

**UNIVERSITY OF VAASA
FACULTY OF BUSINESS STUDIES
DEPARTMENT OF MANAGEMENT AND ORGANIZATION**

Ziguang Jin

**BARRIERS TO KNOWLEDGE CREATION IN COMMUNITY OF
PRACTICE
CASE STUDY OF AAA CENTER**

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UNIVERSITY OF VAASA**Faculty of Business Studies**

Author:	Ziguang Jin
Topic of the Thesis:	The Knowledge Creation in Community of Practice and Barriers: The case of AAA center
Name of the supervisor:	Smale Adam
Degree:	Master of Science in Economics and Business Administration
Department:	Department of Management and Organization
Major Subject:	Management
Program:	International Business
Year of Entering the University	2006
Year of Completing the Thesis	2009

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ABSTRACT

The main aims of this study were to explore knowledge creation process in community of practice (CoP), and find out barriers influences it.

The theoretical part of this study was based on the literatures of knowledge creation, CoP and culture of knowledge management. A new SECI-CoP Knowledge Creation model was set up, based on SECI model and two typical CoP cases.

The methodology used in this research was exploratory with a single case study, using qualitative research. By the interview of members of an online CoP, the CoP-Knowledge Creation model was tested, and eleven barriers of this case VCoP was found.

This research provides a new perspective to the CoP research by exploring it with knowledge creation model. Both CoP and business process were taken as a whole in a complete SECI-CoP model, and this study provide an exploratory test in the Chinese case community. In this case, many barriers for community members to create knowledge are related to low activity phenomenon and face-to-face meeting phenomenon.

This research initiatively took CoP as a knowledge creation platform and provides a new possibility of understanding meanings of CoP activities as knowledge creation tool. As well as that, this research also found out a challenging question of choosing SNS as a knowledge creation platform, and it requires more cross subject studies in the future.

KEYWORDS: Knowledge creation, community of practice, barriers, Chinese community

1. INTRODUCTION

1.1. Study background

As living in a “knowledge society”, companies and organizations more and more realize that knowledge is the source of competitive advantage from now to the future (Burton-Jones 2001; Brown & Duguid 1991). But knowledge is situational (Donna 1991), stickiness (Szulanski 1991), tacit (Polanyi 1966), and has many other characteristics, which make it difficult to manage. To have better understanding of knowledge and develop solutions for managing knowledge, many researches have been done in the last few decades. These sets of knowledge management problems were researched from three different directions: organizational cognition and intelligence; organizational development and strategy; organizational information systems and information processing (Ilkka 1999). Many researchers (Levitt & March 1998; March 1994; Senge 1990; Garvin 1993; Nonaka 1994) focused on understanding how the organizations and their members perceive the environment, and made research approaches like organizational learning, transfer of expertise, innovations and knowledge creation.

Knowledge creation became famous topic because of Nonaka and Takeuchi’s land-marking master piece “*the knowledge-crating company: how Japanese companies create the dynamics of innovation*” published in 1995. Many of the recent knowledge management studies (Margaret 2006; Arnold et al. 2008) can be traced back to their work. In this work, Nonaka and Takeuchi formalized a dynamic model called SECI model (Socialization, Externalization, Combination, Internalization), which presented how new knowledge emerged in organizations through the interaction between tacit (Polanyi 1966) and explicit knowledge. This study provided a solid base for our study on knowledge creation process in a new environment other than ordinary companies or organizations, but a community of practice (CoP).

Community of practice (CoP) is not a new idea and it is everywhere in our life (Wenger 2002). But until recently, CoP was introduced and taken as a bridge to overcome the difficulty of knowledge management (Wenger 2002; Scarso et al. 2007). As an informal (Wenger & Snyder 2000) knowledge management organization, CoP has many advantages on timing, place, members and so on comparing with formal project teams. In that, many researchers spent a lot of efforts trying to have better understand of CoP from many perspectives (Scarso et al. 2007; Wenger 2002; Spies et al. 2005; Dotsika 2006). CoP does not only famous among research topics, but also a promising solution for managers in practice. Davenport (1998) addressed, managers should regard communities of practice as company assets and look for ways to preserve them.

1.2. Research problem and question

Although there are many studies about knowledge transfer or sharing in CoPs (Boyd 2004, Franz et al. 2002; Pos et al. 2005), studies of knowledge creation in CoPs are still missing. Knowledge creation study could have a break through by implementing knowledge creation model in CoP as a new environment, and CoP study also could benefit by adding innovation function as a “selling-point”. From both managerial and academic perspective, the study of combined model will be valuable. As long as this new research take knowledge creation model (SECI model) as a scope to look through the CoP activities, the promising research result may not only provide us a new tool (CoP) for knowledge creation, but also presents the managers exactly how knowledge is created step by step, which is a new key to the question of “how to manage CoP as a tool for innovation”.

Researchers have done many works (Anne et al. 2005; Pat et al. 2007; Alexander 2003) to find out barrier factors for successful CoPs as a sharing environment in the company. It is obvious that knowledge creation process in CoP will also encounter many barriers, which may or may not be the same in the previous studies. These barriers must been identified. So that knowledge creation will be managed smoothly and successfully. It is a necessary work as long as starting the research of knowledge creation in CoP, and it is the focus of this master thesis.

Research Question:

- How do internal factors affect knowledge creation process in community of practice?

This research question is based on the presumption (Nonaka et al. 1995) that knowledge is created through the knowledge creation model (SECI model), and CoP, as a new context, could be applied by this knowledge creation model, as long as it has knowledge creation activities.

1.3. Scope and benefit of the study

This study will focus on the knowledge creation process within one online virtual CoP and its external business process environment. The VCoP is a Chinese community, which is open to all registers. It means members of this case CoP will be from different companies. In the case CoP, there is only one focused theme. All the members have equal rights in the community. In this research, the study of knowledge management was limited to knowledge creation only, but some of the research ideas were taken from previous knowledge transfer studies. The empirical part was limited to Chinese culture background, and online community of practice.

Finding of this study will contribute to the CoP study by providing a knowledge creation perspective. The Chinese background will also be valuable to have a better understanding of culture as a factor influencing the knowledge management in China. For the SECI model, this implementation will reconfirm the value and validity of Nonaka's knowledge creation theory in a new environment.

1.4. Structure of thesis

This thesis consists of five sections. The first section of the study is the introduction of the research. It gives the general picture of the thesis, including the introduction of study background, the research question and problem.

The Second section provides theoretical perspective of previous studies. In this section, a new model was generated as a combination of SECI model and CoP.

The methodological approach and research strategy used in this study can be found in section 3. It presented the data collection and method of analysis of empirical data. It also provides the information of the case company.

The fourth section discusses the empirical findings of this study.

The fifth section provides the conclusions, limitations and suggestions for the further studies.

2. LITERATURE REVIEW

2.1. Knowledge

2.1.1. Concept of Knowledge

In the Cambridge Dictionary, it is said that knowledge is:

1. Understanding of or information about a subject which has been obtained by experience or study, and which is either in a person's mind or possessed by people generally

2. Awareness

These definitions give us several important ideas about knowledge. Firstly, the knowledge must have a subject, which means the knowledge cannot be universally accepted to every issue. For example, knowledge of apple tree cannot be the same as the knowledge of pear tree, even if they can be quite similar. Secondly, knowledge does not come out as long as we born. It suggested that knowledge must be obtained from the outside, regardless of how gifted the person was, when he was born. Thirdly, knowledge is about psychological activities, not physical activities. It means to capture, sustain, and transfer knowledge is difficult.

Moreover, for the study of knowledge transfer, Davenport (1998:5) gave a further statement of what is knowledge:

Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluation and incorporating new experiences and information. It originates and is applied in the minds of knower. In organizations, it often

becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.

Davenport (1998:5) also said knowledge is a mixture of various elements; it is fluid as well as formally structured; it is intuitive and therefore hard to capture in words or understand completely in logical terms. Knowledge exists within people, part and parcel of human complexity and unpredictability.

Davenport (1998:6) also mentioned ‘data’, ‘information’ and ‘knowledge’ as: knowledge derives from information as information derives from data. If information is to become knowledge, humans must do virtually all the work. This idea was also shared by Boisot (1998) and Sanchez (2001). To distinguish these 3 terms, Davenport (1996:2-3) defined ‘data’ as a set of discrete, objective facts about events. In an organizational context, data is mostly useful described as structured records of transactions; ‘Information’ was described as a message, usually in the form of a document or an audible or visible communication. Information is meant to change the way the receiver perceives something, to have an impact on his judgment and behavior. Thus, in order to be information, data has to be provided with a meaning which is specific for and dependent on the respective system (Willke 1998).

Data Information Knowledge and Wisdom Hierarchy (DIKW) gave a better idea of the relationships among them (Figure 1). By saying it, ‘wisdom’ as introduced as arising when one understands the foundational principles responsible for the patterns representing knowledge being what they are. And wisdom, even more so than knowledge, tends to create its own context.

It is noticeable that, wisdom was defined as referring to these foundational principles as eternal truths, which raise the possibility of universal and completely context independent. Here is a blank area that almost no one has ever gone further discuss about it.

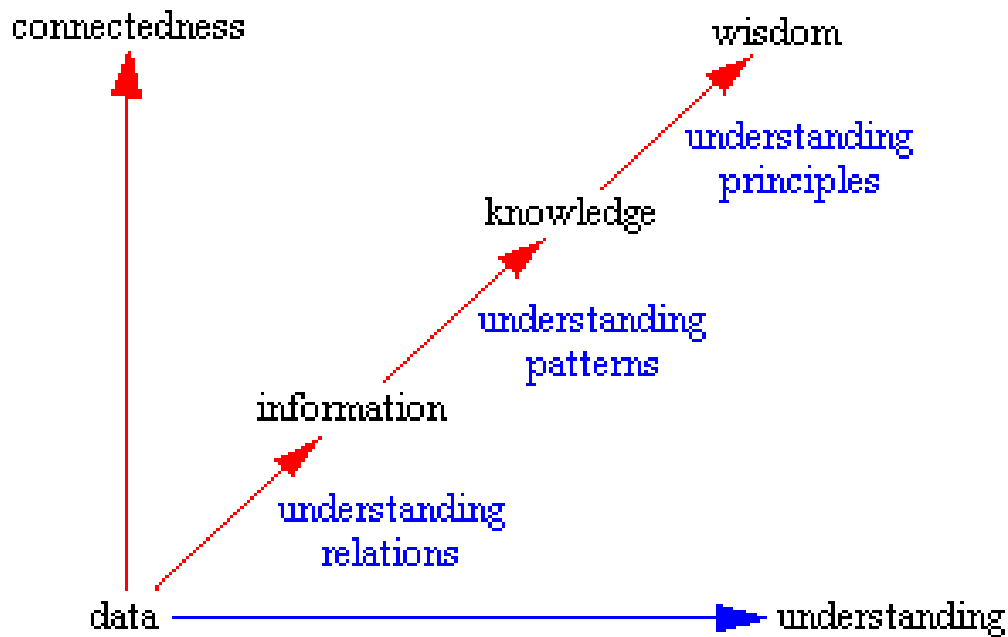


FIGURE 1: DIKW hierarchy

Source: Gene Bellinger (2004)

2.1.2. Characteristics of knowledge

2.1.2.1. Situational

Donna Haraway (1991) called knowledge ‘situational’, because it is inherently social in nature; knowledge serves to establish relations in society and therefore it is never value-neutral, but always already emergent from specific social interests and concerns (Sole & Edmondson 2002). Gherardi and Nicolini (2001:44) had more words on this: Every attempt to label something as ‘knowledge’ is made by a specific social community belonging to a network of power relations, and not by a world consisting purely of ideas. Hence, no knowledge is universal or supreme; instead, all knowledge is produced within social, historical, and linguistic relations grounded in specific forms of conflict and the division of labor.

Situational characteristic can be one of the main reasons for the knowledge transfer difficulties in the organizations.

2.1.2.2. "Stickiness" of knowledge

Szulanski (1995) defined stickiness, when he said a transfer is defined as sticky when it is worthy of remark, i.e. when it is an event. A transfer of knowledge will be less likely to escape being noticed the more costly it is (von Hippel 1994) the longer it takes (Glaser, Abelson and Garrison, 1983; Roger 1983; Attewell 1992) and the wider the gap between expectations and realizations (Pinto and Mantel, 1990). Accordingly, a transfer is not sticky when it is a non-event, i.e. costless, instantaneous and successful.

Szulanski (1995) also said this definition of stickiness differs from other definitions based solely on the cost of transfer in two plausible though rare situations. Stickiness as eventfulness will classify as sticky a non costly transfer of knowledge which does not meet expectations and it will classify as non sticky transfers of knowledge which, however costly, are done routinely by an organization and become a taken for granted part of organizational reality.

This characteristic of knowledge has the origin from barriers of knowledge transfer. The ground logic is that of the mathematical theory of communication (Shannon and Weaver 1949). Szulanski (1995) found that, viewed from the perspective of this theory, a transfer of knowledge is likened to the transmission of a message from a source to a recipient in a given context. Characteristics of the message or the situation that limit the amount of knowledge that can be transferred render the transfer stickier.

2.1.2.3. Tacit and explicit knowledge

The concept of distinguish knowledge from explicit to tacit was originally raised by philosopher Machael Polanyi (1966). Tacit knowledge is personal, context-specific, and therefore hard to

formalize and communicate. Explicit or codified knowledge, on the other hand, refers to knowledge that is transmittable in formal, systematic language.....we can know more than we can tell (Polanyi 1966).

One of the significant utilization and development of Tacit & Explicit theory was made by Professor Ikujiro Nonaka and his colleges. In his book, *the knowledge-creating company, how Japanese companies create the dynamics of innovation (1995)*, he used the tacit knowledge to explain the raise of Japanese companies. He said Japanese companies, however, have a very different understanding of knowledge. They recognize that the knowledge expressed in words and numbers represents only the tip of the iceberg. They view knowledge as being primarily “tacit”- something not easily visible and expressible. Tacit knowledge is highly personal and hard to formalize, making it difficult to communicate or to share with others... ..The distinction between explicit knowledge and tacit knowledge is the key to understanding the differences between the Western approach to knowledge and the Japanese approach to knowledge (Nonaka 1995: 8-9).

Nonaka (1995:8-9) segmented tacit knowledge further into two dimensions (Table 1). The first one is the technical dimension. It encompasses the kind of informal and hard-to-pin-down skills or crafts captured in the term “know-how”. The second dimension is cognitive. It consists of schemata, mental models, beliefs, and perceptions so ingrained that we take them for granted. The cognitive dimension of tacit knowledge reflects our image of reality (what is) and our vision for the future (what ought to be).

Tacit Knowledge (Subjective)	Explicit Knowledge (Objective)
Knowledge of experience (body)	Knowledge of rationality (mind)
Simultaneous knowledge (here and now)	Sequential knowledge (there and then)
Analogue knowledge (practice)	Digital knowledge (theory)

TABLE 1: Comparison between tacit and explicit knowledge

Source: Nonaka, I and H. Takeuchi (1995:61)

2.2. Knowledge management

2.2.1. Concepts of Knowledge Management

O'Dell and Grayson (1998) defined the term knowledge management as a conscious strategy of getting the right knowledge to the right person, at the right time and help them do the right action with the information, and try to improve organizational performance.

Knowledge management become a spot light for managers and researchers, because of downsizing, frequently job switching, change of environment, value of innovation globalization and the transition to the knowledge based society (Amidon 1996).

Managing knowledge and have the best performance are not easy works as they supposed to be. Most companies start efforts by focusing on creating, identifying, collecting, and organizing best practices and internal knowledge, in order to understand what they know and where it is.

Although at the very beginning of the knowledge management study, some people even say that knowledge cannot be even managed, but after decades of study, it is still very hot topic, and “will be an important topic also in the future” (Ilkka 1999).

Knowledge management needs to rest on a double-sided concern: to protect and utilize existing knowledge resources, on the one hand, and to facilitate the mobilization of new knowledge resources, on the other hand. It is my final contention that the knowledge management programme is in need of a better conceptualization of its own role and function—a conception that better reflects this double-sided concern. (Kreiner 2002:122) In the research, “management of knowledge” cannot stand out from “generation of knowledge”, because the two processes are pre-requisite to each other (Kalling & Styhre 2003).

2.2.2. Knowledge conversion

In SECI model, Nonaka (1995) defined knowledge conversion as the interaction of tacit knowledge and explicit knowledge, during the human knowledge creation and expansion through social interaction. In his view, tacit knowledge and explicit knowledge are not totally separate but mutually complementary entities. This conversion is a social process between individuals, individual and groups and groups to organization.

2.2.3. Knowledge creation

In the same book (Nonaka 1995), which Nonaka bring out SECI model, he also provided the definition of knowledge creation. Organizational knowledge creation means the capability of a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems. Organizational knowledge creation is the most valuable and unique method that Japanese company create innovation. They are familiar with bringing innovation continuously, incrementally, and spirally. The skills and expertise of organizational knowledge creation is the reason for Japanese companies’ success.

2.2.4. Knowledge transfer

Argote & Ingram (2000:151) define knowledge transfer as "the process through which one unit (e.g., group, department, or division) is affected by the experience of another".

In the model from Fruin (1997), he stretches knowledge integration, knowledge creation and knowledge transfer in a triangle (Figure 2), and shown their differences and relations by the terms of renewal, innovation and teamwork.

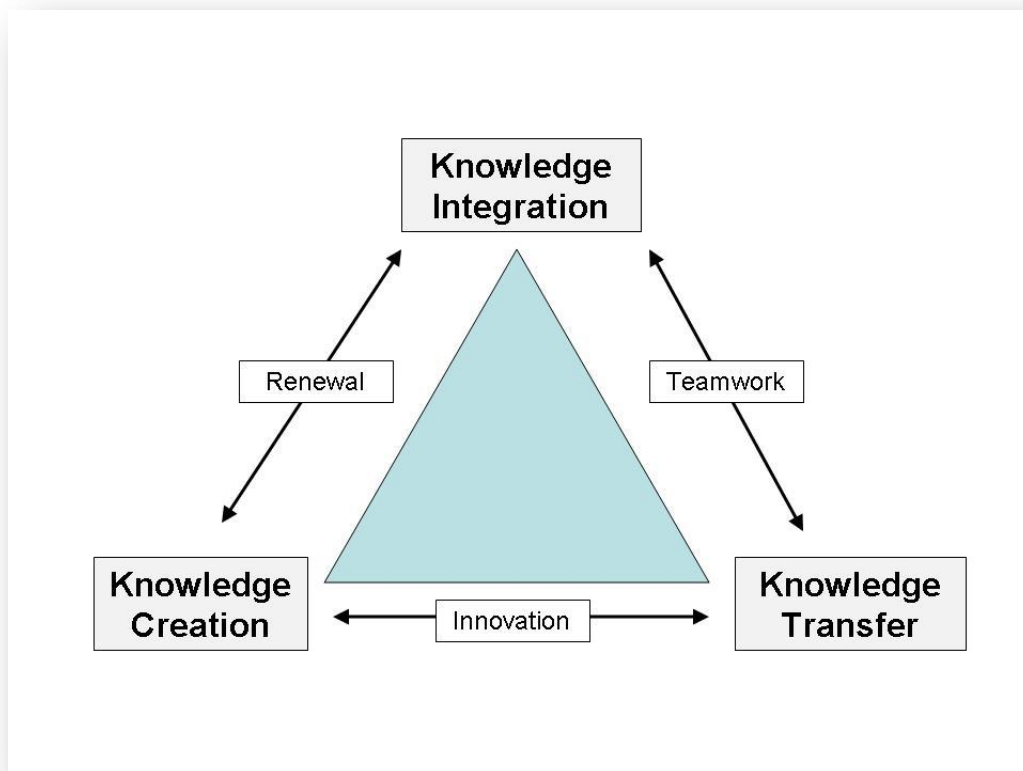


FIGURE 2: Knowledge creation, transfer and integration.

Source: Fruin (1997)

2.3.SECI model

2.3.1. Concept

Nonaka (1995: 61-62) has the view that tacit knowledge and explicit knowledge are not totally separate but mutually complementary entities. They interact with an interchange into each other in the creative activities of human beings. So he claimed that the key to knowledge creation lies in the mobilization and conversion of tacit knowledge.

His *epistemology* dynamic model (Figure 3) of knowledge creation is anchored to a critical *assumption* that human knowledge is created and expended through social interaction between tacit knowledge and explicit knowledge. And this interaction is called “knowledge conversion”. It should be noted that this conversion is a “social” process between individuals and not confined within an individual. This idea of “knowledge conversion” may be partially consonant with the ACT model (Anderson 1983; Singley and Anderson 1989) developed in cognitive psychology. But as Singley and Anderson admit, the ACT model has one limitation: proponents of this model consider knowledge transformation as mainly unidirectional from declarative (explicit) to procedural (tacit). But Nonaka argued that the transformation is interactive and spiral.

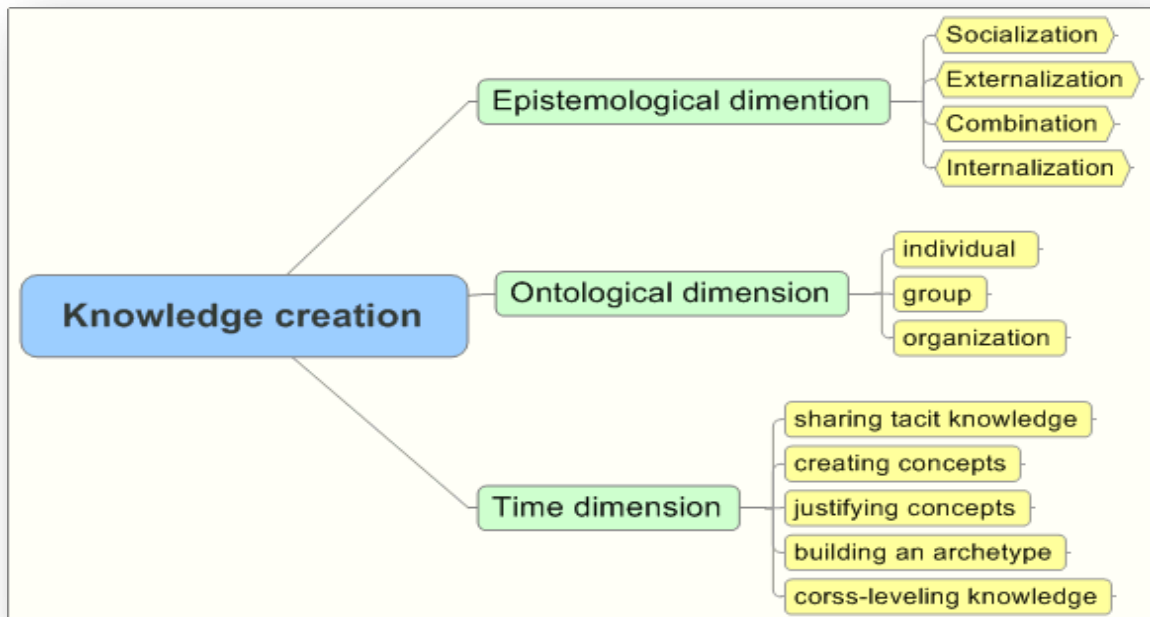


FIGURE 3: Knowledge creation dimensions

Adopted from knowledge creation dimensions (Nonaka 1995)

2.3.2. Four models of knowledge conversion

In the knowledge spiral, Nonaka assumed that knowledge is created through the interaction between tacit and explicit knowledge allows us to postulate four different models of knowledge conversion.

2.3.2.1. Socialization

In the Socialization process, tacit knowledge translated through observation, imitation, practice, and shared experience. According to Nonaka and Takeuchi, an individual can acquire tacit

knowledge directly from others without using language. This conversion happens between individuals, and the knowledge was almost transferred without change.

2.3.2.2. Externalization

During the externalization, which was considered as holding the key to knowledge creation, tacit knowledge was converted from tacit to explicit knowledge. The created new explicit knowledge was expressed by metaphors, analogies, concepts, hypotheses, and models. The explicit idea created an efficient way of expressing knowledge and spread knowledge from inside the individual to the whole group.

2.3.2.3. Combination

Combination is the process of systemizing concepts into a knowledge system. The explicit knowledge within the group was sorted, added, categorized. This process integrated different bodies of explicit knowledge into a whole. Nonaka and Takeuchi took this as the knowledge creation carry out, in formal education and training at schools. In business one of the main roles of middle management is to create new concepts through combining various sources of organizational knowledge. Personally, I believe knowledge within group at this time is most valuable. On one hand, it is explicit knowledge, which means easy to “write down”; on the other hand, it is the created new knowledge, which can solve problems or improve process.

2.3.2.4. Internalization

The fourth convention is internalization. It is a process of embodying explicit knowledge into tacit knowledge. Knowledge become personal “know-how”, and become tacit again. Knowledge returns to the original carriers. It is original type of tacit knowledge, which is suitable for people to acquire, but the new enriched content with capacity of innovation and problem solving. During this process, knowledge came back from the group to the individuals.

The four knowledge conversion continues like a recycle, which Nonaka and Takeuchi called knowledge spiral.

Three of the four types of knowledge conversions (socialization, combination, and internalization) have been discussed from various perspectives in organizational theory. For example, socialization is connected with the theories of group processes and organizational culture; combination has its roots in information processing; and internalization is closely related to organizational learning.

His *ontology* aspect of theory concerns with the levels of knowledge creating entities, which including individual, group, organizational, and inter-organizational. He (1995; 59) supports that, in a strict sense, knowledge is created only by individuals. The organization support 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 a part of the knowledge network of the organization. This process takes place within an expanding “community of interaction,” which crosses intra- and inter-organizational levels and boundaries.

Nonaka took the two dimensions-epistemological and ontological, and make out a graph where knowledge-creation spiral take place. (FIGURE 4)

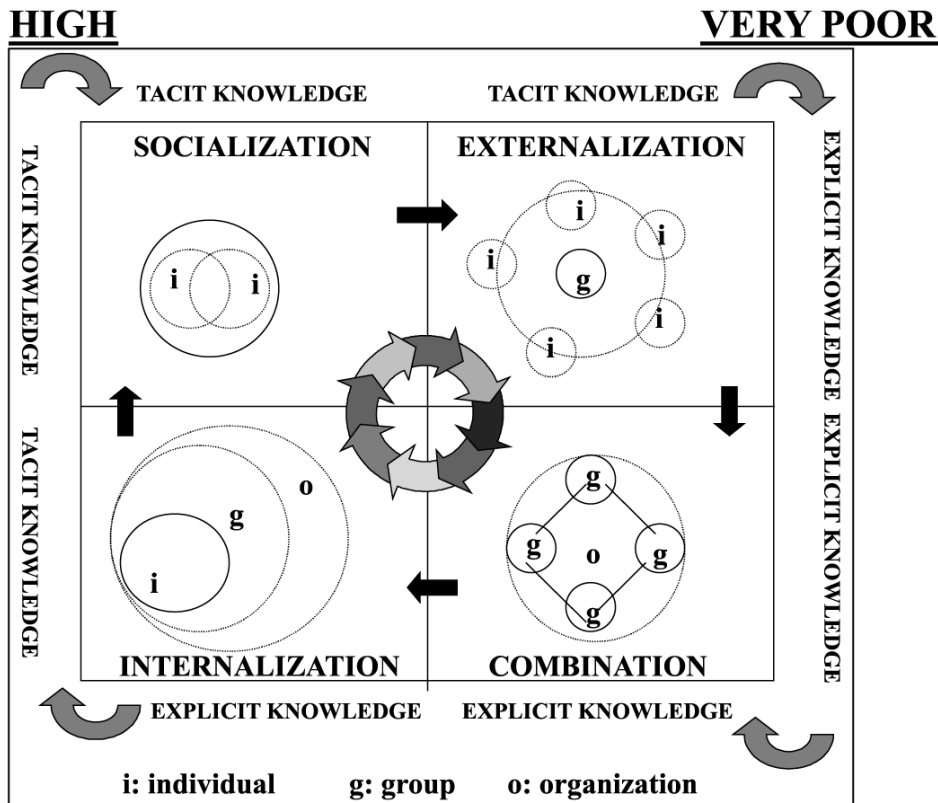


FIGURE 4: SECI model

Source: Adapted from SECI Model (Nonaka & Takeuchi, 1995)

Nonaka (1995: 83-89) used the above theoretical framework and the time dimension together, and compose the five-phase model of knowledge creation process (Figure 5). He roughly corresponds these phase to the four model of knowledge conversion.

At the beginning, the tacit knowledge was shared to the group, by the individual. The reason is “rich and untapped knowledge that resides in individuals must first be amplified within the organization” (Nonaka 1995: 84). Then the shared tacit knowledge was made explicit. After that, the explicit in the organization must be justified, when the rest of the organization determine whether it is a valuable knowledge, which worth to be developed. When it comes to a decision, the

archetype according to the explicit idea would be made. Lastly, this knowledge will be extended across level, which could be outside the organization. These five-phase will be repeated later when used to analyze CoP.

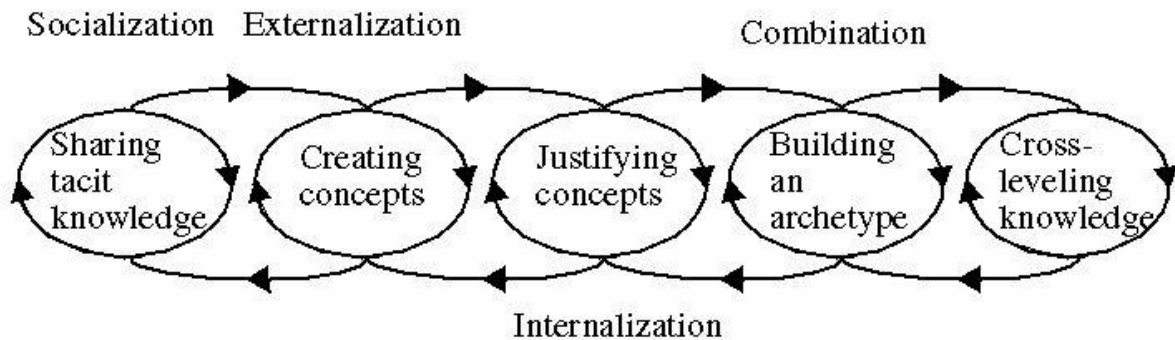


FIGURE 5: Five-phase model of organizational knowledge creation process

Source: (Nonaka & Takeuchi 1995)

2.3.3. Emerging environment of knowledge creation

One of the reasons, why we do not see many knowledge creation activities happening in the companies, is lack of the suitable environment. Knowledge creation requires certain environments, which can be seen as certain type of organizations in the companies, to emerge. Nonaka (1995) stated as following:

2.3.3.1. Intention

Intention is the external environment, set by the company board, according to the whole and long term strategy of the company to make sure employees know what the useful knowledge is. In knowledge creation, intention is used as the most important criterion for judging the truthfulness of a given piece of knowledge. Companies propose the intention, as a commitment, to employees.

It is a fundamental base of the right direction knowledge creation of the employees. Polanyi (1958) said intention is the base of the human knowledge-creating activity.

2.3.3.2. Autonomy

Autonomy starts from the individual free activities. It increases the chance of introducing unexpected opportunities. By this, autonomy also increases the possibility that individuals will motivate themselves to create new knowledge. Eventually, it will become the “minimum critical specification” principle (Morgan 1986) organization.

Besides these, the autonomy eliminates the group and organization boundaries, when individuals pursue the ultimate goals all around. And group, with different background and trans-division, will be formed to accomplish co-operating functions.

2.3.3.3. Fluctuation and creative chaos

Fluctuation stimulates the interaction between the organizational and the external environment. It is not the same as complete disorder and it breakdowns routines, habits or cognitive frameworks. Chaos comes out, when organization faces crisis. The crisis could be made intentially by the managers to evocate the potential tacit knowledge. One of the bases is the word by Kobayashi (1985:171): Relaxed in a comfortable place, one can hardly think sharply. Wisdom is squeezed out of someone who is standing on the cliff and is struggling to survive.

These are the trigger for the employees to change their fundamental ways of thinking. And it helps to externalize the tacit knowledge from the individuals.

2.3.3.4. Redundancy

Redundancy refers to intentional overlapping of information about business activities, management responsibilities, and the company as a whole, in the business organizations. It could

help the tacit knowledge transfer, by unconsciously describe the trials, which others can articulate. Also, redundancy of information facilitates the interchange between hierarchy and non-hierarchy.

However, redundancy of information also could lead to the information overload problem. Then, it becomes a negative factor of knowledge creation. Therefore, the balance between too much overlapping information and insufficient information is important, and should base on the specific organization.

2.3.3.5. Requisite variety

Ashby (1956) said: an organization's internal diversity must match the variety and complexity of the environment in order to deal with challenges posed by the environment. At the same time, the members of the organization should have the equal and easy access to the information when they need it. Many companies tried ways like: 'big-function-type organizational structure' or change the organizational structure frequently, to deal with the complexity of the environment.

2.3.4. Limitations of SECI model

2.3.4.1. Japanese company based analysis

Nonaka repeatedly said SECI model is based on the study of Japanese companies. In western company, there are many different real situations, which make this model possibly not working as well as in the Japanese companies.

For example, in eastern model (Japanese company) the medium-level team leaders are at the core of the innovation process. However, in the western model, the firm's organization presents a clear hierarchy in which the main responsibility for promoting innovation is at the top. In the western model, SECI will have an instinct confliction from the top to the bottom. And it will be a costly, long time change for the western model company changing to the middle-up-down company.

Another example is the Japanese employees are often hired by the company for a life long term. It means, the employee would become more and more professional with the company development, and become the asset of the company. However, in west, employees' contract is shorter, as long as it is not life-long. Company will relatively reduce the investment for the employees, when they know the employees will eventually leave the company. In SECI model, the motivation of sharing will be challenged, if it is not based on long term relationship or long term employment.

2.3.4.2. Linearity necessary of the concept

In some of the examples in Nonaka's book not all the four knowledge convention occurs. Some of the steps are not quite obvious. But Nonaka did not issue if all the four steps are necessary in all the knowledge creation process, or sometimes it can be jumped over.

For example, some times, the tacit knowledge was never translated to explicit knowledge during the knowledge creation. All the participants acquired and improved it by apprenticed to each other. This is easy to be seen in the real life group work, but cannot be explained perfectly by SECI model.

2.4. Community of Practice

2.4.1. Concept

The definition of community of practice, we commonly used in knowledge management and organizational development came from Wenger's book (2002):

Communities of practice (CoP) are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.

But this definition needs interpretation on who are the “groups of people”, what are “the topics” and what is the process of “deepen their knowledge”, etc.

In one of this previous book (Lave & Wenger 1991), concept of community of practice was put underlying the notion of legitimate peripheral participation, and hence of “knowledge”, and its “location” in the live-in world. In another word, community of practice is the site of a learning process, because knowledge is within it. He suggested that, rather than learning by replicating the performances, of others or by acquiring knowledge transmitted in instruction, learning occurs through centripetal participation in the learning curriculum of the ambient community.

Personally, I think it implicated one of the reasons why people join community of practice. Community of practice is the very site where members, who have knowledge, get together and learn from each other (from knowledge holder to “new comers”). The learning content is the “tacit” knowledge, which sticks to the master (member). It also suggests there are generally two types of members in CoPs. One is the new comers; the other is the experts who have knowledge. In the process of knowledge transfer between them, they created another term: legitimate peripheral participation.

Legitimate Peripheral Participation (LPP) was originally brought out in Wenger’s older book (Lave & Wenger 1991) and been better defined in a newer book published in 1998. Jean Lave and Wenger (1998) used LPP to characterize the process by which newcomers become included in a community of practice. And peripherality and legitimacy, as they argued, were two types of modification required to make actual participation possible. I think the former means the access to the community, and the later means the qualification to be part of the community. Both of them need the effort from newcomers and community, and sometimes companion with conflicts between them.

However, LPP was not the focus any more in Wenger’s book (2002). He developed his study from the process of learning (LPP) to the activities of the participants (dynamic fluid CoP levels). Then

the learning (of tacit knowledge) is not a fixed transfer of knowledge from community to the newcomers, but it is a dynamic shift between 3 levels of members.

CoP was divided into 3 levels, according to the capability and motivation of participants. The first core group actively participates in discussions. They often take the leader role and identify topics for community to address, choose community projects, and move community along its learning agenda. This group is usually small, as 10 to 15 percent of the whole community. The next level outside this core is active group. They attend meetings regularly and participate occasionally in community forums. The large portion of community members are peripheral and rarely participate. They keep to the sidelines, and watch the interaction of the core and active members. They are not passive as they seem. In their own way, they are learning a lot. I think they also can bring a lot of new discussion topics from their own experience and thinking to the community. It will be discussed later with knowledge conversion model. Finally, community members move through these levels.

These community levels bring us closer look at what kind of members are in CoPs. Not only that, it also indicates knowledge source of CoPs will not limited to the small number of core group. CoP's knowledge will be limitless and keep developing because everyone has the chance to shift to core group level. This is quite important evidence, when we talk about the knowledge conversion process in CoP later.

Domain is one of the important parts of the CoP structural model (Domain, community and practice). It creates common ground and a sense of common identity (Wenger & Snyder 2002). For easily understanding, personally, I take it as an objective general theme of the CoP. The importance of domain in CoP is stated from many perspective by Wenger & Snyder (2002), e.g. affirming community purpose and value to members and other stakeholders; why sharing and what to share in the CoP.

Although CoPs were initially conceptualized as spontaneously emerging phenomenon, and marked by informal existence and lack of organizational regulation (Lave and Wenger 1991; Wenger and Snyder 2000; Brown and Duguid 2001), shortly afterwards it became clear that such communities should be cultivated and managed. The current practice shows that CoPs are considered key components of systematic and deliberate knowledge management strategies (Smith and McKeen 2003; Wenger 2004). However, it is critical to understand the differences between CoP and many other forms of groups in companies (Table 2).

For multinational companies, CoP has high value on the knowledge transfer between departments. The experience shows that to seek efficiency, and in coherence with the typical functional organization, the different departments, hierarchical levels, geographical locations, and business processes tend to be become knowledge islands characterized by specific and, sometimes, idiosyncratic backgrounds, languages, values, procedures, etc. To bridge such islands and, by this way, promote knowledge sharing, learning, and innovation, several multinationals have favored the deliberate creation of internal CoPs (Davis et al. 2005; Archer 2006; Dubé et al. 2006).

	WHAT'S THE PURPOSE?	WHO BELONGS?	HOW CLEAR ARE THE BOUNDARIES?	WHAT HOLDS THEM TOGETHER?	HOW LONG DO THEY LAST?
Communities of Practice	To create, expand, and exchange knowledge, and to develop individual capabilities	Self-selection based in expertise or passion for a topic	Fuzzy	Passion, commitment, and identification with the group and its expertise	Evolve and end organically (last as long as there is relevance to the topic and value and interest in learning together)
Formal Departments	To deliver a product or service	Everyone who reports to the group's manager	Clear	Job requirements and common goals	Intended to be permanent (but last until the next reorganization)
Operational Teams	To deliver a product or service	Membership assigned by management	Clear	Shared responsibility for the operation	Intended to be ongoing (but last as long as the operation is needed)
Project Teams	To accomplish a specified task	People who have a direct role in accomplishing the task	Clear	The project's goals and milestones	Predetermined ending (when the project has been completed)
Communities of Interest	To be informed	Whoever is interested	Fuzzy	Access to information and sense of like-mindedness	Evolve and end organically
Informal Networks	To receive and pass on information, to know who is who	Friends and business acquaintances, friends of friends	Undefined	Mutual need and relationships	Never really start or end (exist as long as people keep in touch or remember each other)

TABLE 2: Comparison with other form of groups

Source: Wenger (2002:42)

2.4.2. Dimensions affect CoP

Scarso and Bolisani (2007) did a comprehensive work on identifying and categorizing the key dimensions that affect the functioning and performance of a CoP (Table 3). They summarized four major dimensions, which also called “four internal pillars” and two “external influences”. Their work made a big step on filling in the gap of CoP study, with an organic view of the whole previous research achievements.

The different dimensions mutually influence one another, and the conjoint examination of the four dimensions could help us put the CoP management in a more realistic perspective. These dimensions will also be taken as the model of our further study in this thesis.

2.4.2.1. Organizational dimension

This dimension pertains to the structure of the CoP, the role of members, the fundamental mechanisms of functioning, and the relationship with the rest of the organization. The main variables characterizing the dimension include: size of the CoP (number of members); geographical dispersion; “transverseness” across the distinct units of the company; mechanism of participation (e.g. voluntary rather than imposed; open or closed); degree of formalization, integration with the existing firm’s structure; roles of members and distribution of power; and conformity with a fixed global model. (Scarso & Bolisani 2007).

“Transversness”, as a basic characteristic of all CoPs, is one reason why there is CoPs. Franz (2002) pointed out that as we peruse efficiency, there are more and more idiosyncratic knowledge islands in the same project, plant or market. CoPs could bridge these knowledge islands and bring the intellectual capital scattered in the organization to the company value. One example is Shell’s “Turbodude” networks (Boyd 2004), another is DaimlerChrysler engineers inter-company CoPs.

However, considering from company line manager side, transverseness could also have conflict with existing organizational structure. On one hand, CoPs is beyond the existing organization structure. On the other hand, it needs understanding and support from the line management of existing organization (Shönström 2005). The cost of time and energy are luxury for companies who focus on the short term financial results.

Considering from CoP side, all the members have double tasks, which is called “double-knit” in Wenger’s book (2002). In DaimlerChrysler’s “Tech Clubs”, engineers wear two hats: as tech club members, they improve their competence, co-ordinate standardization of practice, and share knowledge with colleagues; but their main affiliation is still at the car plant, and focuses on team work on the design of a new model. However, in Unilever case, the most strategically relevant communities proved not necessarily the most active ones, because their participants were too busy with own job tasks. Although it is said (Scarso & Bolisani 2007), the issue of double tasks of members may reduce effectiveness of participation, personally, I think the double-knit role of members is positively crucial for the knowledge transfers, and utilizations between “inside CoP” and “outside CoP”.

CoPs are not self-sustaining and require a number of formally defined supporting roles (Scarso & Bolisani 2007). Cothrel and Williams’ study (1999) raises a number of unresolved questions about profiling, recruitment and training.

Although CoP was often considered as an informal knowledge transfer community, but structuring and formalization are especially required when communities have an explicit business purpose (Chevron Taxaco case in Stemke 2004). Unilever did some pioneer work by set a formal framework to help ensuring the effective and efficient operation of CoPs (Pos et al. 2005) and establishing appropriate links to the rest of the organization. This does not mean CoP requires more control. According to Ardichili et al. (2006), CoPs do not respond well to the strict control of the traditional managerial style. Rather CoP management should be “democracy”, without rigid

hierarchies and power discriminations (Peile & Briner 2001) and even “finger pointing” (Wenger et al. 2002).

Even though CoPs are considered as “democratic” and egalitarian environments, not all the participants can have the same roll or attitude. As I mentioned at the beginning of CoP introduction, in Wenger’s book (2002), there are three levels of all the community members. A special role is the community leader. Leadership is in an essential ingredient of successful CoPs (Bourhis et al. 2002). Leadership in CoPs should be based on influence, respect and intellectual stimulation, rather than authority and reward systems (von Wartburg & Teichert 2006). The functions of the leader include tasks such as: balancing members’ interests and agendas; identifying priorities; attending inclusiveness; drawing contributions; facilitating interactions; and encouraging a culture of egalitarianism and co-operation (Cargill 2006).

When CoPs become huge and cross-departments or cross-countries, both local and centralized management become challenging. In Accenture case (Paik & Choi 2005), although a central standardized policy may provide common practice and facilitate membership, locally managed CoPs ca favor effectiveness and stricter focus on specific issues of interest. In Caterpillar (Ardichvili et al. 2006), differences in culture, values approaches to competitiveness, sense of authority and preferred modes of communication suggest that the CoP practice should be tailored to the single area of application. On contrary, in the merger and acquisition cases of CapGemini (Wang & Ahmed, 2005) and a large IT company (Pastoors 2007), integration become problematic because of the distinct environments.

2.4.2.2. Cognitive dimension

Cognitive dimension includes aspects such as: knowledge domain, nature and features of knowledge treated, KM processes performed, relevance of topics to participants, members’ cognitive homogeneity, level of trust among members and related mechanisms, members’ prior experience and knowledge base. (Scarso & Bolisani 2007)

The research of knowledge transfer process in CoP taken by Scarso et al. (2006) considered several central elements: e.g. the nature of the shared knowledge (tacit vs. explicit), content (know-about, know-how, know-who, know-why, and know-with), or owner (individual vs. organizational).

In most of the cases, knowledge flows in CoPs are bi-directional. CoPs members are both knowledge contributor (source) and user (recipient). However the motivations behind them are different (Watson & Hewett).

The knowledge transfer between knowledge sources and recipients is affected by the differences or knowledge gap between them. Larger the gap is, more valuable the knowledge transfer. On contrary, the smaller gaps is, easier for the knowledge transfer. In CoPs, consequently, a trade-off is required between the wideness and richness of the knowledge domain – and hence the number of members, that favor the generation of new ideas – and its heterogeneity – that hinders knowledge transfer. Finding the proper balance between focalization and generality is, however, a challenging task that lasts the entire life of the CoP.

Focalization possibly forms knowledge islands in specific business areas. Allianz developed the concept of “Centers of Competence” to identify synergies for the different areas, and knowledge brokers to support the inter-domain knowledge flows (Spies et al. 2005). Boundary objects (Star, 1989), for example, artifacts, documents, terms, procedures, and other forms, are considered useful mechanisms to make the connection between different CoPs possible.

2.4.2.3. Economic dimension

This dimension was build on the fact that CoPs is costly and beneficial. One question is who benefit from it, and who pay for it. Furthermore, in the current practice, how costs and benefits can be effectively measured is still a puzzling problem (Zboralski & Gemunden 2006), because of the “intangible” nature of KM. Another reason is that CoP’s value is often seen in a long-term perspective. Different approaches to measurement have been proposed, and a standard solution

has not been found yet (Scarso & Bolisani 2007). In CapGemini – Ernst Young (Valderrama & Lee 2002), they use qualitative analysis of the CoP performance. In the McKinsey case (Wenger et al., 2002), the initial measurement is taken by individuals, and organizational measurement is taken in a second time. In Financial Consulting Company (disguised name) and Caterpillar, qualitative measures through systematic questionnaires were used (Powers 2004; Menti 2006). However, formal process of evaluation and strict control may engender a sense of frustration, and de-motivate people to share knowledge (Pastoors 2007).

The value created by CoP has two ways to benefit the company. One is by the single contribution of the thought, the other is by other members using, like an economic significance. The more other members use, the more value it created. Many attempts tried to promote the participation of other members, e.g. regarding the “source of knowledge”. Indirect rewards play a greater role than monetary incentives (Oliver and Kandadi 2006), at this time.

2.4.2.4. Technological dimension

Knowledge management system (KMS) is important for the CoPs, especially the dispersed CoPs. The elements of technology that influence and influenced by other dimensions are: nature of the KMS; KM processes specifically supported by electronic systems; overall degree of reliance on KMS process by the CoP, and relations with the social context and members interactions.

Wenger (2005) provided a rich list of tools, as technology applications. But implementation of supporting technology of CoP can vary largely from each other (Dotsika 2006). A well pre-designed technological infrastructure could eventually hamper the function of a CoP. Hence, technologies may be “friends or foes” (Hendriks & Vriens 1999).

To select from different KMS technologies, the aim should be clear. KMS applications can be subdivided in two categories: those for knowledge re-use (e.g. databases, repositories, content management, etc.), that deal with the explicit and coded pieces of knowledge, and those for

connecting people (e.g. groupware, e-mail, discussion boards, etc.), that deal with the tacit and less codifiable pieces of knowledge. (Scarso & Bolisani 2007)

Besides knowledge flow considering, the implementation of proper set of ICT applications requires analysis of both technical and social factors, e.g. the success of Buckman Laboratories (Pan & Scarbrough 1998). On the contrary, in Caterpillar's case, Russian and Chinese employees preferred different communication modes, which is due to the national culture.

2.4.2.5. Business context

The business context consists of elements such as: the business environment (industry, product/services, markets, competition, etc), the corporate culture of the hosting organization (beliefs, basic assumptions, shared values, norms, practices, rituals, etc. – Alavi et al. 2006), the level of ICT literacy, and the availability of resources. In substance, the context entails a set of constraints and opportunities that can affect the functioning of a CoP. (Scarso & Bolisani 2007)

2.4.2.6. Knowledge strategy

The knowledge strategy can be defined as a plan for making the best use of the knowledge-based resources in the view of the organization's competitive advantage (Zack 1999; Holsapple & Jones 2007). The knowledge strategy is strictly associated with the competitive strategy of the firm, and this defines aims and tools of KM programmes and, thus, of CoPs (Akhavan et al. 2006).

Main dimension	Issues	Study
Organizational	Degree of transverseness across the organization	Boyd (2004)
	Relationship with the existing structure	Shonstrom (2005)
	Formal acknowledgement of the CoP	Wenger et al. (2006) Pos et al. (2005)
	Mechanisms of governance	Ardichvili et al. (2006) Peile & Briner (2001)
	Local vs. centralized management	Paik & Choi (2005), Ardichvili et al. (2006), Wang & Ahmed (2005) Pastoors (2007)
	Roles of members and supporting functions	Wenger et al. (2002), Pos et al. (2005), Cothrel & Williams (1999)
	Kind of leadership	Bourhis et al. (2005), von Wartburg and Teichert (2006) & Cargill (2006)
Cognitive	Nature of shared or exchanged knowledge	Spies et al. (2005)
	Cultural proximity of members	Powers (2005), Thompson (2005) & Spies et al. (2005)
	Knowledge gaps between members	Dube et al. (2006),
	Knowledge domain	Kohlbacher & Mukai (2007), Alavi et al. (2006) & Spies et al. (2005)
	KM process & knowledge flows	Watson & Hewett (2006)
	Mechanisms for establishing trust	Power (2004), Raider (2006), Nielsen & Ciabuschi (2003)
Economic	Mechanisms for evaluating costs and benefits	Desouza & Raider (2006), Wenger et al. (2005), Valderrama & Lee (2005)
	Budgeting, resources allocation, accounting	Desouza & Raider (2006)
	Systems to promote and reward participation	Voelpel et al. (2005), Oliver & Kankadi (2006), Pastoors (2007)
Technological	Kind of technological platform	Dotsika (2006)
	KM processes underpinned by technologies	Pan & Scarbrough (1998)
	Relations with the social/organizational context	Ardichvili et al. (2006), Voelpel et al. (2005)
	Intensity of use across the CoP	Dube et al. (2005)
	Familiarity with ICT	Bourhis et al. (2005)

TABLE 3 Internal pillars of CoP.

Source: Scarso and Bolisani (2007)

2.5.SECI in CoP

To build up a new SECI-CoP model, firstly, I go through two CoP-cases in Wenger's study (2000) and analyze the knowledge conversions within it.

2.5.1. CoP cases

2.5.1.1. Case 1

The first one is in Hill's Pet Nutrition facility in Richmond, Indiana. Line technicians meet weekly to talk about recent successes and frustrations as well as challenges looming ahead. This community has a leader, who they called mayor, and chosen by peers to keep CoP on track. This CoP is supported by the plant, and members get time granted participating meetings. As described in Wenger's book (2002), these members wear two hats at the same time. They are member of the CoP, but also the line worker, as long as they start the work back to the work field later.

Once, member John had a proposal about the improvement of his daily work. But the idea did not get enough attention by the senior managers of the plant. They have the reason that the new approach was unproven and in any case would be difficult to incorporate with the plant's current technology.

However, the community members, who are experts in that field, supported him and encouraged him to continue pushing his proposal become implemented. Roger, a technician in the plant, based on his own experience, confirmed John's evidences used to support the proposal. Roger even suggested going along next time to help John's presentation to the management.

The result turned to be very encouraging for everyone. The new technology was installed and made the work much more efficiency. In addition to benefiting the company, The CoP also benefit the members, by give them opportunities to solve nagging problems and hone their ability to horn their ability.

From the CoP perspective, the case can be rephrased as the following (Figure 6):

- John brought this proposal, which is unproved by senior managers because of lacking support, to the CoP.
- Roger and other experts bring in tacit know-how to support John's proposal
- New proposal was presented to the management
- New technology was installed

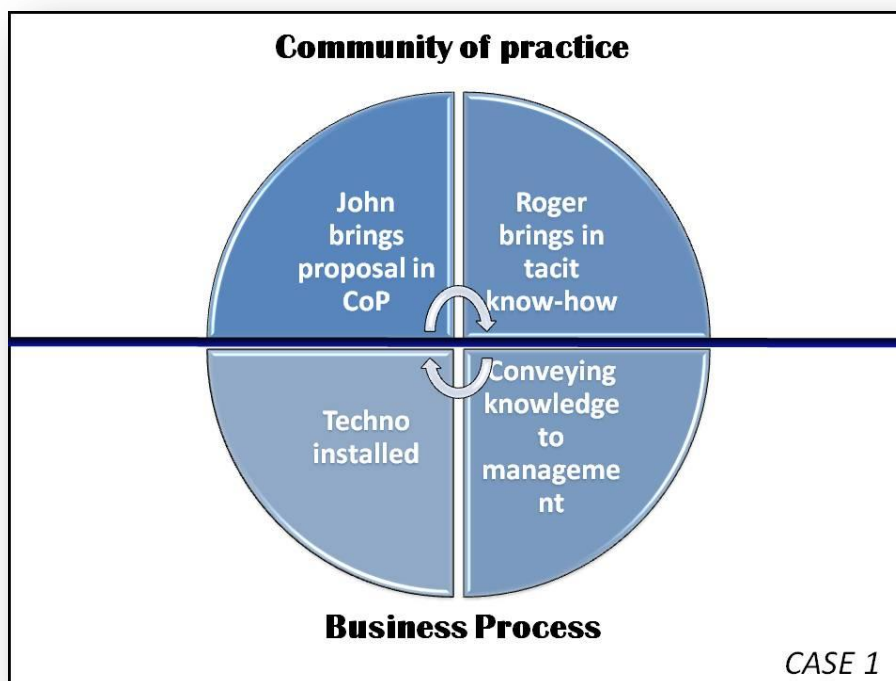


FIGURE 6: Case 1

2.5.1.2. Case 2

In the second case, the CoP focuses on a HP software product called “High Availability”. They used call conference to communicate to each other.

At one time, member Maureen brought her experience with a major customer on installation. During her open and direct talking, other community members interrupted her constantly with questions and examples from their own experiences – all of which helped Maureen understand how to work more effectively with her clients.

During the conversation, her experience turned out to be a persistent bug in the software. Another member Rob, a member of software division that developed the product, took part in the calls, in order to have connection between the product-delivery consultants and software developers. Rob already has the solution for the bug, but this conversation made him have ability to make the solution more effective. He said he would follow up with the calls.

The case can be simplified as the following steps (Figure 7):

- Maureen provided a unique experience with the software customer to the CoP
- CoP discussed and bring in Rob with his software development know-how
- Rob learnt from the call conversations, and made a more efficient solution

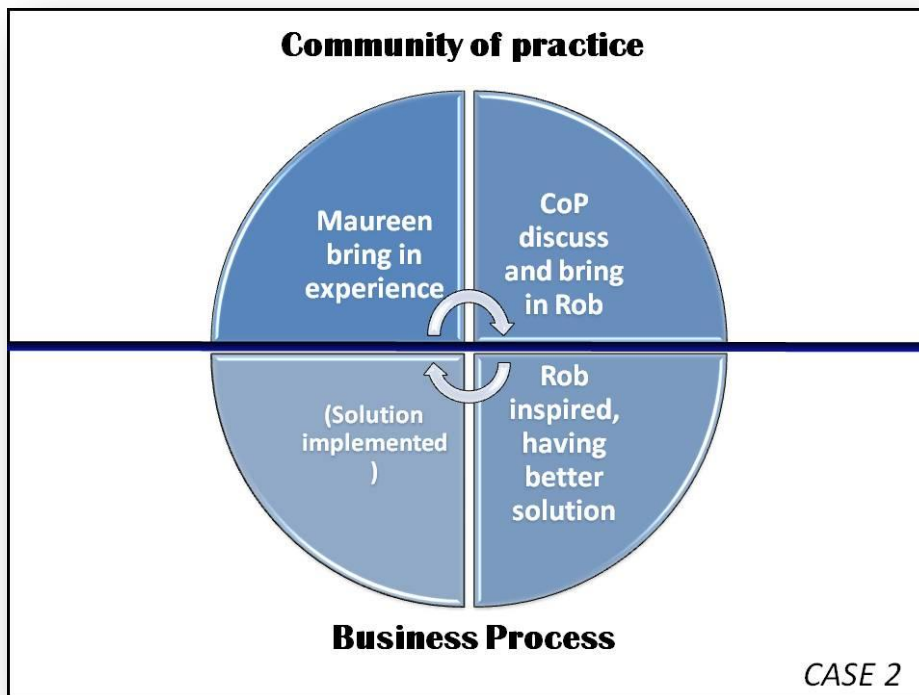


FIGURE 7: Case 2

When I bring the two cases together, obviously, there are some characteristics shared by both of them. Firstly, they all follow a four step process. Although in the second case, the last implementation was not stated in the article, both of these cases have the obvious sections like: “bring in question”; “bring in know-how”; “become a complete solution” and “implementation”. Secondly, all the four steps are accomplished in either CoP or (external) business process. The CoP and (daily) business process terms came from Wenger’s book (2002). He indicated CoP members are wearing two “hats” at the same time. In these cases, the first two sections (bring in question, bring in know-how) were happened in CoP; and the other two sections (become a complete solution, implementation) were happened in business process. Thirdly, there was an individual raise up the discussion topic, based on his/her experience. At the beginning of each case, the individuals (John, Maureen) described their own question, and later the question become

the focus of CoP. Fourthly, there was an expert individual (from knowledge isolated division), who bring in his/her know-how and follow up the problem. Fifth, the know-how member was part of the final solution. In both of the cases, the two experts (Roger, Rob) did not just speak out the solutions, but all participate in the problem solving. Notice this situation could strongly suggesting two possibilities: they are unwilling to let others have the know-how; or these are tacit knowledge (know-how) and cannot be easily transferred in these cases.

Personally, I think the possibility of unable to transfer knowledge was in the fifth character of these cases. On one hand, when I review the two cases, they strongly indicated the difficulty of transferring the know-how from the expert to the one raised the question. In the first case, Roger supported by providing his own experience not teaching John. As we all know, the knowledge based on personal experiences is tacit (Nonaka 1995), and hard to transfer to others. In the second case, it was even more difficult to transfer the knowledge between a product-delivery consultant and a software developer. So they would rather to solve the problem by involving in. On the other hand, in CoP, members are supposed willing to share knowledge to each other, in order to learn from others as well. If the experts prefer to reserve their knowledge, the CoP could not continue any function.

2.5.2. Knowledge conversions in CoP cases

Surprisingly, some of the details of the two cases are pre-described by Nonaka (1995). When he talked about the spiral of organizational knowledge creation, he said: “this process is exemplified by product development. Creating a product concept involves a community of interacting individuals with different backgrounds and mental model”. This was just like the description of a typical CoP and its characters. Then he said: “While the members from the R&D department focus on technological potential, those from the production and marketing departments are interested in other issues.” In the second case, questioner Maureen was from consulting division and Rob was from the software division. The issue is to deal with “a persistent bug”. Nonaka continued: “Only some of those different experiences, mental models, motivations, and intentions can be expressed

in explicit language. Thus, the socialization process of sharing tacit knowledge is required.” It was more than a coincident that in both of the cases, the members with know-how did following up the problem solving, instead of speak out the solution and leave it to the rest. Only some of the know-how could be acquired by other members in CoP. Eventually, the best choice is have the know-how member present in the problem-solving process. He also said: “moreover, both socialization and externalization are necessary for linking individuals’ tacit and explicit knowledge.” These words were the description of the invisible activities of knowledge conversion in these cases. Until now, I have not built the clear relationship between the CoP cases and knowledge creation model in this thesis, but it will be right coming in the next part.

Not only Nonaka stated “CoP-case like” process in his knowledge creation model, Wenger also talked about knowledge creation in his book (1998:214). In communities of practice, the definition of competence and the production of experience are in very close interaction. Community of practice is not only a context for the learning of new comers but also a context for new insights to be transformed into knowledge. A well-functioning community of practice is a good context to explore radically new insights without becoming fools or stuck in some dead end. A history of mutual engagement around a joint enterprise is an ideal context for this kind of leading-edge learning, which requires a strong bond of communal competence along with a deep respect for the particularity of experience. When these conditions are in place, communities of practice are a privileged locus for the creation of knowledge.

As long as I have the premise that there are knowledge creations in the CoPs, the next step of the research is identifying correspondence of each four modes of knowledge creation in SECI model to these cases. This step will help us with positioning the SECI model in the CoP environment.

Socialization

In Nonaka’s book (1995), socialization is the start of the knowledge spiral, and aims at the sharing of tacit knowledge. This mode usually starts with building a “field” of interaction. This field facilitates the sharing of members’ experiences and mental models. In the first case, John shared

his proposal of “substitute pneumatic tubes for the balky conveyor belt that carried the pet food kibbles to the packaging bin” in CoP, which was not accepted by senior managers at the plant. In the second case, Maureen shared her experiences with a major customer. This identified the socialization mode in CoP, the occasion and the member who initial the building of an interaction “field”.

Externalization

The externalization mode is triggered by meaningful “dialogue or collective reflection” in which using appropriate metaphor or analogy helps team members to articulate hidden tacit knowledge that is otherwise hard to communicate. This mode outputs “conceptual knowledge”. Among the four modes of knowledge conversion, externalization holds the key to knowledge creation. (Nonaka 1995) In the second case, externalization happens, when “the conversation then turned to a persistent bug in the software”. Maureen did not know clearly what the issue is, when she tried to share her major customer experience. But during the conversation with the expert members in the call meeting, the issue was clearly found out as a software bug.

Combination

Combination mode is triggered by “networking” newly created knowledge and existing knowledge from other sections of the organization, thereby crystallizing them into a new product, service, or managerial system. Both of the cases have clear indication of this mode, when described the CoP expert member from other division joint the case and follow up all the way, until the case is solved. What worth notice was that, in the cases, none of the know-how expert member taught or trained the questioner member to solve the problem. Instead, they follow up all by themselves, and there was only knowledge combination in mode, without individual member capability increase (for the questioners).

Internalization

Internalization is triggered by “learning by doing”, and produces “operational knowledge about usage, and policy implementation. In the first case, a year after the meeting, the company installed the new technology, and significantly reduced downtime and wasted pet food related to packaging. This time, it is all the line workers, who use this new technology, will get the new knowledge through the using of this new technology. The receiver is probably outsider of CoP, in this case. But, in all, the plant will be the one benefit on efficiency and financial saving.

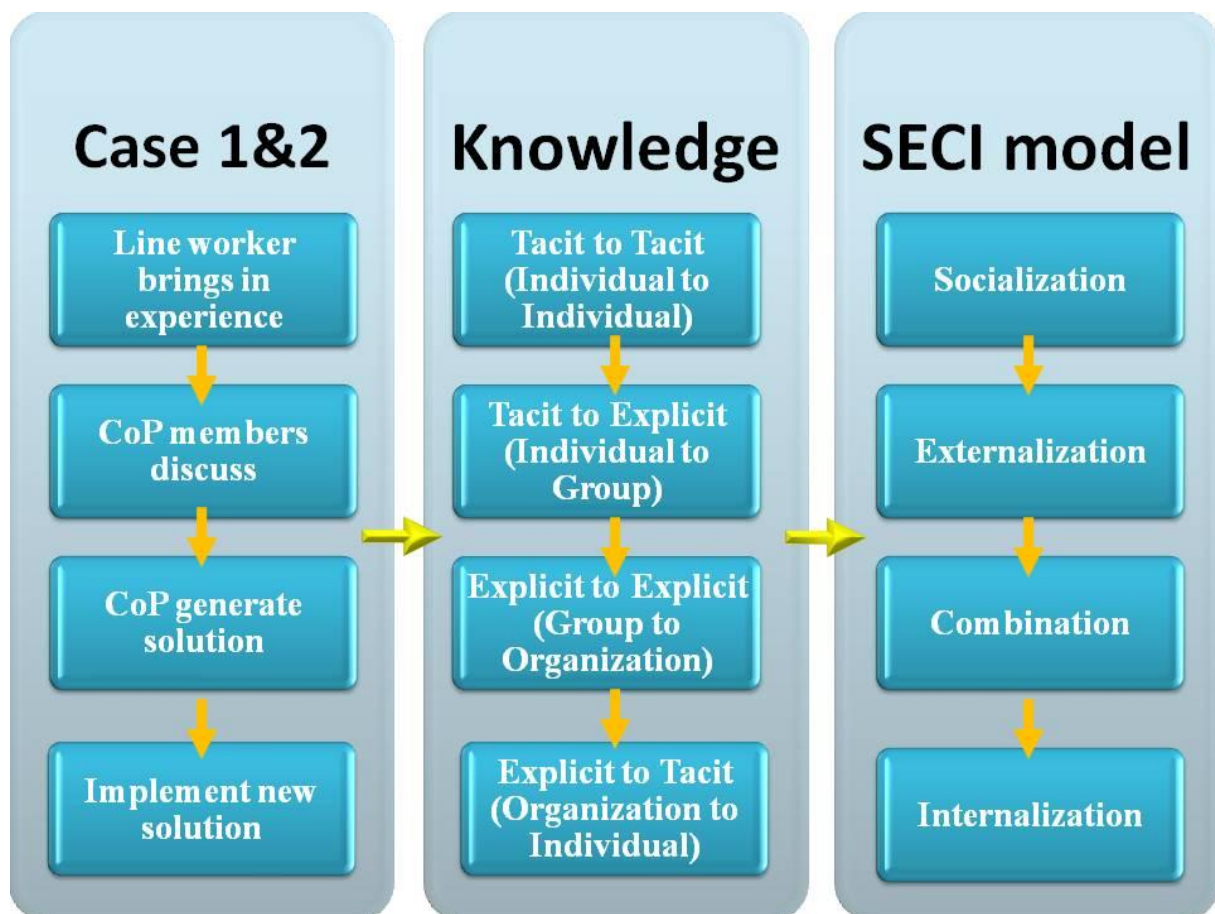


FIGURE 8: Case-knowledge-model

The relationship (Figure 8) between the CoP cases in Wenger's book and 4 modes of knowledge conversion (SECI model) was built up, as shown in this picture. Base on this relationship, I could present another graph to illustrate the position of the knowledge conversions in CoP, and this new illustration is called SECI-CoP knowledge conversion model.

2.5.3. SECI-CoP knowledge conversion model

To make this new model, I start by dividing the context of knowledge conversion into two parts, according to the "Double-knit organization" (Mc Dermott 1999). One part is the community of practice; the other part is business process: e.g. work groups, project teams. Then, I put externalization mode in CoP part; and put internalization mode in the business process part, according to our previous analysis of the cases and relationships. After that, socialization and combination modes are put on the border of the double-knit. Personally, I think both of these two modes could not be clearly located exactly in CoP or in business process. These are "bridge like" process, which bring in and lay out knowledge from CoP. Also, the members, involving in these two modes, are also the link persons, who "hear two hats", as the "brokers" of the two different get-togethers. Lastly, the nodes are the tacit/explicit knowledge, which carried by different units in different sections. I take the personal know-how, held by the helping members, as tacit knowledge, which cannot be easily transferred to others.

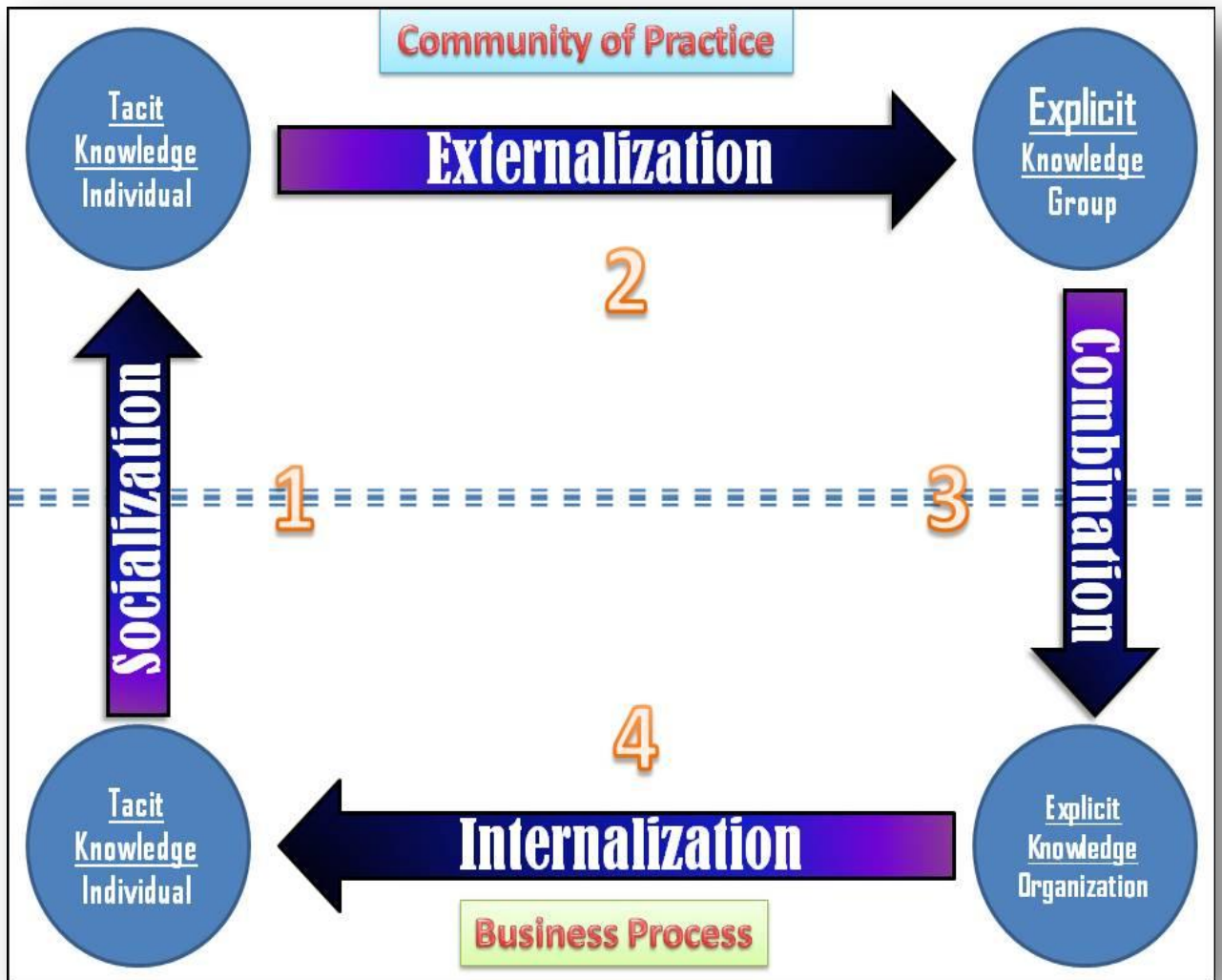


FIGURE 9: CoP-Knowledge Creation model

(SECI-CoP model)

In this model (Figure 9), knowledge was initiated by socialization, which could happen either in the business process or community of practice. It was the origin of the prototype knowledge, and it was tacit. Then, in the community, the very person who has the tacit knowledge externalized and shared it to the members. Although Nonaka suggested it as the most difficult part of four knowledge conversions, this could be much easier because members of CoP could be experts on

this field, and shared same professional background with the one who share the knowledge. As long as knowledge became external, members would add more value by discussing within the community. This process could last to the business process because there might be requirement for practical experiment. The internalization occurs in business process, when line-workers start to implement the new knowledge and learnt it as a know-how of themselves.

2.6.Culture Dimension

General consensus seems to view culture as patterns of beliefs and values that are manifested in practice, behavior, and various artifacts shared by members of an organization or a nation. (Trice and Beyer, 1993)

2.6.1. Organizational culture

An organizational culture consists of the practices, symbols, values, and assumptions that the members of the organization share with regard to appropriate behavior (Schein 2000; Wilson 2000). Such a culture is holistic, historically determined, and socially constructed; moreover, it exists at various levels in the organization and is manifested in virtually all aspects of organizational life (Hofstede, Neuijen, Ohayv, & Sanders 1990). According to Denison (1990), an organization's culture serves as a foundation for its management system and practices. Because the organization's culture provides norms regarding the "right" and "wrong" ways of operation, organizational culture stabilizes the firm's methods of operation.

There are two fundamental dimensions of organizational culture (West 1997): one is flexibility versus control. In the flexible organizational culture, there are "flatter" organizational structures, decentralized decision making, and minimal specialization of jobs. In the controlled organizational culture, the structure is hierarchical, centralized decision making, and a large number of specialized jobs with proliferation of job titles. The other dimension of organizational culture is

internal orientation versus external orientation. External factors, for example national, regional, industrial and occupational cultures, can all shape the organizational culture.

The situation in CoP is complicated, because in one CoP, there are many experts from various fields. In different divisions, normally, they have their own cultures and ways of working in their profession, which are not necessarily harmony to each other in CoP. In order to research and develop in the same CoP, for the long run, all the experts should understand the cultural distance and comply themselves to this CoP culture. It requires appropriate modes of cooperation and communications, as well as trust and tolerances.

2.6.2. National culture

In Hofstede's book (2004), there are five dimensions: power distance index (PDI); individualism (IDV); masculinity (MAS); uncertainty avoidance index (UAI); long-term orientation (LTO). These are common culture differences for people from various countries. Moreover, Davenport (1998) gave more cultural factors that inhibit knowledge transfer. They could also be the problem for CoP daily activities. For example, in some CoPs, members are dispersed in a distance. They discuss on internet without face-to-face meetings. Sometimes, they do not know each other more than names and locations. In that, one of the culture problems, as Davenport said, could be lack of trust. As well as that, members maybe use different vocabularies, or even languages, to describe the same phenomenon. Although in the internet era, common time and place for meeting is not quite a necessary, but for the deep co-operate community, it would be a problem if it is always missing. Lacking of absorptive capacity and intolerance for mistakes is all mentioned by Davenport, which could also lead to inefficient of CoP activities.

2.6.3. Culture model of CoP research

Although this is an exploratory study in the culture and CoP field, there is a pre-structured culture model, which I mostly adopted from the model used by Ardichvili et al. (2006) in his online CoP's knowledge sharing study.

It all started from the well known terms: individualism and collectivism. Individualism describes the tendency of people to place personal goals ahead of a larger social group, such as the organization. Collectivism tends to give priority to the goals of the larger collective or group they belong to (Hofstede 2001). Triandis (1995) further distinguished the two by saying members of individualistic cultures see themselves as independent of others.

People in the individualistic cultures tend to take information as independent of context. They prefer the written and codified form of information, which is low of media-richness, for example, emails and on-line discussion boards. On the other hand, people in collectivism culture pay attention to contextual cues in information and disregard of written information. They prefer high media-richness conversations, like face-to-face talk and phone calls. (Bhagat et al. 2002)

Collectivists tend to have much more in-group sharing than out-group sharing (Chow et al. 2000). This also indicates the attempt to serve the interest of the group instead of pursuing mere self-interest.

Hwang et al. (2003) named two terms, Mianzigain (to gain face), and Mianziloss (losing face), to conduct a study among students. It turned out that students who concern of losing face (Mianziloss) are more likely to use informal communication channels, for example, asking questions of the professor outside the classroom. Meanwhile, the students, who prefer to show their knowledge, mostly use formal communication channels, like asking questions during the class.

In collectivistic culture, the public under-presentation of one's favorable traits and abilities, and modesty issues is prevailing (Kurman 2003). This is mainly lead to low self-enhancement in certain collectivist cultures (Ardichvili et al. 2006).

Bhagat et al. (2002) and Triandis (1995) distanced between vertical and horizontal within both individualism and collectivism. Similar to the power distance dimension (Hofstede, 2001), they defined vertical culture as value equality and seeing themselves as different from others in social status. Within vertical culture, knowledge flow from the top to the bottom. In horizontal cultures, power distance is low and people are not likely to be distinguished by status, and knowledge flows in both directions. Bhagat et al. (2002) suggested that knowledge flows easier, if the sources of knowledge recipient are the same pattern of culture.

Trompenaars (1994) found ascription-oriented and achievement-oriented cultures, which will affect the CoP knowledge sharing. Ascription-oriented cultures regard virtue of age, gender and wealth, as status. While, in achievement-oriented culture, status is derived from past achievements, and is not dependent on seniority or how others relate to his or her position in the community (Trompenaars 1994). This also indicated the status in the community, achieved through a history of achievements (Hildreth et al. 2000).

2.6.4. Summary

These previous studies provided theoretical background for both knowledge creation and community of practice. And this review followed the logical process step by step. Firstly, for creating knowledge in SECI model, the literature review started from definition of knowledge and characteristics of knowledge. These are the base and necessary understanding, when talk about knowledge management, regardless of the environment (context) of it. Especially “tacit” and “explicit” knowledge from Polanyi (1966), they are key-terms in the later study of Nonaka (1995). Secondly, knowledge management was shortly introduced to provide a general hierarchy picture for this research, and locate SECI model in a proper situation in the whole knowledge management study. Thirdly, SECI model was introduced to provide a framework to use when analyze CoP. The emerging environment of knowledge creation from Nonaka’s study (1995) was also presented, and this would have relation to the empirical study part when trying to generate barriers in contrast. To help understand the limitation and background of this study, limitations of SECI model was analyzed as well. Fourthly, by reviewing all three books Wenger wrote about CoP study, the CoP concept part was built up. This well understanding of CoP helped to generate many key terms of barriers in the empirical part. Scarso and Bolisani’s (2007) work was introduced because it comprehensively categorized most of the previous CoP studies, and locate our study in a proper position among previous works. Fifthly, by analyzing two cases from Wenger (2002), the SECI model was successfully located in CoP and I built up a new SECI-CoP (CoP knowledge creation) model. Lastly, culture dimensions, including organizational and national, were settled for the empirical part as a context background.

The coming section is about the method I design and use for this study. As an exploratory research, the literature review part provided the direction of the study; the method will be carefully selected to connect the previous study background and the case reality along the settled direction, which is the SECI in CoP phenomenon. As long as this connection is provides in the method part, the barriers of knowledge creation in CoP will be located and explored as my finding in this study.

3. RESEARCH METHOD

Methodology refers to the theory of how research should be undertaken. It includes techniques and procedures used to obtain and analyze data. This therefore includes questionnaires, observation and interviews as well as both quantitative (statistical) and qualitative (non-statistical) analysis techniques. (Saunders et al. 2007:3)

3.1. Research approach

In this study, I used inductive approach to generate the new SECI-CoP Knowledge Creation mode. Meanwhile, I also use the inductive approach to conduct semi-structured open question interviews to find out the barriers of knowledge creation in the case community of practice.

There are two research approaches: deductive approach and inductive approach. The former approach means the researcher develop a theory and hypothesis (or hypotheses) and design a research strategy to test the hypothesis. The later approach means researcher collects data and develop theory as a result of your data analysis. (Saunders et al. 2007: 117) In inductive approach, theory would follow data. The task would be to make sense of the interview data collected, by analyzing those data. The result of this analysis would be the formulation of a theory (Saunders et al. 2007).

To choose induction the proper research approach, characteristics of former studies were taken into consideration. Although there are studies about knowledge creation model (Nonaka 1995) and cultivation of community of practice (Wenger 2002), but the field of knowledge creation in the environment of CoP is still lack of attentions by scholars. Nevertheless, in the business set, it was not a new phenomenon that knowledge was generated by the activity of CoP members. As long as theory fell behind with real world phenomenon at the moment, an inductive approach was proper to be chosen for building up theory in this study, which aimed to build up a new SECI-CoP model

and explore barrier factors inside it. It also means, researchers have limited knowledge about the real situation of knowledge creation in community of practice for now. And deductive is not a proper choice for this field, because it is very difficult to generate the precise hypothesis to get creative and initiative study conclusion.

3.2.Purpose of research

This research is an exploratory single case study, using qualitative data collected from the target online CoP. The purpose is to take “AAA center” as a case CoP, and assess CoP in the new light of knowledge creation model. So that, better understanding of precise barrier of knowledge creation in new environment could be achieved.

Researchers, designing research projects, are like architects designing buildings (Hakim (2000)). Then it means it is particularly needed to think about the research project and needed to fulfill the particular purpose with limited resource, e.g. time and money (Mark et. al. 1997).

An exploratory study is a valuable means of finding out “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson 2002:59). There are three principal ways of conducting exploratory research: a search of the literature; interviewing “experts” in the subject; conducting focus group interviews. Exploratory study has is flexible and adaptable to change. But it does not mean absence of direction to the enquiry. It means the focus is initially broad and become progressively narrower as the research progress (Adams & Schvaneveldt 1991).

In this study, exploratory purpose was chosen base on research question and research objective of this study. This research is trying to find out what is happening in the case CoP and take SECI as a new insight to clarify the understanding of this new knowledge creation phenomenon. In that, exploratory study is suitable for this study, which has a clear direction but cannot be fully predicted about the result.

Case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple source of evidence (Robson 2002:178). Yin (2003) also highlights the importance of context, adding that, within a case study, the boundaries between the phenomenon being studied and the context within which it is being studied are not clear evident.

In this research, case study is the research strategy, and it is based on the “three conditions criteria” provided by Yin (1994:4-8). The research question is “how do internal factors affect knowledge creation process in community of practice”, and exploratory case study is responding to answer this kind of “how” question. Case study is preferred in examining contemporary events (Yin 1994), and this AAA center is a real community which is operating now. I have personal experience in this community and have relationship with several active members. This provides sufficient support for “direct observation” and “systematic interviewing” (Yin 1994: 8).

The case community is AAA center (anonymous name), which was selected because of easy to approach deep interview and has characteristics of target community, like have the significant activities of sharing and discussing between members.

3.3.Data collection

There are two sampling techniques: probability or representative sampling; and non-probability or judgmental sampling (Mark et. al. 1997). The former means researcher know the probability and change of selecting each case from the whole population of the case. The later means it is unknown to the researcher about the probability of the selected case from the total population. In this research, I use the non-probability sampling, which is impossible to answer research question of statistical inferences about the characteristics of the population. But it still supports (Mark et al. 1997) to answer the question of “*How* do internal factors affect knowledge creation process in community of practice”.

In purposive or judgmental sampling, researchers use their own judgment to select cases to answer research questions, and meet the research objective. This kind of sampling usually works with very small samples like case study, when researchers would like to pick the informative case (Neuman 2000).

In this study, four interviewees were selected based on their profession background and activities in the CoP (Table 4). The validity and understanding of data will be more about data collection and analysis skills than with the size of sample (Patton 2002). They are some of the active new and senior peripherals in the CoP, who could be typical example of case community members. During the procedure of selecting, both judge mental sampling and self-selective sampling were used. Firstly, I sort out the most active and effective members in this community, based on their participations in discussions, shared topics and sufficient background to have deep involvement of community interaction. At this moment, the potential sample size down to 15. Then I sent out the invitation letters which included interview questions and theoretical background of this study to these members. 7 of them responded and show their interest. But due to the time requirement, only 4 of them participate in the complete interview.

	Interviewee A	Interviewee B	Interviewee C	Interviewee D
Age	43	35	30	28
Sex	Male	Male	Male	Male
Profession	Teacher	Ph.D. student	Master student	Management trainee
Activity	Every day	Every 2-3 days	Everyday	Every week
No. of friends (in CoP)	49	16	18	15
Nationality	Chinese	Chinese	Chinese	Chinese
Location	Zhe Jiang (CN)	Canada	Finland	Xin Jiang (CN)
Shared blog	51	3	0	3
Shared topic	3	5	0	8
Focused topic	9	9	15	11

TABLE 4: Interviewee background information

Interview, which used to collect qualitative primary data, can be highly formalized or in-formalized. According to typology, it could be one of the categories (Mark et al. 1997): structured interviews; semi-structured interviews; and unstructured or in-depth interviews.

Structured interviews are interviewer-administered questionings, which is based on predetermined and standardized or identical questions. However, semi-structured and in-depth (unstructured) interviews are non-standardized questioning, which often referred to as qualitative research interviews (King 2004). In semi-structured interviews the researcher will have a list of themes and questions to ask, and they may be different from one interview to another. Some of the questions may be added or omitted basing on the specific contexts (Mark et al. 1997).

This study is conducted by semi-structured interview with 18 open questions and by internet phone (Skype). Semi-structured interview is proper to fit this research approach, because as an inductive study, researcher does not have clear idea about the situation of the researched phenomenon, but have directions. Semi-structured interview could let researcher have some control and focus on the direction of study. Besides that, semi-structured interview is flexible enough to provide researcher better chance to discover (explore) unknown details of the phenomenon than structured interview.

Interview questions were generated base on two aspects. One is the previous studies of barriers in VCoP (Pat 2007; Alexander 2003). The other is the knowledge conversions process (Nonaka et al. 1995) and its efficiency of communication. Probe questions are also used to help interviewees answer some complex questions. Sometimes, temporary questions are added to confirm the answers to the critical questions. The whole interview was taken in Chinese language, because most of them could not manage English well enough to express exactly their ideas.

All interviews were audio recorded. Each of them lasted more than one hour. According to the timeline, the interviews audios are transferred into English. To make sure minimize the misinterpretations, the structures of sentences were kept, and words were translated directly. Some

of the key Chinese words are double checked by online dictionaries and search engine to find the mostly used corresponding English words.

3.4.Data analysis

To generate exploratory project, there are several analytical procedures to choose from (Mark et al. 1997): data display and analysis; template analysis; analytic induction; grounded theory; discourse analysis; narrative analysis. In this study, data display and analysis approach (Miles and Huberman 1994) is used. It is composed of three sub-processes: Data display means organizing and assembling the audio record into visual displays. By using code words (tags), the separate data are categorized by a network related to each other and have the meaning for the conclusion. The data collected were also analyzed based on previous theories, from which these key words came from.

As described by Mark et al. (1997), during the transcript, the entire recordings were listened at least twice. In this study, the translated English script of interview record was firstly tagged with key words, which either used by previous barrier study or abstracted from the interview content. Then, the sentences were re-arranged according to the tags. Some of the sentences were tagged by more than one word, and grouped in both of the tags. The analysis was based on tags, which is much easier to figure out corresponding theories. During the analysis, I kept on checking back time to time to make sure the tagged sentence indicated the same conclusion as we generate from tags.

3.5. Reliability and validity

Reliability refers to the stability and consistency of the result derived from case study, that is, the probability that the same results could be obtained if the measures used from the research were replicated by another investigator (Yin 1994:36). For the non-standardized research, findings are not necessarily intended to be repeatable. Because this finding reflects the reality at the time they were collected, in a situation which may be subject to change. However, the researchers using non-standardized interviews should make and retain notes related to the research design, the reason underpinning the choice of strategy and methods, and the data obtained (Marshall and Rossman 1999).

In this study, the first of four threats to reliability out (Robson 2002) is referring to the interviewees might have different opinions and responses to the same question on different time. In order to make sure the answer was closest to the reality, I required interviewee to give specific example to support their ideas. Sometimes, I added the question like “was it the same idea every time you had”. To eliminate subject or participant bias to minimum, this interview data was collected anonymously. This is quite important for Chinese, when they know their words maybe written down and used in a research. And I even added that the interview feedback of conclusions after this research will be only sent to the interviewees personally, and will not be published with their name. So the interviewee will not know who else in this community participate in this interview. I used 2 devices to record the interviews at the same time and make sure observer error will not intervene the understanding of sentences. Although this study was translated and tagged in English, all the conclusions of study were referred back to the original Chinese records and double checked. The observer bias is critical in this study. In the case analysis process, I cross-checked the sentences when they sometimes refer back to their ideas. And I sometimes interpreted the words blindly without name on that, so the personal impression would not affect my understanding.

Validity of this study was strengthening by take threats to validity (Robson 2002) in to consideration from the beginning of interview design. According to the history record of AAA center, there was no significant change or events happened before this interview. Every interviewee was informed that this research would not have negative impact on their community activities because it was anonymous from the beginning to the end. As long as the interviewees understood this research could, to some extent, help the community developing, they were all very proactive to response to interview questions. According to the observation, AAA center did not initiate any activity to affect the interviewees before and during this interview. Interviewees were offered rights to refuse answering certain questions or terminate the interview, but none of them felt necessary to do that during the interview. They all fully coordinated to the interview. During the interview, responses were required to be confirmed if it is asserting a cause-effect relationship.

3.6. Case background

Dubé et al. (2006) had a comprehensive study on virtual communities of practice (VCoP) and built up a typology of 21 structuring characteristics. In this study, case background will be introduced and analyzed based most of the characteristics.

AAA Center is a Chinese company, which has a public Social Network Service (SNS) providing free platform for knowledge management discussion. It started to serve on 31 May 2008. In this SNS, all the members have to register by real name. Each member has a personal page for personal information and recent updates of his activities. Members can connect to others by adding friends. Although it seems like relation-based, there are public sites for group up and share topic to the group page. Members can also vote or upload pictures to SNS. In this study, the whole SNS was taken as a virtual community of practice (VCoP). It has groups of people who are interested in knowledge management and some of them even doing knowledge management jobs as a living. They all want to deepen their knowledge and expertise in knowledge management area.

This case VCoP was created for strategic purpose. It was for the overall mission of converging knowledge management ideas and people who interested in this field. The uncertainty and fuzziness sometimes emerged and become the challenge. There's no time frame for the VCoP, which means it is an on-going mechanism for information and knowledge sharing online. As a new VCoP, some of the difficult challenges have not been broken. For example, in the case VCoP, the common interests have not been well identified. On one hand, some of the members do not quite understand the exactly meaning for the knowledge management; on the other hand, there are too many sub-topics for knowledge management, and the VCoP has not clarify the specific common interests for themselves. The technology for this VCoP is SNS structure, but it is still doubtful if it is better than a forum, base on the efficiency of sharing and discussing. Although this VCoP belongs to the AAA center company, which is a knowledge management consulting company, but the company has not spent any effort to develop norms and process for the discussion. In the 5 stages of community development (Wenger et al., 2002, p.69), the case VCoP is between the first and the second stage. It is officially launched, and activities are starting, but, as I said above, some of the challenges, like common interests, are still unsolved. Some of these challenges become the barrier of knowledge creation process, and will be analysis in the case study part.

The VCoP is intentionally created by the company, but all the members are spontaneously joined. It means as long as member's interest is there, the sustaining of members is not a challenge for great effort (Schwen & Hara 2003). Members of this VCoP come from very different backgrounds. Boundary crossing high may lead to the inadequate level of trust (Wenger et al., 2002). There's no leader but topic creator in this SNS, everyone else is almost equal. Register number is 1016, according to the record of SNS. However, only very few member are active on the discussion and sharing. There is no core group or the active members are temporarily core group in this VCoP. Around 95% of members are inactive peripheral participants.

Almost all the members are in China, only several are overseas. They are no one but Chinese, who speak the same language. There are occasionally face-to-face meetings. The characteristics of

open selection process make the lurkers in this VCoP learn knowledge, which are useful in the long run. These voluntary members are more motivated than conscripted members (Deloitte Research 2001; Michell 2002). Between most of the members, there were no prior existing networks. It is hard to find out how fluid of the membership. There are always new members joining in, but I do not know if the senior members leave the VCoP. As a virtual community of practice, it is highly depend on information communication technology (ICT), but SNS is very user friendly, and is not hard to be used by members.

Culture diversity is low in this Chinese VCoP, but because of the different background of members, organizational culture and professional culture are heterogeneous. Culture defines what knowledge is, what is worth managing and who should possess it (De Long & Fahey 2000). People tend to interpret information based on own culture filters, and have different understanding of common interest.

The topic is reluctant to relevance. Sometimes, it is the barrier for the engagement and developing commitment in this VCoP. This VCoP is highly depending on ICT. However, it is widely accepted that ICT will never be a perfect substitute for face-to-face encounters and meetings (Deloitte Research 2001). The case VCoP is just like Cramton (2001) said, it is problematic and struggling to establish identity and common purpose, as newly established. For now, there are only limited methods to share and discuss in this VCoP. Rich Media (Daft, Lengel & Trevino 1987) sharing method is still not available, except pictures.

4. FINDING ANALYSIS

In this section, I will present the eleven factors I found, which will influence the knowledge creation in community of practice. There will be analysis between the quotes from the interviewees. And many theories and previous studies either from literature review part or from other researches will be cited to support naming these terms and categorizing my findings.

4.1.Domain

As a young VCoP, domain is one of several difficulties during the early stage of development. One member shared his worry about the barriers for sharing (externalization) and discussing (combination), concerning domain of the community.

I think the well defined domain is very important for our community. Because, as you know, for now, our topics and discussions are very superficial. It will be better with some experts and proper domain.

There were many unrelated and superficial topics and articles shared all over the case community, because some members thought it was also knowledge management related. Wenger (2002) gave a good explanation for this, when he talked about what is domain: the well-defined domain legitimizes the purpose and value of the community to the members. In that, members know the boundaries, and able to decide what is worth sharing, how to present ideas and which activities to pursue. The difficulty from domain starts from the very beginning, when member join the community.

When I, as a new member, joined this VCoP, I had to choose his interested topics from a list, which contains many unrelated chats.

I chose topics like, KM practice and KM thesis. For me, the chat topics are not my options.

And this annoying problem continues during their discussions in the community.

For now, some of the members shared topics that is not quite about knowledge management, I think...however, you cannot ban them from speaking...some take this as a knowledge forum, but other take this as a chat place...it is quite strange, because the initiative of this community was very good, but failed to collect good knowledge.

It is the common idea that these members, who share chats, are not intends to create chaos and frustration in community, but they have misinterpreted community domain. In that, the more enthusiasm these members have, the worse sharing and discussing it become.

When I tried to find out what will be the foremost issue to do, if the interviewee in charge of the community and make it better, the answer directly pointed to the value of the community, which has to be defined by a clear domain.

It is a big question... I will build up the value of community, and let members know the direction of the future. Because many member has no idea what should do in this community.

One interviewee has the experience of sharing some “un-relevant contents” in the community. When he answered the question about how did he choose what to share in the community, he showed full understanding that sharing should all about theme or domain of the community. But he did not show consistence of what exactly the domain is, in this case. It also indicates the member’s misunderstanding of “whatever not prohibited by domain are all allowed”.

Communities have their domain. Our community is about knowledge. So the un-relevant content will diverse the focus of the community...for now it is chaotic, for example, I un-intentionally share some books. There was no one came and delete it. But if it becomes too many in the community, it will become a negative effect.

In this community, domain is not only effecting the sharing (externalization), but also the discussing (combination) process. Interviewees shared their idea about how critical this problem is, and will be.

Topics sometimes have too much variety. The community is spontaneous, and lack of well management and own vision (domain)...our management aim is not clear and lack of efficient tools. If the vision is just like what it is now, the community will become slack.

According to our study, domain in this VCoP was rather a self emerged than pre-settled. This obviously led to the high diversity of motivations and activities in the CoP. It will increase the distraction and frustration of other users, during their sharing (externalization) and discussing (combination). As Wenger (2002: 28) said, this VCoP also lose the chance to recognize the potential or half-baked ideas about knowledge management.

4.2.Coordinator

Community coordinator, who helps the community focus on its domain, maintain relationships, and develop its practice, failed to perform full functions in case VCoP. When a good topic rose to the VCoP, it requires coordinators to organize and manage members getting involved throughout the discussion and create new knowledge. However, members describe the real happening in the community like this:

Once there's a good topic, the coordinator did not come out supervise and encourage the process of discussion. We paid a lot of attentions (to the topic), but it eventually became fruitless.

For the face-to-face meeting in real life, there's a coordinator in there. But for our online community, that was missing.

One member described his feeling like this, when he talked about the frustration in the community discussion:

I think, for me, there was no specific well-developed discussion about topics. It is all small pieces of knowledge, and it is not an enjoyable and efficient process.

One interviewee thought what this VCoP doing was “external supervising”, which contained mainly functions like: recruit new members, pick valuable contents from posts, and maintain the online technical service. According to Wenger (2002) there’s more work for a coordinator to do: identify important domain issue, facilitate events, link members, foster members, manage the boundary, help build practice, and assess health of community. These were suggested as “internal supervising” by the member, which is missing for now.

I think there is “external” supervising. But the “internal” coordination to the discussion is also important. There’s no follow up for the discussion. I have to say, in this way, there are a lot of works to do for that, within the four knowledge conversions.

Members did not just complain about the coordination of this VCoP. They also presented their idea about what the coordinator should be like, and what they expected:

It is like a meeting, there should be a topic or theme list sent out to everyone for preparing in advance. Then, during the meeting, there should be a ‘host’ conducts the discussion. He could choose to silent to the topic, but he has to control the discussion from diverging to unrelated issue. Thirdly, the discussion should be more than superficial. We do not meet for meetings; we meet for the conclusion and solution. After the meeting, members should have their distributed work done, or have the meeting record. After that, the solutions should be reviewed. This whole process is corresponding to the knowledge conversion of knowledge creation process. It means for now, we do not have coordinator to facilitate the discussion project, and we do not have people responding review of the created knowledge.

Coordinating is not as easy as it seems to be. Some interviewees expressed his support and concern about the coordinator in this community:

I think it (emphasis coordinator functions) is very hard. It could be better if we have someone especially in charge of it. But I have not thought through it carefully...even if we have the nominated coordinator, there are always members who would not get influenced from the coordinators. (Because) It would positively encourage the active member. But not for the inactive members, who do not use community often. It does not have much meaning, then. As long as the atmosphere of the community is inactive, the coordinators could not save us from there.

I think it is a good idea to have someone (coordinator) in charge of this whole thing. But this one may not come from our community members. Because we are all busy with work, and community is submit to it. But it will be feasible to have the AAA center company hiring a person to engage and in charge of topic discussions.

On the other hand, interviewees also shared their idea that coordinator is not the only and “work for all” solution for the community.

I think it (emphasis works of coordinator) should become relatively positive for the community... but the effect will be limited by the practical problem...for example, for the inactive members...there was coordinator who pick the best contents and republish on the front-page of website, but I am not sure if it is the real good knowledge. It has to be checked out.

In the process of discussion (combination), the coordinator should plan and facilitate the whole activity. There should be enough supervise, adjustment and encouragement come from the coordinator. But in this case, not well-functioning coordinators directly decrease the morality of members, and lead the discussion to a failure.

4.3.Core group

On one hand, the full function of coordinator is missing, and it becomes a strong negative effect on the efficient knowledge discussion process. On the other hand, there is another similar factor influence the knowledge creation process in case VCoP. The core group, which Wenger (2002) called auxiliaries to the community coordinator, came to the spot light, when the interview came to the real factor that cause the low level active in the community. As the heart of the community (Wenger 2002), members of core group should actively participate in discussions, identify topics, take on projects, and move the community along learning agenda.

...so, there must be a core group. Then the discussion of the topic could be insight and professional. Within our register group, we have the human resource to build up expert and active core group. We could give a try. But for now, there is no evidence of that happening...by using software evaluation system, and authority distribution rules, this (build up the core group) could be achieved.

Members participate in community for different reasons: some for the personal relationships, and the others for the opportunity to improve their work skills. So we cannot encourage all community members to participate equally.

According to Wenger (2002), there are three degrees of community participations: core group, active group, peripheral participants. Like it is said, the core group does not just actively participate in discussion, but also have function of constructing value of the community.

4.4. Professional level

All most every interviewee mentioned about their disappointment of the professional skill of the repliers to their topics. According to their words, most of the community members lack of sufficient knowledge about KM (which is the general theme of the whole community).

I think it may be related to the under-level of members. They may not know much about this topic, but they insist to talk about it. It is nothing wrong with it. But it could be a reason for the futile of discussion.

It is a very important point for our discussion. If they do not have (sufficient) idea about the topic, how could they talk about it? I think (sufficient) background knowledge is, at least, part of their motivations and stands. Without it, it is just feeling of likeness. They cannot participate in the discussion. If they are just peripherals, it is fine. But if we define them as interacting members, who really get involved, what they did were far from enough. The best way and only way we have to participate this community, is by getting involved in a good discussion.

I think the main problems is that, although we are all interested in the topic, but most of us lack the wholly and solid knowledge system of it. The topics we have were not systematical, and typical. For example, the case is incomplete and hard (to generate new knowledge).

On the other hand, it became challenging to have a good topic to discuss. Because that an interesting topic or case requires professional knowledge to generate and discuss.

I think it is very hard to raise a good topic. A good topic should evoke other members to join the discussion. I think half of the fruitless questions are not interesting.

Because that I am not an expert in this field. People can see professional level from the questions they raised for discussions. I did not share many good topics, and I feel insufficient background about this. Then, it is very seldom to use community knowledge in daily work.

For example, some of the members shared the definitions of this topic, but the content is limited to only part of the term. It was not the correct concept of the whole picture. I think they lack the basic idea of this theme (which is the base of discussion)...many of their words are amateur...as a professional KM community, it is quite under level and unacceptable.

4.5.Culture

VCoP are often across cultures, because members are usually from different backgrounds. Wenger (2002) mentioned several factors about culture: national culture, organizational and professional cultures, language. People from different culture have different value and pattern of thinking. It may cause misinterpretation, and become barrier in the knowledge creation process. In Chinese tradition, people used to have a culture to conserve know-how within them. An interviewee g shared his idea about it:

The five thousand years tradition had huge influence on the knowledge transfer. The old say “rather teaches your son than teaches your daughter (because she will marry and belong to a man from other family)”, “once your apprentice learnt your skill, it is time for you to starve to death”. It is reasonable to have the idea of preserve knowledge only for yourself, in Chinese high competition society. But it negatively influenced the knowledge sharing and creating between Chinese people.

Some Chinese culture came from the recent historical experience, and became barriers for members to share their own knowledge.

Culture effect, especially from the society and experience, exists (in the knowledge creation process). For example, in China, we have more freedom of speech than 50s or 70s. But people still have the concern of the possibility that the freedom may be taken by “big brother”. So there are some prudent persons who shared none of their real information online. They are

nobody on line. That is the result of Chinese history. It may not be an issue for western people, but for Chinese, it could be a hamper in the way of their life.

4.6.Mianzi

In our case, national culture is related to Chinese concerns like “mianzi” (gain face or lose face).

For me, it is challenging to point at other one’s mistake in community. We Chinese take “mianzi” as a very important issue when we interact with each other...it may not be his intention to make that mistake, so I will mention that in a much more indirectly way later.

Criticize ideas are usually valuable. But there was a disadvantage about “real-name” registration. People would not directly point out other one’s mistake, because of “mianzi” from both sides. My idea is that there could be a choice for members to post their ideas anonymously. So it will avoid the concern of losing face when try to express their suggestions. No matter during sharing or discussing, “mianzi” was always a personal concern.

As long as members do not reply directly to the topic because of “mianzi”, there were less and less discussions. The whole community would shrink to low amount of interactions. The issue becomes critical when there are experts who do not want to share knowledge only because of “mianzi”.

There was no reply to exactly my idea. People were just talking their own thoughts, which were often distractions from the topic. Maybe everyone is afraid to judge other people’s idea (it could become personal). They may know my flaw of the knowledge, but they save the suggestion for “mianzi” of both sides.

“Mianzi” was not as easy as a removable barrier. One failure example indicated that, if members were not concerning “mianzi”, the personal conflict is more likely to happen in the community.

There was once the discussion become directly personal. A member doubted my idea, and I gave a clear response. Then he also directly pointed to my idea. Not long after that, the discussion became personal and fruitless. None of us get “mianzi” from it.

4.7. Trust

Trust is widely accepted as an important enabler of knowledge management process. In this case, we focus on interpersonal trust, which means the establishing, maintaining and evaluating the trustworthiness of partners so as to exchange important resources, reduce risks, and facilitate future cooperation. It reflects the willingness of one or more parties to devote themselves to others (Mei-lien & Fang-chuan 2008).

Trust is very important and real-name registration increases trust...I think our members who do not know each other in real-life, are easier to trust each other...but there was a limit for the trust. Even between best friends, there's no 100% trust.

Some of the interviewees share their ideas about why they do not think trust is so important in this case. However, if I put their words in the context of our community, we can understand that our community is quite premature, and there were limited utilizations of created knowledge. So the trust is not a huge necessity for now. But the requirement of trust will increase, when our community becomes professional and mature.

I think it is nothing much about trust. It is just an online community, which does not require a lot of trust. Members could just speak out their ideas. There is no need for other members to trust me, before discuss or accept my idea.

In this case community, trust was initially built on the professional backgrounds of the members.

In our community, there was no obvious necessity for trust. If they are professional in this field, I will trust them more. We have many experts in our community, so I can offer my trust to the community.

For the topic of our community, you have to have some professional background for participating. Without background, no one will believe him. If he is a professional, the topic will be insightful and the discussion will be deeper. For example, the speaker is CIO. On the contrary, in forum, it is lack of trust, without background information.

4.8.Language

In the case VCoP, all the members speak Chinese. The language barrier is mainly about the originally shared knowledge, which was in English. People have different ideas about this. Base on sufficient personal language skills, several members believed English content should be shared, because it is likely to be cutting edge knowledge, and new thoughts for Chinese communities.

It is necessary to have new knowledge shared in our community, as the English content is a must. Quotation of English articles is very useful, and should have specific member in charge of it. I do not have much problem with English.

But some other people do not favor English articles shared in the community. Only in ideal situation, that everyone Chinese can read English and understand precise idea about the article. It increases the difficulty for sharing knowledge, which is inherently hard for sharing by words. As well as that, this language barrier will further decrease the activity of the community.

If the knowledge is shared in English, there were seldom replies to it. I suppose the readers had limited language capability. And I do not want to be considered as “show off” my language skills. If I used English to publish my idea, it means the readers are limited to several specific members. Why not satisfy everyone at one time?

4.9.Geographical barrier

In this empirical study, I did not identify geographical distance as a negative effect on the whole process.

There is no difficulty from geographical distance.

No, it was no (discussing process) problem about geographical distance for this internet community. The only issue is you have to get online and be available (which is the issue of work time and time zone).

But this is not the whole issue. I think there are at least two related things to concern, when study the geographical barriers in VCoP. One is the disadvantage of VCoP, comparing with face-to-face meeting;

It will be much better to have an off-line case meeting. Members get together, and have tea. I think it will have deeper conversation and build up relatively good relationship. Obviously, there is much more achievements from one hour face-to-face talk, than one day online community event. Right or wrong, it is my personal idea...so geographical distance has influence on both building relationship and creating knowledge.

The other related factor is the specific situation of this case community.

It (most of the members do not feel geographical distance hamper in knowledge discussions) is also because the discussions themselves are very superficial, and have not gone deep enough. Members lack the demand for further discussion, so they felt virtual internet community is well "enough" (to carry necessary conversations). However, I think, if we go any further, it (geographical distance related problem) will be a great influence...I think, once we have strong interest on it and have enough financial support, we could take cars or planes and meet each other face to face. The "annual knowledge management conference" is a good idea. My point is that it depends on whether we can make this good thing (knowledge management study) work well.

When I put all these aspects together, it is not hard to find out that geographical distance is a critical issue. It becomes more important, as long as the VCoP developed more mature. In the case VCoP, it is still quite premature to have strong feeling about geographical distance issue yet.

4.10. ICT

During the interview, I found some complains about the community lacking of authorizing to members because of ICT technical function missing.

There are facilitators in forums. They highlight the valuable posts. By doing this kind management work, they take the authority and responsibility in the forum. On contrary, in our community, there are no authorities like that. Even if you are the one who initiate the

discussion, you do not have the authority of managing the discussion at all. In our SNS system, there are no authorities like that. As a discussion initiator, we should have the management authority to high light the valuable knowledge in the discussion, adjust, change, and move the responses. We should be able to invite specific member to join certain topic. Then, we all get into deeper discussion about the topic.

Personally, I think it is not just a temporary function missing for this community; it is flaw of our community, since the first day we choose SNS as the main plat form of this case community. SNS, like Facebook, was born like a social relationship network, instead of knowledge creation platform.

Like I found about geographical barrier, face-to-face meeting has more complex expressions than the words online. At this moment, there are many limitations for members to share comprehensive knowledge by the most suitable way.

I think no matter what kind of conversations, there are only two main ways: one is (rich media) word; the other is fact to face. These are also easy and direct. Blogs, podcast, and even videos, have disadvantages on expression. At least it is not real-time. On contrary, in the face-to face conversation, people can receive your body language, influenced by your inspiration. There was once a theme meeting, which supposed to be very good, although I was too busy to participate. But if there is another chance, I will not miss it.

Another ICT drawback is about the poor-function of knowledge searching and categorizing:

This (ICT) is my biggest concern. I think one of the community functions is to restore the created knowledge. When we want to reuse it, we should have the search engine to approach the proper knowledge.

One of the big problems for my community sharing is technical incapacity. For example, I could only post words as plain text. There was no choice for video insert and rich text edit. Although I had very valuable knowledge to share, if I feel frustrated for two times on editing, I will give up. Another thing is knowledge categorizing and searching in the community. I found it very hard to get the right content with my key word searching. I think it is very important to have it for members to reuse the created knowledge.

In this VCoP, the platform and structure are quite depending on the ICT technology. During the interview, I found requirement of efficient knowledge conversion platform; the limitation of available ICT functions. According to the words from interviewees, this even cause the frustration of users.

4.11. Motivation

In this case VCoP, there are three motivations: motivation to join; motivation to share knowledge; and motivation to discuss. For the motivation to join, they said:

I join the community because I am interest in the discussion topic.

Because my thesis topic is the same one as in this community. I also would like to know my topic practicing in China (because I am a Chinese living abroad).

I would like to know more about Chinese KM researchers, and share ideas with them. I would like to propagate KM in China, and proved the original correct ideas to the Chinese community.

Interviewees had concerns about sharing and responding to the raised topic, when talked about the motivation to discuss in the community.

There was no obligation for readers to response to the topic, when they have ideas about. There must be a system to stimulate the motivation of participation. For example, in a forum, the coordinator had to take responsibility for motivating members.

If there was an interesting shred knowledge, which requires a lot of time and energy, I may not spend much time on it. I mean, it must be well organized, or I will not take this as a worth trying. For example, if there was a formal invitation or we have strong personal relationship.

It depends on the situation. If I am too busy at that time, I will put my own study as a priority, and give up the community activities.

According to pervious (Alexander et al. 2003) study, the willingness of members contributing their knowledge to VCoP came from two main streams. One is that they believe knowledge as a public good, which belongs to the whole organization than individual. McLure and Faraj (2000) had the idea that knowledge exchange is motivated by moral obligation and community interest. The other main stream is that the motivation is related to various self-based considerations. Members may felt like establishing themselves as experts; or they found themselves on a stage that it is time to give back to others. According to our case, if the member is motivated by public good and take case community as an entire one, they do not need much motivation from outside any more, for example, the response from the other members during the discussion. But if the motivation is from self-based consideration, it will be different. They are sensitive to the response from the other person.

I do not think that how much I contributed to the community should be equal to what I got from it. The community itself would also be my tool to accumulate my ideas. In this way, it does not matter what other members react to it. For the topic, of course, we need someone to join the discussion.

I think it is better for me to have what I contribute to the community equal to what I get from the community. As long as I have response from the readers, I would to spend more time and efforts. At least, it is for the good of my interested topic.

This is a good question for me. Because of my personality and my know-how on this field, I think it should be a pre-devote for the development of this community. It is quite depending on personal commitment. My motivation came from my feeling of responsibility. I am a supporter of KM, and I would like to have more and more Chinese companies know KM, and know my study. I feel the achievement when I share my idea to the Chinese (who did not have chance to study in foreign universities). I can also get some useful feedback from community, about practical suggestions.

In this case, it is also noticed that, sometimes, one member is not necessarily having only one motivation form either public good or self-based consideration. It could be a combination of from both motivations, which made the interview results superficially contrary to each other. But seeing from the other side, it just precisely reflects the complexity of two interactive motivations of VCoP.

It will relate to the activity level of the community. If it is a very active community, I will participate more and share more knowledge. If I could not see many new topics, or my topics were not replied, I would have to quit. All my meaning of joining the community would vanish, when nobody read or response my sharing.

I think if the community is very low on activity, it would be a very negative impact to me. One of my reason contributing in this community is establishing self-identity. As long as I am not identified by others, there will be no value for me participating in this community. So, if the community is very inactive like what we have now, all of us will leave eventually. It is an easy move for members to switch from this community to a more active one.

5. DISCUSSION AND CONCLUSION

In this section, the findings of the study will be discussed with conclusion of the whole study. Then the study limitations and suggestions for further studies will be provided.

5.1. Discussion of findings

The research question of this study is “how do internal factors affect knowledge creation process in community of practice”, and barriers were identified. In the theoretical part of this thesis, SECI model and community of practice was combined. The new model contains both parts of the characteristics of SECI knowledge creation and community of practice. Externalization and combination conversions were considered as the 2 process occurred within CoP. Internalization and socialization were taken as the processes happened within business process. According to this new SECI-CoP model, community of practice is valuable for the process of knowledge creation because the two valuable conversions (externalization, combination) happen within it, and any barriers hamper these two will be the obstetricals for the whole process of knowledge creation. In the empirical part, case community was interviewed, and eleven barriers were found out. In this case, although it was limited to CoP study, without business process part covered, these eleven barriers are considered as hampers to the whole process of knowledge creation. It means, to have CoP as a platform to cultivate companies’ knowledge creations, these barriers should been taken into considerations.

Locating the eleven barriers is very useful, because it helps to identify them and bridge them in the management practice (Figure 10). According to the evidences from the interview, several barriers have clear identified locations in the four knowledge conversions.

Domain was mentioned in the interview, both in sharing and discussing conversions. But it was mainly about externalization, because it legitimizes the purpose and value of a community. Coordinator's key function is mainly about making sure the discussion go smoothly and efficiently within community. In that, if coordinator did a terrible job, the consequence will mainly emerge in the discussing activities, which is the combination conversion. Core group has functions in both sharing and discussing, although in our case, it is only mentioned in the discussion process. Professional level is related to both sharing and discussing. For the former one, it is because professional level is the base of raising a good topic in community. For the later one, it is because, to have a valuable response to the topic, professional level is a must. Culture, especially historical Chinese culture, is mostly affecting sharing process, because people's concern about freedom of speech. In the process of discussing, members of the community have hesitations because of mianzi. So mianzi is the barrier in the combination conversion. Trust was not obvious in the case community. But according to the analysis in the empirical part, trust could be in the internalization, which is in business process. Language barrier is mainly about sharing. In the case community, if the sharing is in English instead of Chinese, there will be seldom responses. Geographical barrier was not clearly indicated about the location. ICT, as the fundamental support for the VCoP, is located all through the knowledge community of practice. Meanwhile, it could also have functions in business process. Motivation is a general topic from the beginning to the end of the knowledge creation.

Externalization <i>sharing</i>	Combination <i>discussing</i>	Internalization & Socialization
<ul style="list-style-type: none"> •Culture •Language 	<ul style="list-style-type: none"> •Coordinator •Mianzi 	<ul style="list-style-type: none"> •Trust
<ul style="list-style-type: none"> •Domain •Core group •Professional Level 		
<ul style="list-style-type: none"> •ICT 		

FIGURE 10: Locations of barriers in SECI model

These barriers could not only be sorted by locations of knowledge conversions, but also be linked by key words. And these key words revealed, barriers of these processes are more complicated than just concepts abstracted from the interviews. Evidences in this case shown that, these barriers are not isolated but related to each other, by causing the same phenomenon.

One phenomenon is “low activity” in the community during both the sharing and discussing. This phenomenon was mentioned again and again by all the interviewees. Causes of it could come from domain, coordinator, core group, professional level, culture, mianzi, trust, language and motivation. Within them, domain, coordinator, core group and professional level are all related to the key words “raise a good topic (question)”. Trust relates to real name registration and mianzi. So it becomes a centralized network connecting these barriers (Figure 11).

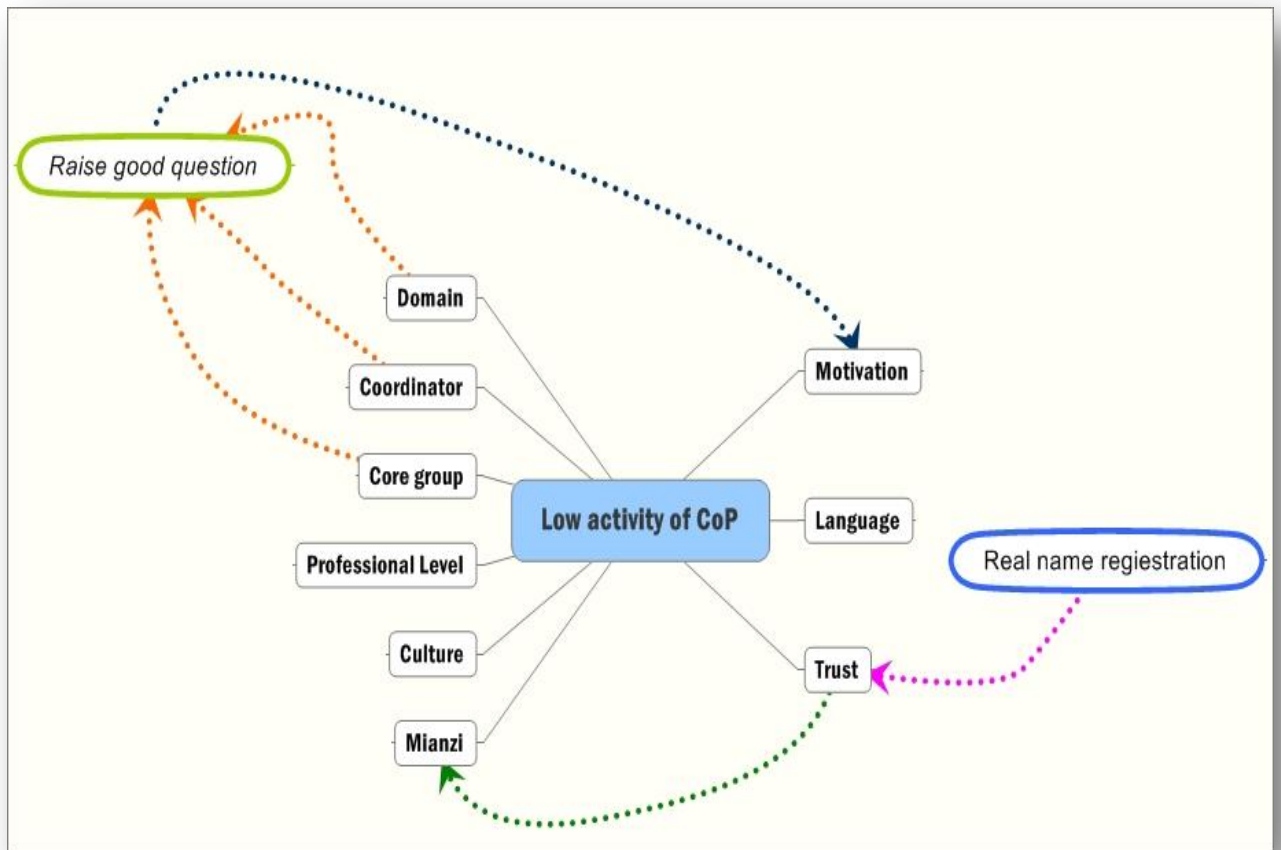


FIGURE 11: Barriers relate to low activity of CoP phenomenon

Another phenomenon is “(non-) face to face meeting”, which indicates the differences between online and offline conversations. Geographical barriers, trust, language, culture, mianzi and ICT are barriers related to it (Figure 12).

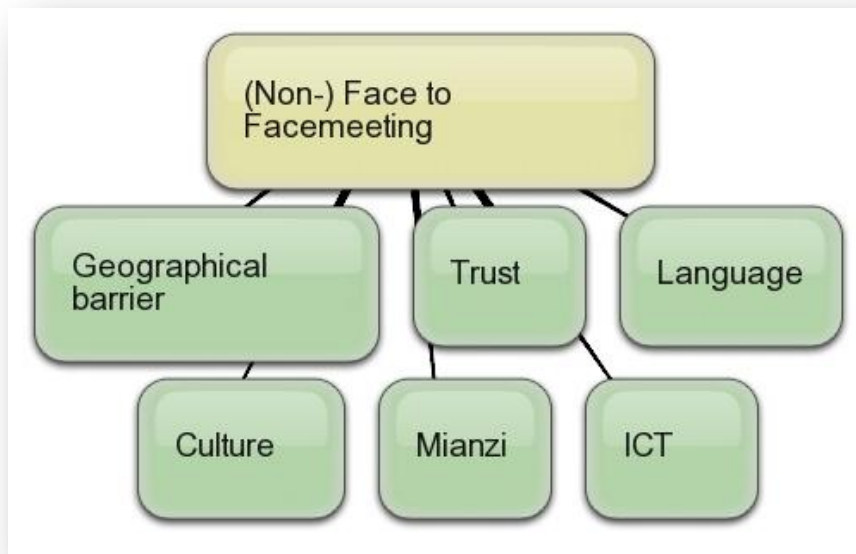


FIGURE 12: Barriers related to (Non-) face to face meeting phenomenon

In this study, I firstly break through the interview words barriers to abstract typical barriers of the conversions. So that in further studies, solutions could be generated from them. Then, I reconnect them back to the phenomenon, and take them as multiple causes, pointing to the same phenomenon. So that researchers could understand the relations and probably interactions between them.

5.2. Conclusions

In this study, SECI model from Nonaka (1995) was used in a new environment, which is a cross-companies public community of practice to study barriers in knowledge creation process. It is different from most of the previous studies, concerning knowledge conversion analysis.

Contributing to that, this study found two conversions (externalization and combination) in the CoP, which was a supplement to CoP profession Wenger's (2000, 2002, 2004) studies. This break-through provides the previous CoP study a new looking and promising future for further study on knowledge creation.

These barriers of conversions indentified in this study were not only from either Nonaka's SECI emerging environment or CoP barriers, but combining both with the case reality. "Professional level" for example, was not identified by previous studies as the significant barriers for knowledge creation. But according to my study, it was referred again and again by interviewees and should be paid more attentions.

It is a little bit surprise that in this study, "trust" was not identified as a critical barrier for knowledge conversions. Although many previous studies emphasized a lot on it, the indication depends much on the context. For some of the community, like the case CoP, trust is not the significant barrier at its early stage.

This study responded to some previous studies by Wenger (2002) about the critical factors on the early development stages of a community. For example, coordinator, core group, domain, they are all key words in Wenger's work (2002).

But it is still early to say CoP is a good solution for knowledge management, although many previous studies tried to assert this by providing many managerial tools about CoP (Ardichvili et al. 2006; Peile & Briner 2001). According to this study, there are many barriers for CoP knowledge creation, and it could be harder than creating knowledge in a business project group. At least that group has completely developed procedures to follow and better governance.

5.3.Limitations

First, in this study, I used non-standard method, which could not be necessarily generalized. Findings and results were limited to only this case community at the specific moment. It was predictable that as long as the community becomes mature, many of the answers from the interviewees would be different. In that, the conclusion will also change.

Second, there was possibility of misinterpretation in the empirical part. Although I randomly choose the typical members as interviewees for this study, it is possible to miss other aspects, which could be also critical for generating the conclusion. The sample size was limited to 4, which is due to the practical difficulty. But it this limitation could be a weak link of this study. The original interview was taken in Chinese by both sides. But the study was based on the translated English script. Although I know both of the language, but during the interpretation, it could be loses of details.

Third, this study is limited by the way that used to conduct the interview. Only by using phone, four interviewees answered all the questions without showing facial or body expressions. Chinese, as a high-context culture, could be easily misinterpreted without immediate receiving related atmosphere.

As a researcher, I doubted that if interviewees are telling the “truth”, because all I heard were their voices. It may lead to bias. Along with the study, it was not hard to find some of them had words contrary to each other. It could be a challenge to choose which one to take. Some of them are very tricky, when the meaning between the words came out of them, and it revealed the contrary. But there are still some words, which seems cannot be interpreted by the words themselves. In this study, it could become an endless work.

Fourth, the case community itself made limitations, as an exception of CoPs. This community quite often failed to match the questions from the semi-structured interview. In theoretical part, a

complete framework was built, including 4 knowledge conversions. However, our case community is a quite premature community, which failed to provide practical evidences of all four conversions. So this study is limited to mainly two conversions (externalization & combination) in the empirical study part.

5.4. Further study

Although it was mentioned in the case analysis that SNS (Social Network Service) might not be a suitable platform for knowledge creation, this research did not go to explore deeper explanation about it. Comparing with forum, which is content oriented, SNS emphasizes on relationship building. While relationship is a powerful factor of online communication, this comparison between SNS and forum will be interesting and valuable for ICT implementation practice research.

In this study, due to the case limitation, only 2 of the knowledge conversions are identified. One is externalization (sharing), the other is combination (discussing). Both of them occur within CoP. The other 2 conversions, which conducted in business process, were not identified. It leaved a promising study filed for later researchers. It could also be a study of the barriers in those processes.

In the theoretical part, SECI-CoP model was built up. But in this study, the research did not attempt to test if characteristics in SECI model are also in CoP. It could be a break through study to combine these two field's previous studies. More than that, future research could also be the test of putting CoP cultivating method into SECI, ves versa. As long as SECI-CoP model combined these two studies fields, they could supplement to each other as a whole.

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APPENDIX 1

Interview invitation

Thank you very much for taking this interview.

The aim of the interview is, to understand and analyze cross-organization knowledge creation process and effect factors, in “AAA center.org” SNS.

- Interview will be conducted by phone or internet-phone, and will last approximately 45 min
 - Interview content will be recorded by video and words anonymously. Participators will be taken as agreed to contribute their content to this research
 - Participators have rights to refuse answer questions
 - Interview content will be used only for this research, without any commercial usage
-

Interview questions

1. Briefly talk about how you use this community
 - a) Why did you join the community? For how long? How often do you use it? Main activities.
 - b) Character and function in this community
 - c) What’s the difference between how much you learnt and how much you shred?
2. How did you share your new idea in this community?
 - a) What kind of content do you usually share? Why?
 - b) How did you share? Do you need more than words to share?
 - c) What is the motivation for you to share?
 - d) What could be the reason if you decide to not share the knowledge? Do you worried about being look down before you ask questions?
 - e) Does the knowledge improved after sharing?
 - f) Did you give up sharing because of copyright problem?
 - g) How do you know other member could well understand your new idea, why?

3. How do you participate in the community discussion?
 - a) Why do you participate in specific topic? Does your professional help on this knowledge?
 - b) Do you follow some of the topics to the end, and make sure it is solved or answered?
 - c) Have you seen negative (destructive) discussions? Example. Why it become negative?
 - d) Have you participated in any discussion, responded by coordinators all through? How does that affect the efficiency of discussion?
 - e) What else do you think will affect the discussion?

4. Do you have any solutions that developed after the community discussion? Example
 - a) Have you ever tried to utilize the discussion result to the business process?
 - b) How did you deal with the contrary between community result and business process strategy?
 - c) What else affects you utilize community knowledge in business process?

5. Do you generate ideas and questions from business process?
 - a) What is the main source for your ideas and questions?
 - b) Could you clearly convey your idea to the other members in the SNS? What are the main problems?

6. How do you think “trust” as a factor in community discussion and sharing?

7. Do you have enough authorize to utilize community knowledge in business process? Example

8. In the daily work, do you have enough authorities to conduct the knowledge generated in community?

9. What is the difficulty for you to participate in the knowledge creation in the community? Externalization, combination, internalization, socialization. What is the missing part in our community?

10. Did you get motivation from the community itself?

 11. How do you think the communication between members, and how's the efficiency of knowledge sharing?

 12. How do you think if sharing information and sharing knowledge?

 13. How do you think the geographical distance effect the discussion?

 14. What do you think the difference between community and other form (work meeting, training group)?
 - a) What is the advantage of community? Is face-to-face meeting better for expressing and discussing?
 - b) What is the disadvantage of community discussion?
 - c) Example

 15. Which ones do you think will affect your knowledge creation process?
 - a) Language (English); academic degree; social background; relationship; culture (mianzi)

 16. What is your biggest benefit from community?

 17. What is the positive/negative effect from the community to your work (study)?

 18. What do you think the different role of members in the same community?
-

Background information: (omitted)

Tacit & Explicit knowledge:

Knowledge creation:

Community of Practice:

SECI model:

CoP-SECI model

According to Nonaka's research (1995) in the book "the knowledge creation company", knowledge creation in community of practice should also follow the four knowledge conversions. Comparing with previous studies, this research focus on the "double-knit" identities, including both "members" and "employees". The knowledge creation process will also go through every identity. In this research, several external effects are also analyzed. E.g. language, culture, and professions. In this exploratory, most of the interview questions are semi-open. In order to inspire interviewees provide more valuable research factors. This research provides a knowledge creation perspective to community of practice. It will also contribute to cultivation of knowledge creating community of practice.

APPENDIX 2

Interview invitation (Original Chinese)

非常感谢您能在百忙之中，抽出时间参与这次采访。

本次采访的目的，是根据“中国知识管理中心”实名社区成员们的描述，了解和研究跨组织知识创造的过程，以及影响因素。

- 采访将以电话和网络（电话）形式进行，时间为 4 5 分钟左右。
- 采访内容将会以匿名文字和录音的形式进行记录。参与者被视为同意将谈话内容用于此次研究。
- 参与者有权利拒绝回答问题。
- 研究结果将向参与者公布
- 调查内容仅限本次研究之用，排除一切其他商业用途。

社区：即“中国知识管理中心”(AAA center.org)的实名社区

1. 简要介绍一下你使用社区的情况

- a) 为什么参与社区？加入了多久？你使用社区的频率？主要参与的社区活动？
- b) 你认为社区对你，和你对社区的作用是？
- c) 你在社区中分享比较多，还是向他人学习比较多，是否有明显差别？

-
2. 当你有一个新想法或者疑问的时候，是如何把它分享到社区的？
- a) 你最经常分享的是什么类型的知识？为什么这个类型的知识分享的比较多？
 - b) 通过何种具体的方式分享？你是否觉得需要文字以外的其他形式和方法来分享你的知识？
 - c) 你个人分享的目的是什么？你如何判断自己的分项行为有没有达到真正的目的？
 - d) 如果你的新想法经过考虑，没有分享给大家，可能的原因是哪些？是否担心提问或分享会被别人看作能力不够的表现？
 - e) 你的新观点经过社区的分享，有没有发生改变？
 - f) 如果有过，请举一个具体的例子。
 - g) 你是否确定读者能够完全理解你的新想法？为什么？
3. 你是如何参加社区讨论的？
- a) 你为什么会对某些话题进行评论？你的专业背景是否对你有所帮助？
 - b) 你是否对某些参与评论的话题进行追踪？并确保问题解决或者得到满意答复？
 - c) 你是否见到消极（缺乏建设性）讨论？请举例。导致消极讨论的原因是什么？
 - d) 你是否参与过，由某个成员负责协调和监督整个过程的讨论？某各成员的全程跟踪，对话题的讨论有何影响？
 - e) 您觉得还有什么因素会对社区讨论产生积极/消极的影响？

-
4. 您是否有观点和疑问，经过在社区讨论后，有了更好的诠释和解决方案？请举例。
 - a) 你是否尝试过将社区讨论后的结论，带到实际工作中应用？
 - b) 你如何对待讨论的结果，和现实工作需要的差距？
 - c) 哪些因素影响你把社区的知识应用到工作中？
 5. 你是否从日常工作中，产生很多社区相关话题的疑问和新想法？
 - a) 你的想法和疑问主要来源是什么？
 - b) 你的想法是否能很有效地分享给社区其他成员？遇到的困难是什么？
 6. 你认为“信任”在你参加社区分享和讨论时，是否起着重要的作用？为什么？
 7. 你在日常工作中是否留意与社区讨论话题有关的内容的？举个例子。
 8. 你在日常工作中，是否有足够的权利，资源尝试社区讨论出的想法？
 9. 你认为自己在社区内参与知识创造过程的困难在哪里？分享，讨论，总结，应用，你觉得社区最应该做到而没做到得是什么？为什么？
 10. 你是否从社区本身得到了分享知识和讨论的动力？
 11. 你认为社区内成员的沟通如何？知识传播效果如何？
 12. 分享知识和分享信息
 13. 你认为社区成员的地理位置距离会对讨论有怎样的影响？

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14. 你认为社区讨论和其他方式（比如工作会议，培训讨论）的讨论有何区别？
- a) 社区讨论形式有什么优点？面对面交谈是否更有助于清楚表达和及时讨论？
 - b) 设却讨论形式有什么缺点？
 - c) 举例说明
15. 你认为以下哪些因素会影响你的知识创造过程,为什么？
- a) 语言(英文), 地理位置, 学历,社会背景差异,成员之间的关系,文化(面子问题)
16. 你参加社区最大的收获是什么？
17. 你认为参与社区活动对你的工作（学习）有何积极影响？是否有消极影响？
-

背景信息：

显性知识 (explicit knowledge)/隐性知识 (tacit knowledge): 根据知识能否清晰地表述和有效的转移，可以把知识分为显性知识和隐性知识。

知识创新 (Knowledge creation) : (组织内) 知识创新指的是，企业作为一个整体创造出新的知识，并通过组织关系传播开来，应用到产品，服务和系统中的一种能力。

实践社团 (Community of Practice): 是有着共同的关注点，同样的问题或者对同一话题感兴趣的一群人，通过在不断发展的基础上相互影响，从而加深在这一领域的知识和专业技术的特殊人群组织形态。

SECI 模型: 在企业创新活动的过程中隐性知识和显性知识二者之间互相作用、互相转化，知识转化的过程实际上就是知识创造的过程。知识转化有四种基本模式——潜移默化 (Socialization)、外部明示 (Extetalization)、汇总组合(Combination)和内部升华 (Internalization)，即著名的 SECI 模型

创新型实践社团模型 (CoP-SECI model): 组织内知识是通过 SECI 模型四个步骤，在实践社团和工作环境中共同完成的。

根据野中郁次郎 (Ikujiro Nonaka) 和竹内弘高 (Hirotaka Takeuchi) 在 1995 年合作的《创新求胜》 (《The Knowledge-Creating Company》) 一书中提出的知识创新模型，实践社团的创新过程，也应该遵照 SECI 模型的四个步骤。与以往研究的不同，这次的研究对象是具有“社团成员”和“企业雇员”双重身份，并且整个知识创造过程也将贯穿每一种身份。本次研究也同时关注，影响这一个知识创造过程的各种外部因素，比如语言，地理位置，文化和职业背景等等。作为探索性研究，采访部分将使用半开放式问答，启发参与者提供更多有价值的研究因素。本次研究提供了从知识创新角度，对实践社团的研究方向，并对如何培育知识创新型实践社团有一定的启发作用。