Management Focus
The ‘ART’ of Knowledge: Systems to Capitalize on Market Knowledge

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The authors argue that current knowledge management practice, which focuses on managing explicit data and information technology, is not enough. Tacit knowledge, such as subjective insights or emotions must also be considered.

Converting between these forms of knowledge is important, and the concept of ART (action-reflex-trigger) systems is introduced to enable this to take place. ART systems enable companies to implement a multi-dynamic approach to knowledge management.

The complex concept of ‘ba’ is introduced—a shared mental space for knowledge creation—which provides a foundation for knowledge creation. The authors explore the nature, context and enabling conditions for ART systems and show how ba can be employed in ART systems.

A case study—of the Seven-Eleven Japan corporation is presented, whose outstanding success is based on the capitalization of market knowledge, striking a balance between supportive IT and human insight, to achieve a multi-dynamic approach to knowledge management. The company integrates several interlinked ba and ART systems. © 1998 Published by Elsevier Science Ltd. All rights reserved

Introduction
To survive in today’s knowledge-based competition, firms are facing the question of how to generate the knowledge necessary to innovate. To answer this question, this paper proposes a conceptual framework for multi-dynamic knowledge management.

The goal of the paper is go beyond the present knowledge management, whose focus is limited to managing explicit data and information technology (IT). For this purpose, we introduce the concept of action-reflection-trigger (ART) systems, as specific support for selected conversion processes. As such ART systems are part of Information Technology that elicits knowledge (Nonaka et al., 1998). ART systems create the linkages between action and reflection, and trigger the dynamic process of accumulation, creation, exploitation and dissemination of knowledge. The framework of ART systems allows a firm to go beyond the common practices in knowledge management.

The Theory of Knowledge Creation
Knowledge is defined as justified true beliefs and bodily acquired skills (Nonaka, 1990; Nonaka and Takeuchi, 1995). There are two kinds of such knowledge. Explicit knowledge can be expressed in words and numbers and easily shared. In the West, in general, this form of knowledge has been emphasized. Tacit knowledge, such as subjective insights or emotions, is non-articulated, and embedded in contexts and actions. It is highly personal and hard to verbalize or communicate. Tacit knowledge, such as bodily skills or mental models, is deeply rooted in
individual’s action and experience as well as in the ideals or values he or she embraces. In the East, in general, tacit knowledge has been emphasized. The conversions between these two kinds of knowledge are the essence of knowledge creation.

**SECI Model for Self-Transcendence**

The SECI model describes the four conversion modes from tacit to tacit, tacit to explicit, explicit to explicit and explicit to tacit knowledge. All four conversions are necessary for the creation of knowledge. Each of the conversion modes can be understood as processes of self-transcendence, as every conversion involves transcending the self of individuals, teams or organizations (Figure 1).

Socialization is the process of sharing tacit knowledge of individuals. Sharing experiences is a key to understanding others’ ways of thinking and feeling. In a certain sense, tacit knowledge can only be shared if the self becomes part of a larger self.

Externalization requires the articulation of tacit knowledge and its translation into forms that can be understood by others. Individuals transcend the inner- and outer-boundaries of the self in dialogue. Dialogue, ‘listening and contributing to the benefit of all participants’ (Bohm, 1980; Nichol, 1996), strongly supports externalization. In practice, externalization is supported by the use of metaphors and analogies.

Combination involves the conversion of explicit knowledge into more complex sets of explicit knowledge. To diffuse fragmentary knowledge, editing and systemizing such knowledge are the keys to this conversion mode. Here, new knowledge generated in the externalization stage transcends the group.

Internalization means the conversion of newly created explicit into tacit knowledge of individuals. Learning by doing, training and exercises are important to embody explicit knowledge. Thus on-the-job training (OJT), simulations or experiments are used to induce internalization of new knowledge.

This SECI model describes dynamic processes of self-transcendence. The individuals or teams go beyond their restricted knowledge to promote the dynamics of knowledge creation within an organization. Also, organizations can transcend their boundaries by engaging in conversion processes with their partners, such as customers and suppliers.

Each conversion can be understood as episodes of action and reflection. For example, socialization needs active encounter and contemplation of tacit knowledge, and externalization needs interactions within groups and reflective dialogues. Combination
requires accumulation and reflection for editing, and embodying needs action and reflection to retain internalized knowledge. Each action–reflection unit needs to be triggered and in turn needs to stimulate other units.

**Degrees of Tacitness and Externalization**

One can express only a part of one’s knowledge. Explicit knowledge can be compared to the visible tip of the iceberg. Customers and suppliers can verbalize and communicate explicit knowledge, and companies can easily accumulate and utilize such knowledge. However, explicit knowledge is often public knowledge, and thus available to all competitors. Therefore, such knowledge can hardly become the basis for sustainable competitive advantage.

A large part of the knowledge iceberg is invisible, i.e. tacit knowledge. Sometimes, observers can articulate such knowledge through their observations even though those who have tacit knowledge are not able to express it. To create competitive advantage, tacit knowledge needs to be collaboratively articulated and utilized by companies and their partners.

An even larger part of the iceberg is invisible to both beholders and observers of the knowledge. Such knowledge cannot be expressed or utilized easily. To use this rich layer of tacit knowledge, it is necessary for a company to engage in dialogues and improvisations with metaphors and analogies.

In the past, such tacit knowledge could not be accessed and its value could not be assessed. As a result, tacit knowledge has been largely neglected by companies. Current knowledge management tends to repeat this limitation by focusing on the disposal of explicit knowledge. In contrast, multi-dynamic knowledge management embraces the importance of explicit and tacit knowledge, contextual and enabling conditions and provides means for implementation (Figure 2).

Companies need a multi-dynamic approach to knowledge management. The implementation of such an integrated approach requires systems of action–reflection–triggers (ART) to create and sustain knowledge dynamism. Such ART systems link action (socialization, internalization) with reflection (externalization, combination) and relate individuals and small groups with large groups and the organization. Thus, ART systems establish routines for conversion processes and thereby help to advance multi-dynamic knowledge management.

**The Ontological Platforms for Knowledge Creation**

**The Meaning of Ba**

The concept of ba, introduced by the Japanese philosopher Kitaro Nishida (1958, 1970, 1990, 1992) has recently been explored as a supportive platform for knowledge creation (Nonaka and Konno, 1998). Ba can be thought of as a shared mental space for emerging relationships. This space can be physical (e.g. office, dispersed business space), virtual (e.g. e-mail, teleconference) or mental (e.g. shared experiences, ideas, ideals). Ba provides a platform for advancing individual and/or collective knowledge. Ba as existential platform with transcendental perspective integrates all information and allows the recognition of...
the self in all. Thus, we consider ba to be a shared mental space or an emergent foundation for knowledge creation.

Knowledge is embedded in ba (in these shared mental spaces), where it is acquired through one’s own actions or reflections on the experiences of others. We ground the concept of ba in an existentialist framework. Ba may refer to a specific time and space or even the space of ‘relations’ (time–space nexus). Ba is the world where an individual realizes himself as a part of the environment on which his life depends. Such ba of knowledge can emerge in individuals, working groups, or on the shop floor. It is such ba where the knowledge embedded in the ambient affords action and reflection.

Ba exists at many levels and these levels may be connected to form a greater ba (known as a basho). The collective embraces the individual that enters the ba of teams or organizations. Such ba support knowledge creation, and this effect is amplified when organically connected open systems temporarily overcome the distinction between self and other. Ba as a physical, mental, or virtual space for emerging relationships facilitates the construction of ART systems.

**Four Types of Ba**

The concept of ba offers the integrating concept for the necessary contextual setting to support the SECI processes. We thus differentiate four types of ba that correspond to the four stages of the SECI model. For each of the conversion modes, a ba is conceptualized to support dynamism of knowledge creation. These ba, originating ba, dialoging ba, cyber ba, and exercising ba provide platforms for multi-dynamic knowledge management.

‘Originating ba’ is the world where individuals share feelings, emotions, experiences, and mental models. An individual sympathizes or further empathizes with others, removing the barrier between the self and others. Here emerges entrainment, which is defined as synchronizing behavior and similar to empathy. Using epistemological metaphors, it is ‘I love, therefore I am’ (Nishida) in contrast to ‘I think, therefore I am’ (Descartes). From this originating ba, care, love, and trust emerge.

Originating ba is where the knowledge-creation process begins. It is associated with the socialization phase of SECI process. Physical activities and face-to-face experiences are the key to sharing of tacit knowledge.

‘Dialoging ba’ is more consciously constructed, as compared to originating ba. Dialogue stimulates reflection on an individual’s mental models and skills. Individuals share the mental model of others, but also reflect and analyze their own. Thus dialoging ba is where Nishida’s world and the Cartesian world interact in thought. To construct ba, selecting people with the right mix of specific knowledge and capabilities is critical to trigger conversion.

‘Cyber ba’ is a place of monologue. In cyber ba, new explicit knowledge is combined with existing knowledge. This generates and systematizes explicit knowledge by justifying the concept throughout the organization. Thus, cyber ba is associated with the combination phase. The combination of explicit knowledge is most efficiently supported by information and network technology.

‘Exercising ba’ facilitates the conversion of explicit knowledge to tacit knowledge, i.e. internalization, on the job training (OJT) or peripheral and active participation (Lave and Wenger, 1991) is stressed. Focused training with senior mentors and colleagues results in the stock of action patterns of the company.

**Three Kinds of ART Systems**

There are three kinds of ART systems for knowledge management. The first kind prescribes a three-step process for the usage of explicit customer knowledge. First, customers need to convert their tacit knowledge into explicit knowledge. Second, companies then collect the explicit knowledge using multiple communication channels. Finally, companies integrate and edit the absorbed explicit knowledge optimized in cyber ba (Figure 3).

This kind of ART system clearly focuses on the combination mode of the knowledge creation process. Upon the discovery of explicit knowledge it is absorbed and the products and services that can be developed based on such new knowledge are offered and fed back to the markets for internalization.

The second kind of ART system requires more commitment to different phases of knowledge creation. In this system, companies first try to understand the tacit knowledge of customers or suppliers through socialization. Then, companies induce externalization by customers or suppliers. Finally, they engage in the collection, integration, and dissemination of such explicit knowledge.

In this kind of ART system, externalization and integration modes of conversion are the key. Therefore, companies need to develop capabilities to design the appropriate ba and enabling conditions for externalization of knowledge held by customers or suppliers.
The third kind of ART system requires a high degree of knowledge consciousness and commitment within a company. It takes four steps to create knowledge in this system. First, companies need to share tacit knowledge with customers, for example through joint experiences in originating Ba. Second, the enabling conditions and occasions for the externalization, such as dialoging Ba need to be provided inside organizations. Third, companies then externalize the tacit knowledge for their customers. Thereby companies become skillful in articulating tacit knowledge. Companies generate hypotheses based on such tacit knowledge, and test them against the knowledge held by customers or suppliers. Finally, customers and companies engage in the combination mode of knowledge conversion and subsequently in internalization.

Such kind of ART system exhibits companies that enable their partners to engage in knowledge creation processes in the four ba. Here a company offers itself as basho (organically coupled ba) for multidynamic knowledge management. Thus, the company as a whole is turned into an open knowledge system where suppliers or customers and companies build co-innovating partnerships. The third level is the most comprehensive ART system.

As stated above, although the use of IT is an important condition to support knowledge management, the primary achievements of IT are in cyber ba, where efficient combination of knowledge is the key. In contrast, multi-dynamic knowledge management systems involve all three kinds of ART systems.

Context for ART Systems

ART systems are of instrumental value to knowledge management. Enabling conditions that generally promote knowledge creation, indicate the directions of how to balance conversion processes that either increase or reduce the variety of created ideas. Enabling conditions thus also indicate the desired effects of instrumental ART systems and enablers such as incentive systems and training programs. Harmonization of enabling conditions and enablers is the difficult task of leaders who thus decide whether ba remain dormant or become active ambients of knowledge creation (Figures 4 and 5).

ART systems attempt to routinize knowledge conversions. However, the effectiveness of ART systems depends on the supportive contexts. To build such systems, leadership needs to utilize basho and to balance fundamental laws of creating order out of chaos. Leadership that is conscious of ba exemplifies the concept of political friendship where emerging relationships are used to achieve goals.

The fundamental laws of creating chaos and order need to be operationalized as enablers of ART systems. Information technology is very important within the system of ba where it helps to create cyber ba. Within cyber ba, information technology is a key factor for knowledge management. However, cyber ba is just one element in multi-dynamic knowledge management that creates the spiral movement of digital and analog knowledge.

Enabling Conditions for ART Systems

Knowledge creation is supported by five enabling conditions: conditions such as autonomy, redundancy, or chaos increase the variety of options and the complexity within an organization. These enabling conditions are the driving forces for dynamic knowledge conversion. On the other hand, conditions such as intention or requisite variety reduce complexity through fit and min–max prin-
Figure 4  Knowledge is Created at the Edge of Chaos

Figure 5  Dormant ba vs Active ba
Enabling conditions do enhance the effectiveness of the organic system of ba (Ichijo and Nonaka, 1996), but each condition supports different ba in different ways. Therefore, we need to identify enabling conditions most synergetic with each ba. The synergetic effects of ba and enabling conditions have to be steered by middle and top management.

Market knowledge is utilized in three phases of the relationship process that harbor the processes of knowledge generation.

First, initiation describes the phase where market knowledge is accessed. Thus, initiation is mostly associated with socialization. To make socialization most effective, a high degree of creative chaos offers opportunities to share tacit knowledge. Moreover, socialization is supported by a high degree of autonomy. ART systems include routines that monitor chaotic actions in markets and initiate reflection on such changes. Therefore, ART systems stress automation of reflection on complex interactions under conditions of autonomy and creative chaos. In other words, ART systems need to develop patterns and routines that automatically trigger reflection. Also, one can accumulate experiences through active participation (action) in ba.

Second, encounter is the phase where the company engages in continued interactions with customers and suppliers. Although all modes of knowledge conversion are important, here we focus on externalization and internalization. Enabling conditions that facilitate creative dialog for externalization are intention and redundancy. Redundancy, such as chance encounters, is needed to stimulate the generation of concepts. However, at the same time, intention focuses articulation. ART systems benefit from intention for it can be used to define selection mechanism. In ART systems, definition of criteria facilitates analysis of databases of explicit knowledge. If such criteria are detected, concrete actions are triggered.

The context for internalization should facilitate embodiment. Thus characteristic enabling conditions for this ba are autonomy and intention. A high degree of autonomy must be granted to offer enough leeway to individual learning styles. Moreover, without learning goals and intention, it is difficult to acquire knowledge or skills. ART systems support iterative encounters by automatically spurring the changes between action and reflection.

Third, intimacy is the phase where trust and loyalty between the company and customers has increased through iteration of encounters until intimacy is achieved. Intimacy as a state of open sharing of tacit and explicit knowledge offers the opportunity to jointly innovate on an ongoing basis. With a degree of intimacy, companies and their partners share their knowledge bases and the underlying values. Besides the enabling conditions mentioned above, the importance of care, love and trust is particularly obvious here. Care, love and trust support all ba because security and emotional stability are important for human beings to become creative (Von Krogh, 1998; Von Krogh et al., 1997). In particular, the dialoging ba and the exercising ba need care, love and trust most. In the dialoging ba where tacit knowledge is freely articulated, care, love and trust reduces the risks of failure. ART systems, to a certain degree, try to substitute conversions of knowledge by people with sets of rules. Thus care, love and trust is also important to justify the introduction of such systems.

In short, ART systems are highly dependent on enabling conditions. ART systems can be designed as versatile for linking action to reflection in order to increase quantity of insights or to increase quality of new knowledge. Enabling conditions are provided by middle and top management and offer guidelines for conversions. Enablers and ART systems are implemented as instruments to realize desired conversions.

**Ba for Art Systems**

The combination of environmental setting (ba) and enabling conditions for conversions guide the design of ART systems. It is important to provide necessary incentives and motivation for people to repeatedly engage and continuously commit themselves to knowledge conversion. The continued experience in spaces shared with professionals is a key to successful multi-dynamic knowledge management. In other words, a revolving process that describes the politics of friendship has to be sustained to generate knowledge-based competitive advantage.

Ba can serve in four fundamental ways to provide triggers to continued conversion. Change of ba naturally induces another conversion mode. Four possibilities to change ba can be employed in ART systems.

First, the space can trigger conversion. Thus people need to move physically to such spaces where either action or reflection is induced. Field research and participating observation illustrate originating ba where researchers need to physically be to share knowledge. The Japanese traditional ‘tenzoku’ of frequent changes of one’s responsibilities within a single company is another example. Here, change of ba triggers reflection. Thus ART systems can include patterns that impose changes to ba and trigger either reflection or action.
Second, ba can be designed for mobility. For example, rules on how to do a brainstorming are highly effective to create a ba for articulation of ideas. Other examples of such ba that can be created independently from physical conditions are role-playing games and action learning. Role-playing games induce changing points of view and action learning can induce internalization. Such ba triggers reflection or action and thus can be employed in ART systems. Imposing changes in ba can trigger continued conversions.

Third, leaders can create ba directly. Management, by walking around, is an example where leaders wander around in their companies and create the necessary ba on the site as a trigger for reflection or action. This way to trigger reflection or action through the activities of leaders is of great importance because the flexibility of such customized ba at the frontline creates rich experiences. ART systems can include human expertise to manage ba and thus trigger action and reflection.

Fourth, the combination and integration of explicit knowledge in databases, networks or virtual reality offer the opportunity to create cyber ba. Advances in IT increasingly make cyber ba independent from physical space or time. Such ba is a key to efficient capturing and editing of knowledge. It is also here where the largest improvements in efficiency in conversion of knowledge are expected.

Cyber Ba and IT

Cyber ba is a key issue in current knowledge management. On the level of craftsmanship and small companies, such as Japanese sushi restaurants, the flow of knowledge from markets to companies is continuous, direct and often face-to-face. Thus IT is not a prerequisite for capitalizing on market knowledge.

However, large companies with a high degree of internal complexity need the assistance of IT. Moreover, IT can function as an enabler that promotes conversion processes. Increasingly, IT has come to improve the capabilities to communicate. Thus, IT may support conversion processes beyond combination and cyber ba. Virtual reality, for example, can support socialization and internalization, and just-in-time training via networks can support exercising ba. IT increasingly offers the opportunity to provide knowledge-rich training facilities that help to internalize explicit knowledge. For example, pilots learn how to fly in a virtual space before flying in reality through simulation.

Still, IT can be best utilized to collect, integrate and combine knowledge in cyber ba. Data Mining is just one of the examples for such usage. Specific data can be looked for with search engines. Selection of data by filtering systems and automatic generation of thesaurus can make combination much more efficient.

However, speed and efficient performance are not enough for multi-dynamic knowledge management. The transmission of tacit knowledge through present technologies is still difficult. In environments where multiple experiences lead to rich tacit knowledge, a trigger is needed to stimulate reflection on what is known tacitly.

Here the importance of leaders becomes obvious. Translating tacit knowledge into triggers for action is one of the primary tasks of leaders. While the first two kinds of ART systems either rely on explicit market knowledge or externalization by market partners, the third kind needs leaders' emotional capabilities.

In short, IT's contribution to ART systems is largest in cyber ba. IT enables ART systems to support combination processes. In contrast to current knowledge management practice, ART systems mainly attempt to automate the spiral movement of knowledge conversion. IT can support the relay function to trigger reflection and action. Yet, ART systems need human expertise for most conversion processes and in particular for multi-dynamic knowledge management. For such knowledge management, leaders are required to harmonize conversion processes and instil dynamism with enablers. In particular, ART systems are a key for successfully linking intellectual efforts with practical achievements.

Constructing ART Systems

Ba and enabling conditions are necessary to capitalize on market knowledge. However, a key for multi-dynamic knowledge management are ART systems that trigger the shift from one ba to another and change the supporting conditions to shift conversion processes. Such systems integrate recognition of action, reflection and inducement of subsequent actions.

Setting the space for knowledge conversions by specific ba has been discussed above. Leaders need to flexibly set spaces responding to the needs of projects groups, departments, etc. Leadership benefits from the broad knowledge perspective and capabilities that allow leaders temporarily to be a part ba and transcend the boundaries in ba at the same time (Arieti, 1976).

Leaders also have to set the pace to manage the speed and intensity with which knowledge is converted in each ba. Conversion processes can be accelerated and intensified according to the differences in importance that leaders assign to the enabling conditions. Leaders need to build capabilities that allow for swift changes in the stress on enabling conditions that cre-
ate either chaos or order. Such leadership capabilities depend on the leader's awareness of fundamental laws of organizational dynamics.

In order to capitalize on market knowledge continuously, leaders can stimulate conversions by balancing changes in ba and enabling conditions to draw closer to the knowledge vision.

There are several differences between Japanese companies and Western companies in how they create knowledge. One of the most important is the emphasis on tacit knowledge in Japanese companies and the stress on explicit knowledge in the West. While the combination mode of knowledge conversion is preferred in the West, socialization is preferred in Japan. Such differences lead to different strengths and weaknesses of Japanese and Western companies. Conclusions for constructing ART systems that balance weaknesses can be made.

Japanese companies tend to lack triggers for reflection. The accumulation of tacit knowledge offers a rich foundation for the generation of original knowledge, but often it does not lead to externalization. The reliance on tacit knowledge in Japanese companies sometimes inhibits breakthrough innovation, since triggers to induce organizational members to transcend their daily practice are not built in.

Western companies, on the other hand, mainly focus on explicit knowledge and attempt to achieve breakthrough insights by compiling and analyzing existing knowledge. The tendency to emphasize verbal and numerical articulation tends to neglect tacit knowledge, which is assertively labeled as 'noise'. This results in a built-in loss of tacit knowledge. A balanced ART system with its triggers would be able to interrupt knowledge combination beyond a meaningful level (critical measure) and induce organizational members to practice, prototype, and apply their knowledge. Thus ART systems provide the opportunity to integrate present organizational knowledge with complementary elements to sustain the spiral process of conversion. Moreover, ART systems are the conceptual foundation for the routines that support organizational knowledge creation.

Case Study: Seven-Eleven Japan

Despite the image of inefficiency of the Japanese distribution and retailing sector, Seven-Eleven Japan is considered to be setting standards in efficiency worldwide. The company has been the most profitable retailer in Japan both in absolute and sales-profit ratio terms. More important is that this franchise of convenience stores capitalizes on market knowledge by using ART systems.

In 1973 Ito-Yokado, a Japanese supermarket chain, and Southland Corporation, the operator and franchiser of Seven-Eleven convenience stores in the United States, reached a licensing agreement. Ito-Yokado established Seven-Eleven Japan and opened the first Seven-Eleven store in 1978. In 1991 it acquired the Southland Corporation.

Each Seven-Eleven store sells some 3000 items, of which about 70 per cent are changed every year. Out of total sales, 77 per cent is foods; about 40 per cent is processed foods (e.g., snacks and cup noodles) and about 20 per cent is fast food such as rice balls and box lunches.

Critical to understanding Seven-Eleven Japan is the fact that it is a franchiser, and it does not sell goods (although it runs several stores for experiments). Rather, it sells information and knowledge. The company charges its franchisees for the services it provides them, royalties for trademarks, lease fees for such equipment as the information systems, display racks, and refrigerated cases.

To provide such services to the franchisees, Seven-Eleven Japan makes extensive use of quintessential explicit knowledge such as manuals for store operation, employee training, and franchisee recruiting/training. This heavy reliance on explicit knowledge differentiates Seven-Eleven Japan from most Japanese companies rather dramatically.

Seven-Eleven’s outstanding success is largely based on capitalization of market knowledge. In striking the balance between supportive information technology and human insight, it realized a multidynamic approach to knowledge management. This approach integrates the utilization of several interlinked ba and ART systems.

Seven-Eleven’s Vision

Seven-Eleven Japan has a business creed: adapt to changes and pursue fundamentals. It considers the following four fundamental principles as the truth of the retailing business: (1) freshness of goods; (2) the best assortment of goods; (3) cleanliness of stores, goods, and employee uniforms; and (4) friendliness to customers.

The creed is continuously disseminated throughout the company to reinforce the consistency of Seven-Eleven’s corporate culture. It provides criteria for all operational procedures, and guidelines for store owners, part-timers, and employees (Figure 6).

Ba and ART Systems At Seven-Eleven

At Seven-Eleven, knowledge conscious leadership provides both ba and ART systems. Several originating ba are used at Seven-Eleven as routines that oblige employees to socialize. For example, customer knowledge is captured throughout the 7000 stores of
Seven-Eleven. At the stores, socialization takes place in the form of dialog with customers. Through such socialization, customer needs which change quickly can be captured. Local employee knowledge and insight in customer needs is shared with other employees and with field counselors and owner consultants who visit stores frequently to consult the stores. The market knowledge and insights are also shared in the weekly face-to-face meetings where all managers get together and share their views and feelings.

Yet another instrument to create originating ba is ‘Burabura Shain (walking around employee)’. These employees have the task to wander around and discover new knowledge in the fields. To do so, they socialize with customers in stores and other originating fields. Field counselors, owner consultants, or Burabura Shain are examples of ART systems because they induce reflection on the company’s actions. The organic coupling of multiple ba refines such self-reflection, and eventually triggers action again. For example, a field counselor might realize a problem with food freshness and shares his insight in the store and at the meetings in Tokyo. All managers share the concern about such problems and an experimental search for solutions is triggered.

The dialoging ba is the place where ideas and hypotheses are generated. The weekly meetings in Tokyo induce dialog. For example, all managers gather in Tokyo to attend a meeting on current problems every Monday. President Suzuki expects the managers who are facing problems to leave the meeting to solve their problems immediately and to return to the gathering to report on the strategies implemented, actions taken and early results. Thus, President Suzuki triggers immediate action by intensive face-to-face communication. Further, all field counselors meet in Tokyo every Tuesday to attend a meeting to listen to a speech by the energetic leader Suzuki. On this occasion, representatives of all areas in Japan are present (at a high cost to Seven-Eleven Japan) and engage in dialog in shared time and space. Another dialoging ba is the lunch meeting where top managers try all new products out. Here dialog and experience of new products help new ideas to emerge.

The cyber ba is epitomized by the POS system (point of sale system) that offers a continuously upgraded base of explicit knowledge. It is used as the key tool to generate profitability listings. Such explicit knowledge is used to identify and replace products that perform below expectations. Thus the POS system is an important part of the ART system at Seven Eleven. Bad performance quickly triggers the replacement with new products.

The POS system and its partly automated nature induce reflection upon important data and offers options on how to analyze and understand the present situation. The graphical user interfaces (GUI) used in the headquarters are a quick and easy-to-use tool for analyzing POS data, building and testing hypotheses. Another tool is the graphic order terminal (GOT) used at stores to simplify and speed up the order process and delivery.
An important part of Seven-Eleven’s exercising ba is largely supported by IT. Internalization through constructing and verifying hypotheses is the key to Seven-Eleven’s ability to innovate fast. In effect, Seven-Eleven has established ART systems to establish routines for knowledge conversions where hypotheses are induced by data (digital) and by the intuition of the employees. The IT triggers the generation of hypotheses. Each hypothesis is tested by actual orders and confirmed by POS data which contain the accumulated explicit knowledge of Seven-Eleven Japan. Then, successful hypotheses are collected and disseminated throughout the company. Seven-Eleven utilizes an IT-based ART system that makes use of the ingenuity of all employees and partners within the company to enrich the company base of justified beliefs.

In summary, Seven-Eleven Japan triggers action and reflection in three phases. (1) The data are used as triggers for the conversion of frontline knowledge into ideas; (2) experimentation is triggered by first ideas; (3) verification of hypotheses leads to experimenting in other regions, expanding the knowledge base of Seven-Eleven.

Thus Seven-Eleven uses a series of triggers that automatically alternate between action and reflection. Ideas are continuously stimulated to generate, and a rigid selection allows instant verification of ideas at the same time which ensures that only valuable ideas are selected.

Internalization at Seven-Eleven is also supported through owner training, including intensive periods of preparation and simulations for running a Seven-Eleven store. Store situations are enacted to make new owners internalize the explicit knowledge of the franchise system by engaging body and mind.

Another important medium for the accumulation of tacit knowledge is OJT, which is stressed throughout the career path at Seven-Eleven Japan. New employees follow a career path that starts on the shop floor as their first exercising ba and leads up to the management positions. Although Seven-Eleven Japan runs only a few directly managed stores, they are an important exercising ba where young entrants internalize the knowledge of the company and the market.

Seven-Eleven’s information–logistics system, centered around the advanced POS system, is viewed as one of the world’s best. Yet, the company emphasizes the human insights and does not even think about introducing a computerized automatic ordering–replenishing system, which most American retailers favor. When placing orders, people hypothesize what items would sell well, how many, and how to sell them. To make such hypotheses, they utilize their explicit knowledge or information such as POS data, advice from field counselors and/or Seven-Eleven Japan’s headquarters, and tacit knowledge captured in the shop.

Team Merchandising—ART to Cross the Boundaries

The strength of Seven-Eleven is its leading role in development teams spanning the boundaries of organizations. Seven-Eleven Japan has built ART systems to develop new products through strategic alliances with manufacturers that possess complementary knowledge. An example of such ‘team merchandising’ is the Japan Delicafoods Cooperative, a consortium of box-lunch and delicatessen makers, which not only co-operate for joint procurement of ingredients, quality control, joint distribution, and new product development, but also share technologies and know-how to improve performance of member companies.

This idea of collaborative knowledge creation among (potentially competing) organizations has been applied so far to more loosely coupled teams of manufacturers, trading firms, and Seven-Eleven Japan. A new product line of freshly-baked bread, for example, has been developed jointly by Itoochu Corporation (a general trading firm in charge of procuring ingredients and building a nationwide system), Ajinomoto Frozen Bakery (which supplies frozen dough), local bread bakers (which have built bread-baking plants near stores), and Seven-Eleven Japan (which provides POS data and outlets.) Seven-Eleven headquarters initiated team merchandising and formed the development team, together with the experts from the manufacturers.

Such merchandising teams can be understood as ba that make conversion processes more dynamic. The five-step process of team merchandising shall be explained briefly. (1) The new product development committee conceptualizes the topic and assigns appropriate members to the team. (2) Manufacturers make trial products to materialize their knowledge and to generate prototypes of solutions. (3) Some of the trial products are selected. Ideas on how to improve them are generated by the team. (4) New prototypes are made based on these ideas. (5) These new prototypes are evaluated at the officers’ meeting at Seven-Eleven Japan. If the approval of Seven-Eleven is gained, the full support in terms of know-how and data is given to finalize the prototype and start production. Thus, the merchandising process at Seven-Eleven is a process of alternating actions and reflections where each action triggers reflection and vice versa.

Implications

This paper has shown the importance of organizational architecture and organizational dynamics to capitalize on market knowledge. The ontological
platforms (ba) and the fundamental laws that enable knowledge creation have been used to support the creation of operational enablers and ART systems. Such ART systems are essential for successful multi-dynamic knowledge management in companies such as Seven-Eleven. The case reveals that, in contrast to the current knowledge management practice, IT does not suffice. Human experience and contextual tacit knowledge are important in creating new knowledge.

This paper has also discussed the role of leadership in multi-dynamic knowledge management and ART systems. Leaders are essential for successful generation of knowledge because it is the task of top and middle management to (1) construct ba; (2) create enabling conditions, and (3) set the pace for knowledge dynamism. Here ART systems and enablers offer operational support. ART attempts to induce continuous conversion of knowledge. Thereby ART systems help leaders facilitate the spiral movement of knowledge.

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