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# The theory of the knowledge-creating firm: subjectivity, objectivity and synthesis

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The theory of the knowledge-creating firm explains the differences among firms not as a result of market failure, but as a result of the firm's visions of the future and strategy. This paper proposes a framework to capture the dynamic process of knowledge creation in which knowledge is created through the dynamic interaction between subjectivity and objectivity. Knowledge is created through the synthesis of thinking and actions of individuals, who interact with each other within and beyond the organizational boundaries.

## 1. Introduction

'Why do firms differ?' This is a central question for the theory of the firm (Nelson, 1991). Unlike neoclassical economics, which views firms as undifferentiated, management scholars recognize the obvious and have been trying to explain differences in firms' structure and performance.

The positioning school explains firm differences with reference to the difficulties in entering an industry or a strategic group. Firms which want to move to a more profitable industry or segment are prevented from doing so by high entry or mobility barriers. The resource-based view of the firm explains firm differences by reference to difficulties that firms have in imitating or acquiring resources. Firms which want to acquire the resources that give other firms competitive advantage are prevented from doing so because such resources are impossible or too costly to acquire.

Evolutionary economists explain that firms evolve differently due to the managers' limited capabilities to foresee an uncertain future and their path-dependency. Transaction cost economists explain that firms have different structures and boundaries due to the difficulties in transacting certain goods or services.

In short, contemporary theories basically explain the differences among firm as a result of profit-maximizing firms' inability to imitate successful firms. Inheriting the implicit assumption of neoclassical economics that there is only one right answer to

solve the problem of profit maximization, such differences among firms are viewed as market imperfections that should be competed away unless blocked by barriers, high cost or limited capabilities of managers.

However, profits are not necessarily the sole purpose of a firm. If we ask managers why their firms exist, their answer would probably differ from 'to maximize profit'. 'Making a good car' is certainly a way to maximize a profit, but it is also the goal itself—the reason to exist—for Honda. Put simply, firms differ because they want and strive to differ. They evolve differently because they envision different futures, which are based on their own dreams and ideals, and also because they adopt different strategies and structures to realize such futures. Even if they have the same goal, it does not necessarily mean that there is only one best solution to achieve it. A 'good car' probably means something different to Toyota than it does to Honda, and their ways of making a good car are also different from each other.

This means that in order to explain why firms differ we have to deal with the subjective elements of management, such as management vision, the firm's value system, and the commitment of employees. This position is well recognized by business historians like Alfred Chandler (1977). However, many management scientists have avoided dealing with the subjectivity of humans. The pursuit of good science requires one to exclude subjectivity in the search for objective 'facts' and universal rules concerning how these facts are connected. For example, Simon (1945) insisted that factual premises have to be separated from value premises for management to become science. However, as Flyvbjerg (2001) argued, social science is fundamentally different from natural science in terms of its need to deal with the issues of subjectivity, such as values, contexts and power. Since humans are both objects and subjects of research at the same time, research in social science cannot be free from subjective factors.

Another assumption imbedded in the neoclassical theory of the firm is the view of the firm as a passive entity which merely adapts to the environment and never tries to shape it (Teece, 2003). A firm is viewed as a static information processing machine that takes and processes information from the environment to set output levels. However, in the view of the firm as a knowledge-creating entity, a firm is a dynamic entity which actively interacts with its environment, and reshapes the environment, and even itself, through the process of knowledge creation.

This paper is an attempt to establish the theory of knowledge-creating firms to explain the complex process of knowledge being created organizationally. Based on epistemology (how to know) and ontology (what one exists for), the theory tries to incorporate subjectivity issues such as values, contexts and power, and capture dynamic processes of knowledge creation through the interaction of subjectivities and objectivities to both shape and be shaped by the business environment.

## 2. The knowledge-based theory of the firm

### 2.1 *A basic view of human beings*

In neoclassical economic theory, the employees of a firm are generally undifferentiated and do not have specific knowledge. The firm is viewed as an information-processing machine to overcome the bounded rationality of human beings. Hence, for those who manage and research such a machine, human subjectivity is a noise to be carefully excluded. However, if we view the firm as an entity to create knowledge, we have to deal with the issues of human subjectivity.

In the long tradition of Western epistemology, knowledge has been defined as ‘justified true belief’. Such definition gives us an impression that knowledge is something objective, absolute and context-free. However, it is humans who hold and justify beliefs. Knowledge cannot exist without human subjectivities and the contexts that surround humans. ‘Truth’ differs according to who we are (values) and from where we look at it (context). In organizational knowledge creation, it is such differences in human subjectivities that help create new knowledge.

The differences in subjectivities here mean the differences in how we view the world. For example, when i-mode service (the internet service via cellular phones developed at NTT DoCoMo) was conceived, it was at first viewed as just ‘another way to use a cellular phone’ to increase revenues for phone companies as the existing voice transmission service entered the low growth period. However, the ‘outsiders’ who were recruited to develop the service viewed it differently. Matsunaga, a former magazine editor, viewed it as ‘something interesting, something that young people can enjoy when they have a bit of time’. Natsuno, a former internet business entrepreneur, viewed it as ‘internet access via mobile phones’. By synthesizing these different views, i-mode service evolved into something totally different from a ‘useful information service for business people’, in terms of the price, the contents it provides and the relationships with the content providers.

Knowledge-based theories of the firm view humans not as replaceable parts of a machine but as beings that differ from each other; and beings not satisfied with the current situation transcend themselves to pursue new goals. Humans are purposeful beings who will act to realize their dreams and ideals—and these are beyond mere preferences (Rescher, 2003). They transform themselves and the environment that surrounds them by questioning their own existence. Instead of being static, human nature and action evolves through environmental dialectics (Heidegger, 1962 [1927]; Merleau-Ponty, 1962). An individual transcends himself or herself through knowledge creation (Nonaka *et al.*, 2000; Nonaka and Toyama, 2003). In the organizational knowledge-creating process, individuals interact with each other to transcend their own boundaries, and as a result, change themselves, others, the organization and the environment.

Viewing individuals as actively creating knowledge may resemble philosophical idealism. However, recent developments in brain science explain that the essence of

human brain activities is not in its passive processing of stimuli from the outside world, but in the active creation of contexts (Mogi, 2003). In management science, Drucker (1993) emphasizes the importance of one's own initiative for the productivity of knowledge workers. Maister (2000) empirically found a positive relationship between financial results and the ability of knowledge workers to make choices, and perceived that the workers are in control of their own destiny.

## *2.2 Organizational knowledge creation: the synthesis of subjectivity and objectivity*

The knowledge-creating theory advanced here is rooted in the belief that knowledge inherently includes human values and ideals. The knowledge creation process cannot be captured solely as a normative causal model because human values and ideals are subjective and the concept of truth depends on values, ideals and contexts. 'Truth' becomes a truth through social interactions, instead of existing somewhere to be discovered. Unlike traditional views of knowledge, the knowledge-creating theory does not treat knowledge as something absolute and infallible. The particular truth can be claimed to be incomplete just as any current state of knowledge is fallible and influenced by subjective factors such as ideologies, values and interests of collectives. However, our review of knowledge-creating theory does not view knowledge as being solely subjective either. If knowledge stays within one's subjective world, it can expand only so far since there is a limit to the world one can see or experience. In such a case, it is hard to create new knowledge or achieve the universality of knowledge.

Creating knowledge *organizationally* does not just mean organizational members supplementing each other to overcome an individual's bounded rationality. It means that subjective tacit knowledge held by an individual is externalized into objective explicit knowledge to be shared and synthesized. The newly created knowledge is then used and embodied by individuals to enrich their subjective tacit knowledge. Hence, our knowledge-creating theory defines knowledge as a dynamic process of justifying personal belief towards the 'truth'.

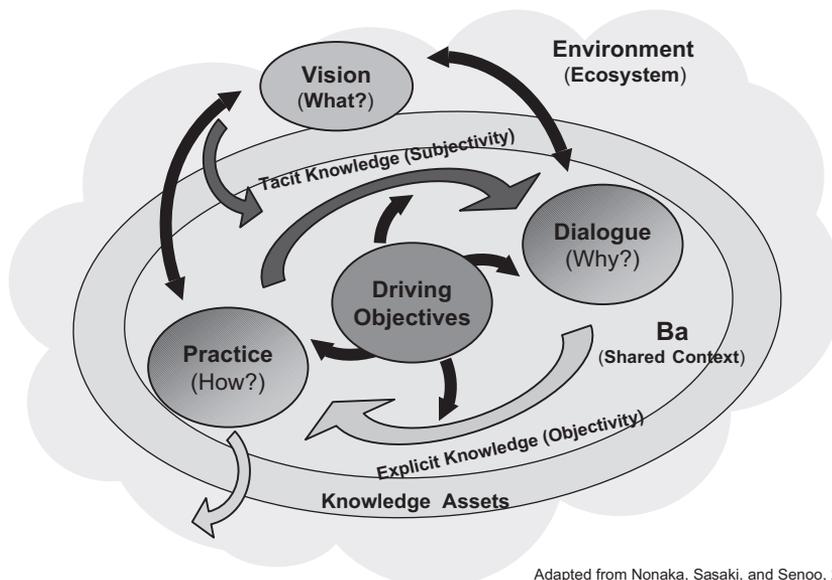
Viewing the knowledge-creating process as the conversion process between tacit and explicit knowledge means that the process is viewed as a social process of validating truth (Nonaka, 1994; Nonaka and Takeuchi, 1995). Contemporary philosophers claim that group validation produces knowledge that is not private and subjective (Rorty, 1979). Knowledge is socially created through the synthesis of the different views held by various people. Through the knowledge conversion process [the Socialization, Externalization, Combination, and Internalization (SECI) process], personal subjective knowledge is validated socially and synthesized with others' knowledge so that knowledge keeps expanding (Nonaka, 1991; Nonaka and Takeuchi, 1995). Tentative and partial knowledge created out of an individual's values and experiences is shared and justified by the members of the organization to create new knowledge. The knowledge created in the organization can then go

through the justification process in the market, and new knowledge will be created by synthesizing views from the market.

For example, product development starts with *socialization*, which is the process by which tacit knowledge of customers is accumulated and shared. Such tacit knowledge is articulated into a product concept through the process of *externalization*. The concept is then systemized and made into a product through the *combination* process, in which explicit knowledge collected from inside or outside the organization is selected, combined and processed to form more complex and systematic sets of explicit knowledge. The knowledge created in the form of a new product is then converted into tacit knowledge by market customers who use it through the *internalization* process. The newly created tacit knowledge then sets off the new spiral of knowledge creation (Nonaka and Takeuchi, 1995). Through this process of tacit and explicit knowledge conversion, subjective values are synthesized into more objective, socially shared knowledge.

### 2.3 The dynamic model of a knowledge-creating company

Figure 1 shows the model of a knowledge-creating firm whereby knowledge is created through dynamic interactions with the environment. The model consists of seven basic components: the SECI process of *dialogues* and *practice*; the *knowledge vision* and *driving objective*, which gives a direction and energy to the SECI process; *Ba*, an existential place for the SECI process; *knowledge assets*, which are inputs and outputs of the SECI process; and the *environment* as an ecosystem of knowledge and multi-layered *ba*.



Adapted from Nonaka, Sasaki, and Senoo, 2004

**Figure 1** Basic Components of Knowledge-based Firm

### Knowledge vision

The *knowledge vision* of a firm arises from confronting the fundamental question: 'Why do we exist?' By going beyond profits and asking 'Why do we do what we do?' the mission and domain of the firm becomes defined. This knowledge vision gives a direction to knowledge creation. It also gives the firm direction with respect to the knowledge to be created beyond the firms' existing capabilities and therefore determines how the firm evolves in the long term. While the strategy of a firm can change as the situation unfolds and uncertainty about the future decreases, the knowledge vision does not change so easily since it stems from the fundamental ontological question of the firm's *raison d'être*.

The firm's knowledge vision also inspires the intellectual passion of organizational members so that they are encouraged to create knowledge. It also defines a consistent value system to evaluate and justify the knowledge created in the organization. The organization needs a value system to define what is truth, goodness and beauty for it. Therefore, the firm's knowledge vision needs to be based on an absolute value which goes beyond financial matrices (Collins, 2001).

The Japanese company Olympus has a vision of 'Social-IN' which, they claim, is a more advanced concept than 'Market-IN' since it is based on the idea that Olympus would create values based on the viewpoints of people who live in the society. At Honda, there is value to realizing 'the joy of buying, the joy of selling, and the joy of creating' more than beating the competition. Eisai, a Japanese pharmaceutical company, has a vision of 'hhc (human health care)'. This vision made the employees of Eisai recognize that the mission of the company is to be on the side of patients and their families, not on the side of doctors or pharmacists. This recognition led to the knowledge-creating activities designed to help patients and their families. For example, Eisai sent its employees to a care home to work as caretakers to accumulate tacit knowledge about the elderly patients and their families. Such direct experience made them realize that elderly often had difficulty in swallowing their medicines. It led to the development of a type of tablet that dissolves in the mouth quickly.

### Driving objective

Without the actual efforts to realize it, a firm's knowledge vision is little more than empty words. For knowledge to be created and justified based on the firm's knowledge vision, the firm needs a concrete concept, goal, or action standard to connect the vision with the knowledge creating process of dialogues and practices. We call such a concept/goal/action standard a *driving objective* since it drives the knowledge-creating process.

A driving objective triggers knowledge creation by questioning what the essence of things is. For example, Suzuki, a Japanese motorcycle company, set a goal of '1CC=1,000 Yen' to develop a new scooter. It was not simply a goal for cost cutting. It was a concrete goal to help realize the vision of 'Inheriting a Japanese manufacturing culture'. It drove the entire company to create knowledge by asking: 'What is the essence of a scooter?' To realize such a driving objective, it was not enough for Suzuki

engineers to ask: 'Is this part/work really necessary to make a scooter?' They needed to ask: 'What is a scooter to begin with?' Such questioning led to the development of a 'Choinori' scooter, which is based on the new concept of adding only really necessary parts to a bare frame, instead of removing unnecessary parts from an existing model (Nonaka and Katsumi, 2004). The 'really necessary parts' do not just mean using low-cost parts. The scooter uses some state-of-the art technologies, which eventually reduced the cost by cutting the total number of parts. The driving objective worked as an engine to synthesize the differences among various departments such as R&D, manufacturing and marketing. It made them focus, and strengthened their commitment to achieving such a demanding goal.

Seven-Eleven Japan uses 'Cut the opportunity loss' as its driving objective. To realize its vision of adapting to the changing customer needs, it has to cut the opportunity loss by avoiding the situation of customers coming to a shop and not finding what they want. Unlike the inventory cost from overstocking, the concept of opportunity loss from unrealized sales is invisible and difficult to grasp without such a mantra. With this driving objective, Seven-Eleven Japan made a thorough effort to prevent its items from going out of stock. Those responsible for placing orders, many of them part-time employees, had to build a hypothesis about next-day sales of each item by divining the essential reason why the item sold or did not sell well, and taking in the context, such as weather or schoolday events in the neighborhood, that could affect the sales of the item. Orders are placed based on such hypotheses, which are immediately tested by objective data from the firm's state-of-the art point-of-sales system.

Seven-Eleven Japan also works closely with manufacturers to find the embedded needs and wants of customers, and to develop new products that customers really want. With such efforts, Seven-Eleven Japan has built a sustainable competitive advantage in offering its customers what they want when they want it. This goes beyond traditional inventory management.

The driving objective of Canon is 'cash flow'. Despite a clear financial focus, the driving objective is not just about profit, but about making everyone in the organization think how he or she can improve the operation to increase cash flow. The concept of cash flow is relatively easy to grasp and understand, and is therefore a good mantra to help everyone in the organization to make the sources of competitive advantage visible in relation to his or her own job.

Although it is a concrete goal, a driving objective such as 'cutting opportunity loss' has no clear end to it and requires relentless effort to achieve it. It keeps driving the organization toward unattainable perfection. 'Unattainable' sounds hopeless; but it actually serves the regulative function of driving the organization by preventing it from contending with the imperfect realities (Rescher, 2003).

Dialogues: the synthesis of thoughts

Knowledge creation is guided through the synthesis of contradictions (Nonaka and Toyama, 2002, 2003). The world is filled with contradictions; duality is an essence of

reality. By accepting such duality and synthesizing it, one can go beyond the simple dichotomy of 'either/or' and create new knowledge to solve contradictions.

Synthesis is achieved through dialectical thinking and action. However, it seems that 'soft dialectic', which embraces contradictions and incorporates conflicting views, is more suited to synthesis in management than the Hegelian dialectic, that does not allow contradictions to stay. In such dialectical thinking (which is an important part of Eastern philosophy), everything is put into a context, and understood in relation to the whole, instead of being considered as an absolute truth (Nisbett, 2003).

Synthesis in knowledge creation is achieved through *dialogue*. One can pursue the essence of seemingly contradictory things and accept others' views through dialogues. These allow one to discard presumptions and find a new solution to the contradiction. Dialogue is a method of learning others' views, which are different from one's own, and to accept and synthesize them. For that, one needs open thought with both self-assertion and modesty.

What matters in dialogues is the meaning it creates, rather than the form of logic it takes. For example, a syllogism, a simple form of logic, leads to the conclusion 'Socrates dies' from the premises of 'every human is mortal' and 'Socrates is a human'. Despite of its correctness, such logic cannot add any new meaning to the original premises. However, if we pursue the essence of being human or the essence of death, we might reach the new conclusion, such as 'Socrates as a thought is immortal'.

At Toyota, essential dialogues are encouraged in daily operation at every level through the practice of 'Ask why five times'. It is not so difficult to come up with a reason why you do a certain thing. However, when you are further asked again and again for the basis of the reason you came up with, it becomes inevitable to ask the essential reason behind your thought or action. Such essential dialogues led Toyota to synthesize many contradictions and go beyond mere compromises. For example, cost and quality, which used to be considered as contradictory conditions, are no longer contradictions at Toyota. By pursuing the essence of quality and cost, it created a new type of manufacturing system, which made it possible for Toyota to lower the cost by raising quality.

At Honda, contradictions are dialectically solved through asking three levels of questions. The first level, called level A, is a question about specifications. For example, there are many contradictions to solve, such as fuel efficiency and power, or safety and speed, before deciding on the specification of an engine. Engineers of Honda try to solve such contradictions not by finding the best balance or a compromise between contradicting conditions, but by asking a question at one level higher. The second level, called level A0, is a question about concepts. Engineers go back to the question of what is the concept of the engine of the car, and then decide on the specifications that are necessary to realize the concept. If the contradictions cannot be solved with the A0 level questions, then the third level question, the A00 level question, is asked. It is an existential question of 'Why or for what do you do it?' The reason why Honda has to make that particular car, or why Honda should exist to start with, is

questioned at the A00 level. 'What is your A00?' is the question asked in the daily operation at Honda.

Such questions seem to be philosophical and have little to do with business. However, deciding on specifications without thinking the essence of 'for what do we do it' just leads to an optimal choice among existing options. To have a new solution that goes beyond the contradictions, one needs to answer the existential question to pursue the essence, based on one's own value system and that of the organization.

A dialogue is also an effective method to articulate tacit knowledge into explicit knowledge (externalization) and to systemize explicit knowledge, to deepen it and create new knowledge (combination). It also lays a foundation to synthesize knowledge held by organizational members, as existential contexts such as deep thoughts or emotions are shared by organizational members by engaging in dialogue.

Practice: synthesis of action

*Practice* lays a foundation to share tacit knowledge (socialization) through shared experience. Practice is also an effective way to embody explicit knowledge by reconnecting it to a particular context to conduct it into tacit knowledge (internalization).

Contradictions that cannot be solved through objective analysis alone can be solved by synthesizing subjective views and intuition that has accumulated through practice. For that, one needs to discard preconceived notions to observe and experience the reality as it is. For example, when Suntory developed its new sports drink, DAKARA, the members of the development team discarded their first concept, 'sports drink to give one more push for working men', which was created by logical analysis of the existing market. Instead, they went out to observe how such drinks are consumed. After thorough observation, they found that sports drinks are taken by tired people who need healing rather than 'one more push'. The finding led to a new concept, 'a drink that you can depend on to protect you when things are a bit too hard' (Nonaka and Katsumi, 2004).

Concepts and hypotheses created out of such observation and experience are made into reality through dialogue and practice. Practice here does not just mean action. Being influenced by Dewey's idea of pragmatism, Schon (1983) emphasized the importance of 'reflection in action', which requires one to think hard about the essential meaning of his or her action and its outcome so as to revise his or her action. In the case of Seven-Eleven Japan, it is not enough to use sales data to check whether a hypothesis was right or wrong. Employees are encouraged to think thoroughly why it was right or wrong, so as to make more effective hypotheses next time. Such reflection in action requires objective logical analysis as well as subjective observation and experience. It requires the viewpoint of meta-cognition where viewpoints of insiders and outsiders are synthesized. Through such dialogues and practices, subjective views are objectified to grow into knowledge.

Ba

Many philosophers have discussed the importance of place in human cognition and action. Plato called a place for a genesis of existence *chora*. Aristotle called a place for

a thing to physically exist *topos*. Heidegger called a place for human existence *ort*. To include the concepts of such places but to tether it to knowledge creation, we introduce the concept of *ba* (which roughly means 'place' in Japanese). *Ba* is a foundation of knowledge-creating activity. It is where dialectical dialogues and practices take place to implement the vision and driving objectives of the firm.

Building on the concept that was originally proposed by the Japanese philosopher Kitaro Nishida (1970, 1990 [1921]), we define *ba* as a shared context in motion, in which knowledge is shared, created and utilized. As Hayek (1945) states, knowledge is context-specific, and therefore needs a physical context or situated action (Suchman, 1987) for it to be created. When individuals empathize in a shared context, their individual knowledge is shared so that new knowledge is created.

The essence of *ba* is the contexts and the meanings that are shared and created through *interactions* that occur at a specific time and space, rather than a space itself. *Ba* means not just a physical space, but also a specific time and space, or relationships of those who are at the specific time and space. *Ba* can emerge in individuals, working groups, project teams, informal circles, temporary meetings, virtual space such as email groups, and at the front-line contact with the customer. Participants of *ba* bring in their own contexts to share, and create new meanings through interactions, since context is in interactions rather than in one's cognition (Ueno, 2000).

We define *ba* as a shared context *in motion*, since it is constantly moving. Through interactions with others and the environment, both the contexts of *ba* and the participants grow. New knowledge is created through such changes in meanings and contexts.

*Ba* as a shared context means that subjective views are understood and shared in the relationship with others. Modern science is based on the premise that subjectivity cannot be shared between oneself and others. Inheriting such a premise, some see knowledge creation as mainly individual activity. For example, Simon claims that 'All learning takes place inside individual human heads' (Simon, 1991: 125), while Grant (1996) claims that knowledge creation is an individual activity and that the primary role of firms is to apply existing knowledge. However, as we have argued, knowledge creation needs subjectivity to be shared and interact with others' subjectivity. *Ba* supports such sharing and synthesizing of subjectivity. To participate in *ba* means to get involved and transcend one's own limited perspective. Nishida states that the essence of *ba* is 'nothingness'. It does not mean that nothing exists at *ba*. It means that at *ba*, one exists in the relationship with others, instead of as an atomistic and absolute 'self'. At *ba*, one can be open to others by losing oneself. Through such relationships, one can see oneself in relation to others, and can accept others' views and values so that subjective views are understood and shared. *Ba* supports such sharing and synthesizing of subjectivity, which is necessary for knowledge to be created.

For that, *ba* needs to have a permeable boundary so that it can accept necessary contexts. *Ba* also needs participants with multiple viewpoints and backgrounds so that they can bring in various contexts, which are shared through dialogues and practices.

Ba does not necessarily mean one meeting or one project. In the theory of the knowledge-creating firm, a firm can be viewed as an organic configuration of multi-layered *ba*. It means that we have to look into not only the formal organizational structure of the firm, but also the meanings that are created at *ba* and the relationship among them.

A view of an organization as an organic configuration of multi-layered *ba* synthesizes the views of an organization as an economic structure and an organization as meaning-creating processes. Such a view helps to solve the paradox to explain structures suited for both routine and non-routine tasks (Thompson, 1967). The organizational structure of a firm defines the interactions within the firm in terms of formally defined command and information. However, such interactions are only a part of interactions that occur within the organization to create knowledge. The meanings emerge and evolve through intersubjectivity and dialectic interactions among organization members and/or between organization members and the environment. An organization, therefore, can be seen partly as organic networks of meanings. While the hierarchies on the objective side determine the objective allocation of resources and formal power, social interaction patterns enable actors to locate and utilize knowledge beyond formally defined information processing routes.

As the organic configuration of the '*ba*' extends beyond the economic boundaries of the firm, the issue of a firm's boundary has a different meaning from the existing theories of the firm as well. Firm boundaries are frequently determined simply by ownership (Arrow, 1974; Williamson, 1975). However, the boundary setting becomes far more complicated when an organization is viewed as an organic configuration of multi-layered *ba*. Knowledge is created through interactions, and interactions cannot be owned even by those who are engaged in such interactions. As a consequence, the subjective 'out there' might be vital for the economic performance 'in here' and cannot be objectively separated when describing the existence and functioning of an organization.

#### Knowledge assets

*Knowledge assets* are created from the knowledge-creating process through dialogues and practices at *ba*. Unlike other assets, knowledge assets are intangible, are specific to the firm and change dynamically. The essence of knowledge assets is that they must be built and used internally in order for full value to be realized, and hence cannot be readily bought and sold (Teece, 2000).

Knowledge assets do not just mean the knowledge already created, such as know-how, patents, technologies or brand, but also include the knowledge to create knowledge, such as the organizational capability to innovate. Although current arguments on knowledge assets tend to focus on the former since they are easier to measure and deal with, it is the latter that need more attention since they are the source of new knowledge to be created and therefore as a source of the future value of the firm.

Knowledge assets also include the social capital that is shared in the organization. The economic value of a knowledge-creating firm is created through the interactions

among knowledge workers, or between knowledge workers and the environment such as customers, suppliers, or research institutes.

One of the most important knowledge assets for a firm is a firm-specific *kata* (which roughly means 'pattern' or 'way of doing things') of dialogues and practices. Nelson and Winter (1982) emphasized the importance of a firm's routines for the firm's evolutionary process. Here, we focus on 'creative routines' of *kata*, which makes knowledge creation possible by fostering creativity and preserving efficiency. *Kata* is different from a routine in that it contains continuous self-renewal process. The three steps of *kata*—*shu* (learn), *ha* (break) and *ri* (create)—means that one learns certain patterns at first, and then one breaks away from them and creates new patterns once one has totally mastered the old. Continuous self-renewal is achieved by incorporating a high quality feedback function that sharpens senses and helps to notify and modify the differences between predicted outcomes and reality (Feldman, 2000). *Kata* works as an archetype with a high degree of freedom as it can be modified based on feedbacks from reality.

With such self-renewal functions embedded within, *kata* prevents a routine from hindering creativity by preventing such tendencies as over-adaptation to a past success (Levitt and March, 1988; Leonard-Barton, 1992). At the same time, it helps an organization work efficiently by functioning as a routine. A firm with a good *kata* looks into the future but also appreciates past successes as a source of its knowledge.

#### Environment: ecosystem of knowledge

For a knowledge-creating firm, environment is not an abstract world which is a subject of analysis for modern science, but a phenomenological 'life-world' to live in and experience as a reality (Husserl, 1970 [1954]). Hence, instead of looking at and analyzing the environment objectively such as industry structure, managers are thrown into strategic decision-making as a way of life. For example, employees of Seven-Eleven Japan are encouraged to think *as* customers instead of think *for* them. Preconceived notions would prevent them from seeing customers as they are if they view customers as a subject to analyze. The phenomenological method of 'seeing the environment as it is' does not mean accepting it unconditionally. By pursuing the essence of it through dialogues and practices, environment is interpreted, and knowledge is created out of such interpretations.

The ecosystem of knowledge consists of multi-layered *ba*, which exists across organizational boundaries and is continuously evolving. Firms create knowledge by synthesizing their own knowledge and the knowledge embedded in various outside players, such as customers, suppliers, competitors or universities. Through interactions with the ecosystem, a firm creates knowledge, and the knowledge created changes the ecosystem. The organization and environment should thus be understood to evolve together rather as separate entities. The constant accumulation and processing of knowledge helps firms to redefine their visions, dialogues and practices, which in turn impact the environment through their new or improved services/products.

Such a dynamic relationship is difficult to grasp with the traditional view of the market and organizations embedded in organizational economics. The existence of firms in the ecosystem of knowledge can no longer be defined by ownership. Boundary setting based on transaction cost is insufficient to understand and manage the competitive advantage based on knowledge. A knowledge-creating firm needs to manage a multi-layered *ba*, which stretches beyond organizational boundaries. At the same time, the firm needs to protect its knowledge assets as sources of competitive advantage. Viewed in this context, the protection of knowledge assets is a complex and arguably somewhat impossible task.

#### 2.4 Knowledge Leadership

What drives a firm as an entity to create knowledge continuously? Schumpeter argued that innovations are brought in by leaders displaying entrepreneurship. However, Schumpeter considered leadership as something for elites, and therefore entrepreneurship was viewed as a matter of the individual's disposition (Peukert, 2003).

However, leadership in the knowledge-creating firm is based on more flexible distributed leadership, rather than leadership as a fixed control mechanism. Since knowledge is created through dynamic interaction, leadership in a knowledge-creating firm requires active commitment from all the members of the organization, not just from a few elites. In knowledge-creating firms, the planning and implementation of strategy is integrated instead of being separated, as suggested by existing theories of strategy and organization. Dynamic capability requires the entrepreneurship of a maestro (Teece, 2003). For such leadership to be effective, the discipline must be shared by the members. This offers a dynamic chain reaction between strategy development and its application.

It does not mean that everyone starts creating knowledge immediately. For knowledge leadership to work, the mechanism of middle-up-down is key. In such a process, middle managers break down the vision or driving objective into concrete concepts or plans, build *ba*, and lead dialogues and practices. Such middle managers create tipping points in small-world networks (Gladwell, 2000; Watts, 2003).

The issue of leadership is related to the issue of power. However, power here does not necessarily mean formal power, which stems from hierarchical position. Knowledge itself can be a source of power, and therefore can exist outside of the hierarchy of the organization. Knowledge as a source of power also means that it is fragile and needs nurturing. The human attractiveness of a leader, which depends on his/her values and views of the world, often affects the efficiency and effectiveness of the knowledge-creating process more than what kind of legitimate power she or he exercises. Research indicates that effective leaders have a capability to synthesize contradictions through understanding that contradictory ideas are a way of life. They energize the emotional and spiritual resources of the organization.

Leadership plays various roles in the knowledge-creating process such as providing vision; developing and promoting the sharing of knowledge assets; creating, energizing and connecting *ba*; and enabling and promoting the continuous spiral of knowledge creation. This paper focuses on the leadership role in providing knowledge vision and *ba*.

Knowledge vision determining collective ideal mission and domain is rooted in the essential question of 'for what do we exist?' Knowledge visions materialize as a set of shared beliefs about how to act and interact to attain some determined idealized future state, giving the firm a focus on the knowledge to be created that goes beyond the existing boundaries of the products, the organizational structure, and the markets. The possibilities to attain a future praxis are manifested at each organizational level by answering the living question of 'what can we do?' (Heidegger, 1962 [1927]). Through personal aspirations and collective sense-making, leaders develop a mental image of a possible and desirable future state of the organization in order to choose a direction.

It is not enough for a leader to set a vision and driving objective to foster the organizational knowledge-creating process. If it stays just as a written slogan, such a vision or driving objective does not work. The knowledge vision and driving objective have to be accepted and shared by organizational members. For that, leaders have to facilitate constant dialogues and practices to 'evangelize' the knowledge vision and driving objectives throughout the organization.

Leaders also have to build, maintain, and connect *ba*. *Ba* can be built intentionally, or created spontaneously. Leaders can facilitate *ba* by providing physical space such as meeting rooms, cyberspace such as a computer network, or mental space such as common goals, and promote interactions among participants at such a space. Forming a task force is a typical example of the intentional building of *ba*. To build *ba*, leaders also have to choose the right mix of people to participate. It is also important for managers to 'find' and utilize spontaneously formed *ba*. Hence, leaders have to read the situation in terms of how members of the organization are interacting with each other and with outside environments in order to quickly capture the naturally emerging *ba*, as well as to form *ba* effectively.

However, building and finding *ba* is an insufficient basis for a firm to manage the dynamic knowledge-creating process. *Ba* should be 'energized' to give energy and quality to the SECI process. For that, leaders have to supply necessary conditions such as autonomy, creative chaos, redundancy, requisite variety, love, care, trust, safety and commitment.

Further, various *ba* are connected with each other to form a greater *ba*. For that, leaders have to facilitate the interactions among various *ba*, and among the participants, based on the knowledge vision. In many cases, the relationships among *ba* are not predetermined. Which *ba* should be connected in which way is often unclear. Therefore, leaders have to read the situation to connect various *ba*, as the relationships among them unfold.

*Ba* needs a certain boundary so that a meaningful shared context can emerge. Therefore, leaders should protect *ba* from outside contexts so that it can grow its own

context, especially when *ba* is trying to create the kind of knowledge that is not part of the organization's current norm. At the same time, the boundary of *ba* should be open so that it can be connected with other *ba*. It is often difficult for participants of *ba* to see and accept the need to bring in different contexts from the one shared in *ba*. It is an important task for a leader who is outside *ba* to find and build the connection among various *ba*. Legitimate power can be effectively used to protect the boundary (cocooning) and keep the boundary open.

### 3. Conclusion

The theory of the knowledge-creating firm views a firm as an entity to create knowledge actively by synthesizing contradictions. Unlike other theories of the firm, our theory of the knowledge-creating firm explains the differences among firms not as a result of market failure but as a result of goals and strategy.

This paper argues that building the theory of the knowledge-creating firm needs to an epistemological and ontological discussion, instead of just relying on an analytical approach. Instead of treating knowledge as just objective and static 'truth', this paper argues that knowledge is created through the dynamic interaction between subjectivity and objectivity. Knowledge emerges through the subjectivity of context embedded actors, and objectified through the social process of knowledge validation. Instead of treating issues such as contexts, values, ideals and power as 'noise' to cloud the facts, this paper argues that we cannot avoid dealing with such subjectivity if we want to capture the dynamic aspect of the knowledge-creating process. Thinking is not detached reflection, but is a part of humans' view of the world. And knowledge is not just about thinking. It is created through the synthesis of thinking and the action of individuals who interact with each other within and beyond the organizational boundaries. The knowledge so created forms a new praxis for interaction, and it shapes the base for new existence through the knowledge creation spiral.

This paper proposes a framework to capture such a dynamic process of knowledge creation, with the concepts of Knowledge vision, driving objectives, dialogues, practices, *ba*, knowledge assets and environment to deal with the issues of contexts, values, ideals and power. Since knowledge emerges out of subjective views of the world, it probably cannot be reached by the one and only absolute 'truth'. The knowledge-creating process is idealistic, since knowledge is created through the social justification process, which relentlessly pursues a truth that may never be reached. We can say that the theory of knowledge creation is based on an idealistic pragmatism which synthesizes the rational pursuit of appropriate ends, whose appropriateness is determined by ideals (Rescher, 1987).

This paper is a first step towards establishing a more comprehensive explanation of knowledge in management science. It is acknowledged that further conceptual and theoretical refining is needed to position our knowledge-creation theory alongside the dominant paradigms. In particular, the issue of power in organizations needs to be

developed further. Also more empirical research combining qualitative and quantitative methodologies is needed to identify the specific mechanism and difference between companies.

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## References

- Arrow, K. J. (1974), *The Limits of Organization*. W.W. Norton & Co.: New York.
- Chandler, A.D., Jr (1977), *The Visible Hand: The Managerial Revolution in American Business*. Harvard University Press: Cambridge, MA.
- Collins, J. (2001), *Good to Great: Why Some Companies Make the Leap...and Others Don't*. Harper Business: New York.
- Drucker, P. (1993), *Post-Capitalist Society*. Butterworth Heinemann: London.
- Feldman, M. (2000), 'Organizational routines as a source of continuous change,' *Organizational Science*, 11, 611-629.
- Flyvbjerg, B. (2001), *Making Social Science Matter: Why Social Science Fails and How it Can Succeed Again*. Cambridge University Press: Cambridge.
- Gladwell, M. M. (2000), *The Tipping Point: How Little Things Can Make a Big Difference*. Wheeler Publishing: Boston, MA.
- Grant, R. M. (1996), 'Toward a knowledge-based theory of the firm,' *Strategic Management Journal*, 17, 109-122.
- Hayek, F. A. (1945). The Use of Knowledge in Society, *The American Economic Review*, 35, 519-530.
- Heidegger, M. (1962 [1927]), *Being and Time*, translated by J. Macquarrie and E. Robinson. Oxford: Blackwell.
- Husserl, E. (1970 [1954]), *The Crisis of European Sciences and Transcendental Phenomenology*, translated by D. Carr. Northwestern University: Evanston, IL.
- Leonard-Barton, D. (1992), 'Core capabilities and core rigidities: a paradox in managing new product development,' *Strategic Management Journal*, 13, 363-380.

- Levitt, B. and J. G. March (1988), 'Organizational learning,' *Annual Review of Sociology*, 14, 319–340.
- Maister, D. H. (2000), *True Professionalism: The Courage to Care About Your People, Your Clients, and Your Career*. Touchstone Books: Carmichael, CA.
- Merleau-Ponty, M. (1962), *Phenomenology of Perception*, translated by C. Smith. Routledge: London.
- Mogi, K. (2003), *Ishiki towa Nanika—Watashi wo Keiseisuru Nou* [What is Consciousness: The Brain That Forms Me]. Chikuma Shobou: Tokyo [in Japanese].
- Nelson, R. (1991), 'Why do firms differ, and how does it matter?' *Strategic Management Journal*, 12, 61–74.
- Nelson, R. and Winter, S. (1982), *An Evolutionary Theory of Economic Change*. Harvard University Press: Cambridge, MA.
- Nishida, K. (1970), *Fundamental Problems of Philosophy: the World of Action and the Dialectical World*. Sophia University: Tokyo.
- Nishida, K. (1990 [1921]), *An Inquiry into the Good*, translated by M. Abe and C. Ives. Yale University Press: New Haven, CT.
- Nisbett, R. E. (2003), *The Geography of Thought: How Asians and Westerners Think Differently ...and Why*. Free Press: New York.
- Nonaka, I. (1991), 'The knowledge-creating company,' *Harvard Business Review*, November–December, 96–104.
- Nonaka, I. (1994), 'A dynamic theory of organizational knowledge creation,' *Organizational Science*, 5, 14–37.
- Nonaka, I. and A. Katsumi (2004), *Innovation no Honshitsu* [The Essence of Innovation]. Nikkei BP: Tokyo [in Japanese].
- Nonaka, I., K. Sasaki and D. Senoo (2004), 'Jizokuteki seichou kigyuu no sikou, koudou youshiki: risouteki pragmatism no tankyuu (The thinking and action pattern of sustainable growth firms: pursuing idealistic pragmatism),' *Think!*, Winter, 92–101 [in Japanese].
- Nonaka, I. and H. Takeuchi (1995), *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press: New York.
- Nonaka, I. and R. Toyama (2002), 'Firm as a dialectic being: toward the dynamic theory of the firm,' *Industrial and Corporate Change*, 11, 995–1109.
- Nonaka, I. and R. Toyama (2003), 'The knowledge-creating theory revisited: knowledge creation as a synthesizing process,' *Knowledge Management Research & Practice*, 1, 2–10.
- Nonaka, I., R. Toyama and N. Konno (2000), 'SECI, ba and leadership: a unified model of dynamic knowledge creation,' *Long Range Planning*, 33, 1–31.
- Peukert, H. (2003), 'The missing chapter in Schumpeter's *The Theory of Economic Development*,' in J. Backhaus (ed.), *Joseph Alois Schumpeter*. Springer: Berlin, pp. 221–231.
- Rescher, N. (2003), *Rationality in Pragmatic Perspective*. Edwin Mellen Press: Lewiston, NY.
- Rorty, R. (1979), *Philosophy and the Mirror of Nature*. Princeton University Press: Princeton, NJ.
- Schon, D. A. (1983), *The Reflective Practitioner*. Basic Books: New York.

- Simon, H. A. (1945), *Administrative Behavior*. McMillan: New York.
- Simon, H. A. (1991), 'Bounded rationality and organizational learning,' *Organization Science*, 2, 125–134.
- Suchman, L. (1987), *Plans and Situated Actions: The Problem of Human–Machine Communication*. Cambridge University Press: New York.
- Teece, D. J. (2000), *Managing Intellectual Capital*. Oxford University Press: New York.
- Teece, D. J. (2003), 'Explicating dynamic capabilities: asset selection, coordination, and entrepreneurship in strategic management theory,' U. C. Berkeley.
- Thompson, A. (1967), *Organizations in Action*. McGraw Hill: New York.
- Ueno, N. (2000), *Interaction*. Daishukan Shoin: Tokyo.
- Watts, D. J. (2003). *Six Degrees: The Science of a Connected Age*. W.W. Norton & Co.: New York.
- Williamson, O. (1975), *Markets and Hierarchies*. Free Press: New York.

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