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The New Dynamism of the Knowledge-Creating Company

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To be on the cutting edge in a knowledge economy, a company must be knowledge-creating. Being simply knowledgeable is not enough. What does it mean to be a knowledge-creating company? As described below, the concepts are straightforward—it is the practice that is hard. The first detailed analysis was published in 1995 by Nonaka and Takeuchi in a study titled *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation.* Subsequently, the knowledge movement has spread and the literature grown enormously.[1]

How could a book written in Japan about Japanese companies spawn such a following and follow-up? The short answer is because there was something to learn from the Japanese approach to knowledge. But that was the past; the distinctive features of the Japanese approach to knowledge described in 1995 are now well known.

What of the future? Are Japanese firms still innovative? Is the Japanese approach to knowledge creation still at the frontier of management? Has a new dynamism propelled it even further? Or has the Japanese approach been overtaken and thus reached a stalemate?

As one of the authors of the original study, I have joined the World Bank Institute and colleagues at Hitotsubashi University to produce this volume to answer these questions. The short answers are innovation is alive and well in Japan, and the Japanese approach has a new dynamism that makes it as relevant as ever—perhaps even more so.

The short answers are elaborated in the five chapters that follow. These are case studies of Seven-Eleven Japan, Lexus Division of Toyota, Sharp, Keyence, Nintendo,

1. Throughout the world there are trade associations and journals bent on advancing best practices in knowledge management. (Important publications in the field include the *Journal of Knowledge Management, Knowledge and Process Management,* and *Journal of Intellectual Capital.*)

Many firms now have a chief knowledge officer or a knowledge creation department. Governments have joined as well, sending officers to overseas conferences and training programs. (As an example, in October 2004 and October 2005, the Hitotsubashi University Graduate School of International Corporate Strategy (ICS) hosted two-week seminars on knowledge management in Tokyo for 18 high-ranking government officials representing 12 countries from Asia. The seminar was funded by the Japan International Cooperation Agency (JICA) and directed by Ikujiro Nonaka. It consisted of lectures, case studies, and company visits.)

There are even endowed professorships, including the Xerox Distinguished Faculty in Knowledge at the University of California, Berkeley (a chair held by Nonaka since it was created in 1997).

and Shimano. These firms span a wide variety of industry segments, including retailing (convenience stores), automobiles, television, electronic components, home video games, and bicycle parts. They are the target of investigation because they have leading shares in their market segments and have been especially good at continuous innovation and self-renewal. (Japan does have failures, and something can be learned from them as well, as shown in chapter 3 of the project's companion volume, *Japan, Moving Toward a More Advanced Knowledge Economy: Assessment and Lessons*.)

The next section briefly summarizes the case studies. The remaining sections summarize the concepts that make up the Japanese approach to knowledge.

The Case Studies

The experiences of the Japanese companies discussed in this volume suggest a fresh way of thinking about competitiveness within the knowledge economy. This section provides an overview of how the companies studied have achieved breakthroughs in innovation and knowledge creation.

Convenience stores were a U.S. innovation that has been radically improved in Japan. Indeed, Seven-Eleven Japan (SEJ) has gone from being the local franchisee to owner of the original U.S. company. SEJ is known not only for its innovative products (such as gourmet rice balls, exotic salads, noodles from famous restaurants, and local delicacies targeted to specific geographic regions) and services (such as mobile phone recharging, dry cleaning dropoff, online shopping pickup, banking, voter registration, and parcel delivery), but also for a novel business model. It has created new markets where none existed, and changed the way people live and work in Japan. To do this, the company has worked closely with suppliers and customers, as well as service providers.

Lexus became the top-selling car in the U.S. luxury car segment in 2000, surpassing Mercedes Benz just 11 years after being introduced. Through a process called *kaizen* ("continuous improvement"), Toyota relentlessly found ways to improve its production system, quality, and productivity to produce "the finest car ever built." Lexus's innovation, however, is not merely about coming up with a breakthrough product. It is equally about continuous innovation in building its coveted customer relationship program. It never stops hammering away at problems and opportunities in its interaction with customers.

Many electronics products have become commodities. To avoid the low margins this implies, firms have sought to move from "dimensional" competition to "nondimensional" competition. Keyence, the leading sensor and measuring equipment manufacturer in Japan, seeks to make this move by working very closely with its customers to solve their individual problems and offer customized solutions. Nintendo, the leading producer of home-use game players in the world, is peering over the shoulders of those playing games to find out the "fun" element they are seeking. These two companies have discovered that tapping their own customers can lead to breakthroughs in innovation.

Sharp became one of the world's leading producers of liquid crystal display (LCD) television sets by relentlessly pursuing serial innovation through a process of creating, sharing, protecting, and discarding knowledge. Sharp, a pioneer in LCDs since the 1970s, was the first to open a sixth-generation fabrication plant, which means it can make LCD panels as large as 1,500 mm by 1,800 mm (known as

tatami-size in Japan). Katsuhiko Machida, only two months after becoming president in 1998, set the goal of all Sharp televisions sold in the domestic market being flat-screen LCD sets by 2005. By then, the company no longer produced tube televisions for the Japanese market. As Machida has shown, one way to spur innovation is being willing to think big and tackle a goal others deem too risky.

Shimano has a 90% share of parts for higher-end bikes sold by the top-three brands in the United States (Trek, Giant, and Specialized) and a dominant worldwide position in parts for mountain bikes. Shimano triggered breakthroughs in innovation by knocking down walls between research, manufacturing, and marketing. Outside the company, it has fueled continuous innovation by working closely with its customers. Every year, Shimano dispatches more than a dozen employees of various backgrounds to work with manufacturers and retailers in the United States and Europe for several months to gauge consumer trends. In addition, its top management team regularly meets top racers, such as Tour de France winner Lance Armstrong, to discuss products and prototypes.

The Japanese Approach to Knowledge

The Japanese approach to knowledge differs from the traditional Western approach in a number of key areas. The distinctiveness of the Japanese approach is summarized in Table 1.1.

Company Viewed as a Living Organism

In the dominant Western philosophy, the individual is the principal agent who possesses and processes knowledge. The Japanese approach also recognizes that knowledge begins with the individual. At the same time, however, it recognizes the important role the interaction between the individual and the company plays in creating organizational knowledge, as well as the important role the group plays in facilitating this interaction.

Thus, knowledge creation takes place at three levels:

- the individual,
- the group, and
- the organizational levels within the company.

The difference in how a company is viewed affects the knowledge creation process. Deeply ingrained in the traditions of Western management, from Frederick Taylor to Herbert Simon, is a view of the company as a *machine* for "processing information." In Japan, a company is viewed more as a living organism. Much like

Table 1.1. *The Japanese Approach to Knowledge*

1.	Views a company as a living organism, rather than as a machine;
2.	Focuses on justifying belief much more than on seeking truth;
3.	Emphasizes tacit knowledge over explicit knowledge;
4.	Relies on self-organizing teams, not just existing organizational structures, to create new knowledge;
5.	Turns to middle managers to resolve contradictions between top management and front-line workers; and
6.	Acquires knowledge from outsiders as well as insiders.

an individual, a company can have a collective sense of identity and fundamental purpose. A shared understanding of what the company stands for (mission), where it is going (vision), what kind of world it wants to live in (values), and, most important, how to make that world a reality, lie at the base of Japanese thinking.

In this respect, knowledge creation is as much about ideals as it is about ideas. Ideals fuel innovation within a knowledge-creating company. The essence of innovation is to re-create the world according to a particular mission, vision, or value. To create new knowledge means quite literally to re-create the company, and all the individuals in it, in a nonstop process of personal and organizational self-renewal. In the knowledge-creating company, creating new knowledge is a way of behaving—indeed, a way of being—in which everyone is a knowledge worker. This contrasts with knowledge creation viewed as a specialized function or the activity of a specialized department. (For more on this topic, see Nonaka and Takeuchi 1995, ch. 3 and Nonaka 1994.)

Knowledge as Justified Belief

Most Western philosophers agree that knowledge is "justified true belief," a concept introduced by Plato. Traditional Western epistemology (theory of knowledge) has focused on "truthfulness" as the essential attribute of knowledge. As a result, it emphasizes the absolute, static, and nonhuman nature of knowledge, typically expressed in propositions and formal logic. Consider, for example, mathematics, in which absolute truth is deduced from rational reasoning grounded in axioms. Or consider, for example, the formal logic of deduction: All humans are mortal; Socrates is human; therefore, Socrates is mortal. All the statements are logical, but they leave little room for new thought to emerge.

The Japanese approach, on the other hand, highlights the nature of knowledge as "justified belief." It emphasizes the nature of knowledge as a dynamic human process of justifying personal belief toward "the truth." It takes the view that knowledge is essentially related to human action. It also focuses attention on the active, subjective nature of knowledge represented by such terms as "belief" and "commitment" that are deeply rooted in the personal value system of an individual.

The Japanese approach clarifies the distinction between information and knowledge. Both are about *meaning.* They are context-specific and relational. However, they differ in two respects. First, unlike information, knowledge is about action. It is always knowledge "to some end." Second, unlike information, knowledge is about belief and commitment. Knowledge is a function of a particular stance, perspective, or intention. Because knowledge emerges out of subjective views of the world, it probably cannot reach the "one and only absolute truth." Hence, the Japanese approach is more pragmatic, regarding knowledge temporarily as "truth" as long as it is practical to those who use it. (For more discussion of what knowledge is, see Nonaka and Takeuchi 1995, ch. 2.)

Emphasis on Tacit Knowledge

The traditions of Western management view knowledge as *explicit*—something formal and systematic. Explicit knowledge can be expressed in words and numbers, and easily communicated and shared in the form of data, scientific formulas, or codified procedures. Thus, anything digital, anything that can easily be processed

by a computer, transmitted electronically, or stored in databases is routinely equated with knowledge.

Japanese companies have a very different understanding of knowledge. They recognize that the knowledge expressed in words and numbers represents only the tip of the iceberg. They view knowledge as being primarily *tacit*—something not easily visible and expressible. Tacit knowledge is highly personal and hard to formalize, making it difficult to communicate or to share with others. This is why Japanese often resort to figurative language, metaphors, and analogies. Subjective insights, intuitions, and hunches fall in this category of knowledge. Furthermore, tacit knowledge is deeply rooted in an individual's action and experience, as well as in the ideals, beliefs, values, or emotions a person embraces.

Managers in Japan emphasize the importance of learning from direct experience, as well as through trial and error. Like a child learning to eat, walk, and talk, they learn with their *bodies*, not just with their *minds*. This tradition of emphasizing the "oneness of body and mind" has been a unique feature of Japanese thinking since Zen Buddhism became established in the 13th century. It is the ultimate ideal condition that Zen practitioners seek by means of internal meditation and disciplined life.

Zen profoundly affected samurai education, which sought to develop wisdom through physical training. Being a "man of action" was considered more important than mastering philosophy and literature. Learning from direct experience stands in stark contrast to "systems thinking," which focuses on learning with the mind. Thus, Senge (1990), the apostle of systems thinking and the learning organization, says trial-and-error learning is a delusion, as most critical decisions made in an organization have systemwide consequences stretching over years and decades, a time frame that makes learning from direct experience an impossibility.

Self-Organizing Teams

Self-organizing teams play a central role in the Japanese approach to knowledge creation. They provide a shared context in which individuals can carry on a dialogue, something that may involve considerable conflict and disagreement. It is precisely such contradiction that pushes individuals to question existing premises and to make sense of their experiences in a new way. This kind of dynamic interaction at the group level facilitates the conversion of personal knowledge into organizational knowledge.

A key aspect of the teams is that they are made up of members from different functions, departments, and divisions within the company. As an example, at Sharp, employees can be uprooted from any division or rank in the company at any time to work on an urgent project for as long as two years. This reflects the fact that no one department or group of experts has exclusive responsibility for creating new knowledge.

Central Role of Middle Managers

Middle managers play a key role in the Japanese approach to organizational knowledge creation. Top management provides a sense of direction regarding where the company should be headed and articulates that vision or dream ("what ought to be") for the company, while frontline workers in the trenches look at reality ("what

is"). The role of middle managers is to resolve any contradictions between what top management hopes to create and what actually exists in the real world by creating mid-range business and product concepts. This approach to knowledge creation is called the *middle-up-down* management process.

That middle managers serve as the bridge between top management and front-line workers is a commonplace. However, in the United States, in particular, the bridge came to be seen as a bottleneck. Consequently, as firms sought to become "lean and mean" in the 1980s and 1990s, middle management positions were often eliminated. The negative consequences of this downsizing are now being felt, and new attention is being paid to the important, positive, synthesizing role of middle managers. The Japanese approach to knowledge creation and organizational structure has always recognized their centrality.

By virtue of being positioned at the intersection of the vertical and horizontal flows of information in the company, middle managers have access to a lot of knowledge. This makes them ideal candidates to lead project teams. As such, they are able to remake reality according to the company's vision.

To become team leaders in the knowledge economy, middle managers must meet a number of qualifications. They need to be skilled at

1. coming up with hypotheses in order to create mid-range concepts,
2. integrating various methodologies for knowledge creation,
3. encouraging dialogue among team members,
4. using metaphors and analogies in order to help others generate and articulate imagination,
5. engendering trust among team members,
6. envisioning the future course of action based on an understanding of the past, and
7. coordinating and managing projects.

Acquiring Knowledge from Outside

Japanese companies have continually turned to their suppliers, customers, dealers, local communities, and even competitors for insights and clues. Knowledge acquired from the outside is shared widely within the company, stored as part of the company's knowledge base, and utilized by those engaged in new developing technologies, products, systems, or ways of competing.

A classic example is Ikuko Tanaka apprenticing with a master breadmaker for several months to gain the insight needed to overcome problems with the automatic bread-making machine Matsushita was developing. Toyota is the archetypical company that works closely with its group of affiliated suppliers to create knowledge across organizational boundaries.

The Modes of Knowledge Conversion

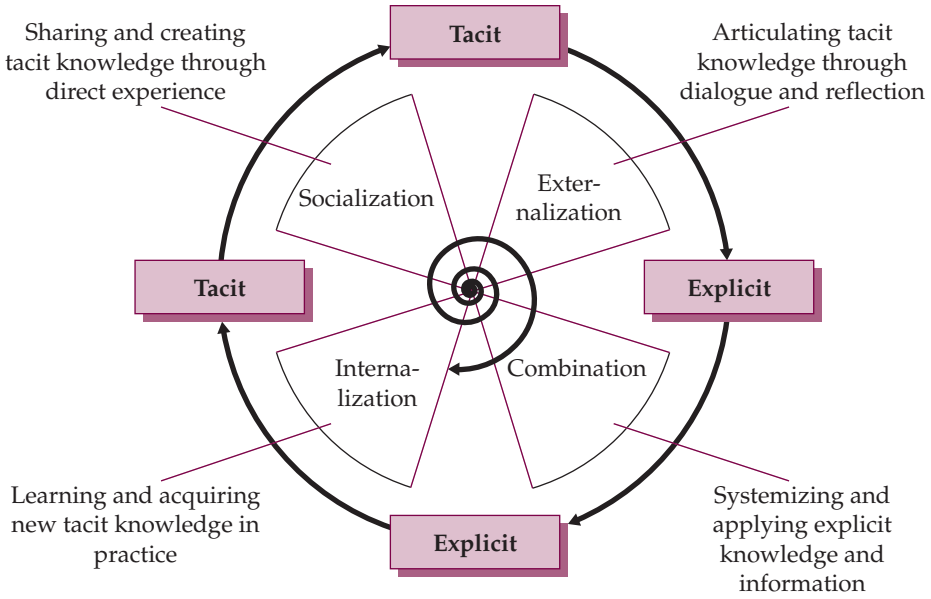
Knowledge creation moves through four modes of knowledge conversion, known as the SECI (socialization, externalization, combination, and internalization) process. This is shown in Table 1.2 and Figure 1.1.

Moving through the spiral, the interaction between tacit and explicit knowledge is amplified. The spiral becomes larger in scale as it moves up the ontological levels

Table 1.2. *The SECI Spiral*

Socialization	Sharing and creating tacit knowledge through direct experience
Externalization	Articulating tacit knowledge through dialogue and reflection
Combination	Systematizing and applying explicit knowledge and information
Internalization	Learning and acquiring new tacit knowledge in practice

Figure 1.1. *SECI Process of Knowledge Spiral*



Source: Adapted from Nonaka and Takeuchi (1995).

(that is, individual, group, organizational, and interorganizational). Knowledge created through the SECI process triggers a new spiral of knowledge creation, expanding horizontally and vertically as it transcends sectional, departmental, divisional, and even organizational boundaries. As the spiral expands beyond organizational boundaries, knowledge created by universities, suppliers, customers, competitors, local communities, government, and others interacts with each other in amplifying the knowledge-creating process. (See Ahmadjian 2004 for a more detailed description.)

To create a knowledge spiral, a number of different conversions or syntheses need to take place. These include a conversion or synthesis across

1. tacit knowledge and explicit knowledge,
2. levels (individual, group, and organizational) *within* the company,
3. functions, departments, and divisions *within* the company,
4. layers (top-management, middle manager, and front-line worker) *within* the company,
5. knowledge *inside* the company and knowledge *outside* the company created by suppliers, customers, dealers, local communities, competitors, universities, government and other stakeholders.

These synthesizing capabilities make or break the knowledge creation process.

The Concept of *Ba*

To explain the interactions involved in knowledge creation, the concept of *ba* is used. *Ba* describes the "linkage points" of interactions and "where" they take place, as well as "when" and "how" (relationships). As such, *ba* can be interpreted as a type of nexus. But *ba* is much more than a simple nexus: A *ba* provides a shared context in which individuals can interact with each other to create new meaning.

By its nature, a *ba* is ad hoc and dynamic. This makes it more analogous to improvisation in jazz than to a scored musical work. When jazz is being improvised, contexts are shared in real time, whereas when an orchestra is performing, contexts are pretty much shared in advance. Note that ad hoc is not the same as spontaneously formed: an organization can establish a linkage point and designate a space that may then become a *ba.* Table 1.3 summarizes the basic characteristics of *ba.*

Table 1.3. *Basic Characteristics of* Ba

Linkage points[1]
Physical group: Conventions and symposiums, academic and industry associations, internal meetings, project teams and task forces, etc. Conceptual group: Communities of practice, etc.
Where[1]
Physical space: A convention center, factory floor, shop floor, office space, meeting room, etc. Virtual space: Teleconferences, file sharing, social networking services, chat rooms and online exchanges such as blogs, and group-edited sites such as wikis, etc.
Nature
Ad hoc and dynamic. Shared context. Existential (having "being" in time and space).
Types
Internal (that is, within an organization, etc.). External with customers. External with noncustomers (such as suppliers, dealers, competitors, local communities, and governments).

1. A *ba* can involve multiple linkages and "wheres." The lists are intended to be indicative of the possibilities.

Conclusion

To state the book's conclusion upfront, the next five chapters should convince the reader that a new dynamism is in play in how Japanese companies create the dynamics of innovation. Japanese companies are pushing the frontier of knowledge management even further, generating a myriad of new concepts. More important, they have shown that the key to gaining competitive advantage in a knowledge economy lies at the *interorganizational* level. The new dynamism comes from finding ways to work together with outsiders—customers, suppliers, dealers, and even competitors—to create new knowledge. New knowledge—whether from *inside* or *outside*—fuels innovative breakthroughs.

The bar has been raised. By the mid-1990s, it was clear that companies could benefit from using the Japanese approach to organizational knowledge creation. The Japanese approach has been evolving. Now, any company wanting to compete on knowledge must learn from the Japanese approach to *interorganizational* knowledge creation.

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