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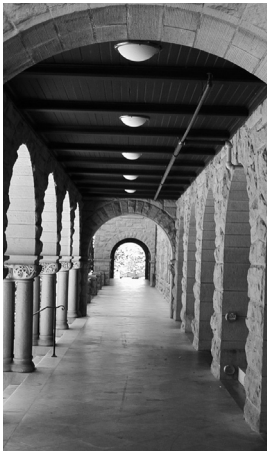

From Transactional Markets to Relational Networks: Amplifying the Innovation Potential of High-Tech Regions

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John Hagel, III and John Seely Brown

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About the Authors

John Hagel, III has nearly thirty years' experience as a management consultant, author, speaker and entrepreneur, and has helped companies improve their performance by effectively applying information technology to reshape business strategies.

Hagel currently serves as co-chairman of the Silicon Valley-based Deloitte LLP Center for Edge Innovation, which conducts original research and develops substantive points of view for new corporate growth.

Before joining Deloitte, Hagel was an independent consultant and writer. Prior to that, he held significant positions at leading consulting firms and companies. From 1984 to 2000, he was a principal at McKinsey & Co., where he was a leader of the Strategy Practice. In addition, he founded and led McKinsey's Electronic Commerce Practice from 1993 to 2000. Hagel has served as chief strategy officer of 12 Entrepreneuring, Inc., and senior vice president of strategic planning at Atari, Inc. Earlier in his career, he was a consultant at Boston Consulting Group and founded Sequoia Group, Inc., a systems house that sold turnkey computer systems to physicians.

Hagel is the author or coathor of a series of best-selling business books, beginning with *Net Gain*, published in 1997, and including *Net Worth*, *Out of the Box*, and *The Only Sustainable Edge* (with John Seely Brown). He has won two awards from *Harvard Business Review* for best articles in that publication and has been recognized as an industry thought leader by a variety of publications and professional service firms.

John Seely Brown is the independent co-chair of Deloitte's new Center for Edge Innovation. He is also a visiting scholar at the University of Southern California and advisor to the provost. Prior to that he was the chief scientist of Xerox Corporation and the director of its Palo Alto Research Center (PARC)—a position he held for nearly two decades. He was a cofounder of the Institute for Research on Learning (IRL). His personal research interests include new models/modes of innovation for the twenty-first century, new forms of communication and learning in the network age, and digital youth culture.

Seely Brown, or as he is often called—JSB—is a member of the National Academy of Education, a fellow of the American Association for Artificial Intelligence, and a trustee of Brown University and the MacArthur Foundation. He serves on numerous public boards (Amazon, Corning, Varian Medical Systems) and private boards of directors. He has published over one hundred papers in scientific journals. In 2004 he was inducted in the Industry Hall of Fame. In 2000, he coauthored (with Paul Duguid) the acclaimed book *The Social Life of Information*, and in 2005 coauthored (with John Hagel) *The Only Sustainable Edge*.

JSB received a BA from Brown University in mathematics and physics, and a PhD from University of Michigan in computer and communication sciences. He has also received four honorary doctorate degrees from universities in the Unitd States and the United Kingdom. JSB's ideas combine science, art, and strategy, and his research exhibits both a broad view of the human contexts in which technologies operate, and a healthy skepticism about whether or not change always represents genuine progress.

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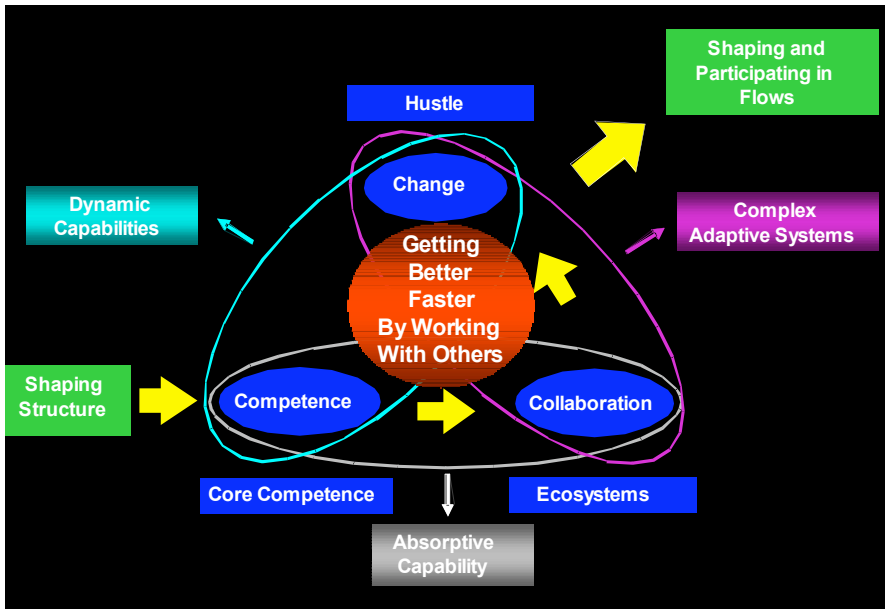
This paper seeks to reintegrate business strategy analysis in a way that better reflects the way that global business has evolved. Over the past thirty years, a variety of promising efforts have been made to reconceive business strategy as summarized on the next page in Figure 1. Each of these initiatives captures important elements of the evolving business landscape, and yet, in the end, they each seem to address only fragments of the challenges and opportunities confronted by business executives today.

Business strategy in the 1970s and early 1980s was dominated by the strategy-as-structure school, as exemplified by academics like Michael Porter in his classic work *Competitive Advantage*, and practitioners like Bruce Henderson, the founder and leader of Boston Consulting Group.[1] This school held that strategic advantage was structural in nature; sustainable profits could be earned by occupying privileged positions on the business landscape that were protected by such structural factors as economies of scale or scope or geographic economics or regulatory barriers.

In the 1990s, this view of business strategy came under increasing attack, reflecting growing instabilities in markets around the world. If industry structures and markets were undergoing increasing change, structural advantages suddenly seemed less promising as a basis of sustainable profitability. Perhaps the most promising of these new perspectives was popularized by Gary Hamel and C. K. Prahalad in their well-known book, *Competing for the Future*.[2] With its emphasis

on core competencies as a source of strategic advantage, this book in return drew on the emerging resource-based view (RBV) of the firm that had begun to emerge in the academic literature at least since the late 1950s.[3] As presented by Hamel and Prahalad, this perspective remained very enterprise-centric: strategic advantage lay in clearly identifying and strengthening core competencies within the firm.

Figure 1. The Changing Focus of Business Strategy



A second school of strategic thought, which we call the collaboration school of strategy, emerged a few years later with the publication of *Co-opetition*, by Adam M. Brandenburger and Barry J. Nalebuff, and *The Death of Competition*, by James F. Moore.[4] In these books, strategy focused less on capabilities within the firm and more on opportunities to achieve competitive leverage by mobilizing resources outside the firm. Using different labels—value nets and business ecosystems—these authors drew attention to the strategic advantages that managers can create by shaping and leveraging broader networks of resources beyond their individual enterprises.

Finally, as change accelerated in global markets during the 1990s, we began to see a variety of strategic perspectives that emphasized strategies of movement. One of the most notable contributions to this perspective was Amar Bhide's article "Hustle as Strategy" in *Harvard Business Review*, but a broader and quite diverse literature emerged under the heading of strategy under uncertainty.[5] These perspectives threw out conventional notions of static sources of strategic

advantage and emphasized that sustained profitability requires a carefully architected sequence of movements capable of managing risk in increasingly uncertain markets.

Over time, there have been efforts to integrate portions of this emerging triad of strategic perspectives—core competencies, collaboration, and movement. For example, David Teece and others have focused on trying to understand "absorptive capacity" as a way to more effectively explore how collaboration can be used to deepen core competencies.[6] While very helpful, this perspective does not explicitly seek to integrate strategies of movement. It instead tends to focus on a relatively static view of core competencies already held by two or more business partners and addresses the question of what determines the ability of each participant to absorb elements of the existing competencies. From this perspective, the opportunity to rapidly build entirely new competencies or capabilities through collaboration remains largely outside the scope of investigation.

The discipline of complex adaptive systems has been appropriated by business strategy scholars in an effort to understand the interplay between collaboration strategies and strategies of movement.[7] Once again, however, the complex adaptive system perspective tends to underplay the concept of core competency, while placing more focus on the interplay of experimentation and broader networks of participants.

Finally, there is a rich body of academic literature seeking to integrate the concepts of core competencies and strategies of movement under the heading of "dynamic capabilities." With rare exceptions, however, the dynamic capabilities perspective remains very enterprise-centric; it focuses on the challenge and mechanics of building capability within the firm, rather than systematically looking at opportunities to accelerate capability building through relationships with other firms.[8]

We suggest that there is an opportunity to integrate all three elements of business strategy—competency, collaboration, and movement. At its simplest level, this integrated view of strategy stresses the need to deploy institutional mechanisms and management practices that are designed to get better faster by working with others. This is a dynamic view of strategy, emphasizing the need for movement and focusing on trajectories and pace of change. It builds upon the capability themes of the RBV school of strategy, but seeks to expand them beyond the boundaries of individual enterprises by emphasizing that some of the most promising capabilities involve management practices that access, mobilize, and build complementary capabilities across firms.[9] This perspective also underscores the power of participating more effectively in a variety of broader collaborative formations—process and creation networks, economic webs, and specialized local business ecosystems (or "spikes"). The bottom line is that this integrated perspective shifts attention from ownership of stocks of knowledge or resources in favor of privileged positioning in flows of knowledge that can accelerate capability building.

It is within this broader context of academic research that we approach below the management challenges and opportunities of more effectively creating

and capturing economic value from global spikes. This set of management challenges and opportunities provides a very focused example of the broader need to find ways to get better faster by working with others. We hope that it will help to illustrate the opportunity to more effectively integrate diverse strands in the academic business strategy literature while also raising many questions (highlighted at the end of the paper) that can provide a foundation for a rich academic research agenda.

Harnessing the Potential of High-Tech Regions

Many discussions of the "flat world" tend to focus on the challenges created by intensifying competition. These discussions often overlook the significant opportunities for innovation and wealth creation that are also made possible by the flat world.

Western companies have begun to pursue various approaches to open innovation, especially focusing on opportunities to connect with customers to generate new product ideas. However, they have paid far more limited attention to using flat-world mechanisms to connect with promising capabilities among suppliers and other business partners wherever they reside. To the extent that they have initiatives in this area, Western companies generally focus on narrowly defined transactions with specific companies or individuals that are designed to gain access to existing intellectual property. These approaches may take the form of a reward for a solution to a research problem posted on InnoCentive, the initiatives by Procter & Gamble to license promising products under its Connect and Develop program, or the acquisition of promising tech start-ups by larger technology companies like Cisco, Google, and Microsoft.

In parallel, Western companies also are searching for ways to access the talent that is gathering in geographic spikes, or highly specialized local business ecosystems, around the world, especially in Asian cities like Bangalore, Shanghai, and Shenzhen. The most common approach here is to build captive offshoring centers located in these cities.

These approaches yield some benefits, but they leave a lot of potential economic value on the table. While many companies view open innovation and participation in highly specialized offshore locations as separate initiatives, more-effective approaches to harness the innovation potential of these offshore spikes can become a powerful platform for open innovation. The ability to effectively integrate open innovation and deeper participation in geographic spikes around the world goes well beyond the intent, much less the practice, of most Western companies today. Bringing these two sets of business initiatives together creates a distinctive new lens for identifying and pursuing significant opportunities to create value on a global scale, far exceeding the potential of even the most aggressive roll-up strategies that dominate the attention of many Western executives.

Most Western companies are still focused on developing the management practices that are required for participating effectively in individual spikes, and they are just beginning to see the opportunities to connect capabilities across spikes. As interesting as these opportunities are, they pale in comparison to a third level of management practice, which is designed to amplify the innovation and learning occurring within spikes by more effectively orchestrating innovation initiatives across spikes.

By adopting a dynamic rather than a static view of these spikes, executives can move well beyond the current hype on business networks and distributed enterprises to create institutional platforms that help all participants to get better faster. Executives can profit from better understanding the experience of early pioneers in this area and more effectively tapping into the economic potential created by a proliferation of spikes.

While substantial economic value is being created within each spike, the most significant value creation will come from firms that discover approaches to more effectively coordinate activities across a growing number of diverse spikes. To do this effectively, companies will need to master three levels of management practices:

- Find and participate effectively in relevant spikes, by moving from transactions to relationships.
- Connect capabilities across spikes, by moving from tightly linked relationships to loosely coupled relationships.
- Pursue opportunities for innovation and capability building across spikes—perhaps the ultimate form of innovation—by moving from mobilizing existing resources to accelerating capability building.

These levels are cumulative; companies cannot succeed at the higher levels until they have mastered the management practices required at the lower levels.

Our purpose in this paper is to sketch out at a very high level some of the challenges and opportunities as demonstrated by companies that have made considerable progress in pushing the envelope of management practices. There are still many unanswered questions regarding the precise nature of the management practices being developed and the range of their potential application. More broadly, these management practices raise important questions regarding industry structure, firm performance, and even the rationale for the firm. In a concluding section, we highlight some of the most interesting questions that might form the foundation for a very promising academic research agenda.

First Level of Management Practice: Find and Participate More Effectively in Relevant Spikes

Most Western companies access only a very limited portion of the economic potential available in the spikes that are surfacing in emerging economies. They tend to identify spikes very late in their development, they have a strong preference for establishing captive facilities in these spikes, and when interacting with other participants in these spikes, they tend to use short-term market transactions that make it difficult to build trust. Each of these factors restricts the potential to create and capture value through more effective participation in spikes.

New spikes are surfacing at a rapid pace, especially within emerging economies. Identifying the relevant spikes and finding ways to participate effectively in them are a continuing challenge for Western companies.

Western companies tend to be highly risk-averse and data-driven. They want evidence that a location offers significant economic value before they make significant investment commitments. They are reluctant to make smaller commitments because of a bias in favor of captive facilities, discussed later. By the time the necessary evidence is in place, the spike is often in an advanced stage of development and the entering companies face a difficult challenge in attracting the appropriate talent and building the necessary relationships in the face of well-established local players.

Three shifts in management mindset are necessary if Western companies are to more effectively identify and participate in promising spikes at an early stage of development. First, Western companies need to engage in a more systematic exploration of the relevant edges to their business, rather than concentrate so heavily on their core operations and geographies. For example, the potential for Bangalore to emerge as a major center for software development started to become apparent from the 1950s on, as Bangalore began to attract a significant domestic high-tech industry targeting defense and aerospace technologies.

Second, large Western companies need to move from snapshot views of these promising locations to video views. Rather than concentrate on existing capabilities available at potential locations, Western executives need to focus on trajectories of capability building, asking what capabilities were in place three years ago, how they compare with today's capabilities, and—given the initiatives that are under way by leading players—what the capabilities are likely to be three years from now. By applying this dynamic view to locations, Western executives might have noticed that the capabilities in Bangalore were slowly building up but began to really take off as the Indian government introduced a series of liberalization measures in the early1990s.

Third, large Western companies also need to take a more active shaping view of these promising locations. By mobilizing their global resources, these companies can often serve as significant catalysts to the growth and evolution of capabilities in these locations by helping to fill in some of the early capability

gaps that slow the early growth of these locations. The establishment by General Electric and Hewlett-Packard of major offshore facilities in Bangalore became a significant catalyst to the emergence of that city as a major provider of offshore software services. By analyzing current trajectories of potentially interesting offshore locations and thoughtfully investigating how their own investments might accelerate the evolution of these locations, Western companies can potentially participate at a much earlier stage in the emergence of global spikes and thereby create and capture more economic value.

Western companies are generally late to spot and participate in emerging spikes, and once they do, they tend to have a strong bias in favor of establishing their own captive facilities, rather than finding ways to work creatively with specialized companies already operating in these spikes. While these captive facilities may play a constructive role in the very early stages of spike formation, they tend to inhibit value creation in later stages of spike development. As the competition for talent intensifies in more mature spikes, captive facilities find it more challenging to attract and retain talent relative to larger and more rapidly growing participants that offer employees the opportunity to work on more diverse assignments with rapid development paths.

Of course, captive facilities may be the right choice for protecting intellectual property, but Western companies often overestimate the benefits and underestimate the penalties of captive facilities. In the end, most companies will end up with some blend of captive facilities and relationships with specialized third parties within each spike, and that blend is likely to evolve over time. For example, General Electric was an early entrant into Bangalore and built up a very large captive facility, expanding from $26 million in revenue in 1999, two years after its founding, to $500 million in 2005, with over 13,000 employees. This facility played a key role in the emergence of Bangalore as a specialized software development center in the global economy. Nevertheless, even General Electric, with significant scale in the operation of its captive facility, made the decision in 2005 to spin out Genpact and establish it as an independent service provider. While a number of motivations drove the decision to spin out this operation, General Electric cited as one of the key factors the need to offer the employees in the offshore facility greater diversity of assignments to accelerate their talent development. If General Electric, with its enormous scale, could not justify maintaining a captive facility, what is the likelihood that much smaller captive operations will remain viable?

Even if Western companies overcome the bias toward captive facilities in these spikes, they run into other challenges in terms of effectively accessing the capabilities offered by more specialized third parties. These Western companies typically rely on formal, tightly specified, short-term transactions to access capabilities from specialized third parties. These short-term deals can create significant value, but they provide only a narrow window on the

diverse capabilities that are available in spikes. As an extreme example, some U.S. automobile manufacturers do not allow their engineers to engage directly with the engineers of their suppliers; all interactions must be funneled through procurement managers.

Often, Western companies are narrowly driven by a quest for near-term cost savings, available through wage arbitrage. This tends to reinforce a bias to seek out the lowest cost providers. Companies with leading-edge capabilities within spikes are rarely the lowest cost, so Western companies risk being marginalized within the spikes in terms of effectively accessing and working with leading-edge firms. Western companies further compromise their ability to access the capabilities available in offshore locations by relying on procurement managers and legal staff to craft and manage the relationships.

Leading-edge firms in offshore locations are generally masters at bootstrapping and have learned that long-term, trust-based relationships are the key to effectively collaborating in dynamic markets. It has become commonplace to talk about trust in business relationships, but there is much less discussion of the mechanisms required for growing it, and in particular, the management techniques that can be used to accelerate the building of trust.

Companies in offshore locations often rely on a series of value exchanges, creating a staircase to accelerate trust building. On one dimension, they begin with relatively low- value collaborations that are not very tightly specified, so that they can begin to develop experience in working together and explore opportunities to learn from each other. As their experience and confidence in each other grows, they move to higher-value collaborations, where more is at stake. Alternatively, they may begin with high-value collaborations that are tightly specified, and then systematically move to lower levels of specification of activities over time, to give their employees more of an opportunity to improvise and experiment in collaboration with their business partners. Companies like Li & Fung and Nike are masters at integrating new partners into their process networks quickly through this trust-building process.

These companies are also thoughtful about other elements of building trust. For example, Li & Fung has a "30-30" rule governing its relationships with partners in its process network. When it signs on a new partner, it commits to utilizing a minimum of 30 percent of that partner's capacity in any given year. This ensures that the new partner will be viewed as a significant partner and will get priority in terms of allocation of the partner's resources and attention. Both sides will invest in building trust, because they are making a significant commitment of resources. At the same time, Li & Fung also indicates that it will never seek more than 70 percent of its partner's capacity, leaving a minimum of 30 percent that can be allocated to other business. The executives of Li & Fung indicate that this is important for building trust. Li & Fung believes that if a partner is entirely dependent on its business, it will never completely trust Li & Fung, because the consequences of breaking trust would be so severe for the partner. By leaving a safety cushion of 30 percent of capacity, Li & Fung

believes it strengthens trust, since the partner always has options to pursue.

To effectively tap into the capabilities residing in offshore locations, Western companies will need to move from left to right on the strategic game board presented in Figure 2. Most Western companies structure interactions with business partners around short-term transactions, rather than focus from the outset on the challenge and opportunity of building longer-term relationships. By adopting a longer-term relationship perspective, Western executives can begin to structure a relevant progression of value exchanges that accelerate the building of trust and that implement governance approaches like Li & Fung's 30-30 rule that help to foster trust.

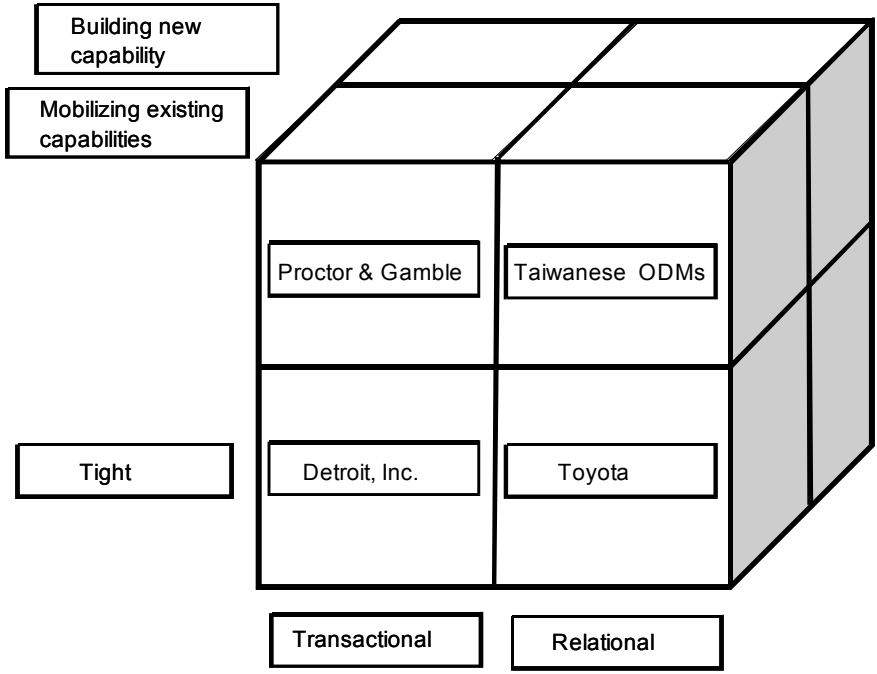
Why is this so important? The move from short-term transactions to longer-term, trust- based relationships helps to build a significant advantage in accessing the capabilities of offshore locations. This move strengthens the potential to access tacit knowledge that resides within business partners in these offshore locations. Given the rapidly evolving capabilities that characterize the most vibrant global spikes, this can provide a significant competitive advantage. The most valuable knowledge in rapidly changing environments is tacit knowledge—the knowledge that emerges in shared practice as groups seek to address new opportunities or challenges. Tacit knowledge represents the frontier or edge in terms of exploiting new opportunities. It is precisely this tacit knowledge that is so difficult to specify in contractual arrangements, but it becomes visible only through extended interactions across partners that trust each other. Trust-based relationships do not guarantee access to this tacit knowledge, but they are a prerequisite for accessing this knowledge. Most Western companies, with their emphasis on formal, short-term transactions, miss the opportunity to access the rich tacit knowledge emerging within leading-edge participants in spikes around the world.

Second Level of Management Practice: Connect Capabilities across Spikes

Spikes are spawning grounds for highly specialized capabilities. These capabilities acquire even more value when they are connected effectively with complementary capabilities that are available in other spikes around the world. The next wave of value creation in the global economy will come from platforms for connecting capabilities across spikes. Rather than build self-contained bilateral relationships like traditional outsourcing relationships with individual outsourcing providers, Western companies need to begin developing networks of relationships spanning across diverse participants in multiple spikes.

In this context, we will restrict the use of the word *networks* to focus on long-term, trust-based relationships that build up across a large number of business partners as the result of initiatives taken by a network organizer to deploy the institutional mechanisms and governance processes that are necessary to ensure effective collaboration. Network organizers act as gatekeepers, determining protocols for participation, in contrast to business ecosystems and broader economic webs that lack this gatekeeping function.

Figure 2. Strategic Spike Game Board



There are many early examples of networks that are emerging to foster collaboration across large numbers of global spikes. We have already mentioned Li & Fung, a company based in Hong Kong that coordinates the activities of ten thousand business partners around the world to create highly customized supply chains for serving the needs of apparel designers. Original design manufacturers (ODMs) in Taipei—companies like Lite-On and Compal—have organized networks of hundreds of business partners that bring together complementary capabilities in geographic spikes across Asia and North America to support the design of new consumer electronic and other high-tech products.

One of the most interesting network organizers is PortalPlayer, a company founded in 1999 by a group of former National Semiconductor executives. PortalPlayer has received very little public attention, but it played a key role in the introduction of Apple's iPod product line. The founders of PortalPlayer recognized the commercial opportunity created by the emerging MP3 product category. They focused on the opportunity to design an MP3 decoder and controller chip with rich firmware explicitly constructed to incorporate technology from a broad range of other companies.

From the outset, the company was organized as a micromultinational with its own operations based in both San Jose and Hyderabad. PortalPlayer invested significant efforts in building a global network of technology companies with

complementary capabilities to support MP3 development. These companies included some UK technology providers like the microprocessor company ARM and Wolfson Microelectronics, a specialized provider of digital-to-analog conversion technology. From the United States, participants in the PortalPlayer network included Texas Instruments and also Linear Technologies, a small company specializing in power-management integrated circuits. From Japan, PortalPlayer recruited Sharp to provide flash memory, Sony for battery technology, and Toshiba for hard disk drive technology. In Taiwan, PortalPlayer developed close relationships with both UMC and TSMC to access silicon foundry capabilities.

PortalPlayer assembled this network to design and produce innovative prototypes of MP3 players that could meet demanding price points, form factors, and performance requirements. When Apple came up with an idea for a new MP3 product line coupled with an online music store, it approached PortalPlayer to mobilize its global design network to help Apple enter the market nine months after the initial product and business concept was approved. In terms of the iPod product itself, Apple focused on the external design and the user interface design, leaving the rest of the design to PortalPlayer and its design network. Leveraging its initial success with the iPod, PortalPlayer today generates over $250 million in revenue with only 280 employees.

The success of companies like PortalPlayer and the Taiwanese ODMs rests on their abilities to design and manage networks that span across multiple geographic spikes. They have taken the first level of management practice described earlier—the ability to develop long-term, trust-based relationships with business partners—and have layered on top a second level of management practices focused on coordinating activities across large networks of partners. This second level could not operate effectively without effective mastery of the first layer.

This second level of management practice depends on a very different approach to process management in order to build networks that can scale beyond a few business partners to encompass hundreds and, in cases like that of Li & Fung, thousands of business partners. Traditional Western business process management approaches perfected within large enterprises like General Motors and General Electric rely on highly specified and tightly integrated activities that are monitored in detail from a single control point. This management approach rapidly reaches diminishing returns as the number and diversity of participants increases, and the complexity overhead in defining and monitoring activities by all the participants soon becomes overwhelming.

To build process networks that are more scalable , organizers of these global networks have moved to a very innovative process management approach that focuses on identifying modules of activities. The network organizer defines standardized interfaces for these modules, so that the appropriate modules can be brought together in changing configurations to meet the diverse needs of

customers. This loosely coupled modular approach offers significant freedom to the business partners that are assigned responsibility for specific modules of activities. They can improvise and experiment in terms of the activities within the modules, as long as they continue to deliver the outputs specified at the interface of the module. This modular approach enhances scalability, since the network organizer is not consumed with the task of specifying and monitoring activities within each module and can focus instead on assessing the capabilities of business partners and ensuring that the outputs of each module meet the requirements specified by the interface.

To date, many of these loosely coupled, global process networks have been decidedly "low tech" in their operations. As an example, the executives at Li & Fung until recently have preferred to rely on telephone and fax as the primary means of coordinating activity across their global process network. They resisted investing heavily in earlier generations of information technology because of a concern that the hard-wired nature of these technologies would restrict the flexibility in their operations that loosely coupled, modular approaches made possible and that their customers value so much.

This concern about the rigidity of information technology has moderated in recent years as a new generation of technology known as service-oriented architectures has become available. These architectures, also built upon loosely coupled, modular design principles, offer great potential to automate the more routine coordinating activities of process networks. Li & Fung has begun deploying a service-oriented architecture based on Microsoft's .Net technology to support its global process network. While service-oriented architectures have emerged largely independently of global process networks, this technology creates an opportunity to significantly enhance the performance of these business networks.

In the context of the strategic game board presented in Figure 2, this second level of management practices enables companies to move from the lower-right quadrant to the upper-right quadrant of the game board. It is important to clarify that, by characterizing networks in this quadrant as loosely coupled, this does not represent a return to short-term, market-based transactions. These loosely coupled networks require long-term, trust based relationships among the participants to function effectively. The term *loose coupling* refers instead to the ability to quickly reconfigure specific participants to meet the needs of a particular design or supply-chain initiative. Li & Fung's 30-30 rule, described earlier, provides a foundation for long-term, trust-based relationships while also providing Li & Fung, as the network organizer, with considerable flexibility in determining which specific network participants will be deployed in each of its supply- chain initiatives.

Loose coupling also does not mean loose or unpredictable performance. In fact, loosely coupled networks are rapidly growing in some of the most competitively demanding global industries, like consumer electronics and apparel, precisely because they focus so clearly on performance outcomes, rather than on

the activities required for delivering these performance outcomes. Loose coupling increases the emphasis on both capabilities and performance while diminishing attention to narrowly defined activities. It also enhances the ability to reach out to capabilities that are more diverse across global spikes and to rapidly incorporate promising new players that are emerging in individual spikes.

The move from tightly coupled to loosely coupled process management techniques creates a second dimension of strategic advantage as companies seek to leverage the capabilities emerging in spikes around the world. Western companies that continue to pursue more conventional tightly coupled process management approaches will only be able to tap into the capabilities of relatively few participants in spikes around the world. This is true even if they master the first level of management practices, in which they enhance the potential to access tacit knowledge within individual spikes.

Mastery of loosely coupled process management techniques enables companies to access a much greater diversity of capability and creates much more flexibility in terms of mobilizing these capabilities to serve the needs of their customers. These techniques become increasingly important as the number and diversity of global spikes expands. We are witnessing a "long tail" of capabilities arise across global spikes. Whether it is synthetic fiber production in certain Korean cities, mathematical research in certain areas of Russia, or the emergence of specialized mobile telephone technology capability in certain coastal cities of China, there is a growing diversity in spikes and their relative specializations. By mastering loosely coupled process management techniques, network organizers can more quickly access the newly emerging capabilities that reside in very small entrepreneurial companies operating in remote spikes, and can potentially capture more of the value generated as some of these companies break out of the long tail and move into the head. In a rapidly evolving global economy, this ability to tap into a growing diversity of capabilities will represent an increasingly significant strategic advantage.

But while accessing existing capabilities is one thing, accelerating capability building across business partners is an even greater opportunity.

Third Level of Management Practice: Amplify Innovation and Learning Opportunities

While accessing and networking existing capabilities across global spikes represents a significant opportunity that goes beyond the current practices of many Western companies, this is only a small part of the full economic potential created by global spikes. The opportunity is to use process networks not simply to mobilize existing capabilities more effectively and more flexibly, but to more rapidly develop the capabilities of all participants.

Global spikes provide rich environments for innovation and learning within the spikes. By connecting capabilities across spikes, network organizers can provide a powerful platform for innovation and learning across spikes as

participants with diverse specializations learn from each other in order to deliver more value to the market. The innovation and learning loops enabled by process networks fold back in on and reinforce the innovation and learning loops that are already in play within individual spikes. These networks are highly dynamic in terms of their potential to deliver growing value over time.

The first two levels of management practice are helpful in addressing this opportunity to accelerate learning and capability building. As already discussed, without long-term, trust-based relationships, it is very difficult to access the tacit knowledge that helps to drive learning and capability building.

The loosely coupled process management approaches discussed in the section on the second level of management practice also foster learning and capability building. We've already mentioned the enhanced ability to improvise and experiment within modules of activity relative to more tightly integrated business processes, where small changes in the activities in one part of the process can lead to unanticipated disruptions in distant parts of the process. Loose coupling also makes it easier to mix and match modules in ways that can deliver more customized value in response to the evolving needs of customers. Finally, loose coupling also enhances the ability to introduce new participants with new capabilities that can help push current participants to get better faster.

Nike has used loosely coupled management techniques to accelerate learning across its global process network. Few people appreciate what a high-tech product the athletic shoe has become. In a quest to continually improve the athletic performance of its customers, Nike aggressively seeks out new materials and ways to integrate them into its shoes and to push the performance envelope. It continually searches for new business partners with promising new capabilities to add to its shoe design and manufacturing process networks. As these business partners are added, they become part of a sophisticated tutelage system in which they are encouraged to work with partners that have complementary capabilities to help them understand how to take greater advantage of new materials and manufacturing techniques for improving their own performance. In return, these new partners also gain greater insight into the activities of complementary partners and can refine their own materials and practices to add even more value to the overall design and manufacturing processes.

To harness the potential for accelerated learning and capability building, Western companies need to master the management techniques necessary for generating productive friction. In their relentless quest for operational efficiency, Western executives have become focused on removing friction wherever it occurs in their operating processes. We are all familiar with the management mantra that drove the early wave of investment in the Internet: the goal was to build a friction-free economy.

This mindset fails to recognize that not all friction is bad. In fact, friction is often essential to foster learning and capability building. Whenever people with diverse skill sets and varied backgrounds come together around challenging

problems, they are likely to come up with various approaches and potential solutions. Often, they are passionate about their ideas and they engage in vigorous debate with others who hold different ideas. This friction often becomes dysfunctional, leading to misunderstanding and suspicion. But under the right conditions, this friction can become highly productive, leading to creative new approaches that push performance boundaries.

The ability to foster productive friction can therefore be very powerful in accelerating learning and capability building. Four key ingredients must come together, and network organizers can be very helpful in ensuring that these ingredients are in place. First, it is important to identify participants with the appropriate skill sets and backgrounds, to ensure that the necessary elements are available for a solution and that creative new approaches can be put on the table. In this context, the loosely coupled process management techniques described earlier become very helpful in scaling networks to include a growing number of participants with a rich diversity of skill sets and backgrounds.

Second, the efforts of the participants must be focused by explicit and aggressive performance objectives while also removing as many constraints on the solution as possible. Once again, this focus on objectives and outcomes rather than on specific activities is very compatible with the design philosophy shaping loosely coupled, modular process networks.

Third, participants should be able to interact around appropriate prototypes that allow them to develop a shared understanding of potential solutions, and should be able to test competing options against the relevant performance requirements. Above all, participants must be provided with clear action points—decision milestones in which differences are resolved and agreement is reached on the best approach for achieving the performance objectives.

Original design manufacturers in Taiwan use these techniques to orchestrate design activity across many specialized component and subsystem vendors for new consumer electronic products. Rather than develop detailed design blueprints and hand them off to their design process networks, these ODMs focus on defining aggressive performance targets and establishing appropriate action points whereby participants must come together to resolve any potential disagreements that may prevent effective integration of the components and subsystems. Participants interact around electronic design documents and prototypes to more systematically explore various design options.

The 30-30 rule adopted by Li & Fung acquires additional significance as well in the context of accelerating learning and capability building. By ensuring that partners always have a minimum of 30 percent of their capacity allocated to other customers, Li & Fung provides an opportunity for their partners to gain exposure to new practices and techniques outside their network. Each partner then brings this learning into the Li & Fung network when they engage with other Li & Fung partners around the performance requirements of specific supply-chain initiatives.

Li & Fung is also using its investment in service-oriented architectures to accelerate learning and capability building. One of the benefits of automating routine coordination activities is that Li & Fung will be able to more systematically capture performance data from its network partners. This performance data can be used to deliver real-time performance benchmarking information to each of its partners, telling them how they are doing relative to comparable network participants along twelve distinct dimensions of performance. Network partners can then use this information to identify and focus on addressing key performance gaps. Li & Fung staff, who were previously heavily focused on routine coordination activity, will now be able to concentrate on coaching network participants in techniques for closing these performance gaps, and on bringing together groups of network partners to explore ways to improve their performance.

Information technology can support accelerated learning and capability building in other ways as well. A new generation of interaction tools like mobile phones, instant messaging, IP-based video conferencing, wikis, and other forms of collaborative workspaces are enhancing the opportunity for richer and more frequent collaboration among distributed participants. Rather than simply focus on automating tasks and eliminating people, this new generation of technology seeks to combine high tech and high touch to enable collaboration on demand.

Learning and capability building can also be accelerated through the process of dynamic specialization within networks. We have already discussed the scalability of these networks. This scalability has an important side effect: it encourages and rewards specialization that rapidly evolves. As more and more diverse participants join a network, each existing participant can afford to focus more tightly on the activities in which it is truly distinctive and rely on other network participants to provide complementary capabilities. At the same time, participants have strong incentives to develop their own specializations more rapidly to exploit the growth opportunities created by expanding networks. By concentrating on further developing areas where they already have great strength, participants have the potential to learn more rapidly in contrast to companies that feel the need to engage in a broader set of activities.

For example, the emergence of specialized semiconductor fab operators in Taiwan as anchors of many design process networks offers an opportunity for specialized semiconductor design firms to focus on strengthening their own design capabilities. They can do this without being distracted by the enormous challenges and resources required for building and operating semiconductor fab facilities.

By harnessing productive friction, network organizers can shift the incentive for participation from near-term cash rewards to the longer-term opportunity to get better faster by working with others. These network organizers increasingly focus on the objective of accelerating the learning of all participants as they build long-term relationships with their business partners. The key test of these

relationships becomes the question, Will all parties be better at what they do as a result of having been in a relationship together than they would have been in the absence of a relationship?

In fact, without this longer-term opportunity to get better faster, building long-term, trust-based relationships becomes more challenging, since participants become vulnerable to all the zero-sum behaviors that economists worry about (for example, holdup, moral hazard, cheating, shirking, and so on). When there is a fixed set of resources, one party loses when the other party gains, focusing everyone on short-term efforts to gain more of the finite resources. This inevitably erodes trust and fosters adversarial behavior. By focusing everyone on the opportunity to expand total available resources through learning and capability building, network organizers can foster more collaborative behavior.

In the context of the strategic game board presented in Figure 2, this third level of management practices, of amplifying innovation and learning opportunities, supports a movement from networks in the upper-right-front quadrant to networks in the upper-right-rear quadrant—networks that we describe as creation networks. Rather than focus narrowly on mobilizing existing capabilities, these networks seek to deploy the mechanisms required for accelerating capability building over time. This in turn leads to a third and much more powerful form of strategic advantage—more rapid innovation and learning—which becomes critical for success in a rapidly changing global business landscape.

Loosely coupled, relational networks can overcome the organizational inertia that often tends to constrain and slow down initiatives within large companies while also providing access to a broad scope of diversified resources. While some organizational theorists emphasize the importance of dynamic capability, they tend to focus within individual enterprises, rather than on the network level. Creation networks represent a powerful way to overcome the organizational tensions that often result from trying to build-in ambidexterity within a single enterprise. By virtue of their scalability, these loosely coupled networks can provide a powerful catalyst for both systemic innovation, requiring the collaboration of large numbers of complementary resource providers, and compound incremental innovation, requiring rapid iteration of small improvements in products and processes.

We believe that these creation networks have an opportunity to dominate a growing number of global industries and markets for two reasons. First, they harness all three forms of strategic advantage created by each level of management practice discussed earlier—enhanced access to tacit knowledge, expanded access to diverse specialized participants in spikes around the world, and accelerated innovation and learning. Second, and more fundamentally, these creation networks also provide an important foundation for ensuring the sustainability of the long-term, trust-based relationships and the loosely coupled process networks that are built through the first two levels of management practice. As we have discussed, in a world of fixed resources, it is difficult to sustain trust as participants begin to develop adversarial practices that are designed to gain

privileged access to scarce resources. In creation networks, the opportunity to create new resources through innovation and learning fosters longer-term trust as participants start to focus on collaboration designed to expand the total resources. Similarly, loosely coupled networks begin to unravel in the absence of trust. Networks focused solely on mobilizing existing resources, rather than on accelerating capability building, soon begin to become consumed in disputes about the allocation of fixed rewards. By providing opportunities to expand total resources through innovation and learning, creation networks can turn loose coupling into a key ingredient to support productive friction, rather than become victims of dysfunctional friction.

Broader Implications of Spike Evolution

The levels of management practices we have discussed are likely to have an impact far beyond the individual firms that pursue them or even beyond the networks that they mobilize. These management practices will help to strengthen incentives to catalyze the formation of new spikes and the more rapid growth of existing spikes. The connective capabilities of the flat world will paradoxically lead to the proliferation and growing prominence of spikes.

Spikes have always been a key engine of economic growth, as talent seeks to come together in specific locations in quest of richer opportunities to collaborate and rapidly improve performance. As an example, the spread of spikes westward in the United States—from the textile mills of Lowell, Massachusetts, to the steel mills of Pittsburgh, to the automobile assembly plants in Detroit, and finally to the high-tech companies of Silicon Valley—marked the various stages of economic growth of the country.

A combination of institutional mechanisms, management practices, and new generations of IT will create powerful platforms for expanding the global reach of participants within each spike. For example, global process networks and new approaches to managing modular business processes help to connect participants within spikes with complementary capabilities around the world and with relevant customers in global markets. The emerging IT architectures and interaction tools discussed earlier will also help to expand the scope of collaboration across spikes by making it easier for individuals in a large number of companies and locations to interact with each other. All of these elements will make it even more attractive for people and companies to come together in specialized local business ecosystems, because their efforts will be amplified on a global scale. As a result, these elements will become significant catalysts for the proliferation and growth of spikes.

Spikes offer powerful environments for learning, only partly driven by specialized educational institutions, and they will become even more attractive for learning as participants discover the ability to connect with individuals and institutions in other, equally specialized spikes around the world. Excellence

within spikes and across spikes will help to breed even higher levels of excellence by virtue of powerful feedback loops.

Western companies today are increasingly driving growth through roll-ups—mergers and acquisitions (M&A) programs designed to leverage economies of scale and scope. In some cases these roll-ups seek to acquire new capabilities that can be used to accelerate internal growth. There is an alternative path: finding ways to access and work with much richer concentrations of talent to drive innovation by leveraging global spike formation and the accelerating renewal occurring within these spikes. As the focus of competition shifts to getting better faster by more effectively leveraging talent and other intangible assets, this alternative path offers great potential to spawn the next wave of wealth creation.

This is not just about deploying networks to more effectively mobilize existing resources and capabilities on a global scale. In fact, static networks that are focused only on today's capabilities tend to be unstable and hard to sustain, because the incentive structures end up focusing on near-term and relatively limited cash rewards. If companies make it only to the first or second level of the management practices outlined earlier, their efforts are likely to generate limited value as the networks of relationships they seek to build become more difficult to sustain. By successfully navigating to the third level of management practices, companies can create much more sustainable and powerful networks. In truth, as we have discussed, most Western companies are still just beginning to see the need to master the first level of management practices as their wage arbitrage efforts yield diminishing and disappointing returns: they are effectively at stage zero.

However, companies cannot leapfrog their development of management practices, since each level builds upon capabilities in earlier levels. This perspective suggests that successful companies will need to move quickly and deliberately through each of the three levels before they can enjoy a sustainable edge in an increasingly competitive global marketplace. This perspective also helps to explain why the emergence and evolution of creation networks is taking time to play out. There are no shortcuts in the race to harness the power of spikes, and a broad range of challenging management practices must be mastered along the way.

Trajectories of Evolution Across the Strategic Game Board

While there is some danger in overgeneralization, companies across the globe are moving in opposite directions in terms of the evolution of their interaction choices over time. These trajectories of evolution suggest the risk of a death spiral for American and European companies as they face more intense competition from a new generation of entrepreneurial Chinese companies, like Longxin, Lite-On, and Li & Fung, that have become adept at mobilizing creation networks. We should not allow the notable exceptions to these general patterns blind us to broader trajectories and the implications of those trajectories.

U.S. companies are playing largely within the transactional space as they seek to access external capabilities. If anything, there is a movement from loose, arm's-length transactions with a broad range of firms to much more tightly defined transactions with a limited number of firms. This movement occurs in part because the near-term economic benefits in terms of cost-saving are much easier to quantify, and in part because tight management approaches create the perception of more control and the illusion of predictability in markets that are increasingly characterized by uncertainty.

Examples of this shift from loose to tight transactions include the narrowing and squeezing of supply-chain partners, with an aggressive focus on driving down procurement costs. In outsourcing, there has been a movement to shorter-term, tightly specified relationships in areas ranging from IT operations and call-center management. Although there has been a lot of talk about open innovation in the business press, much of the activity in this area by such high-profile companies as Procter & Gamble and Cisco takes the form of M&A deals to acquire interesting capabilities. In particular, when it comes to accessing promising capabilities in offshore locations, the dominant practice by U.S. companies has been either to build captive facilities or to engage in relatively short-term outsourcing deals to take advantage of wage rate arbitrage.

Shifting our attention to Europe, the general trend by companies in this region has been to move from away from longer-term relationships seeking to access existing capability, and to adopt more of the U.S. practices favoring short-term transactional deals in an effort to cut costs more rapidly. Perhaps the most publicized example of movement in this direction involved Volkswagen's efforts several years ago to recruit procurement executive Jose Ignacio Lopez from General Motors. These initiatives may provide short-term cost-saving benefits, but they are likely to be at the expense of learning and innovation across enterprises. European companies in general have been even more tentative in terms of their efforts to access offshore capability, favoring either captive facilities or stand-alone partnerships with large, established companies in countries like China and India.

In Asia, there is an interesting contrast between the relative revenue stagnation and profit squeeze of leading Japanese high-tech companies and the rapid growth and increasing profitability of entrepreneurial Chinese companies on the world stage. The difference in the performance of these two sets of players is in part due to an increasing focus by these entrepreneurial Chinese companies on loose relational networks to drive new capability building. These networks have helped the Chinese companies to compete successfully with Japanese companies who still adhere to tight relational forms of networks.

In the 1970s and 1980s, Japanese companies in a number of industries began to challenge and take share from American and European companies. One element of their strategy involved a distinctive form of business organization. These Japanese companies typically operated as part of *keiretsus*—networks

of companies that owned stakes in one another as a means of mobilizing complementary capability.

In the automotive industry, Toyota and Honda evolved an approach to networks that focused much more on accelerating capability building, rather than on simply accessing existing capabilities. However, to accomplish this, these automotive companies designed tight relational networks, emphasizing tightly integrated interactions across business partners, often reinforced by ownership stakes in business partners. As a result, these networks are significantly limited in terms of scalability of the number and diversity of business partners. So far, this has not been a significant limitation, because the primary competitors for these companies have been American automobile companies that are locked into tight transactional relationships—a losing proposition. In fact, many major U.S. automobile suppliers are investing to build deeper relationships with Japanese automobile manufacturers like Toyota as they begin to recognize the opportunity for innovation and learning relative to the tight transactional interactions they have had with U.S. auto companies. Over time, these Japanese auto companies may be vulnerable to a new generation of Chinese competitors that are applying the modular, loosely coupled management techniques developed in motorcycle design and assembly to automobile design and assembly.

In sharp contrast to the tight relational networks favored by leading Japanese companies, entrepreneurial Chinese companies have been at the leading edge of developing the management practices required for shaping and orchestrating creation networks. These entrepreneurial Chinese companies, operating in industries ranging from textiles and motorcycles to consumer electronics and other high-tech products, also differ significantly from the more well-known state-owned Chinese enterprises (or spin-offs from these enterprises) that struggle with bureaucratic structures and that increasingly strive to emulate more traditional Western management practices. Many of the entrepreneurial Chinese companies have directly targeted leading Japanese companies in industries as diverse as consumer electronics and motorcycles. They have been remarkably successful in taking share and eroding the profitability of the Japanese companies, especially in the lower end of their product lines.

There's an additional wrinkle: creation networks will ultimately converge with fundamentally different IT architectures, shaped from the outside in, rather than the more conventional inside-out architectures that most companies live with today. The companies that first understand the opportunities created by this convergence and deploy a new generation of IT architectures will be able to accelerate their movement dramatically. The platforms for such outside-in architectures are largely being pioneered by entrepreneurial U.S. companies like Rearden Commerce, E2open, and Salesforce.com. The irony is that these U.S.-developed IT platforms may first be broadly deployed by Chinese entrepreneurial companies that recognize their value in supporting creation networks. The entrepreneurial Chinese companies to date have very limited IT platforms beyond

phone and fax and as a result have the potential to adopt these new architectures more quickly, in contrast to the leading Western companies that are struggling with hard-wired legacy platforms shaped by inside-out architectures.

The Bottom Line

Given our perspective on the relative strategic merits of various interaction choices and the recent trajectories of companies in terms of their choices for structuring interactions with other companies, entrepreneurial Chinese companies appear to be especially well-positioned to succeed in the most competitive global markets. Western and Japanese companies will face painful transitions as they seek to master the management techniques and institutional arrangements that are required for harnessing the learning and innovation potential of creation networks.

Creation networks represent the dominant position on the strategic game board. The companies that most quickly move into this space will be the winners in terms of the next wave of global value creation. They will also have an unprecedented opportunity to shape the contours of the global business landscape.

Companies, government policymakers, and academics can play a significant role in addressing this challenge. We outline below some of the initiatives that each of these groups can take to enhance the capabilities of Western companies to compete more effectively in global markets by harnessing the potential of creation networks.

Companies

- Build understanding and alignment of the opportunity and challenge within the senior management team by arranging visits to China to meet with some of the leading orchestrators of creation networks.
- Develop a shared view of the role that creation networks might play in amplifying the value that your company could deliver to the marketplace, by answering three questions:
    - Would creation networks represent a more promising way to access offshore capabilities, rather than the establishment of captive facilities in offshore locations?
    - What creation networks should we target to amplify our own capabilities?
    - What role should we play in the creation networks—the organizer role, or the participant role?
    - What can we do to create more value in these creation networks?
- Conduct a trust audit of two or three of the company's most significant business partners today to determine the level of willingness to work collaboratively in defining and delivering innovations.

- Identify two or three operating initiatives that the company could pursue over the next six to twelve months to accelerate trust building with key business partners.
- Determine what role new IT architectures and technologies (for example, service-oriented architectures and Web 2.0 technologies) might play in enhancing opportunities for collaboration across distributed participants.

Public Policymakers

- Reassess intellectual property protection policies in terms of their potential impact on the emergence and evolution of robust creation networks.
- Loosen restrictions on immigration to the U.S. by highly educated and experienced individuals, in terms of entry to both our educational system and our job market. While creation networks offer a capability to mobilize talented individuals wherever they reside, these creation networks tend to be catalyzed by concentrations of talented individuals who are seeking to amplify their own innovation efforts in intensely competitive environments. By creating more opportunities for talent to aggregate in specific geographic areas, government policy can play a role in catalyzing the growth of local business ecosystems that in turn can help to spawn creation networks.
- Develop policies that would encourage significant investment in a robust telecommunications infrastructure. Creation networks depend on robust communication capability to support distributed collaboration. The United States is falling behind many countries in Asia and Europe in deploying broadband and wireless networks that enhance the capabilities of creation networks.
- Reassess financial policies that decrease the attractiveness of IPOs in the United States, so that venture capitalists will have a greater incentive to invest in the entrepreneurial companies that often become the seedbed for vibrant creation networks.

Academic Researchers

- Further develop and refine the typology outlined in this paper and construct research initiatives to quantify the performance of companies based on their relative emphasis on diverse forms of business interactions.
- Explore the specific institutional mechanisms and management practices that contribute to the successful operation of creation networks. In particular, seek to understand the various incentive mechanisms and economic models that appear to be shaping creation networks.
- Identify and analyze the governance mechanisms that shape the operation of creation networks, including processes for admission into creation networks, role definition, interfaces for hand-offs across participants,

definition and monitoring of performance metrics, performance feedback, rent distribution, intellectual property protection, dispute resolution, and protection mechanisms in the event of nonperformance. Explore how these governance mechanisms might differ across process networks and creation networks, as well as how these governance mechanisms evolve across various stages of network formation and operation.

- Expand the promising research that is already under way on dynamic capabilities and highlight the role that creation networks can play in accelerating capability building across participants.
- Identify the organizational barriers that prevent companies from evolving more relational forms of interaction, and develop case studies of companies that have successfully made the transition from transactional to relational forms of interaction. In this context, Li & Fung, in China, provides an interesting example of a company that was deeply rooted in a "deal-making" transactional culture and has become one of the leading orchestrators of a global creation network.
- Analyze the evolving role of brands and the potential tensions between brand owners and creation network organizers/participants.
- Evaluate the potential for the scalability of contemporary creation networks relative to earlier forms of these networks, dating back to the Renaissance that seemed to run into scalability limits.
- Explore the differences in approaches that are required for creating new knowledge and accelerating the building of existing capabilities. For example, contrast Cisco's creation network in the customer relationship side of its business, and its collaboration with venture capitalists to explore edge technologies.
- Articulate the differences between conventional training approaches to capability building, and the process of fostering a culture of productive inquiry that can support continual learning, in which inspiration must be present to effectively leverage infrastructure provided by creation networks.

Notes

[1] Early views of strategy as structure can be found in Bruce D. Henderson, *Henderson on Corporate Strategy* (Cambridge, MA: Abt Books, 1979), and Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Free Press, 1985).

[2] Gary Hamel and C. K. Prahalad, *Competing for the Future: Breakthrough Strategies for Seizing Control of Your Industry and Creating the Markets of Tomorrow* (Boston, MA: Harvard Business School Press, 1994).

[3] Edith Penrose, *The Theory of the Growth of the Firm* (Oxford: Oxford University Press, 1959). Other notable works in the resource-based theory of the firm include B. Wernerfelt, "A Resource-Based View of the Firm," *Strategic Management Journal* 5 (1984): 171–80; R. P. Rumelt, "Towards a Strategic Theory of the Firm," in *Competitive Strategic Management*, ed. R. B. Lamb (Englewood Cliffs, NJ: Prentice-Hall, 1984), 556–570; and J. B. Barney, "Firm Resources and Sustained Competitive Advantage," *Journal of Management* 17, no. 1 (1991): 99–120.

[4] Adam M. Brandenburger and Barry J. Nalebuff, *Co-opetition* (New York: Currency Doubleday, 1996); and James F. Moore, *The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems* (New York: Harper Business, 1996). There is in fact a vast literature on the value of collaboration across enterprises. Unfortunately, most of the literature either focuses narrowly on bilateral relationships like strategic alliances or joint ventures, or goes to the other extreme and embraces all conceivable relationships across enterprises under relatively nebulous terms like networks or ecosystems. A good overview of this literature is available in David Faulkner and Mar De Rond, eds., *Cooperative Strategy: Economic, Business and Organizational Issues* (New York: Oxford University Press, 2000).

[5] Amar V. Bhide, "Hustle As Strategy," *Harvard Business Review* 64: 59–65. For a strong discussion of strategy under uncertainty, see Hugh Courtney, *20/20 Foresight: Crafting Strategy in an Uncertain World* (Boston, MA: Harvard Business School Press, 2001). Real options theory is one of the disciplines used to support strategies of movement; see especially Avinash K. Dixit and Robert S. Pindyck, *Investment Under Uncertainty* (Princeton, NJ: Princeton University Press, 1994); and Tom Copeland and Vladimir Antikarov, *Real Options: A Practitioner's Guide* (New York: Texere, 2001). Another discipline that has helped to shape strategies of movement is business dynamics; see John D. Sterman, *Business Dynamics: Systems Thinking and Modeling for a Complex World* (Boston, MA: McGraw-Hill, 2000). Finally, game theory has also contributed to strategies of movement; see Avinash K. Dixit and Barry J. Nalebuff, *Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life* (New York: W. W. Norton, 1991). Of course, these disciplines are broadly valuable and do not demand adherence to extreme forms of strategies of movement.

[6] See, for example, David Teece, "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy* 15, no. 6 (1986): 285–305. For an overview of the absorptive capacity concept, see also Wesley M. Cohen and Daniel A. Levinthal, "Absorptive Capacity: A New Perspective on Learning and Innovation," *Administrative Science Quarterly* 35 (1990): 128–52.

[7] The best recent effort to integrate these perspectives is available in Eric Beinhocker, *The Origin of Wealth* (Boston, MA: Harvard Business School Press, 2006).

[8] The concept of dynamic capability building within the firm traces its roots back to at least Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper, 1942), but the most notable recent contribution is Richard Nelson and Sydney Winter, *An Evolutionary Theory of Economic Change* (Cambridge, MA: Belknap Press, 1982). This concept has since been further developed by Robert Hayes, Steven Wheelwright, and Kim Clark, *Dynamic Manufacturing: Creating the Learning Organization* (New York: Free Press, 1988); Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Currency Doubleday, 1990); Bruce Kogut and Udo Zander, "Knowledge of the Firm and the Evolutionary Theory of the Multinational Corporation," *Journal of International Business Studies* 24, no. 4 (1993): 625–45; Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge-Creating Company* (New York: Oxford University Press, 1995); and D. Teece, G. Pisano, and A. Shuen, "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* 18, no. 7 (1997): 509–33. For a related perspective on "dynamic transaction costs," see Richard N. Langlois and Paul L. Robertson, *Firms, Markets and Economic Change: A Dynamic Theory of Business Institutions* (New York: Routledge, 1995). See also Shona L. Brown and Kathleen M. Eisenhardt in their excellent book *Competing on the Edge: Strategy as Structured Chaos* (Boston, MA: Harvard Business School Press, 1998), which focuses on co-adaptation, although even here, they end up focusing on multiple business units within a single enterprise, rather than emphasizing the opportunity to apply this technique across enterprises. Other contributions to this body of literature include K.M. Eisenhardt and J. Martin, "Dynamic Capabilities: What Are They?," *Strategic Management Journal* 21 (2000): 1105–21; and Sidney G. Winter, "Understanding Dynamic Capabilities," working paper, Reginald H. Jones Center, The Wharton School, University of Pennsylvania (2002).

[9] We use the term *capabilities* broadly, to refer to the recurring mobilization of resources for delivering distinctive value in excess of cost. "Resources" refers broadly to both tangible resources (e.g., financial, human, and physical resources) and intangible resources (e.g., talent, intellectual property, networks, and brands). These resources might reside within the firm, although increasingly, the relevant resources to support a firm's capability reside in other firms. "Mobilization" refers to both the practices and processes required for creating and delivering value with the resources available. Once again, these practices and processes may reside within the firm, but they increasingly extend into other enterprises as well. Thus, the resources, practices, and processes may extend well beyond an individual firm. The key question for value creation is, Which firm is the most effective in mobilizing resources to deliver value for its customers?

We use the term *capability*, rather than *competence*, because the latter, at least in terms of its common usage, has tended to focus rather narrowly on technology and production skills. As an example of capability, we would say

that Dell has a distinctive capability in organizing pull-based production and logistics processes on a global scale. Nike's distinctive capability, in contrast, is in the creative design and marketing of athletic apparel, especially footwear. Disney has a distinctive capability in creating multiple revenue streams from branded characters.

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Stanford University
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