THE TACIT DIMENSION IN KNOWLEDGE MANAGEMENT: THE IMPLICATIONS OF THE EPISTEMOLOGY OF MICHAEL POLANYI

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นักเศรษฐศาสตร์สังคมอย่าง ปีเตอร์ ดรัคเก้อร์ และ แอลวิน ทอฟฟ์เล่อร์ ได้ทำให้เราสนใจความสำคัญของความรู้ในฐานะที่เป็นทรัพยากรด้านการบริหารและอำนาจ อย่างไรก็ตามเรื่องนี้ก็นำไปสู่คำถามที่ว่าทำอย่างไรจึงจะทำให้ความรู้นั้นมีความสร้างสรรค์ หรือกล่าวอีกนัยหนึ่งก็คือจะสามารถผลิตการสร้างสรรค์โดยอาศัยความรู้ขึ้นมาในบริษัทได้อย่างไร บทความนี้มุ่งที่จะนำเสนอการวิเคราะห์เชิงปรัชญาเกี่ยวกับมิติเชิงสร้างสรรค์ของความรู้ของมนุษย์ ตามความคิดของไมเกิ้ล โพลานยี ผู้เสนอแนวคิดที่ว่า ความรู้ทั้งหมดของมนุษย์ตั้งอยู่บนองค์ประกอบส่วนบุคคลหรือไม่เปิดเผยชัดเจน บทความนี้เสนอแนะว่าธุรกิจมิใช่กิจกรรมที่เป็นกลาง ๆ หรือเป็นปรนัย การจะทำให้ธุรกิจสร้างสรรค์เราจะต้องจัดการให้ธุรกิจเป็นกิจกรรมด้านสังคมที่มีความสัมพันธ์กับวัฒนธรรมประเพณี จากแง่มุมของการรู้โดยนัยยะ ธุรกิจก็คือวิถีทางของการดำรงอยู่ของเราในการทำ ธุรกิจเรายังคงดำรงอยู่ในวัฒนธรรมประเพณีของเราเสมอ

Abstract

Socio-economists such as Peter Drucker and Alvin Toffler have called our attention to the importance of knowledge as a management resource and as power. This issue, however, raises question of how knowledge can be creative, or better, how knowledge creation can be produced in a company? This article is intended to provide a philosophical analysis of the creative dimension of human knowledge. Following the

thought of Michael Polanyi who proposes the thesis that all knowledge is based on personal or tacit elements, this article suggests the idea that business is not a neutral and objective activity. To be creative, it must be arranged as a social activity that has a relationship to cultural tradition. From the perspective of tacit knowing, business is our way of being. We still always dwell in our cultural tradition in doing business.

1. Introduction

Michael Polanyi's theory of tacit knowing has been considered at large in many areas: science, economics, and business. For people who dwell in these areas, *Personal Knowledge* (1958) and *The Tacit Dimension* (1966) are not only philosophical books but also the alternative sources to understand science, human knowledge in general, and organizational knowledge creation. Especially his explanation of creative dimension of human knowledge can be helpful to understand the capability of a company as a whole to create new knowledge, to disseminate it throughout the organization, and to embody it in products, services, and systems. This tone of its relevance in the organizational knowledge creation has been introduced for the first time by Ikujiro Nonaka and Hirotaka Tekeuchi in their book entitled *The Knowledge-Creating Company* in 1995.[1] The book is a scientific report of their research on the success of Japanese companies in the 1970s and 1980s. Started with the assumption that knowledge creation is the source of the highest-quality power and the key to powershift - as a translation of Western idiom "knowledge as power" – Nonaka and Takeuchi reach the conclusion that the great success of Japanese companies in the 1970s and 1980s depends on how the management staffs and the workers dwell into the vision of company, their commitment to company's problem, and their immersion into the company's tradition. All these are tacit dimension in knowledge creation.[2]

In the course of this study the tacit dimension is not just a fact in human knowledge and knowledge management but also has its function in the creative process in knowledge management. Regarding this contribution, scholars in organizational knowledge creation try to understand the secret of tacit knowing with which the philosophers are concerned. This

paper aims to introduce the meaning of tacit knowing and then tries to examine its relevance for organizational knowledge creation. For this purpose, this paper will divide this topic into two stages. At the first stage the paper will take a look at the question how Michael Polanyi explains his theory of tacit knowing and at the second stage it will try to find out its implications in the knowledge creation in business.

2. Michael Polanyi, a Philosopher

Michael Polanyi was born on March 11, 1891 in the talented and intellectual family of Mihaly Pollacsek and Cecilia Wohl, in Budapest, Hungary. His father was born between 1825 and 1830 in a small Jewish settlement in the Hungarian mountains and, after participating in a Hungarian revolt against the Habsburgs in 1848, he escaped to Switzerland where he studied engineering.[3] The mother was an anarchist Russian countess, who had also fled to Switzerland in the aftermath of a bomb plot (for which she had built the bomb in the chemistry laboratory of the Czar's School for Daughters of the Nobility).

Michael Polanyi had three brothers and one sister. The eldest brother was Otto, who in the 1920s became a major industrialist in Italy, where he changed his name to Otto Pol. Otto was known as a Marxist and a financial backer of the socialist newspaper *Avanti*, of which Mussolini was the editor. The next brother in age was Adolph who had emigrated to Brazil, where he found an interracial society in which whites, blacks, and Indians would meld into a new civilization – modern yet tribal, free yet not individualist. After Otto and Adolph came Michael's sister, Mousie or Laura, who around 1900, at the age of nineteen became a leader in the Hungarian folk movement. The sister had an artistic side (Bartok and Dohnanyi) as well as a political and social vision of a life centered in the communal village. Mousie Polanyi was the editor of a magazine for this movement and through this organ helped to define and direct it.

Between Laura and Michael in age came Karl who was the first President of The Galilei Circle at the University of Budapest[4] and eventually became a professor of history of economics at Bennington and Columbia University in 1946. After World War I, he edited the *Austrian*

Economist in Vienna and lived in poverty while giving most of his income to the relief of Hungarian refugees. Karl is now best known for his study of the social and cultural effects of the rise of capitalist market economies through his book *The Great Transformation*, which had been drafted in 1940 and was published in New York in 1944 and in London in 1945.[5] Karl is known because of his criticism of the extensive application of the market system and its law of supply and demand of goods and capital. One of his central arguments is that if this system is applied to land and labor, then the result is that people come to be considered as commodities with a purely economic value. For Karl, the market system violently distorts our views of man and of society. And to counteract this dehumanizing tendency, Karl advocates redistribution of wealth and reciprocity of commitments and obligation according to social and political rather than economic norms.

If Karl, like Otto and Laura, defined himself as a socialist, Michael was looking for an alternative style of life, which he later calls in the *Personal Knowledge*, 'the responsible person'.[6] At first he was concerned with the problem of society and social processes. He tries to find his own way between a bourgeois capitalism that rejects the intervention of community in the individual life and a Marxist socialism that denies the individual freedom and the claim to be an independent person. Opposing the rationalism of the traditional 'Liberal' and anti-human collectivism of the Socialist and Marxist, he builds up his own concept of man and social processes under the formulation: "the freedom of the subjective person to do as he pleases is overruled by the freedom of the responsible person to act as he must".[7] With this position of a responsible person, he defends in his writings the political and social implications of science with a genuine intelligence and thereby opens a clearer path for the life of reason and justice. To look for a solution to the problems that existed in his and his father's generations, he holds that only in co-operation with others in the development of understanding and in responsible action can the full development of human personhood take place.[8]

This difference between the socialism of his siblings and his own responsible personalism which sought justice and freedom, resulted in tensions within the family. One of these is that the relation between Michael and Karl became very cool.[9] At first, the brothers were brought up with

the same world view. Both were members of The Galilei Circle and in this circle both brothers shared the same ideas: they were free in spirit and anti-materialist. By the end of the 1920s, both had moved from free-thinking atheism to Tolstoyan Christianity based on the view that individual self-completion could be the impetus for social change. Here, at this period, however, the brothers began to diverge. While Karl took a definite step beyond individualist ethics towards the societal one, and tried to imbue sociology with moral imperatives, influenced by Kant's categorical imperatives and by Christianity, Michael seemed to keep insisting upon the anti-materialist world view and shifted towards a theoretical philosophy in which the theory of knowledge dominated the theory of society. From here on, the brothers took divergent directions. Karl became a socialist or more precisely a social democrat, while Michael, with his deep understanding of the personal and social dimension of man, from the beginning of his career as scientist and philosopher, engaged in a criticism of Marxism.

The year 1935 marked the critical stage in the relationship when Michael criticised USSR Economic policy in his essay, "USSR Economics - Fundamental Data, System and Spirit" which he wrote when we was in the Manchester School of Economics and Social Studies.[10] Karl accused Michael of not understanding social and economic problems and contended that the working-class must be a starting point in Russia for the sake of socialism.[11] Thus, from their former common ground of Tolstoyan religiosity, Karl had moved towards a community-oriented Christian sociology which led him to celebrate the Russian experiment as the sole embodiment of socialism, while Michael rejected it and went on to construct a social theory based upon a theory of knowledge and of free society. Accordingly, for Michael fascism was not a genuine monster in the twentieth century, but only a consequence of Marxism.

But the cool relationship in the family did not last forever. In the end, Karl knew that Michael was right. The Hungarian revolution in 1956 was the moment. Karl began to criticise Russian power politics; and the emphasis he placed on moral considerations as a motive for the Hungarian revolution brought the brothers closer. Whereas Karl held that the Hungarian revolution was of great significance because it had torn Hungary from its feudal hangovers, Michael set the events in the context of his

theory of knowledge and anti-totalitarian social theory, in which he reasserted the need for "spiritual beliefs" in truth, in fairness and decency, in beauty, in solidarity, and in justice.[12] On this ground, Michael, more than Karl, maintained that science, arts, religion, and jurisprudence, while being fields of independent thought, are yet allied to each other. If the independence of one is taken away, then the freedom of others likewise will be ended. Considering this position Harry Prosch points out: "the ultimate (result) of Polanyi's (Michael's) efforts was to reinforce our traditional beliefs in truth, justice, mercy and fellowship…for the continued existence of a free society…. This will lend an ontological basis for man's grasp of his own dignity and high calling in the universe".[13] Through his emphasis on spiritual beliefs, Michael moved away from the socialist spirit of his own family and began to move toward the examination of the responsible person in a free society.

3. Polanyi and Gestalt Psychology

Polanyi offered his life to inquire human knowledge in which he published *Science, Faith and Society* (1946), *Personal Knowledge* (1958) and *The Tacit Dimension* (1966). His approach in those books was a fresh one. Having rejected the positivistic notion of knowledge he looks for a true epistemology which would constitute a totally new philosophical beginning: *tacit knowing*. While his opponents, the positivists, have a long time been attempting to derive the wholes from parts, in a very explicit way, by identifying the parts and describing their mutual relation, Polanyi turns to a position that says we know more the whole reality although we cannot specify it. He explains that any attempt to specify the particulars of the whole remains incomplete. In one way, there is always a residue of particulars left unspecified; and in another way, even when particulars can be identified, isolation of the particulars can change their appearance. Polanyi, then, says that knowing is a process of comprehending: a grasping of disjoined parts into a comprehensive whole.[14] The mutual relationship between particulars can be grasped only by a sustained effort of imagination.

In any event this position has been developed by Gestalt psy-

chologists who had amassed in their attempts to show that we see objects by supplying forms or patterns in terms of which the various bits and pieces in our perceptual field tend to fall into meaningful place. It seems to be clear from some of their experiments that we do not perceive objects by inferring them from their given parts, nor by a process of induction.

Polanyi's references to Gestalt psychology occurred for the first time in his article in 1941: "The Growth of Thought in Society",[15] when he was still struggling with the freedom of science and drew upon the ideas of Gestalt to argue for decentralized control. He contends that there is more than one form of order besides a predetermined one given by centralized scientific planning. From the work of Wolfgang Köhler,[16] Polanyi shows that there can be an order of the highest complexity spontaneously achieved by internal mutual adjustment. His interest in Gestalt psychology's findings in relation to creative intellectual endeavor becomes the foundation of his major new insight.

Besides Gestalt psychology's importance in the context of the *freedom* of Science, Polanyi also saw its importance in his discussion of knowledge generation. This can be found for the first time in his book *Science, Faith and Society*, when Polanyi concentrates on the problem of scientific discovery. He acknowledges that his reflection on the role of scientific intuition in the process of scientific discovery is "akin to the recognition of shapes as analyzed by Gestalt psychology".[17] The Gestalt psychology assumed that the perception of shapes is caused by the spontaneous reorganization of the physical traces made by sense – impressions inside our sense-organs. The capacity of scientists to guess the presence of shapes as tokens of reality does not essentially differ from the capacity of our ordinary perception to establish the reality of things around us. In *Personal Knowledge* Polanyi says that the finding of Gestalt psychology was his first clue to his concept of tacit knowing. He clarifies: "Scientists have run away from the philosophic implications of Gestalt; I want to countenance them uncompromisingly".[18] The importance of Gestalt psychology for Polanyi, therefore, lies in its thesis that "we may know a physiognomy by integrating our awareness of its particulars without being able to identify these particulars".[19]

For Polanyi, Gestalt psychology was response against the atomic sensationalist theories of the nineteenth century which contended that sen-

sory experience is the basis of all human knowing. In this controversy with atomic sensationalism, the Gestalt theoreticians promoted a thesis that derives from its name: the Gestalt, the whole. In the formulation of Kurt Koffka they seemed to say: "The word Gestalt has the meaning of a concrete individual and characteristic entity, existing as something detached and having a shape or form as one of its attributes. A Gestalt, therefore, is a product of organization, [and] organization the process that leads to a Gestalt".[20] In the process of organization what happens to a part of the whole is determined by intrinsic laws inherent in this whole. All particulars become meaningless if we lose sight of the pattern which they jointly constitute.

Polanyi knows that Gestalt psychology tends to treat perception and knowledge as a more or less passive affair and therefore failed to see perception as a construction, in which we create a tacit integration of sensations and feelings into a perceived object. "Such an interpretation", Polanyi says, "leaves no place for any intentional effort which prompts our perception to explore and assess in the quest of knowledge the clues offered to our senses".[21] Despite this critical defect Polanyi acknowledges that his theory of knowledge uses some proofs from Gestalt psychology. He says that Gestalt psychology has pushed him to build a kind of phenomenology of knowledge. In this standpoint Polanyi formulates his ambiguous attitude toward Gestalt psychology. He writes, "Yet my evaluation of this material is so different from that of Gestalt theory, that I shall prefer not to refer here to this theory, even though I shall continue to draw on its domain and pursue some arguments on lines closely parallel to that of its teachings".[22] With this attitude Polanyi promotes his own view on the nature of knowledge using some data from Gestalt psychology.

4. The Subsidiary Awareness and the Focal Awareness

In the preface to his major book *Personal Knowledge* Polanyi writes his epistemological position:

> I regard knowing as an active comprehension of the things known, an action that requires skill. Skilful know-

> ing and doing is performed by subordinating a set of particulars, as clues or tools, to shaping of a skilful achievement, whether practical or theoretical. We may then be said to become subsidiarily aware of these particulars within our focal awareness of the coherent entity that we achieve.[23]

According to this epistemological encapsulation, the foundation of knowing lies in the distinction between focal awareness and subsidiary awareness. Focal awareness is an awareness of an object as our focus of attention, while subsidiary awareness is an awareness of an object as a clue to another.

His departure point of this thesis is the observation of the relation of a set of particulars to a comprehensive entity in several kinds of knowing, namely, the understanding of physiognomy, the performance of skills, and the mastery of tools and probes. In all these cases, Polanyi finds that we can be aware of something in two mutually exclusive ways. "We can", he says, "be aware of particulars uncomprehendingly, i.e., in themselves, or understandingly, in their participation in a comprehensive entity".[24] In the first case we focus our attention on the isolated particulars and then are aware of the particulars focally. But in the second, our attention is directed beyond them to the entity to which they contribute; we notice them subsidiarily in terms of their participation in the whole. Focal awareness and subsidiary awareness, therefore, are definitely not two degrees of attention but two kinds of attention given to the same particulars.

The critical factor distinguishing the two types of knowledge, however, lies not only in the content but primarily in the logical function of the subsidiary elements. The subsidiary elements function as clues to enable the knower to form a consistent perceptual or conceptual image of an object being considered. Therefore, to clarify what he means by subsidiary awareness and focal awareness Polanyi gives more attention to the evidences that are the results of the organization of sensory clues. In this case Polanyi attempts to clarify that to see object is the result of learning a skill, of learning how to attain a meaningful (but non-explicit) integration of sensory clues.

To explain this Polanyi follows an exposition of the fact which had

been demonstrated by Gestalt psychology, namely, what happens "when I move my hand before my eyes".[25] So far as immediate givens are concerned, I should only see my hand constantly changing its color, its size, and its shape. But instead it appears that I informally "take into account a host of rapidly changing clues, some in the field of vision, some in my eye muscles and some deeper still in my body, as in the labyrinth of the inner ear",[26] and so what I really perceive turns out to be a coherence among these thousand varied and changing clues in the form of a single unchanging object moving about, and therefore tacitly understood, in my perception, as being seen from continually different angles and distances and under variable illuminations. But it is apparent that this coherence could have been accomplished only tacitly, since I could not have been explicitly aware at the moment of some of the clues that apparently have entered into my coherent perception, those provided by my eye muscles, labyrinth organ, etc.

Through this example Polanyi makes clear two points concerning the distinction of subsidiary awareness and focal awareness. In one point he says that one does not need to be consciously aware of all the clues he integrates into a perception. With respect to this point Polanyi holds that the physiologists have long ago established that the way we see an object is determined by our awareness of certain efforts inside our body, some efforts that we cannot feel in themselves. They proved that "we are aware of these things going on inside our body in terms of the position, size, shape, and motion of an object to which we are attending".[27]

In the second point, Polanyi adds, it is also apparent that there must exist a perceptual action enabling me to pick out "objects" from my visual field and to retain them as integrated wholes even when their sense quality changes. I perceive them to be entities in motion retaining their integrity as objects, instead of perceiving them to be changing their character as objects. Given such a mechanism to start with, I could then learn the skill of using it in more and more adequate ways as time went on.

With this analysis of the distinction of subsidiary awareness and focal awareness we can conclude that knowledge is an activity which would be better described as a process of knowing. It is tacit because all the clues and particulars which are at work in our visual perception and the use of tools and probes are unspecifiable. It is an experience that we

have of our bodies and of our mental act as our own. But it is also a consciousness of the intentional terms projected as externally distanced whole, forms, objects, skills and more generally meanings, when forms, objects, skills, and meanings are the object of our focal awareness. Knowing, therefore, involves the objective pole upon which subjective operation may be said to focus, but it also necessarily involves a non-focal substratum experience and performance. It contains "components of which we are subsidiarily aware in the focal content of our thinking, and that all thought dwells in its subsidiaries, as if they were parts of our body".[28] No knowledge, therefore, is wholly focal.

5. The Subsidiaries

The remarkable thing of Polanyi's theory of knowledge is that the appearance of a thing at the centre of our knowing depends on clues to which I am not directly attending. In the case of perception, there must be certain sensory clues essential to what I am seeing, of which I am not focally aware. The question arises as to what is the subsidiary? How can it operate in our knowledge?

Categorically, the non-focal clues or better the subsidiary clues must be of two kinds:[29] (1) There are those clues which Polanyi called subliminal: those events in my body, such as eye-muscles movements, movements inside my labyrinth organ, and neural traces in my cortex that I cannot ever directly perceive as part of my visual field when they are functioning in an act of perception. But (2) there are also clues that I do see, but only from the corner of my eyes. These clues he called "marginal clues." I can observe directly these clues if I choose, but it is obvious I do not attend to them directly when I am viewing an object focally. I merely attend from them to a focal object. Thus my awareness of both kinds of these clues must only be subsidiary to my focal awareness of an object.

The marginal clues can also be broken down into two kinds. Besides what we see "at the corner of our eye:", there is another type of clues which also functions marginally in perception, that is, the way we have been used to seeing in the past. Perception is contextual and historically conditioned and what we see is often a function of what we have

learned to see. It is a habituation. Polanyi in this case explains that if we irresistibly see a room as having a normal shape that is because of another act of tacit knowing involving a subsidiary awareness at the back of our mind of a great many normal rooms that we have seen in the past.[30] So, not only what is at the corner of our eyes, but also what is at the back of our mind that functions as a background in perception. The weight of these memories at the back of our mind functions as a marginal clue, as part of a background upon which we see the objects. This background, in Polanyi's thought, is so important for the perception of objects because it, like a landscape, includes an infinite range of particulars to which we are paying no special attention, but nevertheless makes it possible to see, for example, a cow strolling in a field. Polanyi seems to mean that since the background fills up the field of our vision, it strikes us perceptually as unlimited in its extent, i.e., as infinite. And because what fills up our field of vision cannot be seen to be moving against a further background, it has to appear to us to be at absolute rest.

With this concept Polanyi appears to be holding that the conceptions and general notions we have formed on the basis of the past experience enter only tacitly and as further specifications of what already has become our perceptual background by the operation of our visual mechanisms. The Humean notion that our past experiences automatically condition us to feel certain expectations for the future must therefore be in error from Polanyi's point of view. From what Polanyi says, it would seem to mean that our cognitive expectations, or what Dewey called our "funded experience" are not effective in determining the background in perception when our visual mechanisms provide us with a background that contradicts this funded experience, our knowledge.[31]

Harry Prosch also informs that "as for our tendency to integrate some of our sensory fields into stable objects in the first place – objects that retain their integrity while moving against a stationary background - Polanyi rejects references to 'equilibrations' in our nervous systems, or to any other sort of automatic nervous mechanisms".[32] It seems to him, Polanyi holds rather that this tendency to integrate some of our sensory field into stable objects comes from our "craving to find strands of permanence in the tumult of changing appearances", which "is the supreme *organon* for bringing our experiences under intellectual control".[33] We should

note here that for Polanyi, an intention to bring "our experiences under intellectual control" begins to operate already in basic perception, so that even the basic mechanisms of visual perception are held by him to be teleologically oriented toward the attainment of an intended intellectual coherence. Physiological mechanisms themselves are therefore thought by him to be structured to function toward the goal of attaining meaning, although functioning only mechanically toward such a goal, not deliberately. Thus, they sometimes present us with illusions, i.e., are in error.

Yet, in spite of the mechanical operation of basic perceptual mechanisms, Polanyi holds that our perceptions are not heteronomously caused. Rather, he maintains, "we are performing one single mental act in jointly seeing an object against its background". Such a mental act has a focus in terms of which the background functions in a subsidiary way, and so "we are aware of the background only in terms of the object's appearance – e.g., of its being in motion".[34] He holds that both focal awareness and subsidiary awareness exist functionally related in a single, purposive act of mental awareness. But since we cannot discover in our consciousness all the subsidiary clues that we integrate into a perceived object (we admittedly are unable to infer the object explicitly from all our consciously known sense data), Polanyi's contention is that a perception as a single mental act must rest upon a reiterated supposition that some physiological events in our body that we can never take note of focally by means of introspection are nevertheless elements used by us in a subsidiary way in structuring an integrated object of focal perception - and are not simply causes of such integration. In other words, he holds that subsidiary awareness may function at all levels of consciousness from the subliminal to the fully conscious – that some "functions inside our body at levels completely inaccessible to experience by the subject" are elements of which we take account in the total economy of our awareness.[35] We truly do, therefore, "know more than we can tell".[36]

With the clarification of the nature and the status of the subsidiaries Polanyi, then, says that the act of knowing involves an intentional change of being: the pouring of ourselves into the subsidiary awareness of particulars which function as the elements of the observed comprehensive whole. Polanyi calls his theory of knowledge tacit knowing or the tacit dimension because the grounds of all knowing are subsidiary, or tacit com-

ponents, items or particulars. Tacit knowing, then, although an intentional act, is one in which we are only in subsidiary fashion.

6. Tacit Knowledge: Its Role in Business

Polanyi's theory of tacit knowing reached its highest development in 1966, when he published *The Tacit Dimension.* In this publication, Polanyi defends his position that science is an art of knowing that is developed according to the principle of spontaneous coordination of independent initiatives under the criterion of plausibility, scientific values and originality.[37] Both the criteria of plausibility and of scientific value tend to enforce conformity, while the value attached to originality encourages dissent among scientists. All these criteria are tacit dimensions.

Thirty years later Ikujiro Nonaka and Hirotaka Takeuchi applied this theory in business. The resulting book is entitled *The Knowledge-Creating Company*. The book is not so much one of philosophical reflection, but a management book that focuses on the problem of knowledge creation in Japanese companies. As suggested in the title of the book, Nonaka and Takeuchi were attempting to show that the success of Japanese companies is due to knowledge creation. Following Peter Drucker, Alvin Toffler, James Brian Quinn and Robert Reich, Nonaka and Takeuchi agree that "the economic and producing power of a modern corporation lies more in its intellectual and service capabilities than in its hard assets, such as land, plant, and equipment".[38] Knowledge creation, then, becomes the new competitive resource in business. But the questions arise as to what kind of knowledge the Japanese opt to create? Which knowledge is more preferable? How could this kind of knowledge be developed?

It takes for granted in management that a good organization is one which has the capability to process explicit knowledge. Nonaka and Takeuchi describe this kind of knowledge as formal and systematic, can be expressed in words and numbers, and can be easily communicated and shared in the form of hard data, scientific formulae, and codified procedures. This concept, however, is very different from implicit knowledge as understood by Japanese companies. This kind of knowledge is prima-

rily tacit, something not easily visible and expressible, includes subjective insights, intuitions, and hunches and is deeply rooted in an individual's action and experience, as well as in the ideals, values, or emotions he or she embraces.[39]

In Polanyi's perspective this kind of knowledge consists of two kinds of subsidiaries. The first is the technical dimension, which encompasses the kind of informal and hard-to-pin-down skills or crafts captured in the term *knowing how*. Like a master of craftsman, the Japanese managers develop a wealth of expertise at his fingertips after years of experience. This kind of knowledge is hard to be articulated in words. The second is the cognitive dimension. It consists of schemata, mental models, beliefs, and perceptions so ingrained that we take them for granted. This aspect of tacit knowledge reflects our image of reality and our vision of the future. Though they cannot be articulated, these implicit models shape the way we perceive the world around us. This aspect of tacit knowledge contains also our knowledge of the history of a company and the way how this company looks for solutions in facing its problem.

According to Nonaka and Takeuchi, this vision of knowledge has its roots in the Japanese intellectual tradition influenced by Buddhism and Confucianism. According to these traditions, the Japanese perception is oriented toward objects in nature that are subtle, but, at the same time, visual and concrete. Knowledge does not mean to grasp the objects, but includes the way of being to participate in the way of other being. It means knowledge includes wisdom that is the way of being to discover the reality. If Western philosophy is dominated by Cartesian dualism between subject and object, mind and body, or mind and matter, the Japanese intellectual tradition is concerned with the idea of oneness of humanity and nature,[40] oneness of body and mind,[41] and oneness of self and other.[42] In the context of such a tradition, it can be thought that almost all of the highly visionary knowledge of the top president of a Japanese company consists of subjective insight, intuitions, and hunches. This kind of knowledge cannot be easily processed in a mechanical way (like a computer creating a database). One should dwell in it and have a feeling to what they have in mind. Like a child who learns things with his body, not only by his mind, to understand the implicit knowledge of the top president one should delve into history, into the way the company is organized, and even into the

speech that is spoken in the ceremonial events of company.

With this concept in mind, Nonaka and Takeuchi anticipate that in business it is not the thing that we have knowledge of, but how we create knowledge: "Once the importance of tacit knowledge is realized, then one begins to think about innovation in a whole new way".[43] They explain that in business, knowledge is not just about putting together diverse bits of data and information. It is a highly individual process of personal and organizational self-renewal. In Polanyi words, the task of management is searching the way to discovery or innovation.[44] In such pursuit "we are guided by sensing the presence of a hidden reality toward which our clues are pointing; and the discovery which terminates and satisfies this pursuit is still sustained by the same vision".[45] The essence of innovation is to re-create the world according to a particular vision. This means to create the company and everyone in it in an ongoing process of personal and organizational self-renewal.[46]

To have an insight that is highly personal is of little value to the company unless the individual can convert it into explicit knowledge, thus allowing it to be shared with others in the company. Nonaka and Takeuchi tell us that Japanese companies are especially good at realizing this transition from tacit knowledge to explicit knowledge. They take Honda as a case. Before 1975 Honda produced sedan which has a large and long body. The prototype of this product is Honda Civic and Honda Accord. In 1978, Hiro Watanabe, the top management at Honda, inaugurated the development of a new-concept car with the slogan, 'Let's gamble' which received a positive response from the young engineers and designers (the average age was 27). Mr. Watanabe only had a vision that the revolutionary car should be called 'tall boy' with 'man-maximum, machine minimum' principle. The mission might sound vague, but in fact it provided the team with an extremely clear sense of direction. The result was called "Honda City".

From this example Nonaka and Tekeuchi explain that the tacit knowledge is not a solitary fact. It can be understood because it can be made explicit in three ways.[47] First, it can be expressed in figurative or metaphorical language. A metaphor such as "automobile evolution" "man-maximum, machine-minimum", "tall boy" is a distinctive method perception. It is a way for individuals grounded in different contexts and with

different experiences to understand something intuitively through the use of imagination and symbols, both metaphor and analogy. Through metaphors, people put together what they know but cannot yet say. As such, metaphor is highly effective if fostering direct commitment to the creative process in the early stages of knowledge creation.

Second, it can be disseminated into team work. The story of Honda City suggests how new knowledge always starts with an individual – Mr. Hiroo Watanabe in this case – and how an individual's personal knowledge is transformed into organizational knowledge valuable to the company as a whole. In this case the organization cannot create knowledge on its own without the initiative of the individual and the interaction that takes place within the group. Knowledge can be amplified at the group level through dialogue, discussion, experience sharing, and observation.

Third, although it can be expressed, implicit knowledge is born in the midst of ambiguity and redundancy. The story of the Honda City suggests how certain organizational conditions can enhance the knowledge-creation process. It may sound paradoxical, but the confusion created within the product development team by the ambiguity of the mission handed down by Honda's top management provided an extremely clear sense of direction to the team. Ambiguity can prove useful at times not only as a source of a new sense of direction, but also as a source of alternate meanings and a fresh way of thinking about things. It also invites redundancy. To Western managers, redundancy has connotation of unnecessary duplication and waste. Yet, in case of Honda City, redundancy is important because it encourages frequent dialogue and communication. This helps create a common cognitive ground among employees and thus facilitates the transfer of tacit knowledge.

7. Closing Remarks

"Knowledge is an important factor in economic phenomena". This is one of the basic thoughts of neoclassical economics and has been taken for granted by many contemporary scholars such as Marshall, Hayek and Schumpeter. But what is important here is the way knowledge is treated.

This depends upon the emphasis we put on knowledge, the type of knowledge to which attention is paid, and the ways we acquire and utilize it. What needs to be recognized is the fact that not all knowledge is explicit. The greater part of knowledge is still implicit and can only be expressed in figurative ways.

Looking at the way it is produced and communicated; two things concerning tacit knowing can be deduced in these closing remarks. First, tacit knowing is social-psychological fact, in a sense that it is based on personal or national experiences of things. Human beings acquire knowledge by actively creating and organizing their experiences. Being different from traditional epistemology that derives knowledge from the separation of the subject and object of perception, we contend that human beings create knowledge by involving themselves with objects. Polanyi calls this process 'indwelling'.

Two, tacit knowing is an ontological fact, in a sense that tacit knowing presents different worldviews: the individual world and the organizational world. Tacit knowing suggests that at first stage knowledge is created only by individuals. An organization cannot create knowledge without individuals. The organization supports creative individuals or provides contexts for them to create knowledge. Organizational knowledge creation, therefore, should be understood as a process that organizationally amplifies the knowledge created by individuals and crystallizes it as part of the knowledge network of organization. This process takes place within an expanding community of interaction, which crosses inter-organizational level and boundaries. My knowledge, then, means my world, because only through my knowledge do I dwell in my world. With this perspective, I can say that a company is not only a neutral organization, but a knowledge-sharing organization. It is not determined by its goal, but by its basis, which is the process of sharing-knowledge of those who dwell in a common tradition.

Endnotes

[1]Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge-Creating Company, How Japanese Companies Create the Dynamics of Innovation* (New York:

Oxford University Press 1995).

[2]Ibid., p. 8.

[3]Peter Drucker, *Adventures of a Bystander* (New York: Harper and Row, 1978), pp. 127-138. Citation is taken from Eugene Webb, *Philosophers of Consciousness* (Seattle: University of Washington Press, 1988), pp. 26-30.

[4]The Galilei Circle, formed in 1908, was made up of progressive students. Michael was also one of the founders and members of this circle. Ilona Duczynsk, Karl's wife, has described its motif in these terms: "Let it be free in spirit, let it keep away from party politics, let it be dedicated and decent. Let it appeal to the students who live in poverty in their thousands. Let it be a movement aiming to learn and to teach". Its mission: "to mobilise against clericalism, corruption, against the privileged, against bureaucracy - against the morass ever-present and pervasive in this semi-feudal country". Harry W. Pearson (ed.), *The Livelihood of Man: Karl Polanyi* (London: Academic Press, 1977), p. xi.

[5]Ibid., pp. xi-xii.

[6]*Personal Knowledge*, p. 309.

[7]Ibid.

[8]Michael Polanyi, *The Study of Man* (Chicago: The University of Chicago Press, 1959), p. 60.

[9]Endre J. Nagy, "After Brotherhood's Golden Age: Karl and Michael Polanyi" in *Humanity, Society, and Commitment*, edited by Kenneth McRobbie (London: Black Rose Books, 1994), pp. 88-109.

[10]Michael Polanyi, "USSR Economics – Fundamental Data, System, and Spirit", *The Manchester School of Economic and Studies*, 6 (November 1935), pp. 67-89. This essay was published also as the third essay in *The Contempt of Freedom*, 1940.

[11]Ibid., p. 99.

[12]*Knowing and Being*, p. 34.

[13]Harry Prosch, *Michael Polanyi: A Critical Exposition* (Albany: State of University of New York Press 1986), p. 197.

[14]*Knowing and Being*, pp. 123-124 and The Study of Man, p. 28.

[15]Michael Polanyi, "The Growth of Thought in Society", *Economica* 8 (November 1941), p. 432.

[16]Polanyi refers to Wolfgang Köhler, *The Mentality of Apes* (London: Kegan Paul, Trench, Trubner & Co., Ltd., 1925).

[17]*Science, Faith and Society*, p. 33.

[18]*Personal Knowledge*, p. vii.

[19]*The Tacit Dimension*, p. 6.

[20]Kurt Koffka, *The Principles of Gestalt Psychology* (London: Routledge, 1999), p. 682.

[21]*Personal Knowledge*, pp. 97-98.

[22]*Personal Knowledge*, p. 55.

[23]Ibid., p. vi.

[24]*Knowing and Being*, p. 128.

[25]*Knowing and Being*, p. 139.

[26]Ibid.

[27]*The Tacit Dimension*, p. 13.

[28]*The Tacit Dimension*, p. x.

[29]*Knowing and Being*, pp. 139-140.

[30]Ibid., p. 140.

[31]Harry Prosch, *Michael Polanyi, a Critical Exposition*, Op. Cit., p. 60. Harry Prosch is one of Polanyi's assisstant who becomes co-writer of the book Meaning.

[32]Ibid.

[33]*Knowing and Being*, p. 114, *Personal Knowledge*, pp. 18, 73, 103-104, 132-133.

[34]*Knowing and Being*, pp. 111-112.

[35]Michael Polanyi, "Logic and Psychology", *The American Psychology* 23 (January 1968), p. 31.

[36]*The Tacit Dimension*, p. 4.

[37]*Knowing and Being*, pp. 49-55.

[38]Ikujiro Nonaka and Hirotaka Tekeuchi, *The Knowledge-Creating Company*, Op. Cit., p. 7.

[39]Ibid., p. 8.

[40]Examples of this trait include: the sympathy to nature depicted in the *Man-yohshu*, the notion of change and transition described in the famous *Tale of Genji*, delicate sentiment conveyed by the *Kokin-wakashu*. Yujiro Nakamura, a contemporary Japanese philosopher called this style as emotional naturalism.

[41]In the Meiji era (1868-1912), Kitaro Nishida built up a philosophy that focuses on the fact of human-being-in-the-world as originally having the character of action. In this mode of act, there is separation between body and mind, subject and object.

[42]It assumes that the Japanese view is collective and organic. While Western philosophy promotes the realization of the individual self as the goal of life, the Japanese ideal of life is to exist among others harmoniously as a collective self.

[43]Ibid., p. 10.

[44]*Knowing and Being*, p. 118.

[45]*The Tacit Dimension*, p. 23-24.

[46]Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge Creating Company*, Op. Cit., p. 10.

[47]Ibid., p. 13-15.

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