
Creating Knowledge through Collaboration

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Increasingly, the creation of new organizational knowledge is becoming a managerial priority. New knowledge provides the basis for organizational renewal and sustainable competitive advantage.¹ A failure to create knowledge and manage it as a critical organizational asset may account for the declining performance of many well-established firms. However, our understanding of the organizational processes surrounding knowledge creation and management is rather limited. By examining knowledge creation through alliance strategies, this article provides insights into how firms manage knowledge. Understanding the process by which new knowledge is created poses a fundamental challenge to the development of a learning organization.²

In the past five years, the number of domestic and international alliances has grown by more than 25 percent annually.³ Peter Drucker has suggested that the greatest change in the way business is being conducted is in the accelerating growth of relationships based not on ownership but on partnership.⁴ Many firms have now realized that self-sufficiency is becoming increasingly difficult in a business environment that demands strategic focus, flexibility, and innovation. Alliances provide firms with a unique opportunity to leverage their strengths with the help of partners. In essence, alliances provide firms with "a window on their partners' broad capabilities."⁵ Through this window, alliances create the potential for firms to acquire knowledge associated with partner skills and capabilities. This knowledge can then be incorporated into the firm's systems and

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structures. Without an alliance, access to the partner's skills would probably be restricted, limiting opportunities for learning.

Many firms enter into alliances with specific learning objectives.⁶ Although learning through alliances can and does occur successfully, it is a difficult, frustrating, and often misunderstood process. The primary obstacle to success is a failure to execute the specific organizational processes necessary to access, assimilate, and disseminate alliance knowledge. Successful firms exploit learning opportunities by acquiring knowledge through "grafting," a process of internalizing knowledge not previously available within the organization.⁷

When firms internalize alliance knowledge, new knowledge is created. For example, Sony Corp. has recently formed various alliances with computer and telecommunications firms in an effort to forge new technology linkages for its consumer electronics products.⁸ These alliances provide Sony with access to a wealth of new knowledge, such as how to manage product development cycles in the computer industry (which are much faster than in consumer electronics). The challenge for Sony and other firms involved in such alliances is to incorporate disparate pieces of individual knowledge into a wider organizational knowledge base.

Organizational learning is a systems-level concept that can become useful only when its component parts are thoroughly understood and brought down to an operational level. Unless individual knowledge is shared throughout the organization, the knowledge will have a limited impact on organizational effectiveness.⁹ Thus, organizational knowledge creation represents a process whereby the knowledge held by individuals is amplified and internalized as part of an organization's knowledge base.¹⁰

Radical changes are occurring in the competitive environment. Some of the forces that firms must deal with are deregulation, technological discontinuities, the emergence of trading blocks, and global competition. To deal effectively with these forces, firms must refocus their resources and in many cases, radically change how they do business. To create effective strategic change, managers must generate new knowledge. For example, the telecommunications industry was for many years a cozy, protected market dominated by AT&T. The breakup of AT&T into the Regional Bell Operating Companies (RBOCs) was designed in part to stimulate new services and competition. However, a decade after deregulation, the RBOCs find themselves under a fierce assault from a host of unlikely competitors: energy companies, railroads, cable TV firms, and small start-up firms that are all poised to offer phone services. For the RBOCs to survive, they must create and harness new technological and marketing knowledge for products and services that did not exist a few years ago. In many instances, this involves the formation of strategic alliances to gain access to the skills of other firms.

The Research Study

This research study examined two main questions: Do alliance parents recognize and seek to exploit alliance learning opportunities? and What organizational conditions facilitate effective or ineffective learning? The sample of alliance organizations for the research consisted of 40 American-Japanese joint ventures (JVs) located in North America and involved interviews with their managers. All of the JVs were suppliers to the automotive industry and, with two exceptions, all were startup or greenfield organizations. In terms of ownership, 17 ventures were 50-50, in 15 ventures the Japanese partners had majority equity, and in eight ventures the American partners had majority equity.

The automotive industry at the supplier level provided an interesting context for a study of learning and knowledge creation. Ongoing structural changes in the industry have contributed to what could be referred to as a learning imperative for North American automotive suppliers. With domestic automakers under pressure from transplant Japanese firms, North American suppliers have found their traditional customers increasingly more demanding in terms of cost and quality. This situation, coupled with increasing foreign investment, has created increasingly difficult competitive conditions for automotive suppliers. As a result, this industry was fertile ground for a study of knowledge creation. Many of the American partner firms in the study, struggling to compete in an industry in transition, saw their JVs as a point of leverage for the development of new skills and capabilities.

Five cases from the initial study were selected for further study. Several criteria were used to select the cases. Of particular interest was the alliance learning potential created by the JVs and the motivation of the American parents to exploit the potential. Differences in JV performance, partner history, and the source of JV management were other criteria used in the selection of cases. Overall, the issues faced by the managers associated with these JVs were representative of alliance issues in general.

Exploiting Collaborative Knowledge

There are four critical knowledge management processes used by firms to access and transform knowledge from an alliance context to a partner context: technology sharing; JV-parent interactions; personnel movement; and linkages between parent and alliance strategies. These processes create connections for individual managers through which they can communicate their alliance experiences to others and form the foundation for the integration of knowledge into the parent's collective knowledge base. As individuals interact through the various connections, the interactions become larger in scale and faster in speed as more and more actors in the organization become involved. This process has been described as a "spiral" of organizational knowledge creation.¹¹ In the spiral, knowledge starts at the individual level, moves up to the group level, and then

to the firm level. As the knowledge spirals upward in the organization, it may be enriched and extended as individuals interact with each other and with their organizations.

Although the knowledge management processes are not complex or difficult to understand, the lack of complexity should not be associated with a lack of effectiveness. The creation of organizational knowledge requires the sharing and dissemination of individual experiences. Each process provides an avenue for JV parent managers to gain exposure to knowledge and ideas outside their traditional organizational boundaries. The processes deal with both operational and strategic knowledge and taken together, provide a comprehensive view as to how alliance knowledge can cross organizational boundaries and become the basis for knowledge creation in parent firms.

Tacit and Explicit Knowledge

Organizational knowledge creation involves a continuous interplay between tacit and explicit knowledge.¹² Tacit knowledge is hard to formalize, making it difficult to communicate or share with others. Tacit knowledge involves intangible factors embedded in personal beliefs, experiences, and values. Explicit knowledge is systematic and easily communicated in the form of hard data or codified procedures. Often there will be a strong tacit dimension associated with how to use and implement explicit knowledge.

Table 1 shows the four knowledge management processes and the primary types of knowledge associated with each process. The table also provides examples to help clarify the tacit and explicit dimensions. Two of the knowledge management processes, JV-parent interactions and linkages between parent and alliance strategies, create the potential for both explicit and tacit knowledge to be created. Technology sharing provides access primarily to explicit knowledge. Personnel movement, while it could be associated with explicit knowledge, will be most effective as a means of gaining access to tacit knowledge.

Technology Sharing

In the cases studied, parent firms had put into place various mechanisms to gain access to JV manufacturing process and product technology. The most common approach was also the most straightforward—meetings between JV and parent managers. In one case, monthly meetings were held, with the location alternating between the JV and one of the American parent plants. In attendance at the meetings were plant managers, heads of quality control, R&D managers, the VP manufacturing at the American parent head office, and several senior JV managers. In addition, quarterly R&D meetings were held involving the JV and American parent. The manufacturing vice president of one of the American parent's said that "while he hated to admit it, the quality of the JV product was superior to that in the parent." As a result, he initiated a program with his plant managers about the need to improve quality and customer service.

TABLE I. Knowledge Management Processes and Types of Knowledge

Knowledge Management Processes	Types of Knowledge	Examples of Knowledge Potentially Useful to American JV Parents
Technology Sharing	Explicit	<ul style="list-style-type: none"> • quality control processes • product designs • scheduling systems
JV-Parent Interactions	Explicit	<ul style="list-style-type: none"> • specific human resource practices
	Tacit	<ul style="list-style-type: none"> • expectations of Japanese customers
Personnel Movement	Tacit	<ul style="list-style-type: none"> • continuous improvement objectives • commitment to customer satisfaction
Linkages Between Parent and Alliance	Explicit	<ul style="list-style-type: none"> • market intelligence
	Tacit	<ul style="list-style-type: none"> • visions for the future • partner's keiretsu relationships

Access to partner technology skills also occurred through direct linkages between Japanese and American partners. In two cases, there were regular visits by American parent personnel to Japanese parent facilities. Consistent with the argument that Western firms find it difficult to undertake activities not fitting prevailing notions of what the company is about," an American parent president expressed frustration at the lack of tangible output from these visits.

Our engineers go to Japan and come back with some good ideas but nothing ever happens. They [the American engineers] are too protective of their technology and way of doing things. It drives me crazy when I visit a Japanese partner plant. They are doing the same things we are with one-third the employees. I tell our people here but they can't do it.

Despite this frustration, the president recognized the value of the Japanese technology and decided to initiate some changes within the parent operation. To capitalize on the Japanese partner's fabrication knowledge and ability to operate with fewer equipment operators, the American president invited several Japanese engineers to the United States to train parent engineers. The Japanese engineers brought very detailed equipment designs that would allow the American firm to replicate their manufacturing process. When no visible progress was made on designing new equipment, the American president decided to contract the design and manufacturing of the equipment to the Japanese partner. An American engineer would be sent to Japan to learn about the equipment so it could be installed in the United States.

In another case, the partners signed a very broad global technology agreement. Both partners agreed to be completely open in sharing both product and manufacturing technology. For example, the JV had developed a specific process technology that was considered proprietary (so proprietary, in fact, that a section of the manufacturing line could be closed off behind dark curtains if necessary).

The American parent was actively studying the process to incorporate in its own plants.

With this technology-sharing agreement, there were explicit terms on licensing and royalties only for product technology. For manufacturing technology, such as the proprietary process above, there were no established financial terms. The American parent may ask to borrow a Japanese partner engineer for a few weeks. When this had happened in the past, there was never any financial considerations involved because, according to a manager, "it all comes out in the wash." The American partner recognized the need for reciprocal commitment and tried to make the technology sharing a two-way relationship, as a parent manager explained:

When we give something to the Japanese partner, they will return it tenfold. If we are not coming up with anything, they will not give us anything in return.

Not all the American parents were interested in access to Japanese partner technology. In one case, a Japanese partner offered to share its manufacturing technology with its American partner. The Japanese partner had developed some proprietary process technology and was willing to share it at no cost. The technology was used in the JV and was very visible to American partner managers. The offer was communicated in a written memo from a JV manager to the American partner president. The American firm never followed up on the offer. Why was the offer refused? One JV manager's opinion was that "the people from the American parent do not want to learn because they see the JV as an upstart."

JV-Parent Interactions

The JV-parent relationship plays a key role in knowledge management. In addition to the technology-sharing initiatives discussed above, other JV-parent interactions can create the social context necessary to bring JV knowledge into a wider arena. JV-parent interactions can provide the basis for what have been referred to as "communities of practice."¹⁴ A community of practice is a group of individuals that is not necessarily recognizable within strict organizational boundaries. The members share community knowledge and may be willing to challenge the organization's conventional wisdom. Communities emerge not when the members absorb abstract knowledge, but when the members become "insiders" and acquire the particular community's subjective viewpoint and learn to speak its language. In this study, the insiders were the American managers who recognized the strategic benefits of collaboration and who were prepared to accept the JV as a legitimate basis for fostering learning. As an example, a manager in one case explained, "over time the JV has become grudgingly accepted as more people have been exposed to the JV. Now, there is high regard for what is going on." In this case, the elements of a community emerged when a cross-section of parent and JV managers recognized that the Japanese partner was not a threat but a valuable partner.

Visits and tours of JV facilities were an effective means for parent managers to learn about their JVs. JV managers were generally convinced that differences embodied in the JV were visible and parent managers would appreciate the differences if they spent more time in the JV. However, visits were not always utilized effectively, as a JV manager explained:

Plant managers have been invited and some have visited. However, the American parent organization is so lean that these people have little time to invest in learning....A group of 1st line supervisors spent two weeks in the JV. They spent time learning about the JV systems and took videos and notes back to the parent. They went back to the parent plants and nothing happened....The Japanese partner, on the other hand, sends many people to the JV with a learning objective. They are not afraid to ask questions and spend a lot of time in the JV doing that. There are always Japanese people visiting, both from Japanese parent divisions and from Japanese parent world headquarters. It is not always clear what they are here for. Sometimes they just observe, other times they ask a lot of questions.

An effective utilization of a JV visit occurred when the American parent sent several managers to visit the JV to study the JV's human resource management systems. In contrast to most of the American parent plants, the JV was a non-union operation with a hybrid mix of Japanese and American human resource practices. The American parent was establishing a new non-union operation and decided to use the JV as a model. With the JV managers' support, the visiting managers spent several days studying the JV and then incorporated much of their knowledge in the new non-union plant.

Customer-supplier relationships between the JV and the American parent also created a basis for extensive JV-parent interaction. In one case, the American parent substantially increased its quality because of pressure from the JV customer, which in turn was under pressure from its Japanese transplant supplier. Until the JV was formed, the American parent had not had any extensive interactions with Japanese customers. In supplying the JV, and indirectly becoming a transplant supplier, the American parent was forced to evaluate some of its manufacturing operations.

The customer-supplier interchanges were not always amicable. In one case, the JV acted as both supplier and customer for the American parent. Neither relationship was considered satisfactory, although it was a rich source of knowledge for the American parent. As a customer, the JV had so many quality problems with the American parent's products that most of the business was shifted to an outside firm. As a supplier, there were also problems. In one instance, the parent asked the JV to carry out a special order because they were behind in their deliveries. The JV refused the business because of concerns about the product quality. The reaction from the American parent was "those [JV] people are too inflexible and going too far with the quality issue."

Personnel Movement

The rotation of personnel between the alliance and the parent can be a very effective means of "mobilizing" personal knowledge. Rotation helps members of an organization understand the business from a multiplicity of perspectives, which in turn makes knowledge more fluid and easier to put into practice.¹⁵ In this study, the rotation of interest was a two way movement of personnel between the JV and parent. If there is only one-way movement, such as from the parent to the JV, this was not considered rotation.

Interestingly, none of the cases studied had an explicit process of rotation between the JV and the parent. However, in four cases, there was an informal system of personnel movement between the organizations. For example, an American parent promoted a JV manager to a staff training position at parent HQ. Several engineers also were promoted. In four cases, senior managers were transferred to the JV when the JV was formed. The careers of these managers were considered closely linked to the American parent and not just the JV. In one JV, the Chief Operating Officer of the JV came from the American parent to act as mentor for the younger JV management. This manager will eventually return to the American parent. In another JV, two plant managers spent time in the JV and then returned to plant management positions in American parent plants. The chairman of the American parent in this case told one of the managers that he wanted him back in the American parent to "do some of the things he has learned here [in the JV]."

The attitude of the Japanese parent sometimes constrained rotation. In one case, the Japanese parent preferred that JV personnel not move to the American parent. The Japanese parent saw the JV as distinct and separate from the American parent. Despite this concern, the American parent has moved personnel from the JV to the parent. In another case, personnel were willing to move from the parent to the JV but less willing to return to the American parent. This prompted the American parent to ask its JV not to "poach" any more personnel from the parent.

Linkages Between Parent and Alliance Strategies

The degree to which the parent and alliance strategies are linked plays an important role in the management of alliance knowledge. A JV perceived as peripheral to the parent organization's strategy will likely yield few opportunities for the transfer of alliance knowledge to the parent. A JV viewed as important may receive more attention from the parent organization, leading to substantial parent-JV interaction and a greater commitment of resources to the management of the collaboration. To maximize exposure to partner knowledge, alliance partners must go beyond the narrow confines of the JV agreement. In two cases, the JV functioned like a related division of the American parent, with the parent focused on managing the partner relationship, not just the JV itself. According to the president of one of the American parents:

The JV is treated exactly the same as our other divisions. The JV participates in all our meetings and all of the JV's salaried employees have the same benefits as their counterparts at other divisions. This makes it easier to move people back and forth between the JV and parent.

In this case, the relationship between the partners was getting much stronger. The JV started off strictly as a transplant supplier and relatively independent of its American parent, relying extensively on the Japanese partner for product technology and marketing support. Over the years, the JV became less independent as ties between the two partners increased. Plans were underway to jointly explore several new international options. Both parents realized that pooling their knowledge made sense given the ongoing consolidation in the global automotive industry.

Another case illustrates a deepening of the ties between the JV and American parent. When the JV was formed it was initially presented as a Japanese company to the transplant customers. The JV evolved into a much less "Japanese" firm and through its American parent's contact, had developed a substantial amount of business with domestic customers. The objective, remarked a JV manager, was for both the JV and the parents to benefit.

Through strategic linkages between the JV and the parent, the partners can gain important insights into each other's businesses. For example, an American parent won a contract to supply a part but was unable to meet the target cost. The parent decided to use its JV to produce the parts because of the JV's superior process technology. This type of linkage indicates that the American parent has internalized the differences between the parent and JV. It also opens the door for more knowledge sharing and cooperation in the future.

With these strategic linkages, there is an assumption that the linkages are consistent with the strategic goals of the parents and JVs. If a JV is in a business unrelated to that of the parent, linkages may not be possible and alliance knowledge may have limited value to the parent. In all the cases examined for this study, the JVs were in a similar business and the opportunities for synergy were substantial. Nevertheless, I would classify only two of the JVs as highly integrated with their American parents.

Facilitating Factors

Why do some firms actively seek to leverage alliance knowledge while others make only a minimal effort? Why are some firms more effective at leveraging alliance knowledge? There are six factors that facilitate effective knowledge management: flexible learning objectives; leadership commitment; a climate of trust; a tolerance for redundancy; creative chaos; and an absence of performance myopia.

Flexible Learning Objectives

The collaborative objectives of the JV partners are a key element in alliance knowledge creation. However, it is not enough to enter a JV with a learning objective. Initial learning objectives may have little impact on the effectiveness of knowledge creation efforts. This is not to suggest that learning objectives are unimportant. If learning objectives are associated with the formation of a JV, a parent firm may enter more actively into the search for knowledge. However, if the initial learning objective is not correctly focused and management is unwilling or unable to adjust the objective, knowledge management efforts may be ineffective. For example, in one case the American partner had a very explicit technology learning objective. However, this firm's knowledge management efforts were weak and inconsistent because the firm did not have a clear understanding of its partner's skills. While the partner was highly skilled in specific manufacturing technology areas, its success was also the result of skills in other areas such as customer management and scheduling. The American partner was unwilling to adjust its original, narrow technology learning objective. Rather than reorienting the learning objective, parent management saw the differences between the parent and the JV as irreconcilable. According to the president of the American partner, "the JV is in a different business than us. They do not have traditional customer relationships."

In another JV, the situation was almost the reverse. The American parent was interested in forming a JV primarily to gain access to the Japanese transplant market. When negotiations to form the JV were started, American parent management made it clear that they were only willing to be involved if they managed the JV. According to the JV president, "we have a quality reputation which we should be able to carry over to the JV." But, after working together for several years, American parent management realized that alliance knowledge could be important to their firm and greater effort was made to gain access to the JV operations and JV partner knowledge. The American parent formed its JV with a weak learning objective that grew stronger with exposure to the JV partner.

In several cases, the American firm did not have an initial learning objective until skill discrepancies became obvious and unavoidable. For example, an American firm that had prided itself on its high quality product status found its quality lacking once it formed its JV:

Initially, we thought there was nothing to learn from our partner. We thought we were better than anybody. When we first went to Japan we thought our partners wanted a JV so they could learn from us. We were shocked at what we saw on that first visit. We were amazed that they were even close to us, let alone much better. We realized that our production capabilities were nothing [compared with the Japanese firm]. We realized that we were not world class. Our partner was doing many things that we couldn't do.

As a starting point, a firm must have a learning objective. However, if the initial learning objective is based on an incorrect and inflexible assessment of partner competencies, learning and knowledge creation efforts may be ineffective. Ideally, as a firm builds a relationship with its partner, the learning objective will become more focused and ambiguity about the partner will disappear.

Leadership Commitment

Top management's role in managing knowledge should be one of architect and catalyst.¹⁶ While multiple advocates are important,¹⁷ there must be at least one strong champion of knowledge creation in a leadership position. The leader's role is especially important in initiating linkages between parent and alliance strategies. In one JV, the primary impetus for this close relationship came from the president of the American parent. The president had a longstanding personal relationship with the chairman of the Japanese partner. The president was committed to building the JV relationship and leveraging the JV experience to strengthen the American parent business. Through the president's efforts, both explicit knowledge management efforts designed to transfer specific technologies were initiated as well as more exploratory exchanges of personnel and ideas.

Another example illustrates what happens when leadership commitment weakens. The CEO of the American parent joined the parent shortly after the JV was formed. In the JV's initial years, there was a moderate amount of ideas shared between the two firms, primarily because the JV was formed as an offshoot of a licensing agreement between the Japanese and American partners. After joining the American parent, the CEO found a deteriorating relationship between the JV and the American parent. To improve communication, regular "differences meetings" between the two sides were set up. For example, one issue discussed was the American parent's role in performing some intermediate manufacturing for the JV. JV management accused the American parent of poor quality and high prices. After a few meetings, the CEO stopped attending and no more meetings were held. From the JV president's perspective, the American parent was aware that there were technology differences between the two firms.

When the American parent people come to the plant they can see the differences but they tend to rationalize them: you have new machines, you have only one customer, etc. The real problem is that their management does not have to deal with the same customer demands as us.

A lack of top management commitment was also seen in another case, as indicated by a comment from a JV manager.

The top American partner people come in once or twice a year. They are impressed with the venture and will go back to headquarters and tell their managers: go do this Japanese stuff. The problem is they do not back it up with support. For example, the first plant manager was transferred to Europe and told

to 'do the Japanese stuff.' He put together a proposal that would cost \$200,000. The plan died at that point.

Climate of Trust

A climate of trust between both the JV partners and between the JV and parent organizations is critical to the free exchange of information. Trust between the partners appeared to be both a function of top management involvement in the relationship and a history of cooperation prior to the formation of the JV. In one case, a JV manager suggested that the high trust relationship between the "patriarchs" in each partner was critical to the partner relationship. In another case, in response to a question as to the single most important factor in ensuring an enduring partner relationship, the American parent president indicated that a long history of cooperation was essential. This supports other research findings that a history of ties between alliance partners generates trust.¹⁸ If there is no such history between partners, initial trust may become precarious.

Mutual trust was also important between the JV and the parent as a basis for sharing and cooperating. JV managers indicated that the JVs were viewed by parent middle managers with distrust. In three of the cases, the JV-parent relationship had evolved into a high trust relationship. In one of the other cases, there was a high level of distrust about the nature of the relationship and the motives of the two organizations, as illustrated by the following JV manager statement:

The American parent typically screws up and asks the JV to smooth things over. They [the American parent] cannot meet a commitment. We have helped them lots of times, what have they done for us?

Tolerance for Redundancy

Redundancy means the conscious overlapping of company information, activities, and management responsibilities.¹⁹ Redundancy encourages frequent dialogue and, as Peter Senge argues, dialogue is a key element of collective learning.²⁰ In a dialogue, complex issues are explored with the objective of collectively achieving common meaning. Dialogue involves conversations and connections between people at different organization levels. Inevitably, as issues are debated and assumptions questioned, dialogue will lead to some redundancy in information. Without a tolerance for redundancy, sharing of ideas and effective dialogue will be difficult.

The knowledge management processes discussed earlier involved elements of redundancy. Much of the discussion revolved around concepts such as sharing, interaction, and integration, all of which imply the transfer of knowledge between individuals. Managerial tolerance for redundancy was not consistent across the cases. In one case, the regular attendance of JV managers at meetings involving parent division managers could have been seen as redundant

given that the JV was initially formed with a narrow mandate to supply one transplant firm. However, the attendance continued and, eventually, the mandate of the JV widened to the extent that the JV became an integral division within the organization.

In another example, the American parent president realized that the parent had to make a large commitment in managerial time when the JV was formed if the JV was going to be successful and if the parent was going to directly benefit from its JV involvement. While this commitment was initially costly, the result was a JV closely integrated with the parent's strategy and a clear overlapping of roles.

In a case of low tolerance for redundancy, the JV general manager actively promoted the JV as a training ground for parent managers. With the exception of a few instances, the parent was unwilling to incur the minimal expense of sending key parent managers to the JV on a regular basis to experience the JV firsthand. This type of action could have been seen as wasteful and not directly associated with successful JV management. However, allowing individuals to enter each others' areas of operation promotes the sharing and articulating of individual knowledge, which can lead to problem generation and knowledge creation.²¹ In this study, the Japanese parents frequently took the opportunity to send Japan-based managers to visit the JV, probably because of a greater tolerance for redundancy and because in Japanese firms life-long learning is an explicit element in the career path of Japanese managers.

Creative Chaos

Chaos is created naturally when an organization faces a crisis, such as a rapid decline in performance.²² Chaos can also occur when differences or discrepancies disrupt normal routines. Chaos increases tension within the organization and focuses attention on forming and solving new problems. The job of managers in the knowledge creating company is to orient the chaos toward knowledge creation by providing managers with a conceptual framework that can be used to interpret experience.²¹

Most of the JVs between Japanese and American firms in the automobile supply industry were formed in the late 1980s. For many suppliers, this was a time of chaos. With the domestic automakers under pressure from Japanese firms, many suppliers found their traditional customer base shrinking. In one case, the problems in the auto industry strengthened the JV-parent relationship, as a JV manager explained in 1991:

With the downturn in the auto industry, the JV is now starting to beat the other parent plants. They are losing money and the JV is clearly superior in terms of quality and efficiency. The American parent can no longer ignore the differences between the JV and the American partner plants.

However, in several of the other cases, there was a great deal of suspicion at the middle management level about why the JVs were formed, as the following quote from a JV manager suggests:

There are still people with the attitude 'these guys from Japan are not going to show me how to run a JIT plant.' It is still hard for Americans to admit that there may be something worth learning from Japanese firms.

The impact of crisis-induced chaos on knowledge creation is difficult to assess. A crisis associated with serious financial problems may not lead to managerial reflection.²⁴ However, if chaos is invoked or manipulated *creatively* by top management, it can be a powerful motivator. For example, one JV participated in corporate level meetings with other parent divisions. By showing superior quality indicators to parent plant managers, the JV manager was able to send a very powerful signal. In fact, by treating the JV as a related division and encouraging interaction, managers were in a much better position to challenge what is taken for granted. In contrast, the situation at another company involved conflict over the role of the JV as a parent supplier and customer. While this provided an excellent opportunity to leverage the resultant chaos, parent management chose to use the experience as an excuse for lessening interaction between the parent and JV.

Performance Myopia

Managers seeking to create knowledge must cope with confusing experiences.²⁵ One such "experience" for JV parents was the assessment of JV performance. Several managers in the American parent companies pointed to the poor financial performance of the JVs as evidence that learning was not occurring, or could not occur. More generally, a myopic preoccupation with short-term issues was a common characteristic of the American partners. Although it is too simplistic to describe Japanese management as long-term oriented and American management as short-term oriented, the Japanese partner firms in this study appeared to focus on customer satisfaction and product quality rather than on profit-based performance. Consistent with other studies,²⁶ the Japanese firms seemed less constrained by issues of share price and by impatient boards of directors than their American counterparts. While North Americans focused on the bottom line, the Japanese focused on improving productivity, quality, and delivery.

When a firm is heavily focused on financial performance issues, learning will often be a secondary and less tangible concern. In the poorly performing JVs, American managers found it difficult to conceive that learning could be occurring in the face of poor performance. A JV manager described a situation involving performance and learning:

The American parent's emphasis on the profitability of the JV clouded their judgment. They just could not see past the startup period. The losses distorted the attitudes of the American parent. Learning was never allowed to surface. Their

attitude became, they [the Japanese partner] don't know anything so how can we learn from these people?

In the face of poor JV performance, there will be a reluctance to commit to or even try out proposals generated at the JV level. More importantly, when either learning or performance are less than satisfactory, there are implications for the assessment of the other objective. Poor performance can lead to myopia, which then acts as a barrier to knowledge creation, unexploited learning opportunities can lead to perceptions of unsatisfactory JV performance.

Implications

Successful organizations must be able to create, gather, and cross-fertilize knowledge across individuals and operating units. One potential avenue for creating knowledge is collaboration. Properly managed, alliances can be very powerful vehicles for the creation of new organizational knowledge.

Effective Knowledge Creation

Effective knowledge creation through alliances depends on two main elements. First, there are the organizational processes that firms can use to access and transform knowledge from an alliance context to a parent firm context. While these knowledge management processes are not complex, there was substantial variance in the extent to which firms in this study were actively seeking to exploit the knowledge potential of their JVs. Some parent managers were unable or unwilling to appreciate both the simplicity and the potential of these processes. Simple actions, such as visiting a JV and interacting with JV personnel, can be strong stimulants for learning. Despite the high cost of visits, the Japanese partner firms in this study were much more willing to send visitors to their JVs than were the American partners.²⁷

The second element necessary for knowledge creation is an organizational climate that facilitates the effective implementation and utilization of the knowledge management processes (this incorporates the facilitating factors discussed above.).

While a balance between the knowledge management processes and the facilitating factors is necessary, there is also the question as to which management processes are most important. Does a firm need to be good at all the processes to create knowledge or will an "unbalanced" approach to knowledge management work? The answer depends on the type of knowledge sought and the strategic value attached to JV knowledge. A firm seeking access to manufacturing process technology may use a very different approach than the firm interested specifically in product market positioning knowledge. The firm with a learning objective that covers a broad spectrum of knowledge will probably employ a broad knowledge creation strategy. No two firms will attach the same value to JV knowledge and, therefore, each firm will have to tailor its

knowledge management strategy to its own objectives. Similarly, it is unlikely that all of the facilitating factors will be present in equal strength in any firm. The challenge is to develop an organizational climate that fosters knowledge creation and is consistent with collaborative objectives.

The Cost of Knowledge Creation

An issue that cannot be ignored is the cost of knowledge creation. The four knowledge management processes used by firms to access and transform alliance knowledge involve costs for the knowledge creating firm. Therefore, a decision to initiate knowledge creation efforts must be balanced with the cost of doing so. For example, visits and tours of JV facilities were identified as a simple and effective means for parent managers to interact with JV managers. While visits and tours can be effective, their cost cannot be dismissed. Given the uncertainty associated with any knowledge creation effort, it is not surprising that parent managers in this study raised questions about the value of visiting the JV plants.

Nevertheless, Japanese firms appear to be more willing to make the investment in knowledge creation than American firms and also are willing to accept incremental developments of knowledge.²⁸ As a result, Japanese firms may be in a better position to assess the cost-benefit tradeoff of knowledge creation processes. In contrast, American firms tend to seek knowledge in large discrete steps and there is often a reluctance to experiment and deviate from prevailing notions of what the company is about. Consistent with this perspective, a manager in this study suggested that Americans tend to look for "home runs" before new knowledge is considered worthwhile. The problem is that since potential projects are frequently evaluated against an ideal situation, many organizations fail to undertake any knowledge creation projects. This home run mentality, coupled with the failure to recognize the value of incremental learning, provides additional insights into why parent learning was low even when the potential for learning was high. Much of what could be learned from the JVs in this study was of an incremental nature and closely linked to the Japanese partner's business philosophy.

A further issue associated with alliance knowledge is that partner firms may have to take steps to protect their core technologies. To protect themselves from the learning objectives of their partners, firms may have to be cautious in transferring their technologies to alliances. Firms can also institute measures to limit the transparency or openness of their skills to their partners. These measures include the establishment of gatekeeping roles, limiting the number of partner personnel involved in active alliance management, and controlling key operational tasks in the alliance.²⁹

A difficult question for any firm instituting knowledge creation structures and processes is: At what point has an optimal level of learning been reached? In other words, when does the cost of creating new knowledge exceed its benefit? Because knowledge creation and its benefits may be separated in time, or the

benefits may be masked by intervening forces, assessing the true cost of knowledge creation efforts will never be easy. However, ignoring the cost entirely may lead to inefficient knowledge creation. Assuming the cost is prohibitive may mean no new knowledge is created.

Conclusion

Knowledge creation is a dynamic process involving interactions at various organizational levels and it encompasses a community of individuals that enlarge, amplify, and disseminate their knowledge. It can be haphazard and idiosyncratic and should be viewed as a continuous process, rather than one with identifiable input-output phases. It may occur unintentionally and it may occur even if success cannot be assessed in terms of objective outcomes. Given its haphazard and idiosyncratic nature, firms may view resources committed to knowledge creation as extravagant and wasteful. The view here is that the ability to create knowledge and move it from one part of the organization to another is the basis for competitive advantage. While not all knowledge creation efforts will be successful, some will yield surprisingly important results. Also, not all knowledge creation efforts will have immediate performance payoffs. However, over the long term, successful knowledge creation should strengthen and reinforce a firm's competitive strategy.

Notes

1. J.B. Quinn, *The Intelligent Enterprise* (New York, NY: Free Press, 1992).
2. The notion of the learning organization is explored in detail in P.M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York, NY: Doubleday, 1990); P.M. Senge, C. Roberts, R. Ross, B.J. Smith, and A. Kleiner, *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization* (New York, NY: Currency/Doubleday, 1994).
3. J. Bleeke and D. Ernst. "Is Your Strategic Alliance Really a Sale?" *Harvard Business Review*, 73 (January/February 1995): 97-105.
4. P.F. Drucker, "The Network Society," *Wall Street Journal*, March 29, 1995, p. 12.
5. G. Hamel, Y. Doz, and C.K. Prahalad, "Collaborate With Your Competitors—and Win," *Harvard Business Review*, 67 (January/February 1989): 133-139.
6. There is a growing body of research dealing with learning and alliances. See J. Badaracco, *The Knowledge Link: Competitive Advantage Through Strategic Alliances* (Boston, MA: Harvard Business School Press, 1991); G. Hamel, "Competition for Competence and Inter-Partner Learning Within International Strategic Alliances," *Strategic Management Journal*, 12 (1991): 83-104; B. Kogut, "Joint Ventures: Theoretical and Empirical Perspectives," *Strategic Management Journal*, 9 (1988): 319-322; N.S. Levinson and M. Asahi, "Cross-national Alliances and Interorganizational Learning," *Organizational Dynamics*, 24 (Autumn 1995): 50-63.
7. Huber has explored the various ways by which organizations are exposed to new knowledge: congenital learning, experiential learning, vicarious learning, search ing, and grafting. Of specific interest in this study is grafting knowledge from outside the organization's boundaries; for example, through mergers, acquisitions,

- and JVs. See G.P. Huber, "Organizational Learning: The Contributing Processes and a Review of the Literatures," *Organization Science*, 2 (February 1991): 88-117.
8. D.P. Hamilton, "Sony Expands in Computer-Linked Gear: Effort Requires Shift in Go-It-Alone Tradition," *Wall Street Journal*, April 14, 1995, p. A8.
 9. D.H. Kim, "The Link Between Individual and Organizational Learning," *Sloan Management Review*, 35 (Fall 1993): 37-50.
 10. I. Nonaka has written extensively in the area of knowledge creation. See I. Nonaka, "A Dynamic Theory of Organizational Knowledge," *Organization Science*, 5 (February 1994): 14-37; I. Nonaka, "The Knowledge creating Company," *Harvard Business Review*, 69 (November/December 1991): 96-104. Nonaka and Takeuchi have argued that one of the limitations of organizational learning theory is its failure to develop the concept of knowledge creation. See I. Nonaka and Ff. Takeuchi, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation* (New York, NY: Oxford University Press, 1995).
 11. Nonaka, op. cit., 1994.
 12. Nonaka and Takeuchi, op. cit., 1995.
 13. G. Hedlund and I. Nonaka, "Models of Knowledge Management in the West and Japan," in P. Lorange, B. Chakravarthy, J. Roos, and A. Van de Ven, eds., *Implementing Strategic Processes: Change, Learning, and Cooperation* (Oxford: Basil Black-well, 1993), pp. 117-144.
 14. J.S. Brown and P. Duguid, "Organizational Learning and Communities of Practice: Towards a Unified View of Working, Learning, and Organization," *Organization Science*, 2 (February 1991): 40-57.
 15. Nonaka, op. cit., 1994.
 16. G. Hedlund, "A Model of Knowledge Management and the N-form Corporation," *Strategic Management Journal*, 15 (Special Issue 1994): 73-90.
 17. E.C. Nevis, A. DiBella, and J.M. Gould, "Understanding Organizations as Learning Systems," *Sloan Management Review*, 23 (Winter 1995): 73-85.
 18. R. Gulati, "Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances," *Academy of Management Journal*, 38 (February 1995): 85-112.
 19. Nonaka, op. cit., 1994.
 20. Senge, op. cit., 1990.
 21. I. Nonaka, "Redundant, Overlapping Organizations: A Japanese Approach to Managing the Innovation Process," *California Management Review*, 32/3 (Spring 1990): 27-38.
 22. Nonaka, op. cit., 1994.
 23. Nonaka, op. cit., 1991.
 24. On this point I disagree with Nonaka. Based on his observations of Japanese firms, Nonaka suggested that crisis-induced chaos can stimulate knowledge creation. My observations involving financial crisis suggest that crisis shuts down knowledge creation efforts. The explanation may lie in differences between Japanese and Western firm approaches to knowledge creation.
 25. D. Levinthal and J.G. March, "The Myopia of Learning," *Strategic Management Journal*, 14 (Winter 1993): 95-112.
 26. For example, see J.C. Abegglen and G. Stalk, *Kaisha: The Japanese Corporation* (New York, NY: Basic Books, 1995).
 27. One interpretation of the Japanese partners' willingness to send visitors to the JVs is that the visits provided an opportunity to learn about the American marketplace and business environment. Obviously, the American firms had little to learn in this area.
 28. Hedlund and Nonaka, op. cit., 1993.
 29. Hamel, op. cit., 1991.