Can Tacit Knowledge Alone Drive Innovation?

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Abstract

Tacit knowledge is often described as a crucial component to organizational knowledge creation. However, there are controversies surrounding its sufficiency in generating innovation alone. Many believe that explicit knowledge is often overlooked, yet equally necessary in creating new knowledge. There are several perspectives on this issue, and for the purpose of this paper, these perspectives are grouped into three main streams. The first and second stream believe that tacit knowledge is the core of knowledge creation, while the third stream argues the equal significance of both tacit and explicit knowledge. The third stream also introduces the SECI model to further demonstrate the way both tacit and explicit knowledge can be used to trigger innovation; that is, through the process of knowledge conversion. A case study on the application of the SECI model in a military organization is used to provide evidence that knowledge conversion is highly effective in creating new knowledge. Since both tacit and explicit knowledge are required for this process, both knowledge types are shown to be equally significant to knowledge creation.

Keywords: Knowledge creation, tacit knowledge, explicit knowledge
knowledge, mostly regarding its convertibility and relation to explicit knowledge; thus, the scope of the paper inevitably extends to include explicit knowledge.

There are various perspectives on the way knowledge is created in organizations, and these views are generally grouped into three main streams. The first stream and second stream believe that tacit knowledge is inconvertible to explicit knowledge and that tacit knowledge is the main driver for knowledge creation. On the other hand, the third stream holds a contrasting view, maintaining that both knowledge types are equally significant in creating new knowledge. The purpose of this paper is to discover the means to effectively maximize knowledge creation in an organization. Each stream has their strengths and limitations in demonstrating how knowledge is created. In some cases, one stream is able to fill the gaps of another's limitations, providing a more holistic view of knowledge creation. As a result, it is realized that the knowledge conversion process introduced by the third stream is a valuable theory, with the potential to expand the opportunity for organizations to create knowledge.

**Literature Review**

Organizational knowledge creation is the process of integrating one's knowledge into an organization's knowledge system (Nonaka & Von Keogh, 2009). As such, new knowledge is primarily cultivated from existing knowledge that resides in the minds of individuals. This knowledge is categorized into two different types: articulable (called "explicit knowledge") and inarticulable (referred to as "tacit knowledge"). Tacit knowledge is often described as "tied to the senses, tactile experiences, movement skills, intuition, unarticulated mental models, or implicit rules of thumb" (Nonaka & Von Keogh, 2009, p. 636). Nonaka (1994, p. 16) tells us that tacit knowledge is a "continuous activity of knowing" because it is "rooted in action, procedures, routines, commitment, ideals, values, and emotions" (Nonaka & Von Keogh, 2009, p. 636). It requires the individual to be practically involved in the activity and getting direct experience in order to acquire such knowledge; in other words, it implies learning-by-doing. Because such knowledge underlies the skillful actions of the individual, Nelson and Winter (2009) believe that the individual "is not fully aware of the details of the performance and finds it difficult or impossible to articulate a full account of those details" (p. 73). It is known to reside in the non-rational mind of individual, and as a result, it becomes highly personal and intuitive. For this reason, tacit knowledge is inarticulable.

In contrast, explicit knowledge can be "uttered, formulated in sentences, and captured in drawings and writing," and it can be "transferred across time and space independently of the knowing subjects" (Nonaka & Von Keogh, 2009, p. 636; Lam, 2000, p. 490). Explicit knowledge is easily articulated because it can be represented by universal characters, allowing it to act across contexts (Nonaka & Von Keogh, 2009). As such, explicit knowledge can be recorded and physically stored within an organization so that employees can easily retrieve and acquire it through studying.

As mentioned earlier, most of the controversies on knowledge creation relate to the properties of tacit knowledge, as it is often regarded as the origin of knowledge creation. Some authors associate
explicit knowledge with tacit knowledge, asserting that their relationship forms the rationale for how new knowledge is created. Others maintain that new knowledge is entirely produced from tacit knowledge. For the purpose of this paper, the varying perspectives will be grouped into three main streams, as mentioned earlier. The first stream believes that tacit knowledge is held within individuals, and that individual commitment to assimilating environmental changes and performing activities drives innovation. The second stream holds that tacit knowledge is embedded in the routines of the organization, and new knowledge is created when new combinations of existing routines are discovered. Finally, the third stream maintains that innovation is produced when knowledge is converted between tacit and explicit. In a broader context, there is no absolute right or wrong answer, but only strengths and limitations that ultimately help organizations view their knowledge from different perspectives and devise strategies to effectively create new knowledge.

Polanyi (1966; 1967; 1962), a first stream theorist who introduced the concept of tacit knowledge, believes that “we can know more than we can tell,” because we hold more knowledge within us than we really know. Thus, according to this view, it is impossible to articulate tacit knowledge that is, to a certain extent, hidden and unknown to the individual. To Polanyi (1966), tacit knowledge is the prerequisite of explicit knowing, and is an indispensable part of all knowledge. This suggests that explicit knowledge is derived from tacit knowledge, and therefore, the individual is required to understand and apply tacit knowledge before explicit knowledge can be produced (Venkitachalam & Busch, 2012). In short, explicit knowledge is the constituent of tacit knowledge that is visible to and articulable by the individual. The rest of the tacit knowledge that remains inexpressible or invisible to the individual continues to be tacit.

Tsoukas (1996) agrees with this view and asserts that tacit knowledge “cannot be captured, translated, or converted, but only displayed and manifested, in what we do” (p. 426). Since tacit knowledge is the foundation of all knowledge, new knowledge is expected to also spawn from tacit. Accordingly, new knowledge is created when the individual is committed to the activities they engage in within the organization (Nonaka, 1994). It requires individuals to have the “intention” and “autonomy” (to be motivated) to interact with and assimilate environmental changes, to reflect upon that accumulated new information, and to adapt their activities and processes accordingly by adjusting their routine operations (Nonaka, 1994). Through continuous learning, reflecting, and practically applying acquired tacit knowledge on the same activities and processes, individuals will be able to gain more tacit knowledge, and eventually generate new knowledge. All in all, individual commitment to organizational practices drives innovation.

The second stream is similar to the first stream in the sense that it also considers tacit knowledge to be inexpressible and inconvertible to explicit knowledge. Authors who support the second stream also view most of all knowledge as tacit, but in contrast to the first stream they think that tacit knowledge is embedded in organizational routines; thus, the organization remembers by doing (Choo, 2005). Individuals in the organization learn and develop their skills through performing activities. They
also learn by interacting with, and being under the guidance of, seniors who are experienced with
the routine. As a result, an individual's actions are largely based on the practice and routine of the
organization, rather than their own tacit knowledge. Since tacit knowledge resides in the routine
according to this stream, "routines are the skills of an organization" (Nelson & Winter, 2009, p. 105). It
is "the organization that 'learns' rather than any particular individual" (Lawson & Lorenz, 1999, p. 307).
For this reason, any individual that resigns has little impact on the organization. It is not to suggest
that individuals are not valuable resources, because individuals are needed to carry out the routine in
order for it to exist in the organization, but this stream sees little value in converting tacit knowledge
to explicit knowledge in order to preserve the knowledge within the organization.

How, then, is innovation generated? New knowledge is discovered through existing tacit knowledge
because it is merely new combinations of existing routines (Nelson & Winter, 2009). Organizational
learning takes place through the daily practices of individuals engaging in a variety of different processes
such as engineering, production, distribution, etc. (Lawson & Lorenz, 1999). As explained earlier,
individuals learn routine operations from seniors through interacting with them. Similarly, individuals
find new patterns through interacting with different members from different departments within
the organization. In the process of exchanging knowledge of various routines in the organization,
departments are able to gradually combine the diverse knowledge within the organization, and in
the end create new knowledge. Individuals are indeed valuable resources because they are needed to
generate interactions between different departments and processes that hold different routines made
up of tacit knowledge, in order to bring together the diverse knowledge within the organization. This
stream of thought relies heavily on group effort and social interaction between individuals.

On the other hand, the third stream believes that tacit knowledge can be converted into explicit
knowledge, and that new knowledge is created through this conversion process, known as "knowledge
cconversion." Knowledge conversion is a theory developed by Nonaka (1994), a third stream theorist,
who maintains that tacit knowledge is difficult, but not impossible, to articulate. Nonaka introduced
the SECI model that demonstrates how existing knowledge can be converted from tacit to explicit and
back, and in the process, create new knowledge (Nonaka, 1994). SECI stands for socialization (tacit
to tacit conversion), externalization (tacit to explicit conversion), combination (explicit to explicit
conversion), and internalization (explicit to tacit conversion); these are the modes that make up the
knowledge conversion process (Nonaka, 1994). The following is a brief explanation of each mode.

The socialization mode involves the interaction between individuals to exchange tacit knowledge
without the need for articulation. It is through observation, imitation, and practice that they acquire
tacit knowledge, and share their experience and thinking processes with others (Nonaka, 1994). This
is similar to the second stream interaction process in which individuals conglomerate the diverse
knowledge that exists within the organization. Externalization is the articulation of tacit knowledge
using metaphor, analogy, and models, in order to convert it to explicit knowledge (Nonaka, Toyama
& Konno, 2000). This is the very aspect that conflicts with the first two streams, causing the third
stream to diverge into a separate theory. Next, the combination mode is the process of collecting explicit knowledge from inside and outside of the organization and combining, editing, and processing it (Nonaka, 1994). Finally, internalization is the process by which explicit knowledge is shared throughout an organization, allowing individuals to learn and convert such knowledge into tacit knowledge (Nonaka, Toyama & Konno, 2000). Each mode involves interaction between individuals, and such interaction generates new knowledge (Nonaka, Toyama & Konno, 2000). As a result, new knowledge can be generated through every process of knowledge conversion.

The three streams have many differences, with each holding different strengths and limitations. The first stream believes that innovation is driven by individual commitment to perpetually assimilating and adapting to environmental changes, and commitment to putting tacit knowledge into practice. First, if the individual lacks motivation to innovate, then knowledge creation is immediately put to a halt. Second, since the first stream solely speaks about individuals improving their routine operations, they lack a variety of experiences. Accordingly, if experiences are limited to the same operations, “the amount of tacit knowledge obtained from monotonous and repetitive tasks will tend to decrease over time,” and eventually the individual is able to perform without thinking (Nonaka, 1994, p. 21). This limitation is resolved in the second stream’s thinking when it introduces the combining of diverse knowledge so that individuals can obtain a variety of experiences. The second stream fosters a reliance on group effort, rather than individual willpower, to generate innovation. When individuals within the group are working towards a common goal, the group as a whole can act as a motivation driver to encourage individuals to innovate.

Both the first and second streams stress the importance of tacit knowledge, as it is regarded as the sole element essential to the generation of innovation. Because both streams agree that tacit knowledge contains creative elements and is inconvertible to explicit knowledge, it is further valued and regarded as a significant resource to the organization. Ultimately, they emphasize expanding tacit knowledge, because it is seen as a route to create new knowledge. However, such thinking has been criticized because neither routine nor variety of experiences allow for creativity to be generated (Nonaka, 1994). As Nonaka (1994) states, “in order to raise the total quality of an individual’s knowledge, the enhancement of tacit knowledge has to be subjected to a continual interplay with the evolution of relevant aspects of explicit knowledge” (p. 22). Unlike the first and second streams, the third stream weighs the importance of both tacit and explicit knowledge equally, as both are regarded as fundamental to the creation of new knowledge. According to this view, tacit and explicit knowledge are placed on a continuum, and the dynamic interaction between the two, knowledge conversion, is believed to be the driving force for innovation.

The first and second streams almost disregard the externalization, combination, and internalization modes completely, and focus entirely on maintaining and augmenting tacit knowledge as the most important part of knowledge creation. They do not believe that tacit knowledge can be converted to explicit knowledge. This may be a misconception of the properties of tacit knowledge. According to
Ambrosini and Bowman (2001), “skills may be inarticulable because they are deeply ingrained in the unconscious, they could also be only imperfectly articulable, or articulable, if one could find the right trigger to allow the individuals to express them” (p. 825). The key is to find the right trigger, and in the process one may possibly find new meaning and new knowledge. This is the externalization the third stream describes, and is a valuable knowledge creation opportunity. Andreeva and Ikhilchik (2011) propose that “the basic cognitive processes of knowledge conversion are natural mental processes of any human being,” and “depending on its cultural background, [the] human mind may feel more comfortable with some of these processes as compared to other [sic]” (p. 60). Although the knowledge conversion process may be easier for some and more challenging for others, the point here is that that it is possible. It depends on who is converting the knowledge and how they do it. The third stream agrees with this, which provides it with the opening to new knowledge creation opportunities that other streams overlook.

Nevertheless, this stream also holds its shortcomings. According to Gourlay (2003), the notions of externalization, combination and internalization, so far, have not been clearly described and demonstrated. Also, some authors proclaim that the SECI model has never had a sound empirical grounding and is not supported by evidence (Gourlay, 2003; Gourlay, 2006). Although they lack evidence to prove their theory, the third stream makes evident that there are plenty of resources that surround an organization (both tacit and explicit), and the quality and quantity of knowledge created depends on how we use this existing knowledge.

The above differences distinguish the three streams from each other. However, recurring themes also exist amongst them. For instance, all streams share a common understanding of how tacit knowledge can be transferred between individuals. Tacit knowledge can only be transferred through close social interaction between individuals. Apprentices learn tacit knowledge from their masters through continuously observing and imitating their masters as they perform the activities (Bratianu & Orzea, 2010). Individuals from different sectors, industries, or departments exchange tacit knowledge through the same process. The main idea is to interact with people or the environment and put one's learning into practice for the induction of new ideas and new knowledge. In fact, all three streams imply that in the process of acquiring more tacit knowledge, one is able to create new knowledge. Although it is not the sum of each of their theories, this statement remains true for all of them.

A more basic commonality between them is their acknowledgment of the fact that the process of organizational knowledge creation is “initiated by the enlargement of an individual's knowledge within an organization,” because individuals hold and maintain tacit knowledge (Nonaka, 1994, p. 22). Whether it be combined with explicit knowledge or not, all three streams coincide in the assertion that tacit knowledge is a requirement for new knowledge to be created. It is not only important to constantly interact with different people and the changing environment, but it is also crucial to continuously exercise and put into practice the tacit knowledge held by individuals in an organization.
Implications

In reviewing the existing literature on knowledge creation, and the strength and limitations of each stream’s thinking, it is apparent that tacit knowledge does hold high importance in knowledge creation. However, it is also equally important to not overlook the significance of explicit knowledge. It is highly restricting if one dwells on tacit knowledge alone. As demonstrated by the third stream, explicit and tacit knowledge complement each other. Fundamentally, it is important to be open-minded and to not be hesitant to take an extra step to explore all possibilities. The third stream was able to uncover new routes to knowledge creation because it went further by posing a “what if” question: What if tacit knowledge is convertible to explicit? This resulted in the discovery of the four modes of knowledge conversion, each contributing to knowledge creation. This deepens an organization’s understanding of the value embedded in both tacit and explicit knowledge, and demonstrates how they can better utilize and manage these valuable resources.

In addition, it is recognized that knowledge creation is a “continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world, and new knowledge. In short, it is a journey “from being to becoming” (Nonaka, Toyama & Konno, 2000, p. 8). As the three streams demonstrate, new knowledge is acquired when individuals continuously expose themselves to different people, things, and environments, within and outside the organization. Knowledge creation is not static; it relies on constant interaction and exploration.

Applications

Since there have been various comments on the lack of evidence provided to support the SECI model, specifically the externalization, combination, and internalization modes, the following are suggestions of real-world information systems and practices that uphold the SECI framework. Military organizations, such as NATO and the U.S. Army, have employed Lessons Learned systems and After Action Reviews to foster externalization. Lessons Learned systems are primarily used to provide justification for amending existing practices (Lis, 2014). After Action Reviews support this system as they provide feedback on mission and task performances in training. It is “a verbal, professional discussion of a unit’s actions that … determines what should have happened, what actually happened, what worked, what did not work and why, and the key procedures a unit wants to sustain or improve” (Lis, 2014, p. 67). These two information practices are widely recognized as effective tools as they help organizations to find out “what really works and what doesn’t,” and “when it works and when it doesn’t” (Lis, 2014, p. 67); ultimately, it helps the organization to build the army knowledge base through learning processes. Combination is also employed as the organization combines the Lessons Learned processes with other information to produce military doctrines, manuals, and other publications to standardize military operations (Lis, 2014). Finally, internalization is carried out through training and education in the military force. It integrates the aforementioned knowledge obtained through
externalization and combination into a soldier’s training material, and the material is reviewed and updated during training, thereby creating new knowledge. Evidently, in using these three knowledge conversion modes, new knowledge is created in the military. According to NATO and the U.S. Army, the SECI model is applicable to managing knowledge creation in military organizations (Lis, 2014).

Conclusion

With the introduction to the SECI model by third stream authors, organizations are provided with the grounds to further explore the potentials of both tacit and explicit knowledge. The idea of knowledge conversion is proposed and appears to be plausible to many. Now it is time to apply this theory to attain more evidence of its viability. The first and second streams provide a good foundation for how tacit knowledge alone can generate new knowledge. However, the third stream is able to take a step further by combining both knowledge types to move beyond the boundaries of the traditional way of thinking. As a result, organizations may find new ways to create knowledge if they invest their resources to examine how to convert tacit and explicit knowledge.

References


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