support system that has been implemented at General Motors. The system tracks significant decisions, checks assumptions and outcomes, diagnoses deviations, and makes new learning available to others. The GM experience shows that the willingness to learn is high when users have confidence in the quality of diagnosis and error correction.

Moving from manufacturing to the services sector, Starbucks (chap. 21) takes an engaged and engaging look at the highly profitable and innovative U.S. law firm of Wachtell, Lipton, Rosen, and Katz. Starbucks attributes the success of the firm to its ability to assimilate what appears to be conflicting principles and to learn swiftly from experience, converting initial difficulties into opportunities. Yoo and Torrey (chap. 23) report interesting differences in how consultants of a global management consulting firm create, seek, and share knowledge in two countries. Differences in national cultures would account for the patterns that emerge. (Appleyard [chap. 30] in Part VI also reports differences in knowledge sharing between Japanese and U.S. employees in the semiconductor industry.) Multinational firms should recognize and manage the influence of national cultures, through, for example, training and ways of leveraging particular cultural traits. Moldoveanu (chap. 22) contrasts two epistemologies at work in a venture capital company and a government department as they decide whether to provide financial support for a high-technology start-up firm. Whereas the government department applied a rule-following “justificationist” approach, the venture capital company exercised a more open and questioning “falsificationist” approach. The latter’s more adaptive belief revision strategy led to more robust causal models for guiding investment decisions.

Knowledge Creation

The common theme in part V is the knowledge creation model developed by Nonaka (chap. 24). There are many aspects to the model (a full elaboration is in Nonaka and Takeuchi 1995), but among the most widely cited are the distinctions between tacit and explicit knowledge, and the cycle of four processes that create new knowledge by converting tacit knowledge into explicit knowledge (the socialization-externalization-combination-internalization, or SECI, model). Since 1995, more conceptual elements have been added to the basic model. Umemoto, a colleague of Nonaka, discusses in chapter 25 three major extensions in terms of concepts and applications: the concept of “Ba” or shared context for knowledge creation, sharing, and use; a typology of knowledge assets (experiential, conceptual, systemic, and routine knowledge assets); and knowledge leadership that provides “enabling conditions” conducive to knowledge creation. Ichijo (chap. 26) examines the tension between exploitation and exploration in the context of knowledge creation and suggests that both exploration (of firm-unique knowledge) and exploitation (of public knowledge) are necessary to increase intellectual capital and competitive advantage. Kulkki (chap. 28), who completed her doctoral work with Nonaka, expands the analysis of knowledge creation to global companies. She draws the distinction between local and global knowledge and investigates how some global firms are “architects of time” in the way that they “constitutively create their futures and their future markets with customers, partners, suppliers, and so on.” This co-creation combines local and global innovation processes and is based on shared visions and experiences at the local and global levels. Leonard and Sensiper (chap. 27) suggest three ways that tacit knowledge is exercised in group innovation: problem solving, problem finding, and prediction and anticipation. In problem solving, experts overlay a problem with patterns derived from experience to quickly find a solution. In problem finding, tacit knowledge is used to frame a problem, often in a way that challenges assumptions or reveals hidden dimensions, so as to stimulate more radical innovation. In prediction and anticipation, tacit knowledge enables the prepared mind to follow hunches, listen to intuition, and take mental leaps to new ideas.

Knowledge across Boundaries

Transferring knowledge from beyond the firm’s boundaries is an important strategy for organizations to add depth or breadth to their knowledge-based capabilities. In part VI, the re-
view chapter by Fischer et al. (chap. 29) highlights findings in the research on knowledge transfer in alliances. Knowledge transferred is not necessarily assimilated or applied. The outcome of the knowledge transfer is conditioned by (1) the tacitness or causal ambiguity of the knowledge and (2) the capacity of the firm to absorb the knowledge, or absorptive capacity (Cohen and Levinthal 1990). Recent research has extended the concept of absorptive capacity beyond technical similarities to include such nontechnical similarities as organizational structures and compensation schemes. Fischer et al. suggest that conceptual frameworks from organizational learning and social network theory would be helpful when analyzing interfirm knowledge transfer. This same suggestion appears to have been taken up by other authors in this section without prior prompting. The effect of similarity between units in an organizational chain on the transfer of knowledge is examined empirically by Mitchell et al. (chap. 31). They found that transfer learning was both constrained and facilitated by the level and similarity of capabilities in component units and their chains. High-capability chains transferred knowledge to low-capability components, but low-capability chains required high-capability components to “regress” to capabilities the chain was more experienced with.

A second, related theme of this part of the book is the importance of social, cultural, or community norms that support knowledge sharing and contribution. The field study by Sole and Edmondson (chap. 33) suggests that in dispersed, cross-functional teams, members not only need to engage knowledge from diverse communities in order to surmount difficult problems, but also have to integrate this knowledge by developing congruent understandings of the structure and goals of the collective effort, and by developing norms and practices for communication and information sharing. Ciborra and Andreu (chap. 32) combine organizational learning with knowledge transfer as they develop the learning ladder model to analyze knowledge sharing within and between firms, and among firms collaborating in weblike networks. The way the Linux community has been able to operate successfully as a self-organizing weblike organization challenges conventional notions about coordination and governance, opportunism and free riding, and intellectual property rights protection.

A third theme in this part is the recognition that knowledge transfer is inherently two-way, so that some knowledge is given away even as new knowledge is acquired. Both Appleyard (chap. 30) and Matusik (chap. 34) propose a cost-benefit analysis approach to understand firms’ decisions to share knowledge. Two categories of costs appear important: costs due to the loss of knowledge by the focal firm, and costs due to having to manage the knowledge transfer transaction. Appleyard’s survey of U.S. and Japanese firms in the semiconductor industry also reveals interesting differences in their patterns of knowledge sharing. Employees in the United States relied more on private channels, while Japanese employees relied more on public channels. Thus, U.S. employees were approached more frequently for technical information, but Japanese employees were more likely to answer the (fewer) requests that they did receive. (See also Yoo and Torrey in [chap. 23] Part IV, who report differences in knowledge sharing by Korean and U.S. employees in a consulting firm.)

Managing Intellectual Capital

The chapters in part VII discuss intellectual capital and the stock of knowledge in the firm. Intellectual capital theorists Bontis (chaps. 35 and 36), Nahapiet and Ghoshal (chap. 38) and DeCarolis (chap. 39) propose a multifaceted description comprising human, structural, customer, relational, and social capital. Whereas the intellectual capital literature clearly identifies human capital and structural capital as distinct components, the final three seem to be intertwined and require further unraveling.

Bontis argues that customer capital is a subset of relational capital. In other words, the knowledge embedded in customers in the form of marketing and sales intelligence considers only one element of the integrated value chain. Presumably, organizations have knowledge embedded throughout their value chain, starting with their suppliers. Considering both directions of the value chain requires a broader conceptualization than originally proposed in the literature. Relational capital extends the definition of customer capital by including both sides of the value chain.

Nahapiet and Ghoshal expand the concept of social capital further by including all knowledge embedded in the social network of a firm beyond that of customers and suppliers. While the conceptualization of human and structural capital were initially focused inward, the advent of relational and social capital allows theorists to include an important environmental context as well. DeCarolis further develops the concept of
social capital by providing an important link to entrepreneurial activities.

Pike et al. (chap. 37) bring two vital perspectives into the fold. Although essential for practitioners, accounting disclosure still remains an untapped research area for intellectual capital academics. Researchers recognize the importance of describing intellectual capital assets, but accounting policy makers are facing enormous roadblocks in implementing generally accepted principles that will be universally accepted. There is a tremendous opportunity for researchers to fill the void.

Crossan and Hulland (chap. 40) examine the links among learning, strategy, and knowledge management, and the role of leadership in organizational learning. They found a strong correlation between leadership and all elements of the organizational learning system. Moreover, there is also a strong correlation between the organizational learning system and organizational performance. They conclude that, over time, firms need to innovate through “feed-forward flow of learning” (exploration) while also ensuring financial returns through “feedback flow of learning” that institutionalizes new learning through the levels of the organization (exploitation). Crossan and Hulland show clearly how organizational learning can bring a dynamic, process perspective to the strategic management of stocks and flows of organizational knowledge.

**Themes and Tensions**

The collection of 41 chapters by seventy-four authors in this volume forms a rich pool of thinking and writing in which to look for patterns and motifs. Some of the themes are already apparent from the summaries above, but here our intent is to clarify and broaden these conceptual pathways, bringing in other related work that illuminates these themes.

**What Unique Perspective Does a Knowledge-Based View of the Firm Offer?**

**Toward a Knowledge-Based Theory of the Firm**

A theory of the firm seeks to answer at least three questions: Why do firms exist? What determines the scale and scope of firms? Why do firms differ? One widely applied approach to addressing these questions is based on transaction cost economics. Williamson (1975, 1991) proposes that the unit of analysis in organizational study should be the transaction, or the exchange of a good or service. An organization is seen as a pattern of transactions between individuals or groups of individuals, and it therefore adopts the structure that offers the lowest transaction costs for the exchanges it wishes to enter into. Transactions of goods or services consist of contractual relationships. Williamson (1995) argues that the efficacy of the contracting mechanism is constrained by bounded rationality and subject to opportunism or “self-interest seeking with guile” (p. 26). Moreover, asset specificity arises when the firm is dependent on suppliers who have made specialized investment to engage in the transaction. Where bounded rationality, opportunism, and asset specificity occur together, transactions are better mediated by the private ordering of contracts. In the world of governance, the imperative is to organize transactions so as to economize on bounded rationality while safeguarding them against the hazards of opportunism. Williamson (1975) suggests that there are three generic governance structures: the market, the hierarchy, and a hybrid structure. Organizations move from the market to the hierarchy as transactions become more complex and uncertain. The hierarchy extends the bounds on rationality by allowing specialization in decision making and savings in communication; curbs opportunism by allowing incentive and control techniques; “absorbs” uncertainty and allows interdependent units to adapt to contingencies; resolves small-numbers indeterminacies by fiat; and reduces information gaps between exchange agents by allowing audits and other checks (Williamson 1975, p. 257).

The development of a knowledge-based theory of the firm is still in its infancy. One approach, first broached by Edith Penrose in 1959 (see Penrose 1995), is based on the idea that firms develop unique capabilities or “resources” as they develop products; build up research, production, and marketing capabilities; and learn from their customers. The resource-based view conceptualizes firms as bundles of resources that are heterogeneously distributed across firms. Moreover, these resources cannot be transferred between firms without cost, so a firm’s resource differences will persist over time. Resources may include a firm’s specific physical assets (e.g., equipment), human resources (e.g., expertise), and organizational processes (e.g., marketing).
When firms possess resources that are valuable (they bring about efficiency or effectiveness) and rare, they can produce competitive advantage. Additionally, when these resources are also inimitable (difficult to replicate) and nonsubstitutable (other resources cannot serve the same function), then the competitive advantage becomes sustainable (Barney 1991). Conner and Prahalad (chap. 7 this volume) show how the resource-based view predicts governance modes different from those predicted by transaction cost economics. When opportunism is low, transaction cost economics predicts the choice of a market mode. However, resource-based theory predicts that the firm structure would still be selected in low-opportunism conditions when it allows more valuable knowledge to be applied to the firm’s activities. Ghoshal and Moran (1996) argue that firms are not mere substitutes for structuring efficient transactions when markets fail. The advantage of organizations over markets lies not in overcoming human shortcomings through hierarchy, but in leveraging the human ability to take initiative, cooperate, and learn, and the organizational ability to develop shared purpose. Thus, learning and trust would take the place of cost-economizing and opportunism.

In the ongoing debate between transaction cost economics (governance) and the resource-based (competence) perspective, Williamson (1999) observes that both views are needed:

Given that both governance and competence are bounded rationality constructs and hold that organization matters, both share a lot of common ground. To be sure, there are differences. Governance is more microanalytic (the transaction is the basic unit of analysis) and adopts an economizing approach to assessing comparative economic organization, whereas competence is more composite (the routine is the unit of analysis?) and is more concerned with processes (especially learning) and the lessons for strategy. Healthy tensions are posed between them. Both are needed in our efforts to understand complex economic phenomena as we build towards a science of organization. (p. 1106)

Priem and Butler (2001a, b) evaluate the status of the resource-based view as a formal theory of the firm. They argue that its theoretical statements are true by definition and therefore tautological (e.g., “rare resources that enable a firm to implement specific value-creating strategies are a source of implementing strategies that are not being pursued by competitors”). The definition of “resources” is also problematic, since virtually anything associated with the firm can be a resource. Furthermore, the dependent variable (“value”) lies outside the framework: value is determined by the product-market environment that is external to the firm. As a result, the theory is silent on “how” questions: “How can the resource be obtained? How and in which contexts does it contribute to competitive advantage? How does it interact/compare with other resources?” (Priem and Butler 2001a, p. 35).

In a rejoinder, Barney (2001) discusses a number of practical implications resulting from the resource-based logic. Firms experiencing strategic disadvantage can use the framework to identify those valuable and rare assets that they do not possess, and to indicate that these resources can be duplicated by imitation or substitution. Firms can also use the model to more completely evaluate their range of resources, and then to exploit these resources for sustained strategic advantage. Finally, firms can use resource-based reasoning to ensure that they nurture and maintain the resources that are the source of their current competitive advantage.

Spender (1994) asserts that the resource-based view may be too narrow. By concentrating on the acquisition and protection of critical resources, it underestimates the importance of how resources are brought together, coordinated, integrated, and put into use. Spender suggests that this coordinating capacity is the essence of the firm, and that the core of the rent-producing firm is its ability to learn by doing and to develop its coordinating capabilities. Grant (chap. 8 this vol.) notes that a knowledge-based perspective on economic organization implies that we are shifting our focus away from governance, toward the mechanisms and contexts through which coordination is achieved: “If the goal of organizational analysis is to predict the most efficient structures and systems for organizing production, a knowledge-based perspective suggests that the primary consideration is not so much the institution for governing transactions (markets vs. firms) as the mechanisms through which knowledge integration is achieved.”

Teece et al. (1997) propose that the competitive advantage of the firm depends on its dynamic capabilities, conditioned by its specific asset positions (its portfolio of knowledge and complementary assets), and the evolution path that it has taken. Dynamic capabilities are de-
Eisenhardt and Martin (2000) extend the concept of dynamic capabilities to include “the organizational and strategic routines by which firms achieve new resource configurations” (p. 1107). They point out that some dynamic capabilities integrate and reconfigure resources, while others allow the firm to acquire and release resources. The chapters in this volume provide many examples of firms deriving competitive advantage from this movement and integration of resources. Winter and Szulanski describe the strategic replication of routines in Banc One and Rank Xerox. Mitchell et al. analyze the transfer of learning in chains of U.S. nursing homes. Helfat and Raubitschek examine the coevolution of knowledge, capabilities, and products through product sequencing capabilities in Sony, Canon, and NEC. Knott describes a product development capability at Toyota that integrated exploitation and exploration. Garud and Kumaraswamy, and Sanchez show that modularity and modular product and process architectures can help articulate the firm’s knowledge and facilitate knowledge reconfiguration and reuse.

Three concepts characterize the theory development so far: (1) Firms possess specific resources and capabilities that are heterogeneously distributed. (2) Competitive advantage depends on the firm’s knowledge and ability to continuously configure and integrate resources into value-creating strategies. (3) The firm develops competitive advantage by expanding its unique knowledge and capabilities, and by knowing the specific product and market contexts in which this knowledge generates value. Thus, “resources, representing what can be done by the firm, and the competitive environment, representing what must be done to compete effectively in satisfying customer needs, are both essential in the strategy-making process” (Priem and Butler 2001b, p. 64).

Should the Organization Focus on Creating New Knowledge or Applying What It Already Knows?

Exploration and Exploitation

The tension between exploitation and exploration has been sharply observed in organization theory. An organization that engages exclusively in exploration will ordinarily suffer from the fact that it never gains the returns of its knowledge. An organization that engages exclusively in exploitation will ordinarily suffer from obsolescence. The basic problem confronting an organization is “to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability” (Levitt and March 1993, p. 105). The returns to exploitation are more certain, more immediate, and closer in space than are returns to exploration (March 1991). However, the effect of exploitation is to increase competency in existing domains while raising the opportunity cost of exploration, resulting in “the traps of distinctive competence” or “the success trap” (Levitt and March 1993). The reverse is a firm caught in a spiral of exploration, constant change, and frequent failure (“the failure trap”). Frequent failure is unsurprising since good new ideas are hard to come by, and time and experience are needed to learn how to make a good idea work. An organization can control the balance between exploration and exploitation by adjusting aspirations, beliefs, feedback, incentives, and socialization or selection processes (Levitt and March 1993). An organization can break out of the success trap by raising aspirations to levels that induce exploration or new knowledge creation, or by introducing feedback that exaggerates the high value of exploration. For example, if aspiration levels are tied to the best performers in an industry, then individuals may perceive themselves as performing substantially below the standard and are more likely to take risks and to explore. Symmetrically, an organization can break out of a failure cycle by lowering aspirations or by introducing a particularly good alternative. When individuals perceive themselves as operating above or close to aspiration levels, they become risk averse and refrain from exploitation. In other words, modest success is associated with risk aversion (March and Shapira 1987).

The tension between exploration and exploitation is one of the themes that appears most persistently among the chapters in this volume. For example, Conner and Prahalad contrast the effects of knowledge-substitution (exploiting current knowledge) and knowledge flexibility (exploring future knowledge). Bierly and Daly, and Zack, who independently developed typologies of knowledge strategies, both use the dimension of exploitation versus exploration for classifying knowledge strategies. As we discuss below, the chapters by Crossan and Hulland, Ichijo, and Knott also examine this tension.
The discussions in this volume point to three strategy options. The first would be to focus on exploitation. Exploitation is the use of the firm's existing stocks of knowledge and capabilities. A knowledge strategy focused on exploitation implies the codification of knowledge, rendering it explicit so as to promote reuse in multiple contexts, and to facilitate recombination with other sets of knowledge in the firm. This point of view may be discerned in the chapters by Sanchez, Garud and Kumaraswamy, and Winter and Szulanski. Sanchez recommends that firms develop modular product and process architectures so that knowledge components defined in the architecture can be reconfigured and reused. Garud and Kumaraswamy suggest that firms gain economies of substitution through partial retention and reuse of existing components when designing high-performance systems. Winter and Szulanski show the efficacy of replicating organizational routines in exploiting a firm's knowledge assets.

The second strategy option would be to focus on exploration. Exploration leads to the creation of new knowledge that is then applied in the development of new products and services. Exploration and new knowledge can also expand the capabilities and range of responses available to the firm. (Knowledge creation is examined as a major theme on its own in the next section.)

The third option is to embrace both exploitation and exploration. Several authors in this volume present the case for this option. Knott found empirical evidence that Toyota had executed a knowledge strategy combining exploitation and exploration as complements that reinforced each other. Exploitation led to learning curve cost reductions across product developments, while exploration led to product improvements and innovations. Crossan and Hulland also concluded from their field study that firms need two kinds of learning flows—feed-forward and feedback—that correspond to exploration and exploitation. Ichijo found that GE combined exploration of firm-unique knowledge with exploitation of public knowledge. Whereas Knott, and Crossan and Hulland describe the coexistence of exploitation and exploration across different processes, Ichijo describes the dual strategy working on different categories of knowledge. Finally, Bierly and Daly propose a category of "bimodal learners" for firms that are adept at both exploration and exploitation. Bimodal learners may be "amidextrous" organizations (Tushman and Anderson 1996) with multiple cultures or subcultures that allow it to pursue both directions successfully, or "chameleon" organizations that can rapidly switch their focus between exploitation and exploration in response to environmental changes.

To summarize somewhat baldly, the benefit of exploitation is based on increased efficiency, that of exploration is based on increased innovation, and that of a bimodal combination is based on enhanced adaptability. The task for researchers and practitioners is to clarify the conditions under which exploitation, exploration, and/or bimodal learning would create sustainable advantage. Such conditions would probably relate to the type of industry, the nature of the knowledge, and the characteristics of the firm and its activity.

How Do Organizations Create New Knowledge?

The Knowledge to Create Knowledge

The model of knowledge creation developed by Nonaka (chap. 24 this vol.) and Nonaka and Takeuchi (1995) is one of the most cited theories in the knowledge management literature. At the core of the model is the distinction between tacit and explicit knowledge, and the analysis of the dynamics of knowledge creation through cycles of socialization, externalization, combination, and internalization (SECI cycles) that engage tacit and explicit knowledge across organizational levels.

All organizational knowledge is rooted in tacit knowledge. Yet, as long as tacit knowledge remains the private property of individuals or select groups, the organization cannot multiply its value in at least two important modes. First, the organization is limited in its ability to leverage that knowledge to gain economies of scale or strategic advantage:

Unless able to train large numbers of individuals or to transform skills into organizing principles, the craft shop is forever simply a shop. The speed of replication of knowledge determines the rate of growth; control over its diffusion deters competitive erosion of the market position. For a firm to grow, it must develop organizing principles and a widely held and shared code by which to orchestrate large numbers of people and, potentially, varied functions. (Kogut and Zander 1992, p. 390)

Second, the organization is unable to sustain cycles of new knowledge generation that depend on
the continuous conversion of tacit and explicit knowledge, and on the amplification of this knowledge across many levels of the organization (Nonaka and Takeuchi 1995). Knowledge conversion takes place when people share, externalize, combine, and internalize their knowledge. Knowledge expansion takes place when new ideas and concepts move to other parts of the organization to spark new cycles of knowledge creation.

The dichotomy between tacit and explicit knowledge has been emphasized so often that we need to remind ourselves that the two not only are complementary to each other, but also are in many ways interdependent. In an organization, the exercise of one form of knowledge almost always requires the presence and utilization of the other form. Thus, the exercise of tacit knowledge typically makes references to plans or blueprints, entails the handling of tools and equipment, and involves following written or oral instructions, all of which embody various kinds of explicit knowledge. Conversely, the application of explicit knowledge often requires individuals who can interpret, elaborate, demonstrate, or instantiate the formal knowledge with respect to a particular problem setting. Behind every formal knowledge system in an organization is an informal support structure that is just as important and necessary for the organization to function properly. Some of the most useful sources of knowledge in an organization are those that combine the tacit and the explicit, that articulate the judgmental or the conjectural, and that reveal the hidden or the unobvious.

Organizations face a number of issues with respect to the management of its tacit knowledge. Tacit knowledge grows in the soil of experience, so employees need to be given the time and opportunity to specialize and build expertise in a certain area. As an alternative to cultivating its own tacit knowledge, an organization may consider contracting desired expertise on a “just-in-time” basis. This approach has limitations since tacit knowledge is not exercised in isolation, but needs to be contextualized and combined with the organization’s explicit and cultural knowledge. Another basic concern is one of access: how does an organization find out and provide access to what its participants know, particularly when this personal knowledge defies codification and classification? As long as the personal knowledge remains tacit, it constitutes a unique competitive advantage for the organization, since the knowledge is hard for other organizations to copy. Unfortunately, this uniqueness is not permanent or protected, since the tacit knowledge is lost should the individual decide to leave the organization (and perhaps join a competitor!). The organization managing its tacit knowledge has to deal with three major challenges: how to deepen its own stocks of tacit knowledge, how to access and activate this knowledge, and how to maximize the value derived from its use.

While the classification of organizational knowledge as tacit and explicit is widely discussed, the category of cultural knowledge is less often encountered. In epistemology, knowledge is sometimes defined as justified true belief (Audi 1998, Moser et al. 1998). An organization’s cultural knowledge thus consists of the beliefs it holds to be true and justifiably so (based on experience, observation, reflection) about itself, its environment, and its way of doing business. Importantly, an organization’s cultural knowledge is used to answer such questions as, What kind of business are we in? What is our business model? What knowledge would be valuable to the organization? What knowledge would be worth pursuing? Cultural knowledge consists of the assumptions and beliefs that are habitually used by organizational members to perceive and explain reality, as well as the criteria and conditions that are used to assign value and significance to new knowledge. Collins (1998) highlights two important roles of cultural knowledge: to understand and use facts, rules, and heuristics, and to make inductions in the same way as others in order to enable concerted action. Garud and Rappa (1994) suggest that the development of new knowledge based on technology is a sociocognitive process that rests on three definitions of technology: “technology as beliefs, artifacts, and evaluation routines” (p. 345). Technology development is guided by beliefs about what is possible, what is worth attempting, and what levels of effort are required. In their separate chapters in this volume, both Grant and Spender emphasize that knowledge integration in the firm is dependent on a base of “common knowledge” that consists of shared meanings, common language, and other forms of shared knowledge. Sole and Edmondson’s chapter describes the need for dispersed teams to develop congruent understandings of the goals and structure of their collective effort in order to integrate knowledge.

Overall, an organization’s beliefs about what technology or new knowledge is feasible and worth attempting, a part of its cultural knowledge, would influence the direction and intensity of the knowledge development effort, as well as
the routines and norms by which new information and knowledge would be evaluated. In the context of knowledge creation, cultural knowledge plays the vital role of providing a pattern of shared assumptions so that the organization can assign significance to new information and knowledge. Cultural knowledge supplies values and norms that
determine what kinds of knowledge are sought and nurtured, what kinds of knowledge-building activities are tolerated and encouraged. There are systems of caste and status, rituals of behavior, and passionate beliefs associated with various kinds of technological knowledge that are as rigid and complex as those associated with religion. Therefore, values serve as knowledge-screening and -control mechanisms.

(Leonard 1995, p. 19)

There are familiar accounts of organizations in which cultural knowledge is misaligned with efforts to exploit tacit and explicit knowledge. For example, Xerox PARC in the 1970s had pioneered many innovations that Xerox itself did not exploit but other companies commercialized into products that defined the personal computer industry. PARC had invented or developed the bit-mapped display technology required for graphical user interfaces; software for on-screen windows and windows management; the mouse as a pointing device; the first personal computer, Alto; and an early word-processing software, Bravo, for the Alto (Hiltzik 1999). Xerox did not fully apprehend the application potential of these inventions because its perception of self and what kinds of knowledge it should pursue were bounded by its established position in the photocopier market, and its belief in a business model based on selling closed, integrated systems. Developing the new technologies would have been too radical and risky a departure from what Xerox believed was its core business. Many of the researchers working on these projects subsequently left PARC, taking their knowledge with them.

Nonaka and Takeuchi (1995) do include aspects of cultural knowledge in the way they divide tacit knowledge into technical and cognitive dimensions. The technical dimension encompasses practical know-how, while the cognitive dimension includes mental models, beliefs, and perspectives that are so ingrained that they are taken for granted and therefore cannot be easily articulated. However, the suggestion here is that a separate category of cultural knowledge is helpful for the following reason. Tacit knowledge is personal knowledge that is lost to the organization when the individual leaves. Cultural knowledge, though to a large part not codified, remains with the organization as its membership changes. As beliefs and values that endure in the form of shared perceptions, incentive and reward systems, and evaluation methods and criteria, cultural knowledge has a powerful effect on the creation and adoption of new knowledge.

**What Knowledge Should the Firm Share and Transfer, and What Knowledge Should the Firm Protect?**

**Moving Knowledge across Boundaries**

Because of the substantial investment needed to create new knowledge and turn it into new products, coupled with the risk and uncertainty of the knowledge generation process, the distribution of valuable knowledge is unlikely to be uniform. As a result, the ownership of valuable knowledge can potentially earn both Ricardian and monopoly rents (Winter 1987). Ricardian rents are earned because the firm owning valuable knowledge possesses a factor of production that is more productive than its rivals. At the same time, monopoly rents are earned because the product developed with superior knowledge will be unique. The corollary of this reasoning is that the firm should protect its knowledge from appropriation or imitation (Liebeskind 1996). Spender and Grant (1996) note that “if knowledge is the primary resource upon which competitive advantage is founded, then its transferability determines the period over which its possessor can earn rents from it” (p. 7). Barney (1991) has identified inimitability as a criterion for assessing the ability of a resource to sustain strategic advantage.

Yet there are contexts where the deliberate sharing and transfer of knowledge constitute a strategic move. Firms in highly networked and densely connected industries where technologies and markets are still evolving may purposefully share knowledge in order to (1) encourage and enable the development of complementary products and services, (2) influence the development of common platforms, dominant designs, and de facto or formal standards, and (3) build up a critical mass of customers and users. Industries that experience network externalities where the value
and usefulness of a good or service depend on
the installed base of connected users may choose
to share knowledge with customers, competitors,
and collaborators. In addition to network extern-
ality effects, firms sharing knowledge may also
stand to gain the advantage of increasing returns
by establishing an early lead in a market or by
developing a dominant position in an industry.
The strategic challenge, then, becomes knowing
what knowledge to transfer and what knowledge
to retain as part of the firm’s valuable, rare, inimit-
able, nonsubstitutable resources.

Boisot (chap. 4 this vol.) analyzes the para-
doxical nature of the value of information goods
using 1-space (information space model). An in-
formation good maximizes its value when it is
highly articulated (abstracted and codified), and
when it is scarce. Paradoxically, the scarcity of
highly articulated knowledge is difficult to main-
tain precisely because that knowledge has been
codified and given structure and is therefore
more diffusible. Boisot concludes:

A critical skill for the knowledge-based firm
will thus be to know what to share and what to
hold on to. Recognizing when knowledge
should be actively diffused to outsiders
rather than hoarded, when it can be used to
extend the firm’s organizational reach be-
yond its boundaries, will become an impor-
tant source of competitive advantage. Build-
ing up the capabilities of the networks a firm
participates in through a judicious sharing of
its knowledge strengthens its own competi-
tive position within the network. Confining
its internal focus to core strengths prevents
it from overstretching what will always be
limited cognitive resources. (chap. 4)

Sanchez (chap. 13 this vol.) suggests that the fear
of losing explicit knowledge may be exaggerated.
In a knowledge-intensive economy, organi-
zations do not possess all the knowledge they need
internally but increasingly rely on sharing or
buying technologies or services from other or-
ganizations. The movement of knowledge within
and between organizations is often in the form
of transferring explicit knowledge. Because ex-

cplicit knowledge is articulated knowledge, it is
often assumed to be readily understood by oth-
ers and can therefore diffuse more easily beyond
an organization’s boundary. Sanchez suggests
that this assumption may not always be war-
ranted. Even though the knowledge has been
made explicit, the receiving organization may
experience problems of comprehension and val-
uation as it tries to understand and appraise
the significance of the articulated knowledge. There
may be several reasons: firms develop their own
languages and vocabularies that others might not
understand; different firms possess different lev-
els of technical capability; different firms are at
different stages of growth and development; the
usefulness of the knowledge depends on its link-
ages with other knowledge, resources, and capa-
bilities in the originating firm. Given these
uncertainties, the assumption that explicit
knowledge is fundamentally “less secure” than
tacit knowledge may be simplistic. Each firm
would need to identify the kinds of knowledge
that constitute its distinctive competencies and
maintain close control within the firm of the ex-

cplicit or articulated knowledge that is most crit-

cal, while leveraging as broadly as possible with
other firms knowledge that is strategically less
critical.

Is a Knowledge-Based Strategy the
Product of Careful Planning or the
Outcome of Learning and Discovery?

Organizational Learning as
Strategy Making

Three models of organizational learning as strat-
ey making are presented in this volume. They
share common assumptions and arrive at com-
mon implications: that the challenge of learning
as strategy is managing the stocks and flows of
knowledge across multiple levels of the organi-

cation in order to achieve both renewal and rent

generation.

Crossan and Hulland (chap. 40 this vol.) show
how organizational learning can bring a dynamic
process perspective to the strategic management
of stocks and flows of knowledge through the
organization. The “41 framework” asserts that
organizational learning takes place at the levels
of the individual, group, and organization. These
modes of learning are linked by social and psy-
chological processes of intuiting, interpreting,
integrating, and institutionalizing. The frame-
work is operationalized as the “strategic learn-
ing assessment map” that describes and analyzes
the stocks and flows of knowledge in a compre-

hensive organizational learning system. Their
research suggests that the transference of learn-

ing across levels is one of the greatest challenges
of managing organizational learning.

Another conceptualization of the levels of or-
organizational learning is presented by Ciborra and Andreu (chap. 32 this vol.). They assert that learning occurs at the levels of (1) resources and work practices (routinization learning loop), (2) organizational routines (capability learning loop), and (3) firm goals and core capabilities (strategic loop). Each level of learning is dependent on resources and outcomes from the level beneath it, so the model resembles a “learning ladder.” As do Crossan and Hulland, Ciborra and Andreu believe that it is the transformation of learning across these levels (“climbing up the rungs of the learning ladder”) that poses the major strategic challenge.

In another dynamic, process view of strategic learning, Boisot (chap. 4 this vol.) describes a “social learning cycle” that is divided into the six phases: scanning (identifying threats and opportunities), problem solving (acquiring and codifying insights), abstraction (generalizing new insights), diffusion (sharing new insights with a population), absorption (applying insights through learning by doing), and impacting (embedding in concrete practices).

What Is the Difference Between Managing Knowledge and Managing Intellectual Capital?

The Intellectual Capital Turf War

The concepts of organizational learning, knowledge management, and intellectual capital overlap significantly, but it is possible to draw some helpful distinctions. Bontis et al. (2001) suggest that, at a general level of analysis, intellectual capital represents the “stock” of knowledge that exists in an organization at a particular point in time. Thus, it represents what the organization has learned in a cognitive sense. Managing this stock of knowledge in a firm as it flows and grows is the domain of knowledge management. The way that stocks of intellectual capital change and evolve over time is then dependent on knowledge management strategies. Finally, organizational learning expands the analysis to include behaviors at the individual, group, and organizational levels, as well as processes that create and utilize knowledge in order to understand more broadly how the “stocks” change and flow.

In his literature review, Bontis (this volume) describes both the benefits and challenges academic researchers face when studying the intellectual capital phenomenon. Its intuitive appeal allows ample opportunity for practitioners to work alongside academics in further understanding its complex inner workings. However, while both groups venture forward, functional biases seem to provide added resistance. While accountants concern themselves with disclosing intellectual capital, strategists maintain it is the Holy Grail for sustainable advantage. While finance researchers attempt to value it, technologists argue for its codification. While human resource researchers want to keep it, legal departments try to license it. Our fear in this turf war is that while intellectual capital increases in overall scope and popularity, the depth of our understanding from any single functional perspective will be limited. How can we pursue both depth and breadth?

Among the many directions the accelerating research trajectory of this field can follow, these are some of the tensions that we suggest require increased attention. From an accounting perspective, we have spent significant time talking about disclosing intellectual capital assets; should we not disclose intellectual capital liabilities as well? Caddy (2000) warns that for every positive there is a negative, and for every sunrise there is a sunset. Intellectual capital research would benefit from the same dual perspective. Microsoft Corporation and its loss in the famous antitrust case in 1999 would be a perfect example. What was once considered an arrogant and overreaching monopoly now suffers from an exodus of top executives. The considerable intellectual capital liability generated by the fallout in the public press puts significant downward pressure on Microsoft’s market capitalization. The Exxon Valdez disaster in 1989 provides another setting for the study of intellectual capital liability. Even with over $3.5 billion spent on cleanup (Raeburn 1999), senior executives at Exxon Corporation are still limited in their strategic choices while environment groups watch them under a suffocating microscope.

Another suggestion we would like to make is that intellectual capital empirical research should be pursued with more fervor. We appreciate that studying an intangible, elusive, and ethereal phenomenon is never easy. However, the rewards of sound empirical research are countless. Most of the survey work done thus far (including Bontis (2000); chap. 36 this vol.) mainly reveals the intellectual capital topography of sampled firms (see also other survey researchers, e.g., Bornemann et al. 1999, Miller et al. 1999). More work is required that triangulates user perceptions with quantitative metrics over longitudinal time.
periods. Such a research program is not easy given that only a few firms in the world even have metrics that span more than a couple of years. However, the number of these firms is slowly increasing, and they are typically very enthusiastic about partnering with researchers who will enable them to be at the forefront of intellectual capital measurement.

A final suggestion on intellectual capital research comes from a user's perspective. Do we know that financial analysts want intellectual capital reports? Do we know that information technology administrators have bountiful knowledge repositories that are being used by all organizational members? Do we know that developing intellectual capital strategies is feasible in the long term from a cost-benefit perspective? Do we know that firms who report intellectual capital actually perform better? And finally, do we know that senior management teams that generate intellectual capital reports make better decisions? Unfortunately, the answer to all of these questions is no. The garden of opportunity awaits. We have an extremely fertile ground for future research.

### What Are the Main Levers for Designing a Knowledge-Based Strategy?

**A Framework for Strategic Knowledge Management**

Figure 1.1 ties the main threads of our discussion in a single framework consisting of (1) organizational knowledge processes, (2) locus or levels of learning, (3) types of intellectual capital, and (4) strategic levers.

A firm generates value from what it knows through the organizational processes of knowledge creation, knowledge transfer, and knowledge utilization. In knowledge creation, the firm produces new knowledge through the dynamic conversion and externalization of its tacit, embedded knowledge. In knowledge transfer, knowledge is shared within a firm across different functional groups, product families, geographical locations, and time periods. Knowledge is also transferred between firms through interorganizational alliances and linkages. In knowledge utilization, the firm integrates and coordinates its different forms of knowledge in order to take action and to produce goods and services. Tacit knowledge plays a crucial role in knowledge creation; codified or explicit knowledge facilitates knowledge transfer; “common” knowledge or shared understanding about goals and purpose guides knowledge utilization.

Over time, the firm accumulates a stock of knowledge and capabilities that is unique to its learning and experience. This stock is the firm’s intellectual capital, and it comprises human, structural, and relational capital that reside in its employees, organizational routines, intellectual property, and relationships with customers, suppliers, distributors, and partners. The stock of intellectual capital is continuously refreshed through new learning at various levels: the individual, the work group, the organization, and

<table>
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**Strategic levers**

- Intellectual capital
- Human capital
- Structural capital
- Relational capital

Figure 1.1 A framework for strategic knowledge management.
Figure 1.2 Conceptual structure of the book.

the network of organizations of which the firm is a part.

Within the framework composed by these elements, the chapters in this volume discuss a number of actions that a firm may pursue to leverage its knowledge. These “strategic levers” are shown in the lower part of figure 1.1. They include the following topics discussed by authors in this volume:

- Promoting “exploration” or knowledge creation through converting and sharing the organization’s tacit knowledge (Nonaka)
- Forming cross-functional work teams that are able to access and integrate the diverse knowledge of members (Leonard and Sen-siper, Sole and Edmondson)
- Establishing “enabling conditions” that are conducive to organizational knowledge creation (von Krogh and Grand, Umemoto)
- “Codifying” knowledge to facilitate diffusion (Boisot)
- Replicating organizational routines across different parts and locations of the firm as a way of exploiting knowledge assets (Winter and Szulanski)
- Developing “modular architectures” of product and process components and their interfaces in order to encourage recombination and reuse of knowledge (Sanchez, Garud and Kumaraswamy)
- Transferring knowledge and learning through alliances and organizational chains (Fischer et al., Mitchell et al.)
- Combining exploitation and exploration as complementary elements of the firm’s knowledge strategy (Ichijo, Knott)
- “Sequencing” product development so as to take advantage of the path that organizational knowledge, capabilities, and product has coevolved over time (Helfat and Raubitschek)
- Using a cost-benefit calculus to decide on external knowledge transfer (Appelyard, Matsis)
- Designing decision support as a strategic learning and adaptation system (Barabaa et al.)
- Reconceptualizing the role of leadership in the context of learning and innovation (Crossan and Hulland)
- Purposefully measuring, evaluating, and managing the firm’s intellectual assets (Bon-tis, Pike et al.)

The set of options shown is by no means exhaustive, but they suggest the kind of dynamic interplay between knowledge processes, types of intellectual capital, and the locus of learning and innovation that is necessary in crafting an effective knowledge-based strategy. The framework may also serve as a guide for positioning the seven parts of this book, as shown in figure 1.2.

Coda

Ultimately, there are no universal recipes on how a firm can best map out a knowledge-based strat-
strategy. Each organization would have to design its own responses and initiatives based on its aspirations, learning, and capabilities. These patterns of action would be shaped by conditions in the industry and the broader environment, as well as by the path that the organization has traveled. We recognize that organizations require many different kinds and levels of knowledge in order to be successful. Firms need knowledge to develop products; they need knowledge about customers and competitors in order to identify markets; they need knowledge about coordinating and integrating the flow and deployment of resources; and they need knowledge about how to continuously refresh and rejuvenate the intellectual capital and core capabilities they possess. We recognize that knowledge-based strategy is both an enactment and a response linking the firm’s specific characteristics and the contingencies of the environment it thrives in. In an increasingly dynamic and complex world, firms would need the agility and dexterity to enfold what would traditionally be regarded as opposites: combining exploration with exploitation, sharing and protecting knowledge, managing the stocks and flows of intellectual capital. While there are no pat solutions, the contributors in this volume offer a rich suite of conceptual lenses and analytical tools that can help us better understand and manage knowledge and intellectual capital in the pursuit of superior organizational performance.

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