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**Exploring Knowledge Transfer and  
Knowledge Building  
at Offshore Technical Support Centers**

A thesis  
submitted in partial fulfillment  
of the requirements for the degree  
of  
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by

**Jihong Chen**

The University of Waikato

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# ABSTRACT

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This is an exploratory investigation into knowledge transfer and knowledge building processes observed at offshore Technical Support Centers (TSCs) in China. Utilizing a multiple case study approach, the study examines how knowledge was transferred from the US-based support center to the China-based offshore support center, and how individuals and the organization built and expanded knowledge in a dynamic changing business context. The field cases were three Technical Support Centers in China.

Three models were developed from the qualitative analysis of the field data to explain how knowledge is transferred and built in offshore TSCs. *The knowledge transfer type adoption model* identifies the relationships amongst the levels of knowledge (novice, advanced beginner, competency, and proficiency), the types of knowledge and the knowledge transfer approaches (structured transfer stages, unstructured copy, unstructured adaptation, and unstructured fusion). *The basic individual tacit knowledge building model* shows that tacit knowledge is acquired and built through two continuous knowledge building loops, an explicit learning loop and an implicit learning loop. *The organizational knowledge building model* demonstrates the interaction amongst knowledge flow, absorptive capacity, knowledge stock and knowledge intermediary in offshore knowledge transfer and building within the three levels (individual, group and organization levels) of the SECI spiral (*socialization, externalization, combination and internalization*).

The three models provide new insights into the knowledge transfer process for different levels of knowledge acquisition, individual tacit knowledge building processes and organizational knowledge building processes in an offshore outsourcing business context. By applying these models to appropriate field situations, both practitioners and academics may be able to gain a deeper understanding of knowledge transfer approaches, be able to better guide new

employees' expertise and confidence building through controlled and monitored experiential learning process, and be able to improve understanding of how knowledge is built and evolves within organizations.

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# **CHAPTER 1 INTRODUCTION**

---

This chapter introduces this thesis by addressing the background and motivation for conducting the research and the outline of how this thesis will be presented in the other chapters.

## **1.1 RESEARCH BACKGROUND**

The transfer of knowledge across organizations is a multifaceted and dynamic process which encompasses the more overt structured knowledge transfer between organizations as well as the more difficult to observe but equally crucial absorption of tacit knowledge in the unstructured knowledge transfer between individuals, groups and organizations. Transforming and utilizing the knowledge acquired from the knowledge transfer process flexibly is difficult to achieve, and building up new knowledge to adapt to environmental changes is even more difficult. Over the past decades, a number of research studies on knowledge management have highlighted that the transferring and building (or creating) of new organizational knowledge is becoming one of the most significant strategic inputs for sustainable competitive advantage of an organization (Argote & Ingram, 2000; Grant, 1996a; Johannessen & Olsen, 2003). Successful knowledge transfer and knowledge building can increase organizational dynamic capability and create value (Zander & Kogut, 1995).

However, the process of transfer and building organizational knowledge is a complex phenomenon in practice. It is quite difficult to achieve successfully (Easterby-Smith, Lyles, & Tsang, 2008) because of the tacitness of knowledge, causal ambiguity, specificity, humanistic and dynamic nature. Tacitness refers to the difficulty of communicating and sharing knowledge, because it is highly personal and deeply rooted in action (Nonaka, 1994). Knowledge has the characteristic of causal

ambiguity, because there is a lack of understanding of the logical linkages between actions and outcomes, inputs and outputs, and causes and effects that are related to technological or process know-how (Simonin, 1999a). Knowledge is context-specific, dependent on a particular time and space (Hayek, 1945), so it has to be into a context before it becomes knowledge (Nonaka, Toyama, & Komo, 2000). Knowledge has a humanistic characteristic as it is essentially related to human action (Nonaka, Toyama, & Komo, 2000). Knowledge also has a dynamic nature as it is active, moving and changing, because knowledge is created through the interactions amongst individuals or between individuals and their environment (Nonaka, Toyama, & Komo, 2000). In addition, it is difficult to achieve successfully because many factors (such as the relationships between knowledge provider and knowledge recipient, knowledge transfer mechanisms and the recipient's absorptive capacity) affect the knowledge transfer and knowledge building processes.

Knowledge transfer and knowledge building are two different processes. The knowledge transfer process focuses on transferring a specific type of knowledge from one unit (e.g., group, department, or division) to another (or all other) part(s) of the organization (Argote & Ingram, 2000; Rogers, 1983). The knowledge building process concentrates on absorbing particular knowledge from external source; then utilizing it and turning it into belief system. However, there is some connection between knowledge transfer and knowledge building. Davenport (2000) suggests that knowledge transfer involves two actions: transmission and absorption. The knowledge transfer is the start point of knowledge building. When the knowledge absorption action takes place, the knowledge building process begins. Knowledge recipients then need to apply the new knowledge to real-world problems in their daily work, so that new knowledge can become part of their belief system.

In terms of knowledge building, this study will focus on individual and organizational knowledge building. Individual knowledge building differs from organizational knowledge building. Individual knowledge building involves the

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building of the meaning perspective (i.e., assumptions, frameworks and routines) of the individuals. Individual knowledge building is an internal knowledge building process. Organizational knowledge building is a continuous knowledge construction and improvement process for adapting to changes in the organizational environment. Organizational knowledge building is based on the notion that is the organization as an entity. It is thus collective knowledge building, but not just a sum of the knowledge of its members. It focuses on how individual knowledge building links to group and organizational knowledge building. The relationship between individual knowledge building and organizational knowledge building is feed forward and feedback processes (Crossan, Lane, & White, 1999), in which individuals build up their knowledge, the knowledge is then transferred to the organizational level and becomes embedded in organization systems, processes, structures, rules and routines, which will guide the actions and learning of organizational members, and in turn influence individual knowledge building.

This study aims to explore the knowledge transfer process, the individual and organizational knowledge building processes, and the interaction between knowledge transfer and knowledge building in offshore outsourcing.

## **1.2 CHALLENGES IN KNOWLEDGE TRANSFER AND BUILDING PROCESSES**

There are three main challenges for an organization when transferring and building organizational knowledge in practice.

The first challenge is caused by the fact that if knowledge has been created locally it might not be built in a similar way when an offshore service context replaces the domestic context. Many scholars emphasize that knowledge is embedded in individuals, in the rules, routines, structures and technologies of the transferring

organization (Lam, 2000; Lucas, 2006; Nonaka, 1994; Simonin, 1999a; Szulanski, 1995), and in the interactions of people, tools, and tasks (Argote & Ingram, 2000) within its originating context. As the original context cannot be replicated (Lucas, 2006), it is difficult to transfer knowledge that has been created in a particular context to a different context effectively due to the “stickiness” of the knowledge characteristics (Szulanski, 1996). The first research question is therefore *how is knowledge successfully and effectively transferred across organizations?*

The second challenge relates to building organization members’ individual tacit knowledge after knowledge being transferred. The knowledge building process is a complicated and time-consuming process. Tacit knowledge building generally requires extensive personal contact (Davenport & Prusak, 2000) and extensive socialization. Tacit knowledge is built through experiential learning and practical action (Eraut, 2004; Kolb, 1984; Lewin, 1951; Tsoukas, 2003). Once knowledge comes into an organization from external source, the knowledge user or recipient needs to rely on their absorptive capacity to understand, absorb and internalize the knowledge (Cohen & Levinthal, 1990; Zahra & George, 2002) so that the knowledge can be utilized and applied (Easterby-Smith, Lyles, & Tsang, 2008). In this process, individual could experience some frustrations and difficulties in finding out how the new knowledge relates to something they have already got in their brain, to construct a big framework, dealing with the conflict between old knowledge and new knowledge, and transforming old knowledge into new knowledge. The second research question is therefore *how do individuals build up their tacit knowledge in workplace after explicit knowledge is transferred from external sources?*

The third challenge is associated with building organizational knowledge in a dynamic environment. It is important that organizations have the ability to learn from others and build up their organizational knowledge so they can respond to changes in the environment. After knowledge is transferred from external sources, there must be a continuous process of new knowledge acquisition and updating in

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order to keep abreast with technology innovation, and to respond to new problems as they arise continuously. However, organizational knowledge building is based on individual knowledge building (Kim, 1993), issue is how individual knowledge building links to organizational knowledge building, and at the same time, how organizational knowledge influences individual knowledge building. The third research question is *how do organizations build up their organizational knowledge after knowledge has been transferred from external sources?*

### **1.3 RESEARCH MOTIVATION**

The above three research questions are important for understanding knowledge transfer and knowledge building in organizations. This study will explore these three research questions in offshore organizations. Offshore outsourcing is defined as “performing work for customers in one country using workers located in a different country” (Froehle & Metters, 2004, p. 4). Three reasons motivate me to conduct this research in the offshore organization.

Firstly, offshore outsourcing has grown dramatically in recent years, driven by low offshore labor costs, increasing English language skills in those offshore countries, and internal demand. “According to Forrester Research, at least 3.3 million white-collar jobs and 136 billion dollars worth of salaries will leave the USA and go to other low-cost labor countries by 2015. 14% of these 3.3 million will be related to IS work” (Palvia, 2003). Datamonitor Research concluded in 2006 found that the number of contact center agents based in the Asia Pacific region would continue to grow throughout the following five years (Datamonitor, 2006). Conducting research in the offshore context would be helpful for offshore practitioners to understand knowledge transfer and knowledge building processes, and thus enable them to achieve the expected benefits from offshore outsourcing.

Secondly, success in knowledge transfer and knowledge building in offshore outsourcing is not easy to achieve. Gartner Inc (2005) predicted that through to 2007, 80% of organizations that outsource customer service and support centers with the primary goal of reducing cost will fail. Carmel and Beulen (2005) argue that unsuccessful knowledge transfer is one of the principal reasons for failures in the first few years of offshore outsourcing. Easterby-Smith, Lyles and Tsang (2008) point out that the complexity and difficulty in transferring knowledge between organizations is caused by the multifaceted nature of the boundaries, cultures and processes involved. Therefore, offshore knowledge transfer and building suffer even more difficulties in the knowledge transfer process than that knowledge transfer occurring within an organization. The intricate context in the offshore organization could provide contextual richness of knowledge transfer and knowledge building to identify how such knowledge transfer and building take place, and how the factors affecting the knowledge transfer and building processes.

Thirdly, there is a significant amount of published studies on knowledge transfer within and across organizations, and some studies have focused on knowledge transfer in cross-cultural business contexts (Holden, 2002; Hong, Easterby-Smith, & Snell, 2006; Pauleen, Wu, & Sally, 2007). However, relatively a few studies have paid attention to the structured and unstructured knowledge transfer in offshore outsourcing business context, and a little research has focused on the process of knowledge building. In addition, although some studies have examined knowledge learning and tacit knowledge acquisition processes, a lack of substantive literature on the individual knowledge building process is evident. Moreover, little research has explored how organizational knowledge can be built and developed in a dynamic changing business context, and what processes are employed to build up organizational knowledge. As well as this, prior studies have rarely investigated knowledge transfer and knowledge building together, and little research has identified the interactions between knowledge transfer and knowledge building in offshore organizations.

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In order to achieve success in offshore outsourcing, it is critical to identify successful knowledge transfer and knowledge building processes, and to discover the factors affecting these processes. This research will be useful for both onshore and offshore Technical Support Center (TSC) managers to help them transfer knowledge, acquire knowledge and build knowledge more effectively and successfully. This research would also be valuable for individual Technical Support Engineers (TSEs) by helping them understand the issues surrounding knowledge building, and therefore shortening their lead time to become qualified offshore TSEs. This significant importance motivates me to conduct the research in this field.

## 1.4 GLOSSARY OF MAJOR TERMS

To help reader follow this thesis more easily, this section provides the definitions some major terms used in this thesis: tacit knowledge and explicit knowledge, knowledge building and knowledge transfer, individual knowledge building and organizational knowledge building, stickiness and absorptive capacity, implicit learning and explicit learning, mental model and shared mental model, meaning perspective and meaning scheme, and knowledge intermediary.

### *Tacit knowledge and explicit knowledge*

The explicit versus tacit dimension is concerned with how well the knowledge is articulated or whether it is implicit (Bhagat, Kedia, Harveston, & Triandis, 2002). Nonaka (1994) affirms that explicit knowledge can be articulated in words and numbers and can be shared in the form of data, scientific formulae and specifications. This kind of knowledge can be codified, transferred easily and is free of context. In contrast, tacit knowledge is difficult to communicate and articulate, is highly personal and hard to formalize, and therefore is difficult to share with others. Tacit knowledge is acquired by the accumulation of practical skills or experiences that allow one to do something efficiently. It is deeply rooted in an individuals'

cognitive processes and/or ingrained in the routine and non-routine processes of an organization's unique culture and values (Daft & Lengel, 1986).

*Knowledge building and knowledge transfer*

Knowledge transfer refers to the process of transferring a specific type of knowledge from one unit (e.g., group, department, or division) to another (or all other) part(s) of the organization in order to bring a new idea, experience, practice or technology to that unit (Argote & Ingram, 2000; Rogers, 1983).

Knowledge building, the term created by Bereiter and Scardamalia, is a process of creating new cognitive artifacts through interactive questioning, dialogue and continuous self-transcending (Bereiter & Scardamalia, 2003) and used widely in educational contexts. In a practical context, this study has defined knowledge building as a dynamic of continual knowledge construction and improvement processes. In this process, individuals need to absorb pre-existing knowledge, apply the knowledge to real-world problems in their daily work, so that knowledge can become part of their belief system.

There are some differences between knowledge transfer and knowledge building. Knowledge transfer covers a process which involves five key elements: knowledge provider, knowledge recipient, knowledge types, knowledge transfer mechanisms and knowledge transfer context. It involves the relationships among the five key elements of the knowledge transfer process, and the selection strategies for the knowledge transfer approaches and knowledge provider. In contrast, knowledge building is more focused on the knowledge recipient, and covers a set of internal knowledge learning and constructing processes that include knowledge acquisition, knowledge assimilation, knowledge verification, knowledge refinement and modification and knowledge recreation. It aims at individual behavior changes and performance improvement.

*Individual knowledge building and organizational knowledge building*

Individual knowledge building involves initial knowledge creation, trial, verification, modification, transformation and re-creation in the individual's practice.

Organizational knowledge building involves a continuous knowledge constructing and improvement process, in which organization members continually create and improve knowledge to adapt to changes in the organizational environment. Organizational knowledge building provides value to organization through transforming individuals' experience into shared knowledge that can be accessed and used to achieve its core competitive advantage. It focuses on how the individual knowledge building links to group and organizational knowledge building, how the knowledge flows in and out of the three levels (i.e., individual level, group level and organization level) of knowledge building, and how the knowledge assets are built in the organization.

*Stickiness and absorptive capacity*

Holden (2002) and Szulanski (1996) define stickiness as the difficulty of transferring knowledge or codifying knowledge, and articulating it into words and numbers, that enables knowledge to be shared in the form of data, scientific formulae and specifications.

Absorptive capacity is an ability to acquire and assimilate new knowledge based on prior knowledge which could include basic skills, previous experiences or even a shared language (Cohen & Levinthal, 1990).

*Explicit learning & implicit learning*

"Explicit" learning refers to the learning progresses with the subject's awareness of what is being learned, such as classroom training (Hayes & Broadbent, 1988).

“Implicit” learning refers to the learning takes place without the learner's awareness that he or she is learning (Hayes & Broadbent, 1988). The knowledge acquired during implicit learning is tacit knowledge, which is deeply rooted in action, such as experiential learning, knowledge acquired in one’s daily work.

#### *Meaning Schemes and Meaning Perspective*

“Meaning schemes are the specific beliefs, attitudes, and emotional reactions articulated by an interpretation (Mezirow, 1991, p. 44).” Meaning schemes translate our general expectation into specific ones that guide our actions. Meaning scheme direct us to how to do something, or how to understand what others mean, or how to understand oneself (Mezirow, 1991).

Meaning perspectives are groups of related meaning schemes. Meaning perspectives are rule systems of habitual expectation (orientations, personal paradigms), which influence the way we define, understand, and act upon our experience (Mezirow, 1991).

#### *Mental models and shared mental models*

Mental models refer to deeply held internal images of how the world works, which have a powerful influence on what we do because they also affect what we see (Senge 2006).

Shared mental models are collective tacit knowledge, refer to shared framework and routines, potential rules amongst individuals. It is about the unsaid and unwritten knowledge in the organization. It is often invisible assets of an organization reside in individual mental models that collectively contribute to the shared mental models (Nonaka, 1994; Senge, 2006).

#### *Knowledge intermediary*

Knowledge intermediary is a person in an organization who has an appropriate

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network position to connect knowledge seekers with knowledge sources across many extensive areas of divisions (Behboudi & Hart, 2008). The knowledge intermediary played the role of gatekeeper and boundary spanner in facilitating knowledge transfer across groups and organizations through effective communication and interaction. Also a knowledge intermediary is in charge of researching, collecting, reshaping and storing knowledge in the knowledge base and transferring knowledge from knowledge sources to knowledge seekers in a way that adds business value.

## **1.5 THESIS OUTLINE**

This thesis will report on an analysis of the knowledge transfer process and the knowledge building process observed at three offshore TSCs in China, and examines how knowledge was transferred from the onshore TSCs to the offshore TSCs, and how the individual and offshore TSC organizations built and expanded knowledge in a dynamic changing business context. This thesis is divided into nine chapters.

Chapter 1, addressed the background and motivation for this research and posed three research questions which concern the understanding of the ways of knowledge transfer between onshore and offshore TSCs, how individuals build tacit knowledge and how offshore TSCs build organizational knowledge.

Then, Chapter 2 reviews the relevant literature on offshore outsourcing at IT support centers. It discusses knowledge characteristics and dimensions, knowledge transfer and knowledge building, and identifies the gaps.

Chapter 3 proposes a research plan to answer the research questions. This chapter will justify the selection of the research paradigm and methodology deemed most appropriate for the research. It will also describe the research method and data analysis strategy for the research.

Chapter 4 is a general introduction to the research findings and explains why the findings are presented in that way.

Chapters 5, 6, and 7 present the research findings of the three case studies. Chapter 5 outlines how the knowledge has been transferred from onshore TSC to offshore TSC, and develops a knowledge transfer model to illustrate the knowledge transfer process. Chapter 6 shows how the individual TSEs build up their individual knowledge. It develops an individual knowledge building model to demonstrate the individual knowledge building process. Chapter 7 discusses how the organization builds up its organizational knowledge. Each chapter starts with the research findings of the first case study, and then generates an initial model. After the second and third case studies have been compared, the modified model is presented.

Chapter 8 develops a comprehensive model of knowledge transfer and building in offshore outsourcing. This model provides a holistic picture of how knowledge is transferred and built up in the offshore organization.

The presentation of this thesis concludes with Chapter 9. It summarizes the research findings and discusses the limitations of the study, with five streams of potential future research clearly identified. The Chapter closes by identifying the research contributions for both academics and for practitioners.

## **CHAPTER 2 LITERATURE REVIEW**

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This chapter will review the academic literature relating to knowledge transfer, knowledge building and offshore outsourcing. It is organized into six sections. The first section presents the definition of knowledge, knowledge characteristics and dimensions. The second section investigates five elements of knowledge transfer, the knowledge transfer process and the factors affecting knowledge transfer. The third section explores individual knowledge building and factors impacting on knowledge building. The fourth section investigates organizational knowledge building and factors influencing organizational knowledge building. The fifth section examines knowledge transfer and knowledge building in offshore outsourcing. The chapter ends with identifying the literature gap.

### **2.1 KNOWLEDGE, KNOWLEDGE CHARACTERISTICS AND DIMENSIONS**

#### **2.1.1 Definition of Knowledge**

Knowledge is defined by Alavi and Leidner as “information possessed in the mind of individuals” (p. 109), expertise, and skills acquired by a person through experience or education. It is personalized information related to facts, procedures, concepts, interpretations, ideas, observations and judgments (Alavi & Leidner, 2001). It must go through a recreation process in the mind of the receiver (El Sawy, Eriksson, Carlsson, & Raven, 1998). According to Nonaka, Toyama, & Komo (2000), knowledge is “a dynamic process of justifying personal belief towards the truth” (p. 7).

## **2.1.2 The Characteristics of Knowledge**

Many scholars have studied the characteristics of knowledge (e.g., Simonin, 1999a; Szulanski, 1996). The key characteristics of knowledge include tacitness (Nonaka, 1994), causal ambiguity (Simonin, 1999a; Szulanski, 1996), codification (Zander & Kogut, 1995), dynamic nature (Nonaka, 1994), specificity (Hayek, 1945), and humanistic nature (Nonaka, Toyama, & Komo, 2000).

Tacitness refers to the difficulty of communicating and sharing knowledge, because it is highly personal and deeply rooted in action (Nonaka, 1994). Knowledge can be codified, since it can be encoded and transmitted in formal and systematic language (Zander & Kogut, 1995). Knowledge has the characteristic of causal ambiguity, because there is a lack of understanding of the logical linkages between actions and outcomes, inputs and outputs, and causes and effects that are related to technological or process know-how (Simonin, 1999a). Knowledge has a dynamic nature as it is active, moving and changing, because knowledge is created through the interactions amongst individuals or between individuals and their environment (Nonaka, Toyama, & Komo, 2000). Knowledge can be moved because it is leveraged throughout the enterprise (Nissen, 2005) in response to changes in the environment (Preiss, 1999). Knowledge is context-specific, dependent on a particular time and space (Hayek, 1945), so it has to be into a context before it becomes knowledge (Nonaka, Toyama, & Komo, 2000). Knowledge also has a humanistic characteristic as it is essentially related to human action (Nonaka, Toyama, & Komo, 2000).

## **2.1.3 Dimensions of Knowledge**

A review of literature shows that many dimensions of knowledge have been identified by scholars, including tacit vs. explicit (Nonaka, 1994), individual vs. systemic (Nonaka, 1994), independent vs. systemic (Bhagat, Kedia, Harveston, & Triandis, 2002), external vs. internal (Menon & Pfeffer, 2003), public vs. private (Uzzi & Lancaster, 2003), simple vs. complex (Garud & Nayyar, 1994) and some other

dimensions of knowledge such as declarative (know-about or knowledge by acquaintance), procedural (know-how), causal (know-why), conditional (know-when), and relational (know-with) dimensions (Zack, 1998). The dimensions of knowledge are summarized in Table 2.1. In these dimensions, the tacit-explicit and individual-collective knowledge classifications are widely cited (e.g., Nonaka, 1994; e.g., Spender, 1996).

Table 2.1 Dimensions of Knowledge

Knowledge Dimensions		Definitions	Examples	References
Tacit vs. Explicit	Tacit	Knowledge is rooted in experience, actions, and involved in a specific context	Best way of baking a delicious muffin	(Alavi & Leidner, 2001; Nonaka, 1994)
	Cognitive tacit:	Mental models refer to deeply held internal images of how the world works, which have a powerful influence on what we do because they also affect what we see.	Individual's belief in cause-effect relationships	(Alavi & Leidner, 2001; Nonaka, 1994)
	Technical tacit:	Know-how applicable to specific work	Computer trouble-shooting skills	(Alavi & Leidner, 2001; Cook & Brown, 1999; Nonaka, 1994)
	Explicit	Articulated, codified knowledge	Knowledge of major components in a personal computer	(Alavi & Leidner, 2001; Cook & Brown, 1999; Nonaka, 1994)
Individual vs. Collective	Individual	Created by and inherent in the individual	Market insights gained from two years' selling experience	(Alavi & Leidner, 2001; Cook & Brown, 1999; Nonaka, 1994)
	Collective	Created by and inherent in a collective group	Norms of organization	(Alavi & Leidner, 2001; Cook & Brown, 1999; Nonaka, 1994)
Dynamic vs. Relative static	Dynamic	Dynamic is defined as active and changing. It moves, clumps, and accumulates noticeably within specific people, organizations, and locations.	Microelectronic technology	(Nissen, 2005)

Knowledge Dimensions		Definitions	Examples	References
	Relative static	Relative static is defined as the knowledge being currently relatively stable and inactive.	Knowledge in a textbook	
Simplicity vs. Complexity	Complex	It evokes more causal uncertainties, and, therefore, the amount of factual information required to completely and accurately convey such types of knowledge is greater than would be the case with simple types of knowledge.	Knowledge of how to fix a computer problem	(Garud & Nayyar, 1994)
	Simple	It can be captured with little information and is, therefore, relatively easy to transfer.	Knowledge of how to switch a personal computer on and off	(Garud & Nayyar, 1994)
External vs. Internal	External	Knowledge comes from external sources. External sources are less likely to transfer and improve the performance of a focal unit than is knowledge coming from internal sources	Knowledge comes from external expert	(Menon & Pfeffer, 2003)
	Internal	Knowledge uniquely possessed by a member is less likely to be mentioned, repeated, and attended to in group discussion than is commonly held knowledge.	Knowledge comes from internal employee	(Menon & Pfeffer, 2003)
Public vs. Private	Public	Knowledge available in the public domain through standard reports tends to be "hard" information.	Knowledge in a recipe book	(Uzzi & Lancaster, 2003)
	Private	Private knowledge, which is not equally available to all or guaranteed by third parties, is "soft" information about unpublished aspects of a firm.	Knowledge comes from personal cooking experience	(Uzzi & Lancaster, 2003)

Since tacit-explicit and individual-collective dimensions are broadly discussed in the knowledge management and organizational learning literature (e.g., Lam, 1997; Raelin, 1997), and these two dimensions are related to the three research questions in this study, this study will focus on the tacit-explicit and individual-collective knowledge dimensions. This study looks at explicit knowledge transfer, tacit knowledge building, and individual and collective knowledge transfer and building. The first research question is mainly focused on how explicit knowledge is transferred between

organizations, groups and individuals. The second research question is focused on individual tacit knowledge building in workplace. The third research question relates to how organization builds up its collective knowledge. Thus, these two dimensions are relevant to the three research questions. This study will focus only on tacit-explicit and individual-collective knowledge dimensions.

### ***Tacit and Explicit Knowledge***

The explicit versus tacit dimension is concerned with how well the knowledge is articulated or whether it is implicit (Bhagat, Kedia, Harveston, & Triandis, 2002). These dimensions are conceptualized by Polanyi (1967) and further expanded by Nonaka (1994).

Nonaka (1994) affirms that explicit knowledge can be articulated in words and numbers and can be shared in the form of data, scientific formulae and specifications. This kind of knowledge can be codified, transferred easily and is free of context. Explicit knowledge has a “universal” character (Nonaka & von Krogh, 2009). In contrast, tacit knowledge is difficult to communicate and articulate. It is highly personal and hard to formalize so it is difficult to share with others. Tacit knowledge is accumulated practical skills or experiences that allow one to do something efficiently. In addition, Nonaka (1994) points out that tacit knowledge has a cognitive dimension, which consists of mental models that individuals follow in certain situations. Tacit knowledge is deeply rooted in individuals' cognitive processes and/or ingrained in the routine and non-routine processes of an organization's unique culture and values (Daft & Lengel, 1986). Tacit knowledge is a subset of procedural knowledge acquired through personal experience and directly influences behavior (Sternberg et al., 2000). Tacit knowledge is experience-based, context-specific knowledge and is practically useful. It is acquired through goal-directed activities (Sternberg et al., 2000). The nature of tacit knowledge is inexpressible, personal, practical and context-specific.

In recent years, with regard to the tacit and explicit knowledge conversion, scholars have raised debates. One camp is exemplified by the work of Nonaka and Takeuchi who claim in their organizational knowledge creation theory that tacit knowledge can be converted to explicit knowledge (Nonaka & Takeuchi, 1995). Further, Nonaka and von Krogh (2009) explain that tacit and explicit knowledge is “conceptually distinguished along a continuum” (p. 635). Another camp is exemplified by Tsoukas (2003) who argued that tacit and explicit knowledge are “not the two ends of a continuum but the two sides of the same coin” (p. 425), and that tacit knowledge is not the “knowledge-not-yet-articulated” (p. 425). He believes that tacit knowledge is ineffable and cannot be converted or translated into explicit knowledge. This view was confirmed by Hildreth and Kimble (2002), D’eredita and Barrette (2006), Gourlay (2006), and Ribeiro and Collins (2007). In their view, tacit knowledge is primarily acquired through experience and social practice. It cannot be externalized, so that it cannot be converted into explicit knowledge.

In this study, the author holds the view that tacit knowledge can be converted partially into explicit knowledge. It depends on the degrees of knowledge tacitness. Ambrosini and Bowman (2001) propose four different degrees of knowledge tacitness, namely “deeply ingrained tacit skills” (p. 816) that cannot be accessible to the knowers, “tacit skills that can be imperfectly articulated” (p. 816) through the use of metaphors and storytelling, “tacit skills that could be articulated” (p.816) through some appropriate probing questions, and “explicit skills” (p. 816) that can be easily communicated.

### ***Individual and Collective Knowledge***

Besides the tacit-explicit dimension of knowledge, another knowledge dimension has been broadly discussed in the knowledge management literature: the individual-collective dimension. Knowledge can also be viewed as existing in the individual or the collective (Nonaka 1994). Individual knowledge is created by and exists in the individual, whereas collective knowledge is created by the collective

actions of a group and exists in relationships among individuals or within groups. Individual knowledge is transferable, moving with the person, thus leading to potential problems in retention and accumulation (Lam, 1997). Collective knowledge is largely tacit, composed of cultural norms that exist as a result of working together (De Long & Fahey, 2000). It is the accumulated knowledge of the organization stored in its rules, procedures, routines and shared norms (Lam, 1997).

*Four Types of Knowledge*

Based on the explicit-tacit and individual-collective dimensions of knowledge, four types of knowledge (see Figure 2.1) have been identified: *embrained*, *embodied*, *encoded* and *embedded* knowledge (Blackler, 1995; Collins, 1993; Lam, 2000). Each type of knowledge has a different level of knowledge tacitness, complexity and ambiguity.

**Figure 2.1 Four Types of Knowledge**

<b>Knowledge Types</b>				<b>Example</b>			
<b>Ontological Dimension</b>				<b>Ontological Dimension</b>			
		Individual	Collective			Individual	Collective
<b>Epistemological Dimension</b>	Explicit	Embrained knowledge	Encoded knowledge	<b>Epistemological Dimension</b>	Explicit	Theoretical knowledge	Written rules, procedure
	Tacit	Embodied knowledge	Embedded knowledge		Tacit	Practical experience	Routines, norms

Adapted from Lam (2000)

Embrained knowledge is also regarded as “conceptual knowledge”. This type of knowledge is formal, abstract or theoretical knowledge, and is dependent on the individual’s conceptual skills and cognitive abilities. Embodied knowledge is similar in nature to what others term “experiential knowledge”. This type of knowledge is action-oriented. It is the practical, individual type of knowledge, building upon ‘bodily’ or practical experience (‘doing’). Encoded knowledge is also regarded as “systemic knowledge”. This type of knowledge is conveyed by signs and symbols; it is knowledge that has been codified and stored in blueprints, recipes, written rules and procedures. Embedded knowledge is also regarded as “routine knowledge”, and

resides in organizational routines and shared norms (Lam, 2000).

## **2.2 KNOWLEDGE TRANSFER**

Knowledge transfer has been defined as an attempt by an entity to copy a specific type of knowledge from another entity (Rogers, 1983). In other words, knowledge transfer is the transfer of knowledge to a location where it is needed and can be used.

Davenport and Prusak (2000) suggest that knowledge transfer involves two actions: transmission and absorption. To transmit is to send or present knowledge to a potential person or group. Absorption means the knowledge is absorbed by that person or group, and knowledge is not really transferred unless it is totally absorbed. The goal of knowledge transfer is not only to transmit and absorb knowledge, but also to use and apply the knowledge, to improve an organization's ability, and thereby increase its value (Davenport & Prusak, 2000).

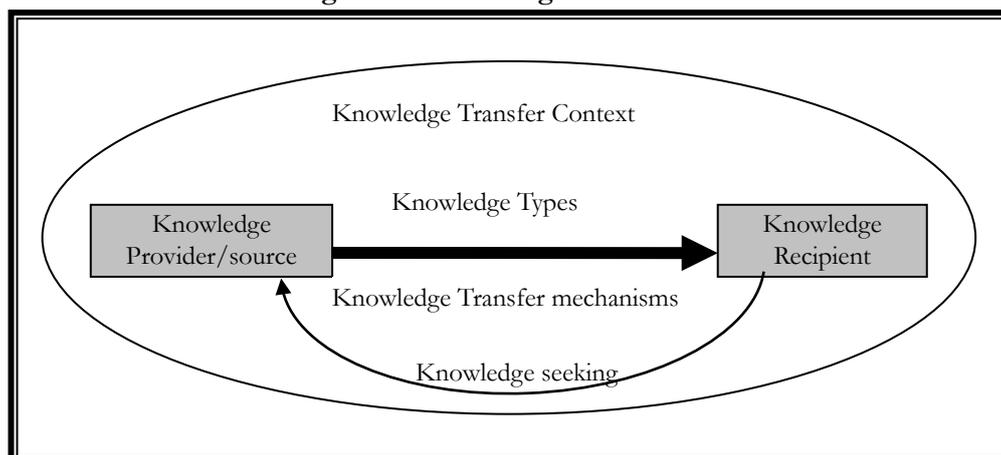
In this study, transferred knowledge includes not only technical knowledge (e.g. know-how, skills), but also cognitive knowledge (e.g. mental maps, beliefs, paradigms and viewpoints). It is not only about organizational knowledge, but also about individual knowledge. Knowledge transfer can take place at various levels. The levels of knowledge transfer include: the individual level of transfer, in which knowledge transfer occurs between individuals; the group level of knowledge transfer, in which knowledge transfer takes place between groups and across groups; and the organizational level of transfer, where knowledge transfer happens between organizations and across organizations.

Researchers have identified several elements involved in the knowledge transfer process, including knowledge (Bresman, Birkinshaw, & Nobel, 1999; Lam, 2000; Simonin, 1999a; Szulanski, 1996; Zander & Kogut, 1995), knowledge

providers/sources (Gray & Meister, 2006; Szulanski, 1996), knowledge recipients (Joshi & Sarker, 2003; Szulanski, 1996), the mechanism of knowledge transfer (e.g., Murray & Peyrefitte, 2007; Platts & Yeung, 2000), and contextual situations (Murray & Peyrefitte, 2007; Szulanski, 1996). The interaction among these five elements could affect knowledge transfer. For example, the characteristics of knowledge such as tacitness and causal ambiguity affect the efficiency of knowledge transfer (Szulanski, 1996); The relationships between knowledge providers/sources and recipients affect the amount of knowledge transferred or diffused (Strang & Soule, 1998). In terms of the mechanism of knowledge transfer, Davenport and Prusak (2000) suggest that the interpersonal transfer mechanism can transfer knowledge more effectively than the codified transfer mechanism can. For example, knowledge acquired from a long apprenticeship will be much richer than that acquired by reading an article. Moreover, with regard to knowledge transfer contexts, Lucas (2006) suggests that successful knowledge transfer is based on an understanding of the origin of the knowledge, and of the people and processes involved. The closer people are to the culture of the knowledge being transferred, the easier it is to transfer, share and exchange the knowledge (Davenport & Klahr, 1998; Gamble & Blackwell, 2001; Westney, 1993).

This study will put these five elements together and will examine how these five elements affect knowledge transfer. The relationship amongst the five elements is shown in Figure 2.2. The knowledge transfer process can be simply described in this way: after knowledge recipient having sought out knowledge provider, the types of knowledge are transferred from the knowledge provider to the knowledge recipient through knowledge transfer mechanisms in the knowledge transfer context.

Figure 2.2 Knowledge Transfer Process



In the following section, each key element in the knowledge transfer process will be separately described.

## 2.2.1 Five Key Elements of Knowledge Transfer

### *Knowledge Recipients*

Knowledge recipients have different levels of knowledge (according to the experience and skills). The knowledge levels in this study are subdivided into the four distinct knowledge levels outlined by Dreyfus and Dreyfus (1986): novice, advanced beginner, competency, and proficiency (see Table 2.2).

**Table 2.2 Dreyfus' Knowledge Model**

Level	Characteristics
<b>Novice</b>	People at the novice level learn many normative rules expressed as declarative knowledge through formal training. They rely on normative sets of rules and regulations to do tasks.
<b>Advanced beginner</b>	People at the advanced beginner level imitate how other more experienced people act in different situations. They begin to apply these techniques in other similar cases as well. They learn to see similarities and differences between situations. Rules are internalized.
<b>Competency</b>	People at the competency level become more experienced than advanced beginners and can see differences between situations. The competent performer seeks new rules to cope with new situations. However, they often cannot resolve unanticipated problems that occur.
<b>Proficiency</b>	People at the proficiency level have reached skilled status and developed their own rules. The rules are primarily formulated not in a direct language but instead, are demonstrated by more experienced technicians in actions. In varying situations, they can apply the rules to new and untested situations.

Adapted from Dreyfus and Dreyfus (1986)

People at the novice level follow explicit rules to do their job. An advanced beginner

begins to notice similarities and differences in the situations. The competent person seeks new rules to cope with new situations; however, they often cannot resolve unanticipated problems that occur. A proficient performer gradually develops their own rules and replaces principles and reasoned responses with intuitive behavior, but still needs to make judgments based on experience.

#### *Knowledge Provider/Knowledge Source*

The knowledge provider offers the knowledge to the knowledge recipient. She/he is the knowledge source (i.e. expertise, experiences, insights, and opinions) for the knowledge recipient. Gray and Meister (2006) point out that people will obtain different performance outcomes if they use different knowledge sourcing methods. Knowledge sourcing behavior is defined as an individual's intentional actions taken to locate and access others' expertise, experiences, insights, and opinions (Gray & Meister, 2006). They identify three distinct forms of knowledge sourcing behaviors (see Table 2.3) including dyadic knowledge sourcing, published knowledge sourcing and group knowledge sourcing.

**Table 2.3 Knowledge Sourcing Methods**

<b>Knowledge sourcing behaviors</b>	<b>Communication model</b>	<b>Knowledge communication mechanism</b>	<b>Example</b>
Dyadic knowledge sourcing	Person-to-Person	Telephone, e-mail, face-to-face conversation, mentoring	Experts
Published knowledge sourcing	People-to-documents	Printed publications, training manuals, knowledge repositories, intranet	Documents
Group knowledge sourcing	Multiple seekers-to-multiple sources	Email (broadcast), electronic discussion, meeting, communities of practice	Network groups

Adapted from Gray and Meister (2006)

Firstly, dyadic knowledge sourcing refers to intentional individual efforts to locate and access others' expertise, experience, insights, and opinions, based on "person-to-person" communication (engaging in dialogue with individual employees), through a variety of channels such as telephone, email, and face-to-face conversation.

Secondly, published knowledge sourcing is defined as intentional individual efforts to locate and access others' expertise, experience, insights, and opinions, based on "people-to-documents" communication (a single knowledge provider who may be accessed by many knowledge seekers), through a variety of channels such as printed publications, manuals, and knowledge repositories (knowledge repositories store explicit codified knowledge).

Thirdly, group knowledge sourcing refers to intentional individual efforts to locate and access others' expertise, experience, insights, and opinions by engaging in public conversation amongst multiple knowledge seekers and multiple sources, through a variety of channels such as electronic discussion, meetings, and communities of practice.

#### *Four Types of Knowledge*

Four types of knowledge have been identified in Section 2.1 based on the explicit-tacit and individual-collective dimensions of knowledge. They are *embrained* knowledge, *embodied* knowledge, *encoded* knowledge and *embedded* knowledge.

#### *Mechanisms of Knowledge Transfer*

The selection of knowledge transfer mechanisms is particularly important in the knowledge transfer process, as transfer media differ in viscosity (i.e., richness), and in time interval (Daft & Lengel, 1986). For example, knowledge retrieved from a long apprenticeship will be much richer than that acquired by reading an article (Davenport & Prusak, 2000). In addition, Davenport and Prusak (2000) suggest that for transferring knowledge, the transfer mechanisms should always suit the organizational and national culture.

Many researchers (e.g., Murray & Peyrefitte, 2007; Platts & Yeung, 2000) have studied the issue of the mechanism of knowledge transfer. The various studies on knowledge transfer mechanisms can be divided into three major types (see Table 2.4):

(1) codified transfer mechanism, which include documentation, manuals, Internet information, electronic data exchange, written reports, data system, intra-network and so on; (2) inter-personal transfer mechanism, including telephone, e-mail (dyadic), instant message electronic discussion (e.g., MSN), knowledge maps, corporate directories, face-to-face conversation, mentoring, apprenticeship, role-playing and storytelling; (3) Communities and networks mechanisms which include communities of practice, knowledge networks, and trust-commitment relationships, covering also full trust-commitment and value sharing.

Table 2.4 Mechanisms of Knowledge Transfer

Mechanism of knowledge transfer	Communication Methods	Media Choice
Codified transfer mechanism	Technology- assisted communication Training method Documentation	Intranet, email, knowledge repositories, database, search engine Training manuals Printed publications
Inter-personal transfer mechanism	Technology- assisted communication  Meeting Training method	Telephone, email (dyadic), Instant message electronic discussion (e.g., MSN), knowledge maps, corporate directories, Face-to-face conversation Mentoring, apprenticeship, role-playing, storytelling
Communities and networks mechanism	Technology- assisted communication  Meeting  Training method	Email (broadcast), electronic discussion group databases, communities of practice (online), and group ware Meeting, communities of practice (face-to-face) Simulation

Adapted from Murray and Peyrefitte (2007), and Platts and Yeung (2000)

### *Knowledge Transfer Context*

Knowledge maybe embedded in individuals, in the organization's rules, routines, structures and technologies, and within its original context. Successful knowledge transfer is based on an understanding of the origin of the knowledge, and the people and processes involved. It is not possible to replicate the original context to transfer knowledge (Lucas, 2006). Due to the fact that knowledge is created locally, where tasks are attended to, and problems defined and resolved, knowledge might not easily be developed in a similar way when an offshore context replaces the original context.

## **2.2.2 Knowledge Transfer Process**

The knowledge transfer process can be divided into two groups: structured and unstructured knowledge transfer. Structured knowledge transfer is a formal, planned and intentional transfer process. Traditionally, knowledge transfer has been considered a very structured process. For example, Szulanski (1996), in considering the introduction of a transfer of best-practice inside the firm, suggests a four-phase knowledge transfer process: initiation, implementation, ramp-up, and integration. In contrast, unstructured knowledge transfer is an informal, unplanned and spontaneous process. Although based on structured transfer stages, it does not adopt the structured knowledge transfer process step by step, but jumps directly to a particular step without going through the earlier steps.

Global organizations knowledge transfer across geographic boundaries is undergoing rapid changes (Bhagat, Kedia, Harveston, & Triandis, 2002). Some spontaneous and unstructured transfers of knowledge routinely take place within and across organizational boundaries (Davenport & Klahr, 1998). For example, when an employee from an offshore technical support centre located in China seeks helpful information and knowledge from a colleague in the U.S. headquarters on how to solve a customer's technical problem, a transfer of knowledge across national borders occurs. In this case, the transfer of knowledge occurs spontaneously and informally.

In the next section, a structured knowledge transfer process for transferring knowledge between organizations will be discussed, based on Szulanski's process model. Then, the following section will suggest an unstructured spontaneous knowledge transfer process for the transfer of knowledge between individuals, groups and organizations.

### **2.2.3.1 Structured Knowledge Transfer**

A review of previous literature on the knowledge transfer process shows that only

Szulanski (1996) introduces a four-stage knowledge transfer process for transferring best-practice inside the firm: initiation, implementation, ramp-up, and integration.

*Initiation (search):* The first stage, initiation, starts with identifying the problem and the required knowledge. The discovery of the required knowledge may include a search for potential solutions, a search that leads to the discovery of superior knowledge. Once the knowledge required to solve the problem is found, this flows through to the second stage of implementation.

*Implementation (learning):* The implementation stage is where the knowledge sources and recipients plan and carry out all activities necessary for knowledge transfer to take place.

*Ramp-up (practice):* The third stage, ramp-up, is where the recipients begin using the acquired knowledge. Issues and problems are worked out to ensure that the recipients are able to achieve satisfactory performance. The ramp-up stage provides a relatively brief window of opportunity to rectify unexpected problems. At this stage, if practice comes with explanatory feedback and any form of instruction, the knowledge will be firmly built (Bonner & Walker, 1994).

*Integration (grasp):* The integration stage begins after the recipient achieves satisfactory results with the transferred knowledge. It looks at the actions required to remove obstacles and deal with the challenges for involved in making the new practice routine.

Szulanski's model of a structured knowledge transfer process has been empirically examined by a few scholars (e.g., Chua & Pan, 2008; Tsang, 2008). Chua and Pan (2008) conducted a study onto how a global IS department in a multinational bank transferred its business application support and development experiences from onshore to offshore resources. They subdivided the knowledge transfer process into

the four distinct stages of initiation, implementation, ramp-up and integration to verify the knowledge transfer at three levels, namely the organizational level, the group level, and the individual level. Tsang (2008) adopted Szulanski's process model to investigate how the issues related to organizational unlearning affect knowledge transfer at each stage of the transfer process. This study will adopt Szulanski's process model to investigate the structured knowledge transfer in a cross-cultural business context.

### 2.2.3.2 Unstructured Knowledge Transfer

Unstructured knowledge transfer is an informal, unplanned and spontaneous transfer process. As already noted, it is based on the *structured transfer stages*, and does not adopt structured knowledge transfer in an ordered step-by-step process; it can jump directly to any step without adoption of the earlier steps. This is described below as a type of unstructured knowledge transfer.

Unstructured knowledge transfer is important to an organization's success (Davenport & Prusak, 2000), since it occurs during daily work. In this knowledge transfer process, the knowledge provider and the recipient work in the same field and share a common practice. This study distinguishes three types of unstructured knowledge transfer that occur in daily work, namely *copy*, *adaptation* and *fusion*.

#### *Type One-- Unstructured Copy*

This type is developed from Intel's "copy exactly" philosophy, which was developed and used in Intel for semiconductor technology transfer whereby production processes are replicated from plant to plant (McDonald, 1998). In this study, *copy* means copy selectively to accommodate existing conditions at the destination. "Copy" is a basic type of transfer of knowledge, and a necessary survival-level task. In this type, the transfer of knowledge is based on pre-existing knowledge sources such as libraries, archives and databases, or on imitating someone's way of performing a task. In this type, the knowledge is more explicit than tacit. The

knowledge acquisition depends not only on recipient motivation and ability to search pre-existing knowledge sources, but also on the recipient's absorptive and retentive capacities. Absorptive capacity is an ability to acquire and assimilate new knowledge based on prior knowledge which could include basic skills, previous experiences or even a shared language (Cohen & Levinthal, 1990). Retentive capacity is the ability of a recipient to institutionalize the utilization of new knowledge (Szulanski, 1996). This ability can be developed by spending some time using the new knowledge. "Repetitive reusing" (Libby, 1993) of the transferred knowledge leads to automaticity in applying the knowledge, reframing the recipient's previous knowledge and then taking it for granted as part of his/her own knowledge. Absorptive and retentive capacities play a critical role in the knowledge acquisition process.

#### *Type Two-- Unstructured Adaptation*

This type of knowledge transfer involves more commitment to transfer knowledge than Type One does. This type of transfer occurs when expected or appropriate knowledge cannot be found in the pre-existing knowledge sources because of knowledge environmental changes. Since organizational environments change rapidly, knowledge is either incrementally changing (progressing or improving), or undergoing an evolutionary process to respond to new developments in the firm and its environment. This type of knowledge transfer (Type Two) involves more tacit knowledge transfer than Type One, because there is a need to modify the pre-existing knowledge to adapt to the new environment.

In Type Two, the recipient who has acquired some explicit knowledge through Type One transfer then builds tacit knowledge through experience and repetitive reinforcement (Kostova, 1996). Once the transferred knowledge becomes embedded and reinforced within the cognition of the recipient individuals through experience and modification, the transferred/modified knowledge merges into the recipients' actions and expertise, as the recipient now has a level of absorptive capacity suitable for acquiring knowledge from the transferring expert and for discussing the

knowledge with the expert; they can follow the expert’s guidance to modify and adapt the transferred knowledge to new problems (Alavi & Leidner, 2001). Without some form of shared experience, it is extremely difficult for people to share each others’ thinking processes (Nonaka, 1994). However, the effective transfer of knowledge depends on both sender and recipient motivations as well as on the recipient’s absorptive, retentive and adaptive capacities. This type of knowledge transfer from individual to individual is based on effective two-way communications between knowledge provider and knowledge recipient.

*Type Three -- Unstructured Fusion*

The fusion type of knowledge transfer occurs when expected or appropriate knowledge cannot be found in pre-existing knowledge sources, or pre-existing resources are not directly applicable. The new knowledge must be generated by a group knowledge fusion process, where people with specialized knowledge are brought together into a group to combine what they know individually (Leonard & Sensiper, 1998). This new knowledge generation process creates knowledge which may be radically different and discontinuous from the components of knowledge held by the participating individuals. In this type of transfer, the recipient must have cognitive tacit knowledge about the processes of developing new knowledge, and be able to communicate and absorb other members’ tacit and explicit knowledge.

**Table 2. 5 Comparing the Three Types of Unstructured Knowledge Transfer**

<b>Knowledge transfer type</b>	<b>Knowledge sourcing behaviors</b>	<b>Knowledge transfer mechanism</b>	<b>Types of knowledge transferred</b>
Unstructured copy	Published knowledge sourcing	Codified transfer mechanism	Theoretical knowledge and procedure
Unstructured adaptation	Dyadic knowledge sourcing	Inter-personal transfer mechanism	Practical experience
Unstructured fusion	Group knowledge sourcing	Communities and networks mechanism	Tacit and explicit, individual and collective knowledge

Table 2.5 summarizes three types of unstructured knowledge transfer approaches. Overall, in the knowledge transfer process, the knowledge source/provider transmits

knowledge content to the knowledge recipient through knowledge transfer channels. How much knowledge can be transmitted and absorbed by the knowledge recipient really depends on the recipient's motivation, absorptive capacity and retentive capacity. In the three types of knowledge transfer process, different type of transfer process place different emphasis on the knowledge source, the knowledge content, the mechanisms of knowledge transfer, and the knowledge recipient. Specifically, Type One focuses on published knowledge sources, employs codified transfer mechanisms, and transfers theoretical knowledge and rule procedures. Type Two focuses on dyadic knowledge sources, makes use of inter-personal transfer mechanisms, and transfers practical experience. Type Three concentrates on group knowledge sources, utilizes communities and networks transfer mechanisms, and transfers both tacit and explicit, and individual and collective knowledge. These three types of knowledge transfer approach will be employed to investigate the offshore unstructured knowledge transfer process in a cross-cultural business context.

### **2.2.3 Enablers and Barriers in Knowledge Transfer**

A review of the literature reveals that many factors impact on the effectiveness of knowledge transfer processes. The enablers and barriers are the major factors influencing knowledge transfer. The following section will describe in detail the enablers of and barriers to knowledge transfer in organizations.

#### *Enablers of Knowledge Transfer*

Much knowledge transfer literature is devoted to descriptions of the enablers of knowledge transfer. Numerous motivators have been suggested, so they are gathered here into four categories: characteristics of the knowledge, the characteristics of the knowledge source, characteristics of the knowledge recipient, and the characteristics of the context in which the transfer takes place (see Table 2.6).

Table 2.6 Enablers of Knowledge Transfer

Categories	Items	Description	Sources
Knowledge characteristics	Explicit knowledge	Explicit knowledge can be articulated in words and numbers. It can be transferred easily.	(Davenport & Prusak, 2000)
Characteristics of the recipient of knowledge	Intellectual Demands	A job with a highly intellectual demand is more likely to produce a greater need for knowledge and triggers learning behaviors.	(Gray & Meister, 2004; Knowles, 1980)
	Learning Orientation	Individuals with a strong learning orientation are more likely to consult with co-workers to improve their knowledge skills, and abilities.	(Brett & VandeWalle, 1999; Gray & Meister, 2004)
	Risk aversion	Individuals with a strong risk aversion are more likely to source more knowledge as a way of reducing the possibility of making an error.	(Gray & Meister, 2004; Pratt, 1964)
	Learning intent	The higher the learning intent, the higher the level of knowledge transfer.	(Simonin, 2004)
	Learning capacity	The higher the incentive-based learning capacity, the higher the level of knowledge transfer.	(Simonin, 2004)
	Absorptive capacity	There is a positive association between absorptive capacity and knowledge transfer. The higher the ability of absorptive capacity, the higher the level of knowledge transfer.	(Cohen & Levinthal, 1990; Lane, Salk, & Lyles, 2001)
Characteristics of the context	Trust	Participants will be less hesitant to post information on Communities of Practice (CoP) sites once they trust the other members, and they are willing to use the CoP if they trust knowledge to be a source of reliable and objective information.	(Ardichvili, Page, & Wentling, 2003; Dhanaraj, Lyles, Steensma, & Tihanyi, 2004)
	Shared values	Shared values and systems enhance the transfer of tacit knowledge.	(Dhanaraj, Lyles, Steensma, & Tihanyi, 2004)
	Closed relationship	Strong ties enhance the transfer of tacit knowledge.	(Dhanaraj, Lyles, Steensma, & Tihanyi, 2004)
	IT support	IT support enables an organization capacity to transfer knowledge faster, create knowledge quicker.	(El Sawy & Majchrzak, 2004; Lee & Choi, 2003; Yeh, Lai, & Ho, 2006)

*Barriers to Knowledge Transfer*

Studying the barriers of knowledge transfer is useful for determining the reason why knowledge might not be transferred effectively. Much knowledge transfer literature is devoted to descriptions of the barriers to the transfer of knowledge in organizations. The range of barriers is classified into four key categories: characteristics of the knowledge, the characteristics of the knowledge source, and the characteristics of the knowledge recipient, and the characteristics of the context in which the transfer takes place (see Table 2.7).

**Table 2.7 Barriers to Knowledge Transfer**

Categories	Items	Description	Sources
Knowledge characteristics	Causal ambiguity	Causal ambiguity creates barriers to imitation.	(Simonin, 1999a, 2004; Szulanski, 1996)
	Tacitness	Tacitness gives rise to the difficulty and frustration in learning, raises barriers to imitation and significantly influences the speed of transfer of knowledge.	(Reed & DeFillippi, 1990)
	Specificity	Knowledge is context-specific, since it depends on a particular time and space. It is not possible to replicate the original contextual to transfer knowledge.	(Hayek, 1945; Lucas, 2006; Simonin, 1999a)
	Questionableness	Employees do not apply and reuse the knowledge due to reasons such as the source of knowledge is questionable, and the feeling of risk aversion.	(Davenport & Prusak, 2000; Rus & Lindvall, 2002)
Characteristics of the knowledge provider	Lack of motivation, knowledge protectiveness	If the knowledge provider lacks motivation to transfer knowledge, the knowledge will be hard to transfer.	(Simonin, 1999a, 2004; Szulanski, 1996)
	Not perceived as reliable	Knowledge source perceived unreliable is a significant barrier to knowledge transfer.	(Szulanski, 1996)
	Reciprocation wariness	Individuals who are reciprocation wary fear being exploited in an exchange relationship and thus might source less knowledge	(Lynch, Eisenberger, & Armeli, 1999)
Characteristics of the knowledge recipient	Lack of motivation	The recipient's lack of motivation and absorptive capacity are significant barriers to knowledge transfer.	(Szulanski, 1996)
	Lack of absorptive capacity		(Davenport & Prusak, 2000; Joshi & Sarker, 2003; Szulanski, 1996)

Categories	Items	Description	Sources
	Lack of retentive capacity	In the absence of retentive capacity, the knowledge recipient has difficulties in continuing to use received knowledge feasibly.	(Szulanski, 1996)
	Personal power of knowledge and promotion opportunities	Employees do not share their knowledge voluntarily due to the feeling of losing some of their power, reducing the chances of success (e.g. promotion, compensation), and additional workload required.	(Rus & Lindvall, 2002)
Characteristics of the context	Barren organizational context	A barren organizational context hinders the gestation and evolution of transfers.	(Szulanski, 1996)
	Arduous relationship	An arduous relationship might create additional hardship in the transfer.	(Strang & Soule, 1998; Szulanski, 1996)
	Cultural differences	Cultural differences may create bottlenecks that either impede or eliminate the potential for successful knowledge transfer.	(Lucas, 2006)
	Trust	Employees hesitate to contribute out of fear of criticism, or of misleading the community members. There is a need for developing various types of trust, ranging from knowledge-based to institution-based trust.	(Ardichvili, Page, & Wentling, 2003)
	IT Support	Employees have difficulties in locating the information required, possibly due to information overload.	(Rus & Lindvall, 2002)

In terms of the characteristics of knowledge, knowledge tacitness, specificity, and complexity have a significant impact on the speed of transfer (Bresman, Birkinshaw, & Nobel, 1999; Simonin, 1999b; Szulanski, 1996; Zander & Kogut, 1995). In terms of the characteristics of knowledge provider, Joshi and Sarker (2003) note that the domain experience of the knowledge provider, the perception of the knowledge source as unreliable and the knowledge provider's lack of motivation are significant barriers to knowledge transfer. In terms of the characteristics of the recipient of knowledge, several studies show that the characteristics of the knowledge recipient that are likely to intervene in the knowledge transferring process include absorptive capacity, the ability to exploit outside sources of knowledge (Szulanski, 1996), levels of motivation (Szulanski, 1996), and spatial proximity (Schenkel, 2004).

In terms of knowledge transfer context, variations in organizational contexts regarding formal structures and systems may influence the success of attempts to transfer knowledge (Bhagat, Kedia, Harveston, & Triandis, 2002; Szulanski, 1996). For example, in vertical cultures such as Western cultures, information flows primarily from top to bottom, whereas in horizontal cultures, such as Eastern cultures, information flows both ways (Bhagat, Kedia, Harveston, & Triandis, 2002). Relationships between knowledge sources and recipients are also a major determinant of knowledge transfer success (Strang & Soule, 1998; Szulanski, 1996). Some researchers (e.g., Strang & Soule, 1998; Wang & Nicholas, 2005) emphasize that strong relationships such as close social relation or similar organizational cultures could facilitate frequent interaction, pressures for conformity, and increased trust, as a way to accelerate the knowledge transfer process. In contrast, weak relationships may hinder knowledge transfer.

## **2.2.4 The Role of Culture in Offshore Knowledge Transfer**

Today, cultural diversity is a major challenge for project managers who undertake international projects. If they are not aware of broader cultural difference, projects could suffer (Kwek, 2006). This view is shared by Meschi (1997), who reports that most of the problems encountered in international projects can be traced back to cultural factors, either in the national or organizational culture.

### **2.2.4.1 The linkage of national culture, organizational culture and shared mental models**

Culture is defined as a system of beliefs that are deeply embedded within the society and reflected in the behaviors of its organizations and people (McDermott & O'Dell, 2001). Culture represents a core set of values which govern the attitudes employees adopt towards change and their approaches to the introduction of something new

(Schein, 1985). Shared mental models are collective mental representation of knowledge. It refers to framework and routines, potential rules, tasks, goals, and attitudes that are shared by organizational members (Lim & Klein, 2006; Nonaka, 1994; Senge, 2006; Smith-Jentsch, Mathieu, & Kraiger, 2005).

Shared mental models and culture are conceptually overlapped (Chou, Wang, Wang, Huang, & Cheng, 2008). According to Schein (1994), “culture is about shared mental models--shared ways of how we perceive the world, what mental categories we use for sorting it out, how we emotionally react to what we perceive, and how we put value on things (p. 1)”. This view also was confirmed by other scholars. For example, Wiig (2004) points out mental model is unconscious, a result of deep-seated cultural values and life experience. Schneider (1987) suggests a strong culture can generate and reinforce shared mental models. Pauleen, Wu, and Sally (2007) consider that shared mental model underpin culture. Therefore, there are some connections between share mental models and culture.

Holden (2002) points out that culture is “infinitely overlapping and perpetually redistributable habitats of common knowledge and shared meanings” (p. 227). People create habitats of common knowledge and shared mental models through direct and indirect communication around groups, organizations, and the world (Holden, 2002). The sharing of the common knowledge through continuing communication and shared practices among organization members leads to shared mental models which underpin organizational culture. A similar process occurs at the national level to build a national culture.

In this study, the culture phenomenon is investigated at the national culture level only, because national culture plays a very important role in knowledge transfer from one organization to another organization. It also affects organizational culture building, which is shown by the extension of Adler’s model developed by Pauleen and his colleagues (Pauleen, Wu, & Sally, 2007). They consider that national culture affects

the values, attitudes and behaviors of the organization, and that national culture will directly affect knowledge transfer and sharing behaviors in individuals through its influence on the values and attitudes of individuals. Since there are some connections between shared mental models and organizational culture (Schein, 1994) and shared mental model is more relevant to this study, the organizational culture is examined through the shared mental models among organizational members. In a future study, the organizational culture perspective could be included so that more specific barriers to organizational culture could be discerned.

#### **2.2.4.2 The Impact of National Culture on Knowledge**

##### **Transfer**

A review of literature related to national culture affecting knowledge transfer shows that there are several scholars focusing on this area. Holden's (2002) cross-cultural knowledge management work suggests that cross-cultural diversity could be transformed into organizational knowledge, which can be converted into a resource for underpinning core competence. He suggests developing cross-culture know-how could solve the cross-culture issues.

Mowery et al. (1996) state that distance and cultural differences between partners are key obstacles to inter-firm knowledge transfer. Knowledge is contextual, so managers need to pay careful attention to contextual issues that affect knowledge transfer efforts (Lucas, 2006). In cross-border knowledge transfer within a business context, the partners' national and organizational cultures have the potential to affect all aspects of a collaboration, including the process of knowledge management (Tiemessen, Lane, Crossan, & Inkpen, 1997). The cultural conflicts and cultural misunderstandings which are rooted in cultural differences can minimize flows of information and learning (Lyles & Salk, 1996). McDermott and O'Dell (2001) point out that in order to successfully implement knowledge management, companies

should not change their culture to fit their knowledge management approach, but should build their knowledge management approach to fit their culture.

Lucas (2006) studied the issue of culture's role in knowledge transfer within multinational corporations (MNCs), on the basis of Hofstede's four cultural dimensions. He argues that the location of subsidiaries along each of these cultural dimensions will have a significant impact on the possibility of knowledge transfer occurring between subsidiaries. Such transfers are very complex because they involve movement of human capital and technologies which must be adapted and institutionalized in their new environment as knowledge is embedded in technologies, routines, practices, and people. He claims that cultural differences may create 'bottlenecks' that either impede or eliminate the potential for successful knowledge transfer. The research concludes that it is important to note that inter-subsidiary knowledge transfers are likely to be more effective when they involve subsidiaries located in similar cultural contexts (Lucas, 2006).

Bhagat, Kedia, Harveston and Triandis (2002) conducted research into knowledge transfer in the individualism/collectivism culture dimension. They indicate that organizations located in individualist cultures are better able to transfer and absorb knowledge that is more explicit and independent. In contrast, organizations located in collectivist cultures are better able to transfer and absorb knowledge that is more tacit and collective. Individuals with a high tolerance for ambiguity are better able to transfer and receive knowledge that is tacit, complex and collective, compared to those with a relatively low tolerance for ambiguity.

The study reported here focuses on the issue of national culture in knowledge transfer across organizations, based on a subset of Hofstede's (2005) cultural dimensions. Power distance (PD) is the extent to which the members of a society accept inequality in an organization. It reflects the non-symmetrical nature of relationships that may exist between knowledge provider and recipient.

Individualism/collectivism (IC) is the extent to which a person sees himself or herself as an individual rather than as part of a group. In individualistic cultures, ties among individuals are very loose. Everyone is expected to look after himself or herself, but collectivist societies reinforce the notion of group. Such cultures are generally driven by group interest rather than by self-interest. Uncertainty avoidance (UA) is the degree to which the member of a society feels uncomfortable with uncertainty and ambiguity. Masculinity/femininity (MF) is the willingness to promote societal values. This research focuses only on power distance, the level of uncertainty avoidance, and individualism/collectivism. Table 2.8 contrasts the cultural dimension index in terms of power distance, uncertainty avoidance and individualism/collectivism for the US, Canada and China. From this table, it can be seen that the US and Canada have similar power distance, uncertainty avoidance and individualism/collectivism cultural dimensions, while the US and China have the different cultural dimensions.

**Table 2.8 Contrasting US, Canadian and Chinese Cultural Values**

<b>Cultural Element</b>	<b>US perspective (score)</b>	<b>Canadian perspective (score)</b>	<b>Chinese perspective (score)</b>
PD	Small (40)	Small (39)	Large (80)
UA	Strong (46)	Strong (48)	Weak (30)
IC	Individual (91)	Individual (80)	Collective (20)

Source: Hofstede and Hofstede (2005)

Even though Hofstede’s culture dimensions have been highly cited in literature, several scholars such as Pauleen (2007), and Fukuyama (1995), Groeschl and Doherty (2000) have criticized Hofstede for thinking each country has just one dominant culture. They believe that nations could contain different cultures or subcultures within national borders, and cultural boundaries between nations are often unclear.

Hofstede’s (1997) four cultural dimensions were generated by the analysis of IBM subsidiaries in more than 50 countries. The study focuses on national culture and work-related value differences in a single organization, which is relevant to this study, and in an information technology firm. Therefore Hofstede’s study has some

relevance to this study and his culture dimensions are appropriate for use in this study.

Surprisingly, even though many previous studies indicate the importance of national culture in the knowledge transfer process within cross-culture business contexts (Davenport & Prusak, 2000; Holden, 2002; Pauleen, Wu, & Sally, 2007; e.g., Rao, 2004; Simonin, 1999a), some studies have proposed a theoretical framework for understanding how the differences in national culture affect structured knowledge transfer across Hofstede's (1997) culture dimensions (i.e., Bhagat, Kedia, Harveston, & Triandis, 2002; Lucas, 2006). Relatively a little exploratory research has demonstrated how national culture impacts on the structured and unstructured knowledge transfer processes in an offshore outsourcing business context. This study seeks to examine how the different cultural groups work together during the knowledge transfer process, and to identify a pattern of cross-cultural knowledge transfer.

### **2.2.5 Literature Gap in Knowledge Transfer**

This section reviews previous studies in knowledge transfer. There have been some studies (e.g., Simonin, 1999a, , 2004; Szulanski, 1996) that identify the five elements involved in the knowledge transfer process: knowledge provider, knowledge recipient, knowledge types, knowledge transfer mechanisms and the knowledge transfer context. Much research has focused on the inhibitor and motivator factors affecting knowledge transfer (e.g., Bresman, Birkinshaw, & Nobel, 1999; Simonin, 1999b; Szulanski, 1996; Zander & Kogut, 1995) and some attention has been paid to the factors affecting the selection of the knowledge provider and transfer media. Some quantitative research has investigated knowledge transfer in cross-cultural business contexts (Holden, 2002; Hong, Easterby-Smith, & Snell, 2006; Pauleen, Wu, & Sally, 2007). However, relatively a few studies have examined the structured and unstructured knowledge transfer in an offshore outsourcing business contexts. In order to bridge this gap, this research will focus on structured and unstructured

knowledge transfer processes in an offshore outsourcing business context.

The next section will review the literature relating to individual knowledge building and factors affecting individual knowledge building.

## **2.3 INDIVIDUAL TACIT KNOWLEDGE BUILDING**

### **2.3.1 Definition of Knowledge Building**

Knowledge building is a process of creating new cognitive artifacts through interactive questioning, dialogue and continuous self-transcending (Bereiter & Scardamalia, 2003). The process involves collective inquiry, deeper understanding and collaboration. The concept created by Bereiter and Scardamalia is widely used in educational contexts. In a practical context, this study defined knowledge building as a dynamic process of continual knowledge creation and improvement. This section will focus on individual knowledge building. The individual knowledge building process involves initial knowledge creation, trial, verification, modification, transformation and re-creation in the individual's practice. In order to verify individual knowledge, this process may also involve group inquiry and dialogue.

#### *Individual Tacit Knowledge Building*

Tacit knowledge is acquired through action, practice, and reflection (Nonaka & von Krogh, 2009). It is built through experiential learning and practical action (Eraut, 2004; Sternberg et al., 2000; Tsoukas, 2003), and cannot be acquired through reading manuals, or simply be transferred by a person (Tsoukas, 2003). Individual tacit knowledge building is the dynamic and accumulative process whereby knowledge is built through the transformation of experience (Kolb, 1984). The transformation process enables knowledge to be continuously refined, created and recreated. This definition emphasizes several critical aspects of the knowledge building process as

viewed from the experiential perspective. The first critical aspect is that tacit knowledge building is based on the experience of interacting with people and the environment. When the environment changes, new knowledge is created; previous knowledge will be replaced by new knowledge. If the environment no longer needs the old knowledge, it will be forgotten gradually. Second, the goal of knowledge building is to “advance the frontiers of knowledge” (Scardamalia & Bereiter, 2003, p. 1371) as the knowledge builder perceives them. The knowledge building process is a continuous improvement process from primary to advanced, from partial to holistic. Thirdly, the tacit knowledge building process is a personal process rooted in an individual experience, and in actions within a specific context.

#### *The Relationship between Knowledge Building and Learning*

The concept of knowledge building would seem to have some similarities with the concept of learning. Learning is broadly used in education research contexts. Learning is the process whereby knowledge is acquired (Eraut, 2000). It is an internal, unobservable personal knowledge building process that results in changes in beliefs, attitudes, or skills (Scardamalia & Bereiter, 2003). Mezirow (1991) defined learning as the process of “using a prior interpretation to construe a new or a revised interpretation of the meaning of one’s experience in order to guide future action” (p. 12).

Knowledge building is a continuous learning process. It involves a set of learning and it is a summation of all the results of learning. Thus, knowledge building is based on learning. The difference between learning and knowledge building is that the goal of tacit knowledge building is not only to acquire knowledge, but also to advance the frontiers of knowledge (Scardamalia & Bereiter, 2003); therefore, more emphasis is placed on the creation of new knowledge than on acquiring knowledge.

Knowledge building is a long term and time-consuming process based on the experience of interaction between the person and the environment. A review of

previous literature shows research focusing on the individual knowledge building process has been sparse. Only a few studies have concentrated on the knowledge learning and tacit knowledge acquisition process. The following sections provide some details about these studies.

## **2.3.2 Knowledge Learning and Tacit Knowledge**

### **Acquisition Process**

A review of previous literature shows that the activities of trial, experience, reflection and conceptualization play a critical role in the knowledge learning and tacit knowledge acquisition process (Dewey, 1938; Kolb, 1984; Lewin, 1951; Mezirow, 1991; Piaget, 1951; Raelin, 1997; Sternberg et al., 2000). The following section will present the model of experiential learning at first. Then Sternberg et al.'s, (2000) memory structures and knowledge acquisition pathways will be discussed. Next, Mezirow's (1991) transformative theory in adult learning will be described. In the end, Raelin's (1997) model of work-based learning will be examined.

#### **2.3.2.1 The Model of Experiential Learning**

Tacit knowledge is built through personal experience rather than through instruction (Allee, 1997). In this process, experience plays an extremely important role in the tacit knowledge acquisition process (Allee, 1997; Sternberg et al., 2000). Four learning models namely Dewey (1938), Lewin (1951), Piaget (1951) and Kolb (1984) noted the importance of experience.

These four experiential learning models emphasize acquisition, manipulation and recall of abstract symbols. Also they recognize the role of consciousness and subjective experience in the learning process. Lewin's model begins with here-and-now experience (Concrete experience) followed by the collection of data on observations about that experience. The data are then analyzed and the conclusions of this analysis are fed back to the actors in the experience for them to

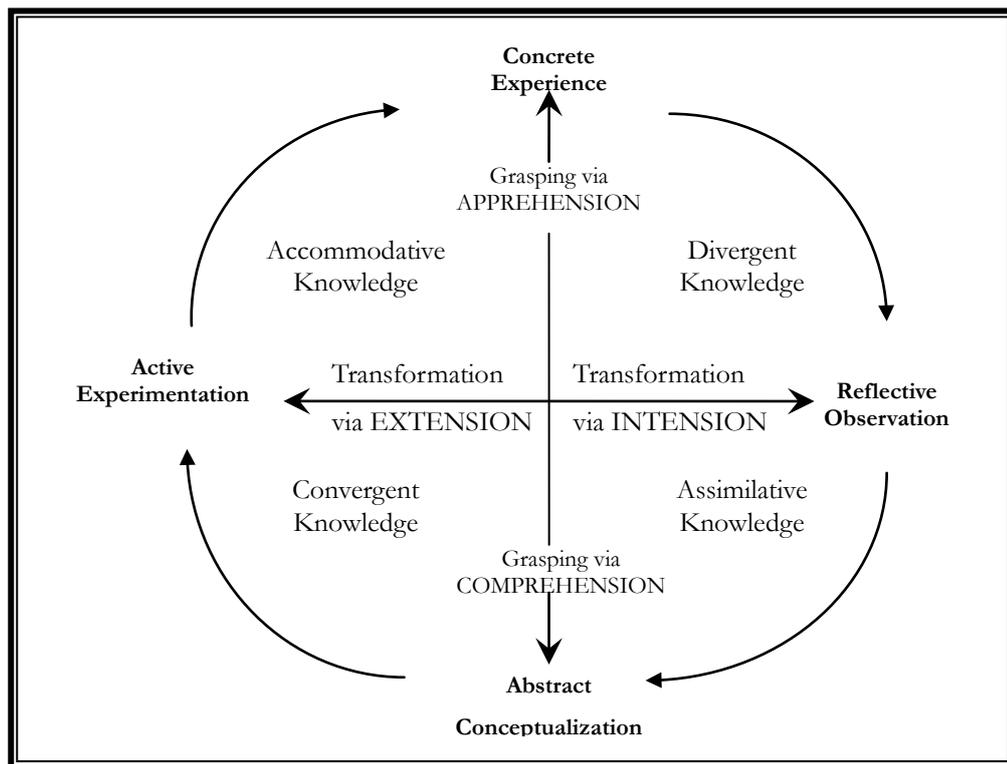
modify their behavior and understand new experience.

Dewey's model of experiential learning is similar to Lewin's model, as it emphasizes that learning is a dialectic process integrating experience and concepts, observation, and action. This model shows how learning transforms the impulses, feelings, and desires of concrete experience into higher-order purposeful action.

Piaget's framework emphasizes learning and cognitive development. He proposes that the key to learning lies in the mutual interaction of accommodation and assimilation. Accommodation is the process of adapting one's mental concepts based on one's experience in the world. Assimilation is the process of integrating one's experience into existing mental concepts and schema. From the cognitive development perspective, the process of cognitive growth is based on the continual transaction between assimilation and accommodation. This continual transaction process enables an individual to shift cognitively from concrete experience to abstract conceptualization and from active experimentation to reflective observation (Piaget, 1951).

Kolb (1984) presented an experiential learning model based on the work of Lewin (1951) and Dewey (1938), enriched and corroborated by Piaget's (1970) model of learning and cognitive development. Kolb's model suggested that new knowledge, skills or attitudes are achieved through confrontation among four adaptive modes of experiential learning: concrete experience, reflective observation, abstract conceptualization, and active experimentation (see Figure 2.3).

**Figure 2.3 Structural Dimensions Underlying the Process of Experiential Learning and the Resulting Basic Knowledge Forms**



Source: Kolb (1984)

In the experiential learning process, learners involve themselves in experiences in order to grasp concrete apprehensions of the world, reflect on and observe their experiences from many perspectives, create concepts that integrate their observation into logically sound theories, and then use these theories to make decisions and solve problems.

This model identifies two primary dimensions to the learning process. The first, the apprehension dimension, represents two dialectically opposed modes of grasping experience, one via direct apprehension of immediate concrete experience, the other through indirect comprehension of symbolic representations of experience (abstract conceptualization). The second transformation dimension includes two dialectically opposed modes of transforming experience, one via intentional reflection (reflective observation), and the other via extensional action (active experimentation). Thus, in the process of learning, one moves in varying degrees from actor to observer, and from specific involvement to general analytic detachment. The model of experiential

learning proceeds from a different set of assumptions. Ideas are not fixed and immutable elements of thought but are formed and re-formed through experience (Kolb, 1984).

However, Boud, Keogh, and Walker (1985) argue that ‘concrete experience’ in this experienced learning model does not include the feelings associated with episodes. Eraut (2004) suggests that people build knowledge from experience. “An experience” refers to a single episode or incident stored in people’s memory. According to Sternberg et al.’s (2000) model, personal experienced events are stored in episodic memory, making up one’s experience. They present memory structures and knowledge acquisition pathways to illustrate the tacit knowledge acquiring process as follows.

### **2.3.2.2 Memory Structures and Knowledge Acquisition**

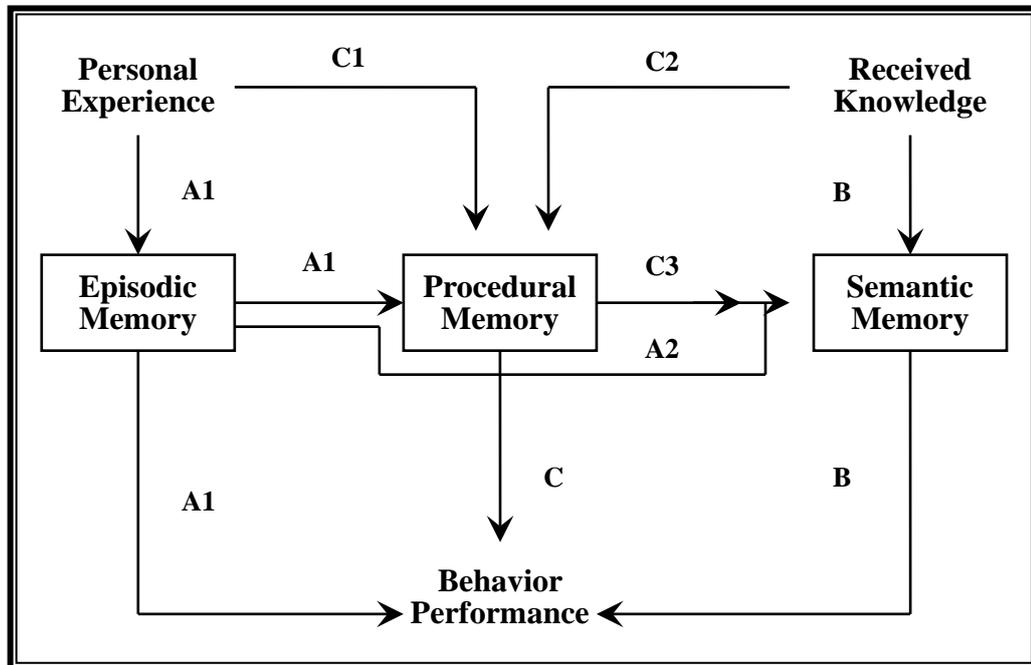
#### **Pathways**

Knowledge building is a mental process of encoding and storing information in memory and retrieving it from memory (Sternberg et al., 2000). Sternberg et al. (2000) present memory structures and knowledge acquisition pathways to illustrate the tacit knowledge acquiring process. They identified three types of memory: episodic, semantic and procedural memory (Sternberg et al., 2000) (see Figure 2.4).

According to Sternberg and his colleagues, personally experienced events are stored in episodic memory, which makes up one’s experience (path A). Semantic memory has general, impersonal, explicit verbal knowledge memory for information that transcends particular episodes, which can be built up either through formal teaching or through private study (path B), or through reflection on episodes from experience (path A2). Procedural memory stocks up specific condition-action pairings that guide a person’s actions in a given situation, which can be acquired either through experience alone (path C1 or A1) or by the communication of generalized knowledge based on someone else’s experience (path C2). The knowledge stocked in

the procedural memory can guide one's behavior and allow one to follow procedures without having to stop and think about what to do next (Sternberg et al., 2000).

**Figure 2.4 Memory Structures and Knowledge Acquisition Pathways in a Cognitive Model of Tacit Knowledge**



Source: Sternberg et al. (2000)

Sternberg et al. (2000) define tacit knowledge (procedural memory) as acquired by episodic memory (paths A1) and personal experience (path C1). This knowledge is acquired through personal experience, since the personal experience includes conditional information about the types of problems or situations to which the knowledge is relevant. When knowledge includes contextual information, it becomes more useful than knowledge that is not contextualized. This procedural knowledge can guide one's behavior (i.e., decisions and actions) without necessarily being accessible to conscious awareness.

In this model, Sternberg et al. classify as tacit knowledge (i.e., procedural knowledge) only the knowledge that leads to rapid decisions or actions. However, Eraut (2000) argued that tacit knowledge includes not only routinised actions knowledge and decision-making knowledge, but also tacit understanding of people and situations.

D'Eredita and Barreto (2006) have a similar view to Sternberg et al. (2000), in that they emphasize that individuals acquire knowledge through the acquisition of experiences or episodes, and tacit knowledge is acquired by episode-based memory. They suggest that tacit knowledge is proliferated, or passed from one person to another, through a "drawing attention to attention drawing" mechanism.

I would argue that this model does not explicitly address the importance of how received knowledge (explicit knowledge) affects the concrete experience (i.e. episodic memory), and how the received knowledge indirectly influences the tacit knowledge (procedural memory) acquisition. In the personal experience acquisition process, there is an immediate apprehension of here-and-now experience, which is a personal subjective process that will be stored in personal episodic memory. The apprehension of the here-and-now experience will be interpreted and criticized (i.e. reflected, analyzed, rearranged) by generalized previous knowledge (i.e., received knowledge or semantic knowledge) (Kolb, 1984; Mezirow, 1991). The received knowledge (or semantic knowledge) is used to guide one's choices of experiences and to direct one's attention to those aspects of apprehended experience to be considered relevant, and to explain, select and reshape apprehended experience in ways that could guide one's decisions and actions without having to stop and think about what to do next. Thus, from this point of view, the received knowledge (semantic knowledge) plays a critical role in tacit knowledge acquisition.

From this perspective, a concrete experience is a series of episodes and direct sensations of the here-and-now that are stored in episodic memory. The episodes and sensations will be interpreted and critiqued by semantic knowledge which is stored in semantic memory to generate abstractive conceptualization knowledge. The semantic knowledge is learned from formal education, training or experience; it is used to guide one's choices of experiences, direct one's attention, and influence what is noticed and/or remembered. This view is supported by Mezirow (1991) who suggests that learning is the process of using a prior received knowledge to interpret

a new experience, or revising a prior received knowledge through reflection to interpret the meaning of an experience as a guide to awareness, feeling and action. The following section will address Mezirow's (1991) transformative theory in adult learning.

### **2.3.2.3 Transformative Learning Theory**

Mezirow (1991) suggests that "learning means using a meaning that we have already made to guide the way we think, act, or feel about what we are currently experiencing" (p. 11). This theory reveals that adults learn by making meaning of their experiences. Meaning is an interpretation of experience or giving coherence to one's experiences. In the process of interpreting an experience, people seek to establish the truth, justification, appropriateness, or authenticity of what is asserted. They reflect and modify any misinterpreted meanings in the learning process. The reflective learning process involves the confirmation, extension, rejection, or transformation of ways of interpreting experience (Mezirow, 1991).

Mezirow (1991) suggests that critical reflection plays an important role in learning, and that reflection can take us into new meanings. He identified three forms of reflection based on the object of the reflection itself: content reflection, process reflection and premise reflection. Content reflection involves an examination of what we perceive, think, feel or act upon. Process reflection involves an assessment of how we perform what we perceive, think, feel, or act upon. Premise reflection involves a judgment of why we perceive, think, feel, or act as we do. Content and process reflection enable us to "assess consciously what we know about taking the next step in a series of actions and consider whether we will be "on course" in doing so" (Mezirow, 1991, p. 117). Premise reflection allows us to question or challenge presuppositions and fundamental beliefs.

The transformative learning theory emphasizes two types of transformation: the transformation of meaning schemes, and the transformation of meaning

perspectives. The transformation of meaning schemes is made through content and process reflection, while the transformation of meaning perspectives is made through premise reflection.

Two important concepts are identified by Mezirow (1991) in his theory: meaning scheme and meaning perspective. Schema are defined by Mezirow (1991) as “memory storage bins” (p. 48) which include a variety of different dimensions or processes that possess different levels of abstraction; however the relationships among them and the role of meta-schemas have not been clearly described. Goleman (1985) defines schema as “the structures memories are stored in” (p. 79), schema guide people’s analysis of sensory input, simplify, determine relevance, are the focus of attention and determine what will enter our awareness. Schema are “lions at the gates of awareness” and “the building blocks of cognition” (p. 79).

“Meaning schemes are the specific beliefs, attitudes, and emotional reactions articulated by an interpretation” (Mezirow, 1991, p. 44). Meaning schemes translate people’s general expectations into specific ones that guide their actions. Meaning schemes direct how to do something, or how to understand what others mean, or how to understand oneself (Mezirow, 1991). The concept of “meaning schemes” is similar to “mental models” proposed by Senge (2006) and by Nonaka (1994). Senge (2006) states that “Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action” (p. 8). Nonaka (1994) refers to mental models as schemata, paradigms, beliefs, and viewpoints that influence individuals in perceiving and defining their world. Mental models provide the context in which to view and interpret new material, and they determine how stored information is relevant to a given situation.

Meaning perspectives are groups of related meaning schemes. Meaning perspectives are rule systems of habitual expectation (orientations, personal paradigms), and meaning schemes (knowledge, beliefs, value judgments, and feelings that constitute a

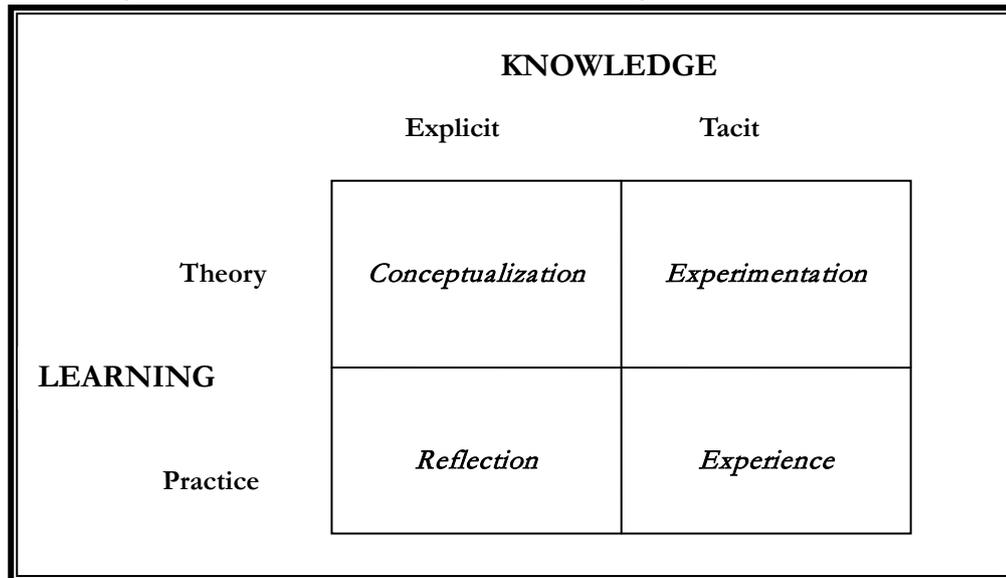
specific interpretation). Both influence the way one defines, understands, and acts upon one's experience. Meaning perspectives form, limit, and distort how one thinks, believes, and feels (Mezirow, 1991). As Mezirow (1991) argues, "because meaning perspectives are structures of largely pre-rational, unarticulated presuppositions, they often result in distorted views of reality" (p. 62). He considers that the goal of adult learning is to correct or transform inadequate, false, distorted, or limited meaning perspectives or schemes, and to test fundamental assumptions, rather than to merely extend knowledge (Mezirow, 1991). Mezirow (1991) suggests that "the most significant transformations in learning are transformations of meaning perspectives" (p.38), which can lead us into new meanings.

Mezirow's theory highlights the importance of making meaning of experience and offers three reflections (i.e., content, process and promise reflections) on experience in the learning process. He provides insights and strategies for adults learning about how to learn by making meaning of their experiences, and how to reflect on and understand the assumptions that underlie their beliefs and perceptions, and their own experiences. However, his theory does not explicitly address the process of how tacit knowledge (i.e., meaning perspective) is acquired. The following section will present Raelin's (1997) model to illustrate the combining of explicit and tacit forms of knowing and theory and practice modes of learning at the individual level.

#### **2.3.2.4 A Model of Work-Based Learning**

Raelin (1997) suggests four learning types at the individual level: conceptualization, experimentation; experience and reflection (see Figure 2.5).

Figure 2.5 A Model of Work-Based Learning at the Individual Level



Source: Raelin (1997)

Raelin (1997) points out that work-based learning starts with conceptualization which provides learners with a means to challenge the assumptions underlying their practice. In experimentation, it is important that learners have the opportunity to engage in experiments to make their conceptual knowledge tacit, and applicable to the situation at hand, and to try out their conceptual knowledge so that it becomes contextual or grounded. The experience type of learning reinforces the tacit knowledge acquired in experimentation. In fact, learning acquired through experience is often referred to as implicit learning in which complex knowledge is acquired without the learner's awareness that he or she is learning. The reflection type of learning is required to bring the inherent tacit knowledge of experience to the surface, and to uncover and make explicit to oneself what one has planned, observed, or achieved in practice. It thus contributes to the reconstruction of meaning (Raelin, 1997).

This model has some similarities to the model of experiential learning (Kolb, 1984) as it identifies conceptualization, experimentation, experience and reflection activities in the learning process. The four learning activities are similar to Kolb's model of four modes of experiential learning: concrete experience, reflective observation, abstract conceptualization, and active experimentation. However, Kolb's model does not identify the tacit and explicit forms of knowing. Raelin's (1997) model illustrates

the combining of explicit and tacit forms of knowing and the theory and practice modes of learning at the individual level. It merges theory with practice and acknowledges the intersection of explicit and tacit forms of knowing. However, this model does not identify a set sequence of work-based learning. Also the model has not been tested by empirical study.

### **2.3.2.5 Justification for Individual Knowledge Building**

#### **Research**

The above sections presented four important models of knowledge learning and tacit knowledge acquisition process in the literature. The model of experiential learning focuses on the process of reflection on experience and the learning cycle. However, from the perspective of knowledge building, this model addresses only the knowledge acquisition process; it does not explicitly present how to advance the frontiers of knowledge. This is similar to Sternberg et al.'s (2000) model, which emphasizes that individuals' tacit knowledge is acquired through experiences or episodes. Sternberg et al. did not mention how to advance the acquired knowledge. Mezirow's theory concentrates on making meaning and transforming meaning. He suggests that learning is the process of using meaning perspectives or meaning schemes to interpret current experience, and transforming meaning perspectives or meaning schemes through content, process and promise reflections on experience. In terms of knowledge building, this theory explains how to advance the frontier of knowledge, but does not present a process of how to acquire and build up the tacit knowledge. Raelin's (1997) model identifies explicit and tacit knowing, and links practice and theory modes of learning, but it does not explicitly address a continuous learning process. In summary, a review of previous literature reveals some studies on knowledge learning and tacit knowledge acquisition process, but, a lack of substantive literature on the individual knowledge building process is evident.

In this study, the author will explore the individual knowledge building process and examine how individuals build up their tacit knowledge in workplace and

continuously advance their frontier knowledge as they perceive. Also the study will investigate how individuals put organizational knowledge into action within particular contexts and, as a result, gain a new experience and knowledge.

### **2.3.3 Factors Affecting Individual Tacit Knowledge**

#### **Building Process**

A review of the literature shows that relatively a little research has been done on tacit knowledge building and factors influencing on knowledge building. Only a few studies identify some factors affecting learning (Bereiter & Scardamalia, 1993; Eraut, 2004, 2007; Jarvis, 1993). Eraut (2004, 2007) developed a two triangle model which identifies two types of factors influencing informal learning in the workplace: learning factors and contextual factors. In this study, these two types of factors will be used to group factors which affect learning.

#### ***Learning Factors***

According to Eraut (2004, 2007), the learning factors include the challenge and value of the work, feedback and support, and confidence and commitment. The triangular relationship between challenge, support and confidence shows that confidence is the central factor affecting individual learning. As well as these three factors, Bereiter and Scardamalia (1993) identify motivation as another factor affecting learning.

#### ***Challenge and Value of the Work***

The Challenge of the work itself influences the individual's confidence development and learning. If individuals are over-challenged in their position, they would have some difficulties in meeting challenges in their work, and they could lose confidence in doing their job, which would hinder professional role development and performance. If individuals are under-challenged in their position, they would learn nothing new from their job. Therefore, it is important for managers to set the right level of challenge in order for employees to develop confidence (Eraut, 2004).

*Feedback and Support*

The feedback and support provided by a manager or an expert would be very important for early-career learning, retention and commitment (Eraut, 2004). The feedback on progress, strengths and weaknesses, and meeting organizational expectations is necessary for individuals to confirm or verify their ability or knowledge, to adjust their actions and behaviors, or to improve their skills. From the emotional perspective, people require supportive relationships; they want to be supported in their endeavor by colleagues when working independently (Eraut, 2004); and they want to be supported when they are faced with challenging jobs. Thus, it is important to provide feedback and support for employees to help them build up their skills and knowledge.

*Confidence and Commitment*

Confidence refers to a belief in a personal abilities and can appear as self-assurance (Jarvis, 1993). Learning is dependent on the development of self confidence. Self confidence is enhanced through experience, practice and being given responsibility, familiarity with the environment, and the supportive encouragement of colleagues or customers (Eraut, 2004). Confidence generally develops over time and is dependent on previous experience, either directly with a situation or with a related experience. It is generally believed that the more you do something and the better you are at it, the more confident you are.

Both high and low levels of confidence affect individuals' ability to become and practise to a level where they are able to extend themselves. If an individual lacks confidence, this has a negative effect on practice. A lack of confidence affects the process of learning (Jarvis, 1993). A low level of self confidence appears to impede professional role development and performance (Flagler, Loper-Powers, & Spitzer, 1988). High levels of confidence are a positive empowering emotion and evoke a feeling of being in control. An individual with high levels of confidence would like to be proactive in seeking learning opportunities (Eraut, 2004).

### *Motivation*

Intrinsic motivation plays an important role in individual learning. If people are interested, they will be willing to put effort into the developing of expertise. In this situation, the effort put into the learning actually makes the individual feel good (Bereiter & Scardamalia, 1993). Also, extrinsic motivation such as monetary compensation can motivate individuals to work hard and put some effort into developing their knowledge and skills to achieve a high level of expertise.

### *Contextual Factors*

According to Eraut (2004, 2007), contextual factors include the allocation and structuring of work, encounters and relationships with people at work, and individual participation and expectations of their performance and progress. Among these factors, allocation and structuring of work is a central factor affecting individual learning.

### *Allocation and Structuring of Work*

Since individuals accumulate tacit knowledge through direct “hands-on” experience (Nonaka, 1994), what type of job individuals do determines what kind of work experience they have. Individual tacit knowledge is built through experience. Thus, the allocation and structuring of work can affect individuals’ tacit knowledge building. For example, if individuals do monotonous and repetitive tasks, this would affect the amount of tacit knowledge obtained from the job. It also would affect the quality of tacit knowledge obtained from deep personal commitment into bodily experience (Nonaka, 1994).

Also the allocation and structuring of work affects the difficulty or challenge of the work (Eraut, 2007). The individual’s workload should be at a right level to allow him/her to respond to new challenges effectively. Thus managers have to balance the employee’s job and give greater attention to the allocation and structuring of

appropriate work.

#### *Encounters and Relationships with People at Work*

The allocation and structuring of work also affects the opportunities for individuals to meet, observe and work alongside people who have more or different expertise. The people whom the individuals encounter would affect what knowledge they can learn from them, affect the relationships that they can build with them and affect the feedback and support they can acquire from them (Eraut, 2007).

#### *Individual Participation and Expectations of Their Performance and Progress*

If individuals have high expectations of their performance and progress, this would motivate them to work hard and to be proactive in seeking learning opportunities. If individuals have low expectations of their performance and progress, they will lack the willingness to seek learning opportunities and work hard (Eraut, 2004).

### **2.3.4 Literature Gap in Individual Knowledge Building**

An examination of the literature has revealed, even though there have been some studies on knowledge learning and the tacit knowledge acquisition process (Dewey, 1938; Kolb, 1984; Lewin, 1951; Mezirow, 1991; Piaget, 1951; Raelin, 1997; Sternberg et al., 2000), there is a lack of relative literature on the individual knowledge building process in workplace. With regard to the factors affecting individual knowledge building, some research has been done on individual informal learning (Eraut, 2004, 2007), but there is a lack of research on the factors affecting individual tacit knowledge building. This study will bridge the gap and explore the individual knowledge building processes and factors affecting these processes.

The following section will review the organizational knowledge building literature.

## **2.4 ORGANIZATIONAL KNOWLEDGE BUILDING**

### **2.4.1 The Definition of Organizational Knowledge Building**

#### **Building**

Based on Bereiter and Scardamalia's (2003) definition of knowledge building, in this study, organizational knowledge building refers to a continuous knowledge construction and improvement process, in which organization members continually create and improve knowledge to adapt to changes in organizational environment, and provide value to the organization through transforming individuals' experience into shared knowledge that the organization accesses and uses to achieve its core competitive advantage. In this process, the emphasis of organizational knowledge building is collective rather than individual. In other words, organizational knowledge should be built collectively and not be just an assemblage of individuals' knowledge.

There is conceptual confusion between the terms organizational knowledge building, organizational learning, and organizational knowledge creation. In this study, the concept of organizational knowledge building has some similarities to the concept of organizational knowledge creation and organizational learning.

Knowledge creation focuses on knowledge innovation. It is defined as a process of creating and defining problems and then actively developing new knowledge to solve problems in the organization (Nonaka, 1994). It is "a continuous, self-transcending process by means of which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world and new knowledge" (Nonaka, Toyama, & Komo, 2000, p. 8).

Organizational learning focuses on learning processes that determine the organization's capacity to develop new knowledge or insights, to transfer and share the knowledge with others, to embed it into organization routines and to influence

organizational members' behavior (Crossan, Lane, & White, 1999). The previous literature shows that many scholars have done research into organizational learning. Levitt and March (1988) view organizational learning as "encoding inferences from history into routines that guide behavior" (p. 319). Slater and Narver (1995) share a similar view in stating that organizational learning develops new knowledge or insights that have the potential to influence behavior. Garvin(1993) describes organization learning as the process of creating, acquiring, and transferring knowledge, and adjusting its behavior. Dodgson (1993) suggests that organizational learning consists of the activities of building, increasing and organizing knowledge and routines within the organization's culture, to improve the broad skills, and to develop organizational efficiency.

In this study, organizational knowledge building emphasizes continuous learning and creation. It includes the processes of both organizational learning and knowledge creation. The knowledge building process includes ascertaining the source of the existing knowledge, and how the organization accepts external knowledge, and combines it with its existing knowledge. It also includes ascertaining how the organization continuously creates new knowledge and adapt the assimilated knowledge to respond to environmental changes.

## **2.4.2 The Organizational Knowledge Creation and Learning Process**

Organizational knowledge building process is a dynamic (Crossan, Lane, & White, 1999; Nonaka, 1994), upward spiral process of continuously creating new knowledge out of existing stocks of knowledge (Nonaka, Toyama, & Komo, 2000). In this process, the organization interacts with its environment, continuously creates and defines problems, develops and applies new knowledge to solve the problems, and then develops new knowledge through the action of problem solving. The organization aggregates its knowledge through the dynamic process of knowledge building during interacting with and reshaping its practices to respond to changes in

the environment (Nonaka, Toyama, & Komo, 2000).

A few studies have looked at the knowledge building process. Nonaka (1994), a famous scholar in the organizational knowledge creation field, identifies three elements in the process: the SECI spiral (i.e., *socialization*, *externalization*, *combination* and *internalization*), *ba*, and knowledge assets (Nonaka, Toyama, & Komo, 2000). Kim (1993) developed a model to demonstrate how individual and organizational learning link together through mental models (Kim, 1993). Crossan, another notable scholar in the organizational learning field, identifies four psychological processes: intuiting, interpreting, integrating, and institutionalizing and three levels (individual, group and organization levels) within organizational learning (Crossan et al., 1999). Zahra and George's (2002) study has focused on the absorptive capacity in organizations. They identify four dimensions of absorptive capacity: acquisition, assimilation, transformation and exploitation. They suggest that organizational absorptive capacity enables knowledge creation and innovation. The following sections will present these four scholars' organizational knowledge creation and learning theories.

#### **2.4.2.1 Nonaka's Organizational Knowledge Creation Theory**

Nonaka (1994) states that an organization cannot create knowledge on its own. Individuals' knowledge is the basis of organizational knowledge creation. The dynamic interaction amongst individuals or between individuals and their environment facilitates four modes of knowledge conversion between tacit and explicit knowledge (i.e., *socialization*, *externalization*, *combination* and *internalization*). The four modes of knowledge conversion enable organizational knowledge to become externalized and amplified, and organizational knowledge building to become larger in scale and faster in speed.

Organizational knowledge building is a spiral process, starting at the individual level and moving up through expanding communities of interaction, that cross group, departmental, divisional, and organizational boundaries. At the same time, the

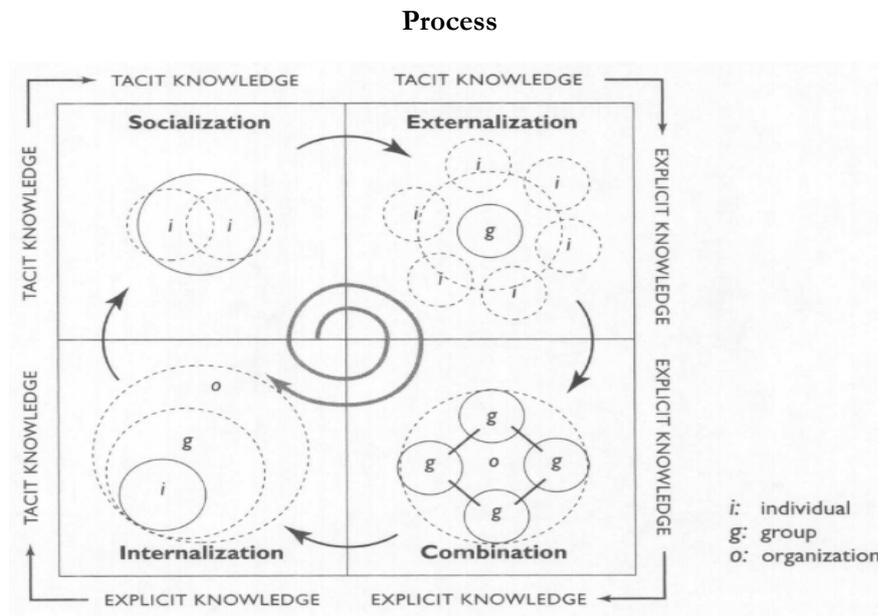
organizational level of knowledge is transferred from the organizational level to the group level, and then to the individual level (Nonaka, 1994). In this process, the organization has to initiate individual tacit knowledge building and encourage individuals to interact with group members through dialogue, discussion, experience sharing, and observation. This dialogue can involve considerable conflict and disagreement. However, dialogue enables employees' double-loop learning and pushes employees to query existing premises and to make sense of their experience in new way. "Double-loop learning occurs when mismatches are corrected by first examining and altering the governing variables and then the actions" (Argyris, 1993 pp. 8-9). This kind of dynamic interaction facilitates the transformation of personal knowledge into organizational knowledge (Nonaka & Takeuchi, 1995). Nonaka and Takeuchi (1995) recognize three levels of knowledge creation (i.e. individual, group and organizational levels), but the three levels are not a substantial part of their organizational knowledge creation model.

Nonaka (1994) states that three elements: the SECI spiral (i.e., *socialization*, *externalization*, *combination* and *internalization*), *ba*, and knowledge assets play a critical role in the knowledge creation process (Nonaka, Toyama, & Komo, 2000). The SECI spiral is the process of knowledge building through the conversion of tacit and explicit knowledge (Nonaka & Konno, 1998). *Ba* is the shared context for knowledge building. It is an environment, context-knowledge place. Knowledge assets are the inputs and outputs of the SECI spiral; they moderate the knowledge-creating process. The following section will describe in detail the SECI spiral and the four categories of knowledge assets.

### The SECI Spiral

Figure 2.6 shows the spiral evolutions of knowledge conversion and self-transcending processes.

Figure 2.6 Spiral Evolutions of Knowledge Conversion and Self-Transcending



Source: Nonaka and Konno (1998)

*Socialization* is a process of converting tacit knowledge to tacit knowledge. It aims to yield synthesized knowledge through building a field of interaction to share experiences and mental models.

*Externalization* is a process of concept building involving the conversion of the shared tacit knowledge into explicit knowledge. In other words, tacit knowledge is articulated into explicit concepts. Tacit knowledge is shared by a self-organizing group through dialogue or reflection, in which uses an appropriate metaphor or analogy helps group members to articulate hidden tacit knowledge. Further, tacit knowledge is converted to explicit knowledge in the form of a new concept.

*Combination* is a process of systemizing concepts into a knowledge system. The knowledge conversion involves combining various forms of explicit knowledge such as documents, meetings, telephone conversations, or computerized communication

networks through sorting, adding, combining and categorizing them into new knowledge, a new product or new service.

*Internalization* is a process of embodying explicit knowledge into tacit knowledge. The knowledge conversion process of “learning by doing” triggers *internalization*. New concepts created by individuals or the group need to be justified through bodily experience.

Nonaka’s SECI model has been almost universally used both in conception and in application by the knowledge management community. It also has been used to analyze empirical data, for example, Matsudaira (2010) used Nonaka’s SECI model to examine knowledge creation in relation to improvements on the production line in the manufacturing department of Nissan Motor Company. Vaccaro, Veloso, and Brusoni (2009) also used the SECI model to examine the organizational knowledge creation processes in two highly virtual teams involved in new product development projects in the automotive industry. Furthermore, it has been applied in qualitative studies such as Peltokorpi, Nonaka, and Mitsuru (2007) and quantitative studies such as Dyck, Starke, Mischke, and Mauws (2005).

However, Glisby and Holden (2003) have argued all four modes of knowledge conversion are culture-dependent. In other words, Japan-specific cultural factors tacitly embedded in the model’s, cultural context variously influence what is understood by tacit or explicit knowledge, and influence how either mode of knowledge can be communicated, perceived, and absorbed. Glisby and Holden suggest that understanding Japanese social and organizational culture and related value systems might enable this model to be used successfully in a western setting.

#### ***Four Categories of Knowledge Assets***

Knowledge assets are the inputs and outputs of the knowledge building activities (Nonaka, Toyama, & Komo, 2000). In the organizational knowledge building process,

organizational members build knowledge assets and use them to create value for an organization so it can achieve its core competitive advantage. Nonaka, Toyama, & Komo (2000) categorize knowledge assets into four types: experiential knowledge assets, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets (see Table 2.9).

**Table 2.9 Four Categories of Knowledge Assets**

<p><b>Experiential knowledge assets</b> Tacit knowledge shared through common experiences</p> <ul style="list-style-type: none"> <li>◆ Skills and knowledge-how of individuals</li> <li>◆ Care, love, trust and security</li> <li>◆ Energy, passion, and tension</li> </ul>	<p><b>Conceptual knowledge assets</b> Explicit knowledge articulated through images, symbols, and language</p> <ul style="list-style-type: none"> <li>◆ Product concepts</li> <li>◆ Design</li> <li>◆ Brand equity</li> </ul>
<p><b>Routine knowledge assets</b> Tacit knowledge routinized and embedded in actions and practices</p> <ul style="list-style-type: none"> <li>◆ Know-how in daily operations</li> <li>◆ Organizational routines</li> <li>◆ Organizational culture</li> </ul>	<p><b>Systemic knowledge assets</b> Systemized and packaged explicit knowledge</p> <ul style="list-style-type: none"> <li>◆ Documents, specifications, manuals</li> <li>◆ Database</li> <li>◆ Patents and licenses</li> </ul>

Source: Nonaka et al. (2000)

#### *Experiential knowledge assets*

Experiential knowledge assets consist of the shared individual tacit knowledge. The individual experiential knowledge is built up through the sharing of hands-on experience amongst organizational members. It may include contextual experiences in working in this and other organizations, and processes for working and interacting with other colleagues, organizational customers, suppliers or affiliated firms.

#### *Conceptual knowledge assets*

Conceptual knowledge assets consist of individual explicit knowledge, which is articulated through metaphors, images, symbols and language. They may include the concepts held by organizational customers and members, the brand equity perceived by customers, and the designs perceived by the organizational members. Conceptual knowledge assets are easier to transfer and share than experiential knowledge assets, but the customers and organizational members' insights and perceptions are difficult to convert into conceptual knowledge.

#### *Systemic knowledge assets*

Systemic knowledge assets consist of systemic collective explicit knowledge, which is

a combination of organizational explicit knowledge and conceptual knowledge. They may include explicitly stated technologies, product specifications, manuals, and documented and packaged information about customers and suppliers. They also include licenses and patents. The systemic knowledge assets are relatively easy to transfer.

#### *Routine knowledge assets*

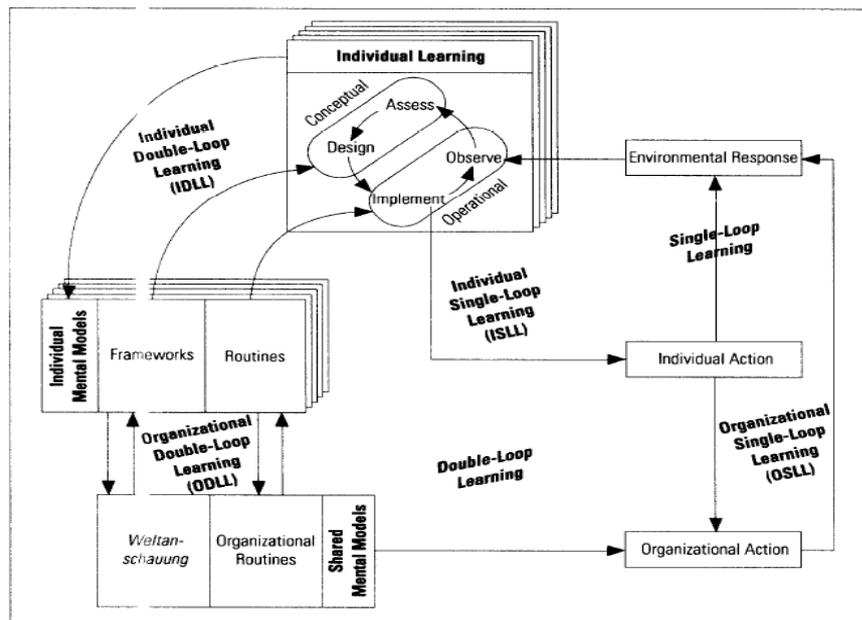
Routine knowledge assets consist of the collective tacit knowledge. They are recorded in a collective memory and routinized and embedded in the actions and practices of organizational members. Routine knowledge includes the forms, rules, procedures, conventions, strategies, and technologies. They also include beliefs, frameworks, paradigms, codes, and cultures. The routine knowledge is reinforced and shared in the organization through practices and actions.

In summary, organizational knowledge creation is a process in which an organization uses its existing knowledge assets to create new knowledge through the SECI spiral that occurs in ba. Then, the new created knowledge turns into the organizational knowledge assets, which facilitate a new spiral of knowledge creation (Nonaka, Toyama, & Komo, 2000). Easterby-Smith et al. (2000) argue that Nonaka's knowledge creation theory emphasize knowledge over action. They suggest that Nonaka and Takeuchi should "elevate the role of action and of being and doing, within the knowledge-creation process" (p. 789).

### **2.4.2.2 Kim's Organizational Learning Model**

Kim has a similar view on organizational knowledge building to Nonaka's. He considers that organizational knowledge building is based on individual actions and beliefs. The individual actions lead to organizational actions, and result in some environmental response. The environmental response affects individual actions and beliefs, which then change organizational actions. In turn, this starts a new cycle of learning (Kim, 1993).

**Figure 2.7 A model of Linking Individual and Organizational Learning through Mental Models**



Source: Kim (1993)

Kim (1993) points out how individual level learning is transferred to organizational level learning through mental models (see Figure 2.7). He suggests that individual mental models include frameworks and routines. The frameworks comprise individual belief systems and deep-rooted assumptions. Routines are individual action scripts, and technical know-how. Operational individual learning produces new or revised routines that are executed in the place of the previous ones. Conceptual individual learning challenges the existence of procedures or conceptions, and leads to new frameworks in the mental models through individual double-loop learning (Kim, 1993).

An individual's set of mental models contributes to the organization's shared mental models and learning. Individual mental models become organizational mental models through shared mental models. Individual frameworks then become embedded in the organization's weltanschauung (i.e. culture, deep-rooted assumptions, artifacts, and behavior rules). Similarly, individual routines that are proved to be sound over time become organizational standard operating procedures. They can include procedures for escalating a difficult problem, call handling procedure, and TSEs performance

reviews. The level of individual learning affects learning at the organizational level through its influence on the organization's shared mental models. The individual and shared mental models affect the way an individual or organization views the world and takes action (Kim, 1993).

### **2.4.2.3 Crossan's Organizational Learning Framework: from Intuition to Institution**

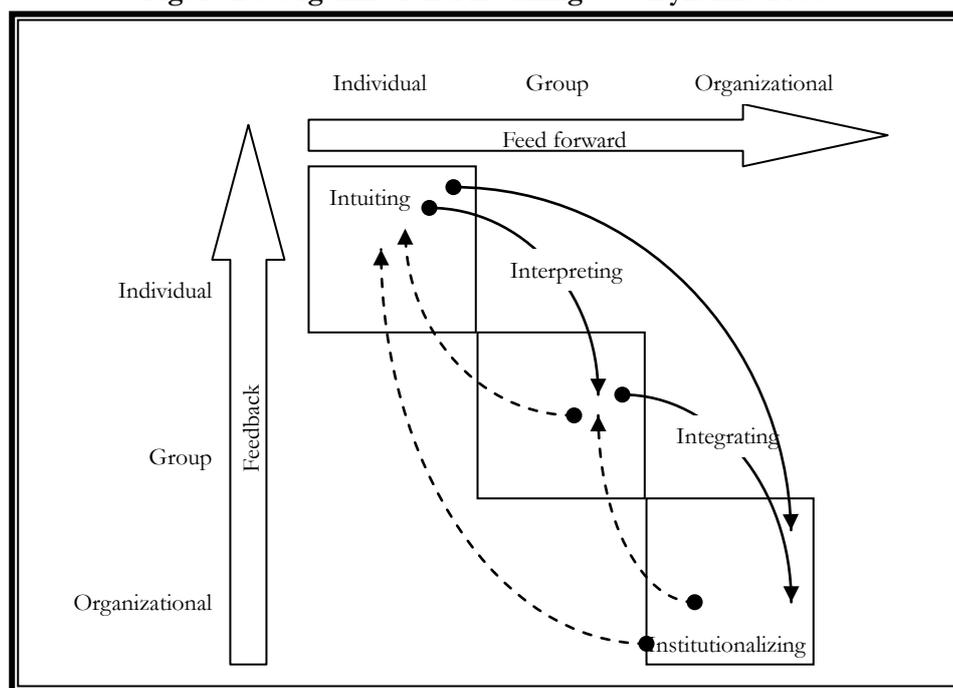
Crossan, Lane, and White (1999) state that "organizational learning is a dynamic process" (p. 532). They identify four psychological processes--intuiting, interpreting, integrating, and institutionalizing and three levels (individual, group and organization levels) within organizational learning (Crossan, Lane, & White, 1999).

Intuiting is a subconscious process. This process involves recognition of the inherent possibilities or patterns in one's experience. This process could influence the intuitive individual's behavior. Interpreting is the process of converting subconscious insights into conscious. Through conversations and interactions with others, the individual's insight or idea can be explained to others through the development of language. Integrating is the process of integrating an individual's knowledge into the group through development of a shared understanding and action adjustment amongst individuals. Institutionalizing is the process of leveraging the learning of individuals and groups, and ensuring that formal rules and procedures are established and certain actions are institutionalized and embedded in systems, structures, or routines and strategy (Crossan, Lane, & White, 1999).

These four processes happen at three levels. The intuiting and interpreting processes take place at the individual level. The interpreting process bridges the individual and group levels. The interpreting and integrating processes happen at the group level. The integrating process links the group and organizational levels. The integrating and institutionalizing processes occur at the organizational level.

Crossan, Lane, and White (1999) propose an organizational learning framework and suggest that organizational learning involves knowledge exploration and knowledge exploitation through four psychological processes occurring in three levels (see Figure 2.8). The exploration enables individuals to develop their new ideas and action, for example, an individual member recognizes the pattern or possibility inherent in his/her experience. Through conversations and interactions with others, the new ideas or actions are interpreted and explained to others through words and/or actions. Then the new idea or action flows from the individual to the group through integrating the ideas in a way that develops a shared understanding among the group members. Next, the new idea or action flows from the group to the organization through the establishing of formal rules and procedures and the new ideas or actions are institutionalized and embedded in systems, structures, or routines. At the same time, the knowledge of what has been learnt is exploited and transformed by the organization's members. The knowledge flows back from the organization to the group and to the individual levels, to affect behaviour and thinking of the organization members.

Figure 2.8 Organizational Learning as a Dynamic Process



Source: Crossan, Lane, & White (1999)

#### 2.4.2.4 Absorptive Capacity in Organizational Knowledge

##### Building

Absorptive capacity was first conceptualized by Cohen & Levinthal (1990). It is defined as an ability to acquire and assimilate external knowledge based on prior knowledge including basic skills, prior experiences or even a shared language. Cohen and Levinthal (1990) suggest that “an organization’s absorptive capacity is not resident in any single individual but depends on the links across a mosaic of individual capabilities” (p. 133). An organization’s absorptive capacity depends on the absorptive capacities of its individual members who stand at the interface of either the organization and the external environment, or at the interface between subunits within the organization. The organization’s absorptive capacity depends on transfers of knowledge and expertise across and within subunits, and also on the individual absorptive capacities being leveraged.

In recent years, a number of studies have examined absorptive capacity in organizational settings both conceptually and empirically (Easterby-Smith, Graca,

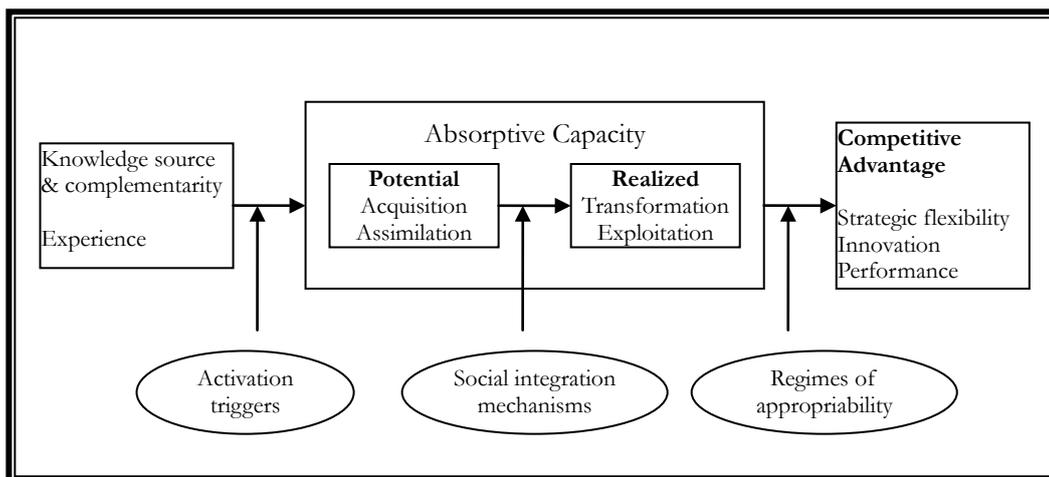
Antonacopoulou, & Ferdinand, 2008; Jones, 2006; Lane & Lubatkin, 1998; Sun & Anderson, 2010; Zahra & George, 2002).

Lane and Lubatkin (1998) conducted an empirical study in a dyadic inter-organizational alliance situation. They reconceptualized Cohen and Levinthal's absorptive capacity at the inter-organization level. In their view, one firm's ability to learn from another firm depends on the relative similarity of both firms' knowledge bases, organizational structures and compensation policies, and dominant logics. This relative similarity affects the student firm's (i.e., knowledge recipient) ability to value, assimilate, and commercialize its teacher firm's (i.e., knowledge provider) knowledge.

Based on Cohen & Levinthal's definition, Zahra and George (2002) re-conceptualized and extended the definition of absorptive capacity. They refer to absorptive capacity as "a dynamic capability embedded in an organizational routines and processes" (Zahra & George, 2002, p. 186). Also, Zahra and George (2002) identify four dimensions of absorptive capacity: acquisition, assimilation, transformation and exploitation. The four dimensions form two distinct components of absorptive capacity: potential and realized capacities. Potential absorptive capacity reflects the organization's capacity to acquire and assimilate the external knowledge, while realized absorptive capacity reflects the organization's capacity to transform and exploit the knowledge that has been absorbed.

The model of absorptive capacity (see Figure 2.9) suggests that the organization's past experience, knowledge complementarity and diversity of knowledge sources influence potential absorptive capacity. The organization's potential and realized capacities can differentially influence the creation and sustenance of its competitive advantage. The realized capacity allows for new knowledge creation and for innovation, while potential capacity provides strategic flexibility for changing and reconfiguring a firm's operations (Zahra & George, 2002).

Figure 2.9 A model of Absorptive Capacity



Source: Zahra & George (2002)

Jones (2006) extended the work of Zahra and George (2002) by identifying the importance of gatekeepers, boundary spanners and change agents in building the ability of organizations to acquire, assimilate, transform and exploit new knowledge. Gatekeepers play a role in facilitating formal and informal communication within the different groups who have different mental maps, languages and time frames (Dougherty, 1992). Boundary spanners take responsibility for linking the organizational structure to the external knowledge source through effective communication and interaction (Kostova & Roth, 2003). Change agents are responsible for developing strategies to respond to the changes in the environment, such as strategic reformulation, reorganization, and organizational change (Caldwell, 2003).

Easterby-Smith et al.(2008) provided insights into the processes of absorptive capacity. They confirmed the importance of gatekeepers, boundary spanners and change agents in the knowledge transfer process and identified that systemic power and episodic power play a critical role in the access to external knowledge source, knowledge's adoption and utilization. They also identified that the nature of boundaries within and around organizations play an important role in knowledge transfer, as they can facilitate or inhibit knowledge transfer within or across organizations.

Sun and Anderson (2010) examined the relationship between absorptive capacity and organizational learning. They claim that prior knowledge creates absorptive capacity, which enables the organization to learn and deploy new organizational capabilities, which will enhance prior knowledge.

This study builds on the above studies to investigate the interaction between absorptive capacity and knowledge transfer, and between absorptive capacity and knowledge building.

### **2.4.2.5 Justification for Organizational Knowledge Building**

#### **Research**

This section presented four important models of organizational knowledge creation and organizational learning found in the literature. These four models emphasize that organizational knowledge building happens at many levels. Nonaka's model and Crossan's model suggest that it occurs at three levels: individual, group and organization. Kim's model recognizes two levels in organizational learning: individual and organization. In addition, all three models suggest that organizational knowledge is built up through its individual members, and starts at the individual level. Cohen and Levinthal (1990) suggest that an organization's absorptive capacity depends on the absorptive capacities of its individual members, and depends on the individual absorptive capacities being leveraged.

Moreover, the first three models recognize that shared mental models play a vital role in the organizational knowledge building process. Nonaka emphasizes that a mental model helps individuals to perceive and define their world, but he does not explicitly address the role of mental models in linking the three levels of knowledge building. Kim's model points out that shared mental models link individual to organizational learning. The individual frameworks become embedded in the organization's *weltanschauung*, with individual routines that have proved to be sound over time

becoming organizational standard operating procedures. Crossan considers shared models (i.e. shared understanding and meaning, and mutual adjustment actions) play a very important role in interpreting and integrating the processes of organizational learning, which link individual learning to the group learning and to the organizational learning. Cohen and Levinthal do not mention the role of shared mental models in knowledge transfer and knowledge building, but they point out that shared prior knowledge and experience could increase an organization's absorptive capacity, and then affect knowledge transfer and building.

Even through these four models identify three levels of knowledge building in the organization and that shared mental models link these three levels of knowledge building together, they do not explicitly present details about how the knowledge flows in and out of the three levels of knowledge building and how the four types of knowledge assets can be built in the organization. This study will therefore explore these two questions to develop a model of organizational knowledge building at three levels.

### **2.4.3 Factors Affecting Organizational Knowledge**

#### **Building**

A review of the literature shows that relatively a little research has been done on organizational knowledge building and factors influencing knowledge building. A few studies identify some factors affecting organizational knowledge creation (e.g., Nonaka & Takeuchi, 1995; Tovstiga, 1999). Nonaka and Takeuchi (1995) identify five factors affecting organizational knowledge creation: intention, autonomy, fluctuation and creative chaos, redundancy, and requisite variety. Tovstiga (1999) considers that knowledge distribution, conversion and sharing are dependent on the organizational context: its learning culture, knowledge base and enabling practices. The Learning culture reflects the organization's learning values and orientations, including learning focus, experimentation, and leadership. The knowledge base reflects the organization's learning patterns or orientations, including residing

knowledge, knowledge sourcing, and knowledge dissemination. The enabling practices provide the appropriate context for assisting group activities and knowledge processes at the individual level. These practices include intention, autonomy, creative chaos, redundancy, and requisite variety (Nonaka & Takeuchi, 1995; Tovstiga, 1999).

Even though there are some studies on factors affecting organizational knowledge creation in previous literature, there is a lack of research on the factors affecting organizational knowledge building. This study will fill the gap and look at the factors affecting the organizational knowledge building processes.

#### **2.4.4 Literature Gap in Organizational Knowledge Building**

A review of the literature on organizational knowledge building shows that some scholars (Crossan, Lane, & White, 1999; Kim, 1993; Nonaka, Toyama, & Komo, 2000) identify three levels of knowledge building in an organization and that shared mental models link these three levels of knowledge building. However, they do not explicitly present details about how the knowledge flows in and out of the three levels of knowledge building and how knowledge assets can be built in an organization. Even though there has been some studies carried out on knowledge innovation and knowledge creation (Avadikyan, Llerena, Matt, Rozan, & Wolff, 2001; Buchel, 2007; Nonaka, 1994; Robertson, Scarbrough, & Swan, 2003), relatively few studies have focused on knowledge building and the literature seems to show that the terms are not clearly distinguished. However, there is a considerable difference between creation, innovation and knowledge building. The purpose of knowledge creation is to create new knowledge and the purpose of innovation is to take internal knowledge and to use it to do things in a new way. Knowledge building involves applying experience knowledge and turning it into the organization's member's belief system. It is a long term and time-consuming process and can take many years to institutionalize and embed in organizations, so that it can guide and change people's

behavior and the way of thinking. This study will focus on organizational knowledge building and bridge the gap in literature.

## **2.5 KNOWLEDGE TRANSFER AND KNOWLEDGE BUILDING IN OFFSHORE OUTSOURCING**

### **2.5.1 Offshore Outsourcing Technical Support Centres**

Technical support centers (TSCs) have been defined as after-sales support organizations that assist customers in solving problems with the firm's goods or services, often in real time, and based on a limited understanding of customers' situations, to increase customer satisfaction after they have purchased a product and started to use it (El Sawy & Bowles, 1997; Gray & Durcikova, 2005). At TSCs, call agents receive inbound telephone calls, with these calls being processed by some form of predictive dialing systems or automated call distribution (ACD). Services provided by Technical Support Engineers (TSEs) include product support, installation enquiries, warranty claims, customer assistance and training, technician training, complaint handling, and returns and refunds (El Sawy & Bowles, 1997).

Offshore outsourcing is defined as the process of turning over part or all of an organization's functions to external service providers in a foreign country, located far from the organization, so as to achieve economic, technological and strategic advantages (Gonzalez, Gasco, & Llopis, 2006; Loh & Venkatraman, 1992). An organization establishes an offshore TSC in a foreign country with the role of delivering a range of services over the telephone to help customers resolve their technical problems (Richardson & Howcroft, 2006). Offshore TSEs spend their time in near real-time contact with customers, making or receiving calls and delivering solutions or processing the information received.

TSCs adopt three-level escalation systems with knowledge management systems to maximize customer satisfaction and minimize labor costs (El Sawy & Bowles, 1997). In other words, TSCs hire large numbers of TSEs who know little about the technology or the product because they can rely on the knowledge repository to provide the necessary knowledge (Davenport & Klahr, 1998), and hire a few experts to keep up with the growth in both product knowledge and the technical expertise required by customers.

Three-level escalation systems can be described as follows. At level one, after dispatch, the customer call goes to a level one TSE. He/she tries to resolve the problem by consulting various knowledge sources such as knowledge repositories, documents, colleagues, or back-line support. If the problem is not resolved at level one, it will be escalated and queued to a level two technical engineer who is more skilled and who investigates the problem thoroughly. If the level two technical engineer is unable to resolve the issue, then it will be escalated to the problem tracking request manager (level three) who verifies the problem and must find a way to resolve it (El Sawy & Bowles, 1997).

### ***Types of Offshore Outsourcing Relationships***

There are three kinds of offshore outsourcing relationships: conventional offshore outsourcing, quasi-outsourcing and joint venture (see Table 2.10). The emphasis of this study is on the quasi-outsourcing relationship. In this relationship, a parent corporation transforms an internal department into an associated subsidiary which can behave as an external provider that supplies services to the parent corporation's customers (Gonzalez, Gasco, & Llopis, 2006). At the same time, the parent corporation exerts strong control over the activity that has been outsourced (Aoki, 1990). The most important aspect of this relationship is that the quasi-outsourcing relationship balances not only market but also organizational transactions (Gonzalez, Gasco, & Llopis, 2006). This type of relationship has been widely adopted in the high-tech IT industry, for example, Hewlett Packard, IBM, DELL, EDS, CSC and Oracle have their own subsidiaries in offshore countries like India, China and Russia

(Palvia, 2003). However, it would appear that quasi-outsourcing relationships have not been examined to any extent in published studies. It is important to conduct research in this field to find out the impact of quasi-outsourcing partnerships on outsourcing success. This study will focus on quasi-outsourcing partnerships.

**Table 2.10 Types of Offshore Outsourcing Relationships**

Type	Relationships	Example
Conventional offshore outsourcing	Conventional offshore outsourcing is to outsource all or part of its IT operations without having any property relationship with the provider firm.	Clopay Corp. (Weier, 2003)
Quasi-outsourcing	Quasi-outsourcing is to establish a subsidiary in a low-cost country and transfer all or part of the IT activities to that country. The offshore subsidiary is partially owned by the parent, but independently managed.	Hewlett Packard, IBM, EDS, CSC and Oracle
Joint venture	Joint venture is to create an organization in a low-cost country, which implies sharing risks and rewards rather than a simple transactional agreement. Both the firm based on the outsourcing country and the one which receives the joint venture win something: one achieves lower costs; the other finds a way to attract foreign customers.	Microsoft

Adapted from Barthelemy and Geyer (2005), Gonzalez, Gasco, and Llopis (2006) and Ito (1995)

Offshore outsourcing involves three parties, including the company that outsources the work (outsourcer), the company that performs the outsourced work (outsourcee), and the end user who uses the product or is a beneficiary of the service (Misra, 2004).

A review of literature shows that many motivators drive the outsourcing organization to adopt offshore outsourcing, but that, many inhibitors impede the outsourcing organization from achieving the benefits of offshore outsourcing. The following section will describe the motivators and inhibitors of offshore outsourcing.

### ***Motivators of Offshore Outsourcing***

Much of the offshore outsourcing literature is devoted to descriptions of the drivers to offshore outsourcing. Numerous motivators have been suggested, which can be gathered into four categories: cutting costs, focusing on core competencies,

improving service level, and facilitating access to expertise (see Table 2.11).

**Table 2.11 Motivations for Offshore Outsourcing**

Categories	Items	Resource
Cutting costs	Lowering operating costs	(Carmel & Tjia, 2005; Fiveson, Aug 2001; ICMI, 2006; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Pai & Basu, 2007; Stackhouse, Apr/May 2006); (Clott, 2007; Gonzalez, Gasco, & Llopis, 2006)
	Cutting labor costs	(Carmel & Tjia, 2005; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Stackhouse, Apr/May 2006)
Focusing on core competencies	Competitive pressure	(Clott, 2007)
	Focusing on core competencies	(Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Pai & Basu, 2007)
	Making capital funds available	(Pai & Basu, 2007)
	Reducing investments in assets	(Fiveson, Aug 2001; Pai & Basu, 2007)
	Turning fixed costs into variable costs	(Pai & Basu, 2007)
Improving service level	Improving Service quality	(Gonzalez, Gasco, & Llopis, 2006; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Pai & Basu, 2007)
	Technical feasibility, flexibility, speed, more quality	(Gonzalez, Gasco, & Llopis, 2006)
	Improving logistics and reducing delivery time	(Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007)
	Expanding capacity	(Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007)
	Scalability	(Pai & Basu, 2007)
	Improving staffing flexibility	(Gonzalez, Gasco, & Llopis, 2006; ICMI, 2006)
	Expanding hours Better handling of peak traffic Higher productivity	ICMI (2006) ICMI, 2006 ICMI, 2006
Facilitating access to expertise	Access to expertise	(Fiveson, Aug 2001)
	Access to new knowledge and technology	(Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007)

***Inhibitors of Offshore Outsourcing:***

An organization that wishes to participate in offshore outsourcing faces many barriers, because it is more difficult to work with people far away than with those closes by. Much offshore outsourcing literature is dedicated to descriptions of the barriers to business offshore outsourcing in organizations. The full range of inhibitors is classified into four key categories: communication, management control, offshore transition, and culture clash (see Table 2.12).

**Table 2.12 Inhibitors of Offshore Outsourcing**

<b>Categories</b>	<b>Topics</b>	<b>Key points</b>	<b>Resource</b>
Communication	Language	The lack of a common language among workers in multinational corporations is a significant barrier.	(Grant, 1996b)
	Coordination	When organizations are offshoring, coordination slows because coordination cannot happen spontaneously. This slowing results in problem-solving becoming delayed again and again, or the project going down the wrong track until it becomes very expensive to fix.	(Carmel & Tjia, 2005)
Management control	Poor quality assurance and control Scheduling and delay in issue resolution Increasing overheads Slippage of project deadliness Limited visibility into day-to-day delivery status	When offshoring, it is difficult to maintain management control through telephones and e-mail rather than roaming around to see, observe, and dialogue with staff.	(Carmel & Tjia, 2005; Diamondcluster International, 2007)
Offshore transition	Lack of offshore knowledge about the transfer process	Due to a lack of offshore knowledge about the transfer process, the process of transferring knowledge from onshore client to offshore vendor (everything from hard skills like programming knowledge to more tacit knowledge such as an understanding of what the company and its users expect from a system) can make or break a project.	(Overby, 2004)
Culture clash	Cross-cultural misunderstandings Lack of company-specific understanding	Service outsourcing must deal with cross-cultural misunderstandings. Also, it is an unavoidable reality that offshore vendors usually lack company-specific understanding.	(Overby, 2004)

***Key performance indicators***

Offshore outsourcing is subject to various types of risks, for example financial, quality, legal and managerial control risks (Gonzalez, Gasco, & Llopis, 2006; Tafti, 2005). In order to avoid these risks and achieve the goals of achieving the level of performance expected by all three parties, many scholars (e.g., Niranjan, Saxena, & Bharadwaj, 2007; e.g., Pai & Basu, 2007; Tafti, 2005) suggest that adopt Service Level Agreements (SLA). A SLA is a contract that sets out the functions and services the offshore service provider (outsourcer) will give to its client (outsourcer), the volume of work that will be accepted and delivered, and acceptance criteria for responsiveness and the quality of deliverables (Pai & Basu, 2007). At TSCs, time and accuracy of response are the prime parameters monitored in SLA metrics. Curtland, Cargille, Ellis and Goodwin (2004) identify the key performance indicators of a TSC as customer satisfaction, number of calls per resolution, minutes per call or cost per call minute.

Firstly, customer satisfaction is an indicator of customers' assessment of services. For example, if a customer is not satisfied with the service, the reason could be that the problem has not been solved by the TSE within the time that the customer expected it would take.

The second indicator is the number of calls per resolution. Ideally, it is expected that there will be one call per resolution and that the problem will be resolved at the first time of reporting. Sometimes, TSEs cannot provide a solution at the first time of reporting, so the customer will call the support centre twice or even more times. TSEs are supposed to prevent this happening.

The third indicator is the minutes per call or cost per call. The aim of an offshore TSC is to cut operational costs. In order to reap the potential benefits of offshore sourcing to low-cost countries, cost-per-call-minute is a very important metric to measure the quality and efficiency of the offshore call centre (Feinberg, Kim,

Hokama, de Ruyter, & Keen, 2000). If TSEs spend too much time on the call when dealing with the customer's problem, this will cost the organization in telephone fees. So agents are supposed to resolve the customer's problem at "lightning" speed.

According to these measures, the key performance indicators are speed, cost, and service quality. Whether a technical support centre can achieve a high performance really depends on the TSEs' ability, and how fast they can locate the knowledge, transfer the knowledge, absorb it and apply it to customers' real problems, and thus satisfy customers.

### **2.5.2 Knowledge Transfer in Offshore Outsourcing**

The purpose of knowledge transfer between onshore outsourcers and offshore providers is to acquire the onshore outsourcing organization's knowledge so that they can integrate the transferred knowledge into their routines and processes (Dibbern, Goles, Hirschheim, & Jayatilaka, 2004). The knowledge that needs to be acquired and built at the offshore TSC can be divided into four categories: conceptual knowledge (i.e., embrained knowledge), experiential knowledge (i.e., embodied knowledge), systemic knowledge (i.e., encoded knowledge) and routine knowledge (i.e., embedded knowledge). Conceptual knowledge and experiential knowledge are made up of what an individual knows or knows how to do, which is inherent in an individual's skill or expertise. Systemic knowledge is systemic and collective explicit knowledge, such as technology descriptions, product specifications, manuals, and documented and packaged information about business processes and procedures. Routine knowledge is collective tacit knowledge that is routinized and embedded in the actions and practices of the organization. The collective tacit knowledge is built up and accumulated through practice in the day-to-day business of the organization by organizational members.

The transfer of knowledge between onshore outsourcers and offshore providers could be two-sided, from onshore outsourcers to offshore providers, or from

offshore providers to onshore outsourcers (Quinn, 1999). This study focuses on two phases of knowledge transfer. The first phase of knowledge transfer concentrates on the pre-outsourcing (i.e., transition) knowledge transfer. In the pre-outsourcing phase, the knowledge is transferred from onshore outsourcers to offshore providers. The second phase of knowledge transfer focuses on the post-outsourcing knowledge transfer. In this phase, the transfer of knowledge is two-sided, from onshore outsourcers to offshore providers, and from offshore providers to onshore outsourcers.

Since the onshore outsourcer and the offshore provider have some differences including differences in time zones, climate, language, political philosophy, legal and regulatory regime, culture and history (Carmel & Tjia, 2005), the knowledge transfer between onshore outsourcers and offshore providers faces many challenges and difficulties. There is some published work on the barriers to knowledge transfer between onshore outsourcers and offshore providers. The major barriers to knowledge transfer include: cultural differences and cultural distance (e.g., Ang & Massingham, 2007; Chen, Sun, & McQueen, 2010; Lucas, 2006); the absorptive capacity of the organization and the organization's past experience (e.g., Blumenberg, Wagner, & Beimborn, 2009; Tsai, 2001); the characteristics of knowledge, such as tacitness of knowledge, causal ambiguity, and unprovenness (Szulanski, 1996); the characteristics of the knowledge provider, such as lack of motivation and source of knowledge not perceived as reliable (Joshi & Sarker, 2003; Szulanski, 1996); the characteristics of knowledge recipient, such as lack of motivation and lack of absorptive capacity; and knowledge transfer contingency, which includes lack of retentive capacity, barren organizational context, arduous relationships, and lack of trust (Szulanski, 1996).

Due to the above difficulties of and barriers to knowledge transfer, Gartner Inc (2005) predicted that 80% of organizations that were outsourcing customer service and support centers with the primary goal of reducing costs would fail by 2007. Carmel and Beulen (2005) argued that unsuccessful knowledge transfer is one of the

principal reasons for failures in the first few years of offshore outsourcing, because knowledge is created locally, where tasks are attended to, and problems defined and resolved, knowledge might not easily be developed in a similar way when an offshore service context is used to replace a domestic context. The major reasons for failure in knowledge transfer are described as follows.

Firstly, outsourcing organizations underestimate the complexity of the knowledge transfer process. Overby (2004) argues if the offshore outsourcing project managers do not recognize the extent of the knowledge that must be transferred, and do not spend the necessary time and money to get the knowledge from the onshore organization to the offshore provider, the transfer of knowledge will not be successful. Moreover, she points out that some failures in knowledge transfer are caused by the project managers concentrating only on transferring the technical knowledge and forgetting about all the other aspects, including changes in management, staff retention and mentoring (Overby, 2004). In addition, Carmel and Beulen (2005) consider that failures in knowledge transfer result from outsourcing organizations not managing the prolonged process of knowledge transfer well.

Secondly, because knowledge is created locally and is geographically sensitive, it is impossible to transfer knowledge in its entirety (Overby, 2004). It is not possible to replicate the original context when transferring knowledge (Lucas, 2006). Since the context of the knowledge cannot be transferred and the offshore workers do not have this contextual knowledge they have little understanding of the pre-existing knowledge in the knowledge repository or knowledge system, and do not know how to apply the pre-existing knowledge generated at the onshore TSC into their work. This can cause failure in the knowledge transfer. Moreover, “the complex and idiosyncratic interaction processes” (Björkman, Barner-Rasmussen, & Li, 2004, p. 444) between the onshore outsourcing organization and its external counterparts produce competences that cannot easily be used in an offshore provider’s business context. This is because that the knowledge and competences are developed and

built through the on-shore outsourcer's unique interaction process, which is not easily transferred to the offshore providing organization (Björkman, Barner-Rasmussen, & Li, 2004).

Thirdly, there are some difficulties in transferring and documenting tacit knowledge, because the tacit knowledge employees possessed cannot be articulated or documented easily. For example, an employee might feel frustrated, because he/she could fix something much faster than he/she could document it for someone who does not have the same knowledge he/she has. Even if there is documentation available or a laid-off employee agrees to stay on to download his/her knowledge of an application or process, the technical composition of a system is only a tiny piece of the knowledge that must be passed on (Overby, 2004).

Fourthly, the onshore outsourcer and the offshore provider companies confront some external challenges such as cultural and communication differences (Clott, 2007). For example, the outsourcing company may have little understanding of the offshore country's laws, society or culture before the outsourcing program is implemented. At the same time, the offshore companies may not understand the context of the onshore companies operation and this slows implementation. In addition, it would take time and effort to bridge any gaps in understanding of the differences between the onshore company's work practices and the offshore company's work practices. Moreover, the offshore provider company also faces many challenges in developing new organizational structures when operating within different national and organizational cultures (Clott, 2007).

A review of previous literature shows that many studies have focused on cross-border knowledge transfer. Most have been quantitative studies focusing on the factors affecting knowledge transfer (Björkman, Barner-Rasmussen, & Li, 2004; Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Liao & Hu, 2007; Robert & Gabriel, 2004; Simonin, 2004; Yong Suhk & Young-Ryeol, 2004). Only a few studies have examined the process of knowledge transfer in offshore organizations. For example,

Hong et al. (2006) examined the cross-border transfer of organizational learning systems from Japanese MNCs to overseas subsidiaries within the manufacturing industry in China. These researchers demonstrated the essential aspects of the transfer process in knowledge repositories transfer, collective learning routines transfer and 'Japanization' of enterprise contexts transfer in the subsidiaries of Japanese manufacturing companies based on three perspectives in organizational learning: cognitive perspective, routine-oriented perspectives and social/contextual perspectives. Although Hong et al. (2006) examined the knowledge transfer process in cross-border organizations, and emphasized the collective knowledge transfer or organizational level knowledge transfer; they did not explicitly identify how knowledge transfer occurs at the individual level and the group level, and how the unstructured knowledge transfer process enables knowledge to be transferred from an onshore organization to an offshore organization. Therefore, this study will focus on structured and unstructured knowledge transfer processes at the three levels (i.e., the individual level, the group level and the organization level) in an offshore outsourcing business context.

### **2.5.3 Knowledge Building in Offshore Outsourcing**

Previous literature shows that organizational knowledge building is based on individual learning, actions and beliefs (Kim, 1993). A review of literature relating to individual knowledge building shows the majority of the research has been done in educational contexts (e.g., Bereiter & Scardamalia, 1993; Scardamalia & Bereiter, 2003). It is surprising that so little work has been done on individual knowledge building in the workplace.

A review of previous literature relating to organizational knowledge building shows that only a few studies have focused on organizational learning in offshore outsourcing. Chua and Pan (2008) conducted a study on knowledge transfer and organizational learning in IS offshore sourcing. That study identified the importance of acquiring knowledge from onshore outsourcing organizations. Chua and Pan

(2008) consider that acquired knowledge is fundamental for building up of knowledge in offshore organizations. They suggest that the offshore organization hire members from the onshore organization to quickly build up the foundation of offshore location knowledge. Also, as the offshore organization acquires the second-hand experience of onshore staff, the offshore staff can eventually take over their role through observation and copying of successful routines. Moreover, they point out the experiential learning and training mechanisms play an important role in the offshore organizational knowledge building process. For example, the offshore staff can learn the experiential knowledge of the onshore staff through support simulations and playback training mechanisms as a form of cause-effect relationships and feedback. It is found that self-appraisals, such as tests, interviews and group appraisals are key experiential learning sub processes that are adopted to ensure that what is transferred is learnt by the offshore staff.

Previous literature also shows that knowledge flow and knowledge stock play significant roles in transferring and storing knowledge in the organizational knowledge building process. Knowledge flow is defined as a process of knowledge passing between people. It has three significant attributes: direction, content, and carrier (Zhuge, 2002). Direction determines the sender and the receiver. The content is information and knowledge. The carrier is the knowledge transfer media which can pass the content, such as the Internet or a local network (Zhuge, 2002). Gupta and Govindarajan (2000) identify the importance of knowledge flow across individuals, groups and organizations in the process of knowledge transferring, sharing, and distribution of knowledge within multinational organizations. They suggest that knowledge outflows from an organization or inflows into a subsidiary firm not only increase the motivational disposition to share knowledge and acquire knowledge, but also improve the organization's capacity to absorb the incoming knowledge and to enrich the transmission channels.

The stock of knowledge is the cumulative result of flows of knowledge into the

knowledge stock through knowledge channels such as social networks, and flows out of it through knowledge depreciation. Knowledge depreciation represents the knowledge flow out of stock, because know-how knowledge depreciates over time (Darr, Argote, & Epple, 1995; Dierickx, Cool, & Barney, 1989). For example, Darr et al. (1995) claim that knowledge acquired through learning-by-doing cannot persist indefinitely. It may depreciate through individuals forgetting, or through turnover of organization personnel. Therefore, the knowledge stock is accumulated through continuous knowledge inflow into the organization, and knowledge is depreciated through the knowledge outflow from the organization's knowledge stock at the same time.

In this study, the knowledge inflow refers to the knowledge acquired, assimilated and built by individual or organization in the knowledge transfer and building processes. It is a process of transferring the knowledge from external sources to individuals or organizations, and a process of building knowledge to increase the stock of acquired knowledge to sustain the organizations competitive advantage (Dierickx, Cool, & Barney, 1989). Knowledge outflow has a different meaning from Darr, et al.'s (1995) knowledge outflow through knowledge depreciation. In this study, knowledge outflow refers to the knowledge shared with other individuals or organizations. It is a process of transferring knowledge from an individual or an organization to an external knowledge recipient.

Much prior research demonstrates that knowledge flows faster locally (Agrawal & Cockburn, 2003; Oettl & Agrawal, 2008; Thompson & Fox-Kean, 2005) than it flows across borders, because knowledge cannot flow freely across the different borders, due to the different public policies and firm strategies that influence knowledge flow patterns. Also the tacit knowledge transfer can be affected by geographic stickiness, as tacit knowledge often requires direct interaction with the knowledge provider and recipient for effective transfer (Oettl & Agrawal, 2008).

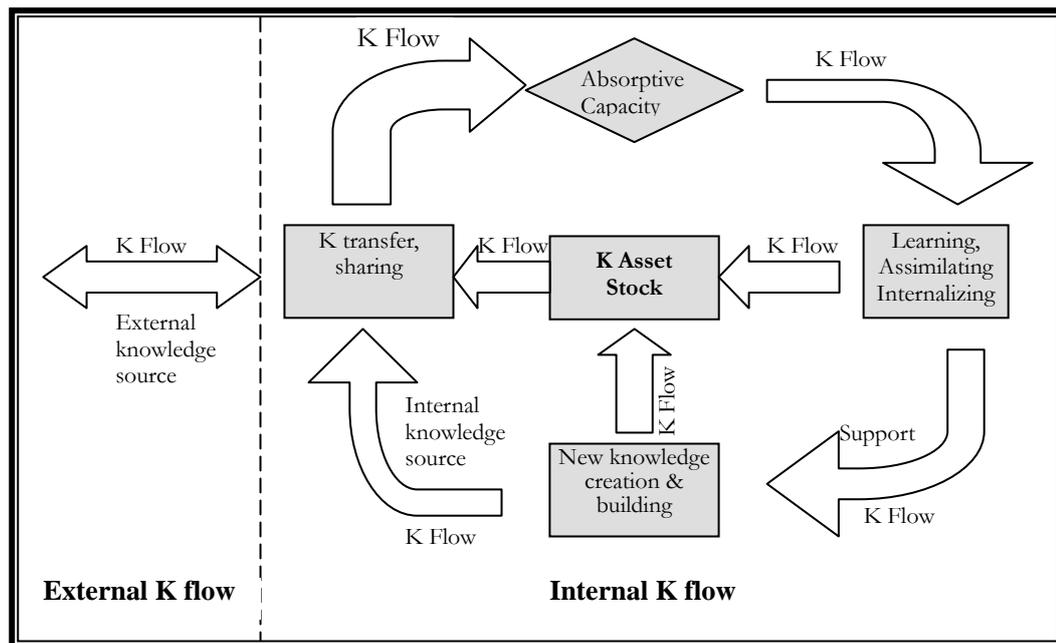
With regard to the factors affecting knowledge flow and knowledge stock, Gupta and Govindarajan (2000) recognize that the absorptive capacity of the receiving organization affects the knowledge inflow into that organization. They identify two factors affecting organizational absorptive capacity. One is the extent of prior related knowledge shared between sending and receiving organizations. If the two organization's prior knowledge or experience is not related, the receiving organization will have a low level of absorptive capacity to internalize and assimilate the sending organization's knowledge. The second reason is the extent of inter-organizational homophily. The members in the receiving organization will have a high level of absorptive capacity if they share mental models and a mutual sub-cultural language with the members in the sending organization (Gupta & Govindarajan, 2000; Rogers, 1995).

Based on the review of previous literature, the key elements in offshore knowledge transfer and building have been identified as knowledge transfer, knowledge building, knowledge asset stock knowledge flow, and absorptive capacity. The following section will synthesize the key elements into a framework to describe the knowledge transfer and building in offshore outsourcing.

### **2.5.4 Synthesis Framework of Knowledge Transfer and Knowledge Building in Offshore Outsourcing**

The many theoretical concepts gleaned from the diversity of perspectives in knowledge transfer and knowledge building literature are synthesized and integrated into a framework of knowledge transfer and knowledge building in offshore outsourcing (see Figure 2.10). The framework illustrates the interactions among knowledge transfer, knowledge building (i.e., learning and creation), knowledge asset stock, knowledge flow and absorptive capacity in offshore outsourcing.

**Figure 2.10 Synthesis Framework of Knowledge Transfer And Knowledge Building in Offshore Outsourcing**



The framework shows the knowledge inflow into an offshore organization from an external knowledge source, and the knowledge outflow from the offshore organization to the external knowledge recipient. Knowledge flow occurs in the knowledge sharing, transferring and distributing processes within organizations and across organizations (e.g., between onshore and offshore organizations). For example, knowledge flows occur in chatting, gossiping, brainstorming, in-depth discussions, problem analysis through day-to-day interactions among the individual members within organizations; and, across organizations through their social networks (Bathelt, Malmberg, & Maskell, 2004) that transfer, share and leverage knowledge.

As the knowledge flows into the organization, the organization's absorptive capacity determines the amount of knowledge assimilated, acquired and internalized. If the organization has related prior knowledge or experience to the knowledge sending organization, the receiving organization will have a higher level of absorptive capacity to acquire and assimilate the sending organization's knowledge. Also, if the receiving organization shares mental models with the members of the sending organization, the receiving organization also will have a higher level of absorptive capacity to

acquire and assimilate the knowledge from external knowledge source. However, Nooteboom (2000) argues that the knowledge receiving and sending organizations must have sufficient difference in their knowledge base to make the interaction worthwhile, so that they can exchange knowledge and learn from each other. On the other hand, if the knowledge bases of knowledge receiving and sending organizations become too different and there is great cognitive distance, then inter-organization learning could stop (Nooteboom, 2000).

The interaction and communication between members of the respective organizations encourage the development of shared values, attitudes and interpretative schemes (Crossan et al, 1999), members can then apply the same interpretative schemes and mutual understanding of new knowledge and technologies, as well as apply the shared cultural traditions and habits within a particular technology field, which stimulates the establishment of conventions and other institutional arrangements (Bathelt, Malmberg, & Maskell, 2004). The interaction and communication between the members of the respective organizations also facilitate continuous updates of their information and knowledge, which enable the organizations' members to engage in interactive learning, and in both intended and unanticipated learning processes (Gordon & McCann, 2000). This communication and interactive learning form the background knowledge for building new knowledge. Once the new knowledge is built, it will flow into the knowledge stock. The stock of knowledge could be transferred or shared within the organization and across organizations, would facilitate outflow knowledge from the knowledge stock into internal organization and external organization (see Figure 2.10).

This framework provides a rough picture about the interactions amongst knowledge transfer, knowledge building (i.e., learning and creation), knowledge asset stock, knowledge flow and absorptive capacity in offshore knowledge transfer and the knowledge building process. However, this framework does not indicate how

knowledge is transferred and built at the individual level, group level and organization level, and the details of knowledge transfer and building processes.

### **2.5.5 Literature Gap in Offshore Knowledge Transfer and Building**

In summary, much of the previous research focuses on motivators of offshore outsourcing (Gonzalez, Gasco, & Llopis, 2006; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Pai & Basu, 2007) and inhibitors to offshore outsourcing (Carmel & Beulen, 2005; Lucas, 2006; Overby, 2004). Some qualitative studies have focused on knowledge transfer in a cross-border context (Holden, 2002; Hong, Easterby-Smith, & Snell, 2006; Pauleen, Wu, & Sally, 2007). There have been some articles on knowledge flow within and across organizations (Agrawal & Cockburn, 2003; Oettl & Agrawal, 2008; Thompson & Fox-Kean, 2005). A few researchers point out the value of having a stock of accumulated knowledge (Dierickx, Cool, & Barney, 1989) and of organizational learning in offshore outsourcing (Chua & Pan, 2008). Relatively a little research has focused on the process of knowledge transfer and knowledge building in offshore outsourcing.

## **2.6 LITERATURE GAP**

This chapter reviewed the previous literature relating to knowledge transfer, knowledge building, and knowledge transfer and building in offshore outsourcing over the last few decades.

Section 2.2, knowledge transfer, outlined two groups of knowledge transfer: structured knowledge transfer and unstructured knowledge transfer, and five basic elements in the knowledge transfer process: knowledge provider, knowledge recipient, knowledge types, mechanisms of knowledge transfer and knowledge transfer context. This section identified many enablers of and barriers to knowledge transfer. An examination of the literature has revealed that there has been

considerable study of the factors affecting knowledge transfer (e.g., Davenport & Prusak, 2000; Rus & Lindvall, 2002; Simonin, 2004; Szulanski, 1996). National culture plays a critical role in knowledge transfer within the cross-cultural business context (Holden, 2002; Pauleen, Rooney, & Holden, 2010; Pauleen, Wu, & Sally, 2007). A review of previous literature shows that some studies have focused on knowledge transfer in a cross-border business context (Holden, 2002; Hong, Easterby-Smith, & Snell, 2006; Pauleen, Wu, & Sally, 2007). A few researchers have proposed theoretical frameworks for understanding the differences in national culture affecting knowledge transfer across Hofstede (1997)'s culture dimensions (e.g., Bhagat, Kedia, Harveston, & Triandis, 2002; Lucas, 2006). Surprisingly, relatively a few attention have been drawn to the structured and unstructured knowledge transfer in an offshore outsourcing business contexts.

The section of individual knowledge building reviewed the literature relating to the individual knowledge building process and factors affecting the building of individual knowledge. There is some literature on knowledge learning and the tacit knowledge acquisition process (Dewey, 1938; Kolb, 1984; Lewin, 1951; Mezirow, 1991; Piaget, 1951; Raelin, 1997; Sternberg et al., 2000), and some studies have focused on factors affecting workplace learning (Eraut, 2000, , 2004). However, a lack of relative literature on the individual knowledge building process is evident. Also a little research has been done on individual tacit knowledge building, and on the factors affecting individual tacit knowledge building.

The section on organizational knowledge building reviewed the organizational knowledge building process and factors affecting organizational knowledge building. Four models (Crossan, Lane, & White, 1999; Kim, 1993; Nonaka, Toyama, & Komo, 2000; Zahra & George, 2002) identified three levels of knowledge building in the organization, and that a shared mental model links these three levels of knowledge building. However, they do not explain how the knowledge flows in and out of the three levels of knowledge building and how the four types of knowledge assets are

built in the organization. Also there is a lack of research on the factors affecting organizational knowledge building.

The section on knowledge transfer and building in offshore outsourcing reviewed motivators and inhibitors of offshore outsourcing, and the inter-relationship between knowledge flow, knowledge stock and absorptive capacity in the offshore knowledge transfer and building processes. Firstly, many articles show that organizations can expect benefits from offshore outsourcing (Fiveson, Aug 2001; ICMI, 2006; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007; Pai & Basu, 2007; Stackhouse, Apr/May 2006). However, much of the research documents failures in knowledge transfer in multinational corporations (Carmel & Beulen, 2005; Clott, 2007; Lucas, 2006; Overby, 2004). Secondly, a few researchers highlight the importance of having a stock of accumulated knowledge (Dierickx, Cool, & Barney, 1989) and of organizational learning for offshore outsourcing firms (Chua & Pan, 2008). Some articles have investigated knowledge flow within and across organizations (Agrawal & Cockburn, 2003; Hong, Snell, & Easterby-Smith, 2009; Oettl & Agrawal, 2008; Thompson & Fox-Kean, 2005). However, little research has demonstrated how knowledge flows in and out of organizations through knowledge transferring and sharing, and how the knowledge asset stock of organizations is accumulated through organizational learning and knowledge creation.

Overall, this study integrates individual knowledge building and organizational knowledge building through structured and unstructured knowledge transfer processes in an offshore outsourcing context. This type of study has not been done before.

## **2.7 CHAPTER SUMMARY**

This chapter presented the academic literature relating to knowledge transfer, knowledge building and offshore outsourcing and identified the literature gap. Section 2.1 provided the definition of knowledge, its characteristics and its

dimensions. Section 2.2 addressed five elements of knowledge transfer, knowledge transfer process and factors affecting knowledge transfer. Section 2.3 reviewed individual knowledge building and factors impacting on knowledge building. Section 2.4 investigated organizational knowledge building and factors influencing organizational knowledge building. Section 2.5 examined knowledge transfer and knowledge building in offshore outsourcing. Finally, section 2.6 identified the literature gap.

## **CHAPTER 3 RESEARCH DESIGN**

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In the previous chapter, the justification for the research project was outlined in terms of the current literature on knowledge transfer and knowledge building. From the gaps in the literature, three research questions emerged for investigation. This chapter will present the research design which has been developed and carried out specifically to answer the research questions. The chapter is organized in five sections. It begins by presenting the research purpose and research questions. The second section justifies the selection of the research paradigm and methodology. The third section justifies why a case study has been selected as the research method and how the case study has been employed to conduct the research. Data analysis is then discussed. The chapter concludes with a detailed discussion of the trustworthiness issues of this research.

### **3.1 RESEARCH PURPOSE AND RESEARCH QUESTIONS**

#### **3.1.1 Research Purpose**

This study has three principal purposes.

Firstly, this research aims to gain an insight into the knowledge transfer processes employed by the offshore TSC to acquire knowledge from the onshore TSC, and to investigate the factors involved in the transfer process that affect knowledge transfer. The research wishes to help those offshore managers of organizations who intend to offer offshore outsourcing services to make knowledge transfer more effective and successful. Also, this study focuses on the impact of culture on the knowledge transfer process at offshore TSCs--a relatively unexplored sector of research.

The second purpose of this research is to explore the individual knowledge building processes, and the factors affecting these processes. It will also investigate how an individual builds up his/her tacit knowledge (mental models and technical know-how), and how the organization can help the individual build up their tacit knowledge. The research wishes to help the organization understand methods for building individual tacit knowledge in their new employees.

The third objective of this research is to look at the organizational knowledge building processes, and the factors affecting these processes. This study investigates how an offshore TSC expands its organizational knowledge, how the organizational knowledge is developed to adapt to a new environment and how new knowledge is created in the organization after knowledge transfer from an onshore TSC to an offshore TSC.

### **3.1.2 Research Questions**

The literature plays an important role in this study because it stimulates thinking about the research gap, questions, and sub-questions, which this study aims to address. From a review of the knowledge transfer literature, it is clear that much research has focused on the factors affecting knowledge transfer, but less attention has been paid to the factors affecting the selections of the knowledge provider and the transfer media. Moreover, a few relatively studies have focused on the different knowledge levels of recipients' knowledge transfer processes. A little empirical or exploratory research has explicitly identified how national culture impacts on structured knowledge transfer across Hofstede's culture dimensions. Therefore, the first research question is:

#### **How is knowledge transferred from an onshore TSC to an offshore TSC?**

Sub-questions:

- ◆ What processes are employed in the knowledge transfer from an onshore TSC to an offshore TSC?
- ◆ How do knowledge recipients, at different knowledge levels, acquire

knowledge from different knowledge providers?

- ◆ How does national cultural difference impact on the knowledge transfer process?
- ◆ What are the factors affecting the selection of the knowledge provider and transfer media in the knowledge transfer process, and how do these factors affect the transfer process?

This research aims to develop a knowledge transfer type adoption model based on the research findings of different knowledge levels of offshore TSEs, knowledge transfer processes, and the analysis of the affecting factors.

The second research question focuses on the process of the individual knowledge building and the factors affecting the building process. Although some research has been conducted in educational contexts, little research has been done in the workplace context. There are some studies on knowledge learning and the tacit knowledge acquisition process, but there is a lack of relative literature on the individual knowledge building process. Moreover, a little research has been done on the factors affecting individual tacit knowledge building. The question is:

**How do individuals build up tacit knowledge in workplace?**

Sub-questions:

- ◆ How can individuals' tacit knowledge be built up and developed in workplace?
- ◆ What processes are employed by an individual to build up his/her tacit knowledge?
- ◆ What factors influence the individual knowledge building process?

This research aims to propose a model of an individual knowledge building process.

The third research question focuses on the organizational knowledge building process and the factors affecting the building process. Many researchers have examined organizational learning and organizational knowledge creation, but there is

a lack of research on the knowledge building process and the factors affecting organizational knowledge building. The question is:

**How does an offshore TSC organization build up its organizational knowledge after knowledge has been transferred from an onshore TSC?**

Sub-questions:

- ◆ How can organizational knowledge be built up and developed?
- ◆ What processes are employed by an offshore TSC to build up its organizational knowledge?
- ◆ What are the factors influencing the organization's knowledge building process?

This research aims to generate an organizational knowledge building model.

## **3.2 RESEARCH PARADIGM AND METHODOLOGY**

In order to select the most appropriate research paradigm and methodology for this study, the first sub-section of this part reviews available research paradigms and outlines the characteristics, advantages, and drawbacks of each. The second sub-section identifies the most viable methodology for this study and argues its appropriateness.

### **3.2.1 Research Paradigms**

The term *paradigm* means the progress of scientific practice based on people's philosophies and assumptions about the world and the nature of knowledge (Collis & Hussey, 2003). The choice of paradigm is fundamental to research, since the paradigm reflects what is seen as important, legitimate, and reasonable (Patton, 1990). It represents an understanding of the world, and is used to determine what problems deserve research attention, and how the research might be conducted (Lincoln & Guba,

1985). The fundamental philosophical assumptions about the nature of reality, knowledge and human behavior influence the author's acceptance of research methodology; they will be reflected in the way the author designs her research.

Based on the underlying research epistemology, Burrell and Morgan (1979) describe epistemological assumptions as being the ground of knowledge, which is concerned with how knowledge can be obtained from the social world. There are two major epistemological approaches to conducting research: the positivist and interpretivist (Burrell & Morgan, 1979; Patton, 1990). In the epistemology of interpretive, it is believed that knowledge can only be gained from the social world by understanding it from standpoints of individuals who are directly involved in the studied activities. In contrast, a positivist approach gains knowledge by seeking regularities and cause-effect relationships between constituent elements (Burrell & Morgan, 1979).

#### *Positivist Research Paradigm*

The positivist research paradigm typically views reality as objective and independent of the observer (researcher), and as something that can be measured objectively through the use of an instrument (Myers, 1997). It generally relies on quantitative and experimental methods to test hypothetical-deductive generalizations.

#### *Interpretive Research Paradigm*

The interpretive research paradigm typically views reality as subjective. It is concerned with understanding the social world from the perspective of a participant rather than an observer's. Interpretive research generally attempts to understand phenomena through the meanings that people assign to them. The philosophical bases of interpretive research are hermeneutics and phenomenology (Boland, 1985). Interpretive research considers words rather than numbers as the major elements of data. This research therefore tends to pay more attention to subjective information collected from interviews rather than concentrating only on objective value-free data (Patton, 1990).

*Justification of selected research paradigm*

This research is based on the interpretive research paradigm. There are two major reasons to justify the selection of this paradigm. Firstly, the author supports the subjective nature of reality and the assumptions related to this subjectivity. She considers that “social reality is based on people’s definition of it” (Neuman, 2006, p.69). The interpretive paradigm treats human organizations as based on subjective meaning and interpretation (Mingers, 1997). Neuman (2006) states that “an interpretive explanation documents the actor’s point of view and translates it into a form that is intelligible to readers” (p.72). This paradigm matches the author’s philosophy and the research purpose.

Secondly, interpretive research would help the author capture a richer understanding of how knowledge transfer and knowledge building processes happen in an organization (Kaplan & Duchon, 1988), because knowledge transfer and tacit knowledge building processes are inside, cognitive and subjective processes. People take knowledge in and add it to what they have already got, and imbed it into their brain in a different position. Since people have different experiences and educational backgrounds, they have different meaning systems to interpret knowledge and build up their individual knowledge. In order to understand the processes of knowledge building and transfer, the researcher has to ask participants to interpret their internal knowledge building process, and try to understand the processes and phenomena through the meanings that participants assign to them. Interpretive research would enrich the researcher’s understanding of the knowledge transfer and creation in organizations while describing, interpreting, and understanding the social world from the participants’ perspectives. This would provide valuable opportunities for her to learn, reconstruct experience and generate profound knowledge on the phenomena (Laverty, 2003; Orlikowski & Baroudi, 1991). The “positivist” research paradigm is not appropriate for this research because positivist research is used broadly to test theories and hypotheses. It uses an instrument such as a questionnaire or statistical

data analysis software to measure data, and it is context free and lacks rich details (Orlikowski & Baroudi, 1991). This research is theory building rather than theory testing which is why a richer picture of the phenomena is required; and for this reason the positivistic research paradigm is unsuitable.

### **3.2.2 Research Methodology**

Research methodologies can be broadly classified into two distinct approaches: qualitative and quantitative. According to Minichello et al (1992), “qualitative research attempts to capture people’s meanings, definitions, and descriptions of events. In contrast, quantitative research aims to count and measure things”(p. 9). Indeed, qualitative methods are “ways of finding out what people do, know, think, and feel by observing, interviewing, and analyzing documents” (Patton, 1990, p. 94). This section discusses research methods and provides justification for the most suitable qualitative research method.

#### *Quantitative research methodology*

Quantitative research methodologies were originally developed in the natural sciences to study natural phenomena. This methodology usually produces findings by means of statistical procedures or other means of quantification (Strauss & Corbin, 1990). It involves data, large randomized samples, application of statistical inference, and a few applications of cases demonstrating findings. The main strengths of this approach lie in precision and control (Burns, 1997). Precision is achieved by quantitative and reliable measurement and statistical analysis, and control is reached through the large sample size and the research instrument design. The key limitation of the quantitative approach is that the results provide less detail about human behavior and attitudes and motivation, and the digitized results may provide no meaning to the researchers. Thus, many researchers have argued that the quantitative approach degrades human individuality and ability to think (Burns, 1997).

*Qualitative research methodology*

Qualitative research is generally defined as research that involves analyzing and interpreting texts and interviews, to explore and understand the attitudes, opinions, feelings, and behavior of individuals or a group of individuals, to “discover meaningful patterns descriptive of a particular phenomenon” (Auerbach & Silverstein, 2003, p. 3). Qualitative research is the best method for discovering underlying motivations, feelings, values, attitudes, and perceptions. The main strength of this methodology is that the results provide more detail and understanding of human behavior, attitudes and motivation, which allows the researcher to get a rich and deep insight into the phenomenon. The primary limitation of qualitative research is that the findings are not statistically projectable to the population under study.

A summary of the common characteristics of both research methodologies is shown in Table 3.1.

**Table 3.1 Comparison of Quantitative and Qualitative Research Methodologies**

Comparison	Quantitative Research Methodology	Qualitative Research Methodology
Assumptions about the nature of the social world	Objective	Subjective
Literature review	Must be done early in study	May be done as study progresses or afterward
Purpose Research designs	Tests theory Descriptive, co-relational, quasi-experimental, experimental	Develops theory or tests the theory Phenomenological, grounded theory, ethnographic, historical, philosophical, and case study.
The process of research	Reduction, control, precision Reasoning is logistic & deductive	Discovery, description, understanding, shared interpretation Reasoning is dialectic & inductive
Research context	Context free	Context dependent
Data collection	Researcher is separate from the research field or site. He/she uses instruments to collect data	Researcher physically goes to the people, setting and site, to communicate, interview, and observe or record behavior in its natural setting.
Data analysis	Measurable: Basic element of analysis is numbers; it reports statistical analysis.	Interpretive: Basic element of analysis is words/ideas; it reports rich narrative, individual interpretation

Adapted from the following sources: Creswell (1994), Merriam (1988), Minichello et al.(1992), Patton (1990), Strauss and Corbin (1989)

#### *Justification of Selected Research Methodology*

After considering these two research methodologies, the author determined that this research would be based on the qualitative research methodology. There are two major reasons to justify this.

The purpose of this study is to explore the transfer of knowledge between offshore and onshore organizational units, to discover individual and organizational knowledge building processes, and to develop a theory. The knowledge transfer and knowledge building processes are a complex interplay of organizational factors which cannot be simply explained by linear relationships. Therefore, the study of knowledge transfer and building process requires a breadth and depth of analysis. It would be difficult to analyze these processes using statistical methods or other

positivist scientific approaches. Sherah, Kurnia and Johnston (2002) suggest that in-depth interpretive research methods—qualitative research, are suitable for this kind of research, as they allow the author to document the complex and dynamic knowledge transfer and building processes in organizations. The qualitative research methodology would also enable the author to study the “how” research questions in greater depth (i.e. “how does knowledge transfer from an offshore TSC to an onshore TSC?”, “how is individual knowledge and organizational knowledge built during the process?”, and “how do factors affect the knowledge transfer and building process?”). This research approach is more exploratory than confirmatory and oriented more toward theory building than toward theory testing (Yin, 2003). Therefore, the qualitative research methodology is the appropriate research methodology for this study.

#### *Selected Research Method*

“A research method is a strategy of inquiry which moves from the underlying philosophical assumptions to research design and data collection” (Myers, 1997, p. 242). As this research will be conducted using an interpretivist approach as the research paradigm, the main methods of case study, action research, and grounded theory are all consistent with this paradigm. In comparing these three significant methods, case research has been selected for this research. There are four reasons justifying this decision.

Firstly, one of the main strengths of case research is that a contemporary phenomenon can be studied in its natural context (Yin, 1989). Cavaye (1996) states that case study research is considered to be particularly appropriate when theoretical knowledge on a phenomenon is limited or when the need for capturing context is important. The research attempts to explore how knowledge can be effectively transferred from an onshore organization to an offshore organization, and how individual and offshore organizations build up their knowledge after the knowledge is transferred. Also, this study aims to investigate how national cultural difference

impacts on knowledge transfer and how other factors influence the knowledge transfer and building process. Case study research is contextual. It gives the author an opportunity to learn about knowledge transfer and building in a natural setting. It can provide rich information about the relationships among the factors, and how the factors result in the current behaviour or status (Gay & Diehl, 1992).

Second, this research is an exploratory study, aimed at identifying phenomena and their associated causes. The case study research method has the potential to provide more in-depth understanding of the knowledge transfer and building process in offshore providing organizations. It provides the opportunity to gain a rich and deep insight into the phenomenon.

Thirdly, the case study method addresses the “how” and “why” research questions, not just the “what” (Benbasat et al., 1987; Yin, 2003). This research concerns how knowledge is transferred and built at an offshore TSC. It includes the tasks, for example, to develop a knowledge transfer model to cater for the different knowledge levels of recipients, which includes some “how” and “why” questions (such as “how do lower level of experience TSEs acquire knowledge from an onshore knowledge provider?”, “why does absorptive capacity affect the knowledge transfer approaches they adopt?”). The case study method not only provides the opportunity to understand the existence of a phenomenon, but also identify why it has occurred.

Fourthly, the interpretive case study method for exploration of knowledge transfer and building in a real-life context may help other researchers to identify important issues (McBride & Fidler, 2003). Barrett and Walsham (2004) pointed out that cases based on the interpretive case study method can provide key learning for other researchers seeking to develop their own research contributions. Since this research aims to explore the little researched field of knowledge transfer and knowledge building processes at offshore TSCs, the interpretive case study method not only can generate valuable knowledge, but also can raise important issues of concern to other

researchers.

Therefore, the case study method is particularly appropriate for an investigation of the author's research questions.

### **3.3 CASE STUDY DESIGN**

The author proposes to use multiple-case study as the research method, because this method has some advantages in comparison to single-case design. First, the evidence from multiple cases is often considered more convincing, and thus the overall study is regarded as being more valid (Yin, 1994). Second, the use of multiple cases broadens the understanding of the experiences and practices chosen by a variety of organizations. Third, a multiple-case study allows the investigation of a particular phenomenon in diverse settings, allows cross-case analysis and comparison, and strengthens research findings (Eisenhardt, 1989). Therefore, multiple-case study is an appropriate research strategy for the proposed research.

#### **3.3.1 Number of Cases**

Yin (1989) emphasizes that when a researcher decides to use multiple-case studies, every case should serve a specific purpose within the overall scope of inquiry. The author chose three cases (Alpha, Beta, and Gamma) to investigate how knowledge is transferred and built at offshore TSCs and how factors affect the knowledge transfer and building process.

This study adopted a multiple asymmetric case design approach, where the first case was studied in depth, and the second and third cases were done in less depth and intensity and used to confirm or extend the findings of the first case study. In the three cases, the first case (Alpha) is the main case, on which the author spent one and half years in collecting in-depth data. On the basis of this case study, she generated a basic model of knowledge transfer and knowledge building at the offshore TSC. The

second and third cases were employed to verify and test this research model for greater generalizability.

### **3.3.2 Unit of Analysis**

Yin (2003) identified two designs of unit of analysis: holistic design and embedded design. An embedded case study is a case study containing more than one sub-unit of analysis. Holistic design is advantageous when subunits cannot be found. It may be conducted at an abstract level, but lacks any clear measures.

This research has adopted the embedded (multiple units of analysis) design rather than the holistic (single unit of analysis). This is because the research was attempting to explore how knowledge can be effectively transferred from an onshore organization to offshore organizational units, and how individual TSEs build up their knowledge after knowledge has been transferred from the onshore organization. This involves several units of analysis. The main unit was the organization as a whole; the smallest unit was the individual support engineers. Therefore, this research consists of multiple-case studies with embedded design (multiple units of analysis). Three offshore TSCs made up the three case studies with each case (offshore TSC) having embedded sub-cases (individual TSE). Each offshore TSC case reveals an individual organization's story about how the offshore TSC transferred and built up organizational knowledge. Each embedded sub-case reveals how individual TSEs in an organization build up their personal tacit knowledge.

### **3.3.3 Site Selection**

This study selected three TSCs. Since the selection of the research organizations had the potential to influence the quality of data obtained, the author employed a selection criteria to choose the participant organization (a large knowledge-intensive organization).

Firstly, the TSE should be an offshore technical support centre. Benbasat, Goldstein

and Mead (1987) suggest that, when conducting research on organizational levels, the positions of authority and cultural environment phenomena should be taken into consideration. As the research was concentrating on the knowledge transfer from an onshore TSC to an offshore TSC in a cross-cultural business context, the sites should be chosen from knowledge-intensive organizations--offshore TSCs, in which culture differences have an effect on the knowledge transfer process. At offshore high-tech support centres, the business operation is greatly influenced by culture, time pressure and knowledge management so the research should be conducted in this business context.

Second, the offshore-based TSC should be in China. According to a 2006 global IT offshore sourcing report published by DiamonCluster, IT offshore sourcing in China was growing more rapidly than ever before. Gartner Inc. predicted that, by 2007, China would pull in \$27 billion for IT services, including call centers and back-office work (Palvia, 2003). In addition, the 2008 Beijing Olympic Games and the 2010 Shanghai World Fair would be two events that China could exploit to globalize its economy even more to consolidate its position in the offshore outsourcing market. Thus, conducting this research in China would be appropriate for both onshore and offshore managers who intend to offer offshore outsourcing service or plan to outsource IT service offshore. Moreover, this research is based on the interpretive research paradigm. Lacity and Janson (1994) suggest that researchers must have much in common with the participants, such as living in the same epoch, speaking the same language, and living in the same culture so as to understand the participant's intentions. The author is a Chinese, having lived in New Zealand for eight years and having one year's work experience in an offshore TSC. She therefore has a good understanding of Chinese and Western culture, and can better understand the participants' culture, faith and experiences. This would make easier for her to find prospective participants for research and collect significant data at offshore technical support centres in China.

Thirdly, the organization should have some recent experience in knowledge transfer from onshore to offshore TSC units. There are two reasons for this selection criterion. Firstly, the shorter the period of time, the greater the likelihood that the key project manager, knowledge providers and knowledge recipients who were involved in the knowledge transfer process still work at the organization. It would be easier to find interviewees who could trace their experiences. Secondly, since this research aims to explore the individual and organizational knowledge building process after knowledge transfer, a short time period would be useful to see the outcomes of knowledge transfer and knowledge building.

Fourthly, the organization must show willingness to participate in the study. If the participants are keen to take part in the research, and are able to spend time with the author; they would provide more support, and information. The author would be able to collect more valuable and useful data.

Ten offshore-based technical support centres in China were identified through Google search and personal contacts. These firms were then contacted and asked if they would be willing to participate in the study. Six offshore-based TSCs agreed to participate in the research. After a few initial interviews with key individuals in these six TSCs, three offshore-based TSCs in the information technology and communication industry were selected. These three TSCs have something in common. They are in the list of FORTUNE 500 companies, and their onshore home offices are in US. They have had some experience in knowledge transfer from onshore to offshore TSC units in the past three years.

### **3.3.4 Description of Research Sites**

For confidentiality reasons, the names of the participant offshore TSC organizations have been disguised.

#### ***Alpha***

Alpha is an offshore TSC located in Dalian, China. The support center has around

1200 staff, and supports commercial customers in the Asia-Pacific region including China (Mainland, Taiwan, Hong Kong), Asia Pacific (Japan, Korea, Australia, New Zealand), and North America (Canada, US). The center provides Chinese, Japanese, Korean, and English language support. It supports users of commercial products, such as commercial computer servers, desktops, laptops, printers and scanners. This support center thus provides a rich environment for investigating knowledge transfer in a multinational organization. Knowledge transfer employed in such a work environment is valued as it is critical to the organization's productivity and performance.

This study focuses on the North American support tower at the Dalian center. This group was founded in 2006 and was the first English IT technical support group for this organization in China to support customers based in the US. It offers telephone support and an 8 hour 5 day service. The products supported by this group are commercial desktops and laptops, which are commodity stand-alone products. For this type of product, the complexity of product problems and connectivity is not very high, but response time is critical. It is imperative that TSEs respond to their customers' technical problems at "lightning" speed (El Sawy & Majchrzak, 2004), and most customers' problems are expected to be resolved at the time of first contact on the phone. In addition, as this type of product is fast moving, with a short life cycle, the company's survival in a complex and dynamic environment depends on the support engineer's speed of learning (El Sawy, Eriksson, Carlsson, & Raven, 1998). Customer support knowledge changes rapidly. Every month new products or models are released, new problems are encountered, and new pieces of documentation are written. Therefore, the TSC needs to have a very fast response time, and highly skilled support engineers who have the ability to learn very quickly about product and technical innovations. The quick learning requirement has forced a radical rethinking about how learning occurs during the customer support process in this TSC.

***Beta***

Beta is a global leader in IP telephony, communication systems, applications and services. Beta Global Services provides comprehensive services and support for small to large companies. BETA has more than one million business customers including 90 percent of the FORTUNE 500 companies. Beta's products include enterprise communication solutions incorporating such products as desk-set phones, office-building switches and switchboards, call-center systems, voice-mail software, cabling, Internet Protocol telephony, wireless data communication, customer-relationship-management software and speech recognition technology.

Beta Global Services has approximately 8,500 services experts worldwide, 27 network operations and TSCs. This study focuses on an offshore TSC located in Dalian, China. This TSC was founded in 2007, and has around 200 technical support engineers. It supports enterprise business customers such as commercial bank call centers in the Asia-Pacific region, including China (Mainland, Taiwan, Hong Kong, Macao), Asia Pacific (Japan, Korea, Singapore, Malaysia, Indian, Indonesia, Thailand, Philippine, Sri Lanka, Australia, New Zealand). It provides Chinese, Japanese, Korean, and English language support. This study focuses on the English technical support groups which provides 24 hour and 7 day telephone, email and online web support. The products supported by this group are enterprise call-center systems and IP telephony, which are non-stop commercial network products (including hardware and software). For this type of non-stop network products, down-time is prohibitively expensive for the customer. Fast response and highly skilled personnel who have the ability to learn very quickly about products are frequently morphed due to rapid product upgrade (especially software) and dramatically shorter product life-cycles. Since these product problems are complex, they may require collaborative problem-solving with other departments or business partner companies located around the world. Therefore, most customers' problems cannot be resolved at the time of first contact on the phone.

***Gamma***

Gamma is the largest business software company in the world. It supplies information management software, database technology and applications in enterprises, throughout the world. The company has more than 320,000 customers—including 100 of the Fortune Global 100—and supports these customers in more than 145 countries.

Gamma Global Services has approximately 7,000 services experts worldwide, and has 18 global TSCs located around the world. This study focuses on an offshore TSC located in Dalian, China. This TSC was founded in June, 2006, and has around 100 technical support engineers. It provides Chinese, Japanese, Korean, and English language support. This study focuses on the English global contact center and a group founded in 2007. This group provides telephone, email and web online, and an 8 hour 5 day support service. This group supports all the Gamma products.

In summary, all the offshore TSCs are located in Dalian, China. Their parent companies are in U.S., and they are global companies in the information and communication industry. The main differences between these three TSCs include the customer group supported by the TSC, the communication channel, the main duties of the TSEs and the issue-resolving channel. A comparison of these three cases is summarized in Table 3.2.

Table 3.2 The Comparison of Alpha, Beta, and Gamma

Company name	Supported Customer group	Communication channel	Main duty	Issues resolved
Alpha	<u>Type:</u> End user, enterprise customer <u>Region:</u> U.S. Australian, New Zealander customers	Telephone	Technical support	Remote resolved rate>80%
Beta	<u>Type:</u> Enterprise customer, Business partner <u>Region:</u> Australian, New Zealander, Singapore, Indian, Indonesian customers	Telephone Email Web portal	Technical support Coordination Single point of contact (SPOC), information hub	Issues are more complicated. Remote resolved rate<50% Problem solved by group (T3 + onsite engineer)
Gamma	<u>Type:</u> Enterprise customer <u>Region:</u> American, European, Asian customers	Telephone Email Web portal	Technical support Coordination	Remote resolved rate>80%

### 3.3.5 Data Collection

In this study, data were collected from multiple sources for generating rich detailed information, and for triangulation purposes as well. Yin (1994) suggests that the use of multiple data sources can increase the reliability of the research result. The author employed three techniques for data collection in the field: document review, participant observation, and semi-structured interviews. The research started with document review to get a general idea about the organization. Then the author observed and participated in organization knowledge transfer programs, and knowledge sharing meetings to observe the TSEs knowledge transfer activities. The semi-structured interviews began when the author had obtained a clear idea about the organization's processes of transferring and building knowledge. Triangulation of evidence was achieved by document review and participant observation and asking the participants the same questions in different ways and at different times to confirm their opinions.

***Document Review.***

There are many sources of documents that could be used for better understanding of the processes of transferring and building knowledge. Document review included the schedules and contents of knowledge transfer, work instructions, manuals provided by participant companies to employees, survey results about customer satisfaction, individual TSE's work performance and participant companies' performance reports and repositories of organizational knowledge. This document review provided important background information about knowledge transfer schedules, the knowledge provider and knowledge recipient's roles and jobs, and the results of knowledge transfer.

***Participant Observation.***

The method of participant observation allowed the author to become directly involved as a participant in particular situations and settings (Jorgensen, 1989). During the participant observation, it was possible for her to describe what went on, who or what was involved, when and where things happened, how they occurred, and why things happened. Through participation, the author was able to observe and experience the meanings and interactions of people from the position of an insider (Jorgensen, 1989). Easterby-Smith et al. (2008) note that engagement in the social setting allows researchers to understand members' perspectives which enhances the quality of qualitative research. This data collection method is similar to ethnographic method, which engages in direct, first-hand, up-close observation of daily participation (Richardson, 2000).

Four participant roles are identified by Gold (1958, 1969) including complete observer, participant-as-observer (more observer than participant), observer-as-participant (more a participant than observer), or complete participant. In this study, the author adopted the observer-as-participant role, becoming more a participant than an observer which is obscured from the views of outsiders. This research focuses on the TSE's individual knowledge building process. The knowledge

building process is an invisible process; much of the knowledge building is taken for granted and respondents lack awareness of their own knowledge building. Also it is difficult for the respondents to describe the process.

The research started with observation. Observation took the form of sitting with twenty-six key participant TSEs when they were on and off the phones to observe how they found a technical solution through knowledge sources (such as knowledge base, colleagues, senior technicians) to solve customers' problems; asking TSEs to give explanations about what they were doing, what they learnt and how they learnt; and taking notes on their work practices. During the observation, the author as an outsider overviewed the knowledge transfer and building processes and events, and identified the relationships and patterns in the processes of building and transferring knowledge.

As a participant, the author performed two roles over the course of a study. One role was as a new technical support engineer and the other was as a mentor. As a technical support engineer, the author was able to participate in the new employee training programmes, and group knowledge sharing meetings to observe how knowledge was transferred from the US knowledge providers to the China-based TSEs, how TSEs conducted group discussions, and how they shared knowledge among the group members. As a technical support engineer, the author was able to observe and ask many questions. After eight months in this role, the author was appointed as a mentor. As a mentor, she played a role as a knowledge provider, which enabled her to understand some knowledge transfer techniques and adopt different ways of providing knowledge to suit the different knowledge levels of recipients. She could also observe how the new TSEs overcame their difficulties in building up their individual knowledge, and how they moved from being novices to qualified support engineers.

The author's immediate experience can be an extremely valuable source of data

(Cooley, 1969). The performance of two roles offers the distinct advantage of providing access to different standpoints and perspectives (Jorgensen, 1989). From the new support engineer perspective, the author gained a comprehensive and accurate picture of how knowledge was transferred from the onshore TSC to the offshore TSC, and how the tacit knowledge was built after the knowledge was transferred from the onshore TSC. From the mentor perspective, the author gained a comprehensive understanding of how to transfer knowledge, and how to help a knowledge recipient acquire knowledge. The role also offered insights into how the TSEs built up their individual knowledge at the different knowledge levels. In both roles, the author developed relationships with different people. These relationships were based on mutual interests, which opened up the opportunity for further participant observation. Moreover, these relationships enabled the interviewees to talk about their experience and to be more willing to share their perceptions and views about the processes of transferring and building knowledge with the author at the interview stage.

### ***Semi-Structured Interviews.***

The semi-structured interview is a useful way of conducting a research project due to its flexibility as balanced by structure and the quality of the data obtained (Gillham, 2005). In a semi-structured interview, some of the questions are formalized, but the interviewer is allowed to add additional questions during the interview “in order to obtain more detailed information about a particular answer or to explore new issues that arise from a particular answer” (Collis & Hussey, 2009, p. 195). It allows interviewees to share their thoughts and insights and to provide rich data for interpretation. This study designed a different question set for each interviewee group. The semi-structured interview questions are in Appendix B.

Before the main research began, a pilot study was conducted to test whether the semi-structured research questions could achieve the research objectives. The author did seven pilot interviews. Each pilot interview was treated as a real interview except

that the participant was asked to provide feedback on a number of issues discussed within the interview. Ambiguous questions were revised and the interview design refined as a result of the pilot study.

It was intended that the interviews would be conducted at the firm's offices and be about 30 to 60 minutes in duration. Twenty interviews were conducted at each TSC. In each of the TSCs, the author interviewed three groups of people. The first interviews at each site were with the offshore transition project manager, the operation manager or the floor supervisor and group leaders to get a general idea about the organization's knowledge transfer and knowledge building processes. These interviews were 45 to 90 minutes long.

The author then interviewed the quality auditor, culture coach, business process trainer, and technical trainers. The interview started by inviting participants (e.g., knowledge providers or knowledge recipients) to describe their roles and their jobs in the knowledge transfer process in a very detailed manner. The knowledge providers were asked to describe how the knowledge was transferred during the knowledge transfer process, and what methods and activities were used in the knowledge transfer process.

Thirdly, the author interviewed front line TSEs from four different knowledge levels: novice, advanced beginner, competency and proficiency. The interview started by inviting participants (e.g., knowledge providers or knowledge recipients) to describe their roles and their jobs in the knowledge transfer process in a very detailed manner. The interviewee was then asked to tell a story about how he/she had gradually built up their knowledge, how their knowledge was acquired, what approach they usually used in the knowledge transfer process, and what methods and activities were used in the process. The discussion then moved on to the difficulties or challenges they had encountered during the knowledge transfer process, and how they overcame them. The author started by interviewing novice TSEs and advanced beginners, then the

competency level TSEs, and moved up to the proficiency level TSEs. The author continued interviewing research participants at each level until she found that new interviewees were providing the same information at which point, she moved to the next knowledge level of TSEs. In effect, forty-eight interviews were conducted in total at the three TSCs. Twenty-six interviews were conducted at Alpha, sixteen at Beta, and six at Gamma. A summary of the key interviewees is shown in Appendix A. For reasons of confidentiality, the names of participants have been disguised.

At Alpha, the author observed knowledge transfer processes with two distinct groups of participants. Group 1 included the first batch of China-based TSEs who had experienced knowledge transfer from the US-based support center to the China-based support center. This group included three US trainers, five mentors, two quality auditors and twenty trainees (i.e. eighteen Chinese trainees and two Canadian trainees). The author observed the knowledge transfer process in this group for a year (during her period of employment at the organization). Group 2 comprised the first batch of China-based TSEs who had experienced knowledge transfer from experienced Chinese trainers who took on the US trainers' position when the original US providers withdrew. This group included two Chinese trainers, one US culture coach, five Chinese mentors, one quality auditor and fifteen trainees (i.e. fourteen Chinese trainees and one Canadian trainee). The author observed the knowledge transfer process in this group for a period of 6 months during the research investigation.

At Beta, the author interviewed sixteen participants in the TSC including a floor supervisor, a culture coach, a business process trainer, technical trainers, and TSEs from four different knowledge levels. They worked in three different groups---Global Management Service, Global Service Delivery (Asia) and Global Service Delivery (Australia).

At Gamma, the author interviewed six key participants in the TSC including floor

supervisor, technical leader and four front line TSEs from different knowledge levels.

The interviews were conducted at the firm's offices. Each interview lasted between 45 and 90 minutes. Forty-six interviews were digitally recorded and subsequently transcribed. Two interviews were not recorded because of confidentiality reasons, so notes were made immediately after the interview. The author conducted thirty-six interviews in Chinese and twelve in English. In order to prevent any loss in the meaning of the original language and save the time spent on language translation, the data analysis was based on the language of the original interview. When the open coding was completed, the free notes and tree notes were translated into English.

## **3.4 DATA ANALYSIS**

### **3.4.1 Data Analysis Strategy**

The process for carrying out the data analysis of texts is complex. Lacity and Janson (1994) divide text analysis approaches into positivist, linguistic, and interpretive approaches based on researchers' underlying assumptions about text data. Since this research is based on the interpretive paradigm, the interpretivist text analysis approach was deemed to be a suitable method for analyzing the qualitative data of this study. The interpretivist text analysis method assumes the meaning of text data is subjective, and attempts to understand phenomena through the meanings that people assign to them. It requires extraneous information to understand the originator of the text (Lacity & Janson, 1994).

The interpretive text analysis approach requires a researcher to learn more about the participant, his or her culture, and time period to understand the text (Lacity & Janson, 1994). Because research participants' expressions reflect their culture, and unique experiences, many implicit assumptions are not articulated in the text. The author is a Chinese who has had a year's work experience at an offshore TSC. This experience, along with her cultural background, helps her to better understand

participants' culture, biases, faith, and experiences.

The author used qualitative research software—Nvivo 7 to help her analyze the case study. She used Nvivo 7 to manage her primary research data. This primary qualitative text data consisted of interview transcriptions and observation notes. Nvivo was a useful tool for storing, organizing, coding, and searching case text data and for supporting theory generation. Using this qualitative research software to support data analysis enhanced the efficiency of her research process.

### 3.4.2 The Process of Data Analysis

This research employed the multiple case study method. Eisenhardt (1989) claims that multiple-case data analysis can be divided into two steps: within-case analysis and cross-case pattern analysis.

During the within-case analysis step in this study, Yin's (1989) pattern-matching technique was used to generate patterns for each case. The process of pattern generation used Nvivo 7 qualitative research software to assist the data analysis and followed the data analysis steps (i.e., Phase One, Phase Two and Phase Three) adapted from Auerbach and Silverstein's (2003) six steps of constructing a theoretical narrative from text (see Table 3.3).

**Table 3.3 Six Steps for Constructing a Theoretical Narrative from Text**

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MAKING THE TEXT MANAGEABLE

1. Explicitly state your research concerns and theoretical framework.
2. Select the relevant text for further analysis. Do this by reading through your raw text with step 1 in mind, and highlighting relevant text.

HEARING WHAT WAS SAID

3. Record repeating ideas by grouping together related passages of relevant text.
4. Organize themes by grouping repeating ideas into coherent categories.

DEVELOPING THEORY

5. Develop theoretical constructs by grouping themes into more abstract concepts consistent with your theoretical framework.
  6. Create a theoretical narrative by retelling the participant's story in terms of the theoretical constructs.
- 

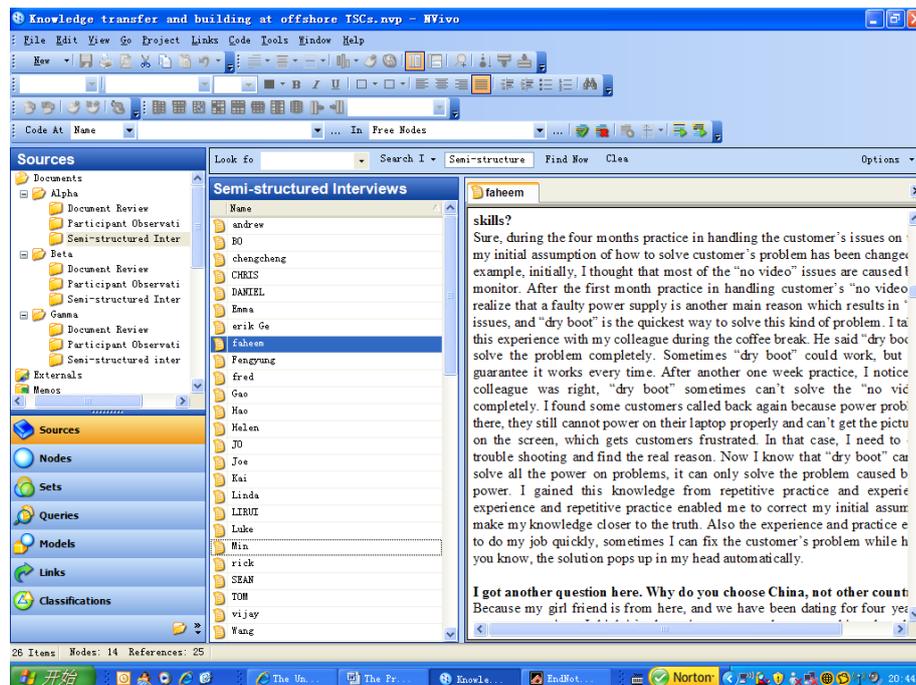
Source: Auerbach and Silverstein (2003)

The analysis process was divided into five phases.

Phase one—Using Nvivo to Manage and Code Data (see Figure 3.1):

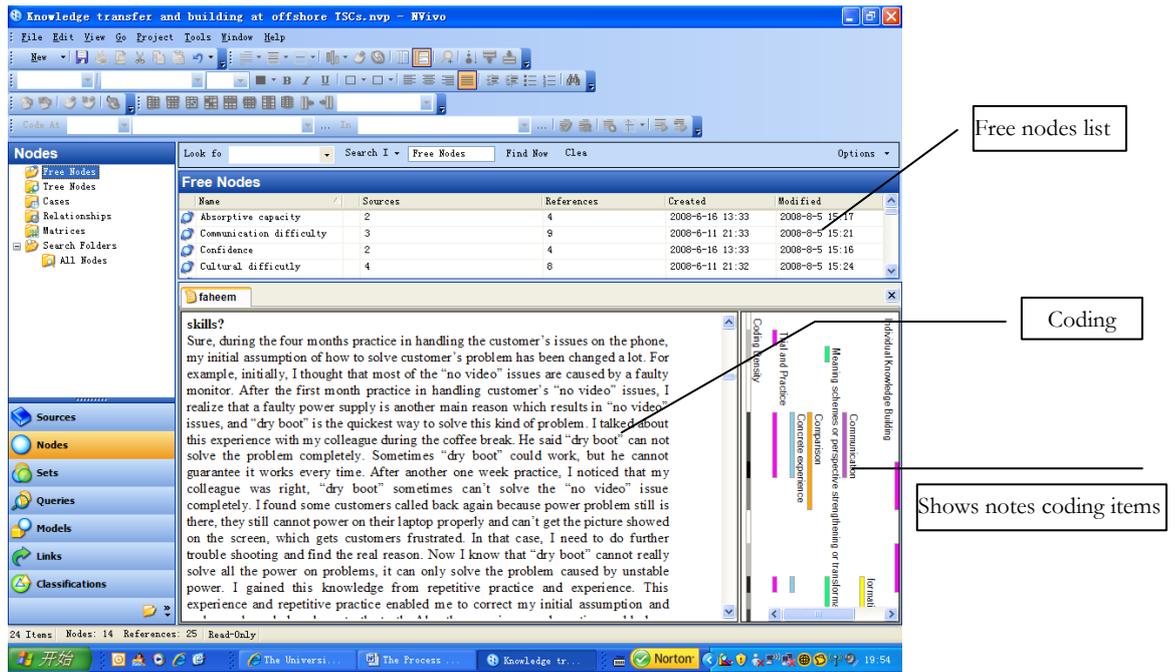
1. Nvivo was used to store all the research data (interview transcriptions, field notes) collected from the three TSCs research site (see Figure 3.1). Before coding data, the author quickly read through the full set of interview transcripts and field notes drawn from document reviews and participant observations to gain a sense of the whole and thus identified the key themes, specific points or issues in the data. Using the “memos” function in Nvivo the author made notes about what she thought the data was telling her, and recorded her ideas about a concept or theme.

**Figure 3.1 Nvivo Being Used to Store All the Research Data**



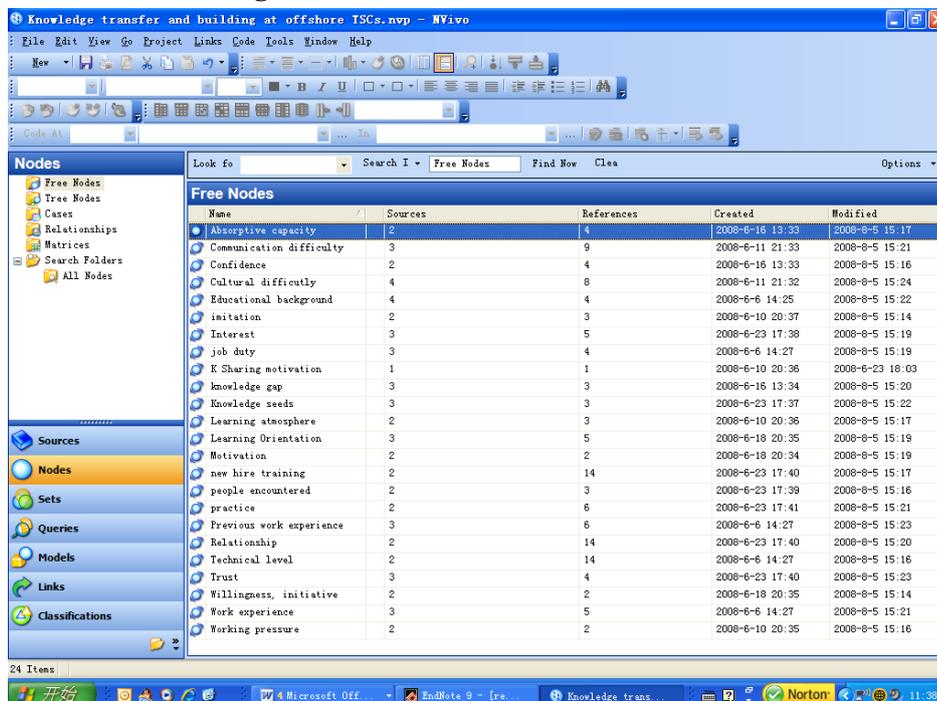
2. Next, the author classified the raw field notes and verbatim transcripts to make sense of them so that the texts could be viewed by group as well as by source. To do so, the author identified the text related to the research purpose, concerns and research questions, and marked them with one or more appropriate codes (called free nodes in Nvivo), and named the free node carefully with a meaningful title (see Figure 3.2).

Figure 3.2 Nvivo Being Used to Code Transcript Data



3. The author continued this process with all of the text, and coded the raw text in a different free node. The Figure 3.3 shows an example list of free codes.

Figure 3.3 A List of Free Codes in Nvivo

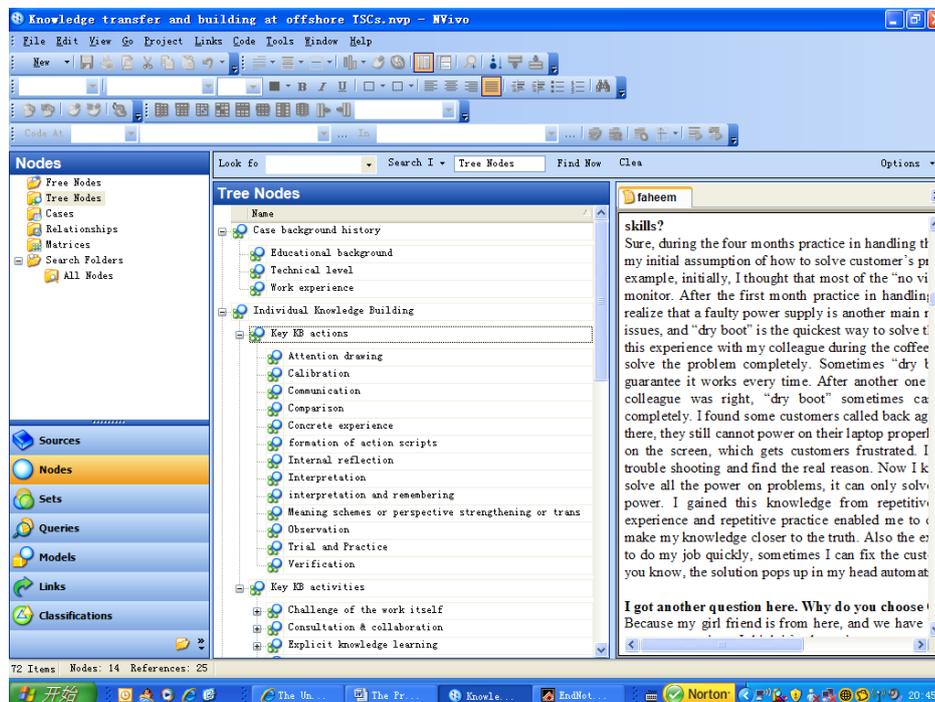


Phase two—Using Nvivo to Group Codes, and Connect Ideas

1. This phase was to identify the repeating ideas in separate transcript, combine the repeating ideas from all the transcripts into tree nodes in Nvivo. To do so, the author

went through the free nodes list, combined and merged the related ideas of relevant text located at different free nodes into a single tree node, and gave a meaningful title to the tree node (see Figure 3.4).

Figure 3.4 Nvivo Being Used to Group Codes



### Phase three—Organize Themes by Grouping Repeating Ideas into Coherent Categories

Based on the tree nodes identified at Phase two, the author attempted to identify themes (i.e., an implicit idea or topic that a group of repeating ideas have in common (Auerbach & Silverstein, 2003)) by grouping related items together, or in other words, organizing the repeating ideas (i.e. tree notes) into larger groups that express a common theme. To organize the themes in Nvivo, the author inspected all the tree nodes, identified how they could be clustered into categories and then provided a name for category. Each of these categories defines a theme, such as explicit knowledge learning and initial practical learning (see Figure 3.5).

Figure 3.5 Nvivo Being Used to Organize Themes

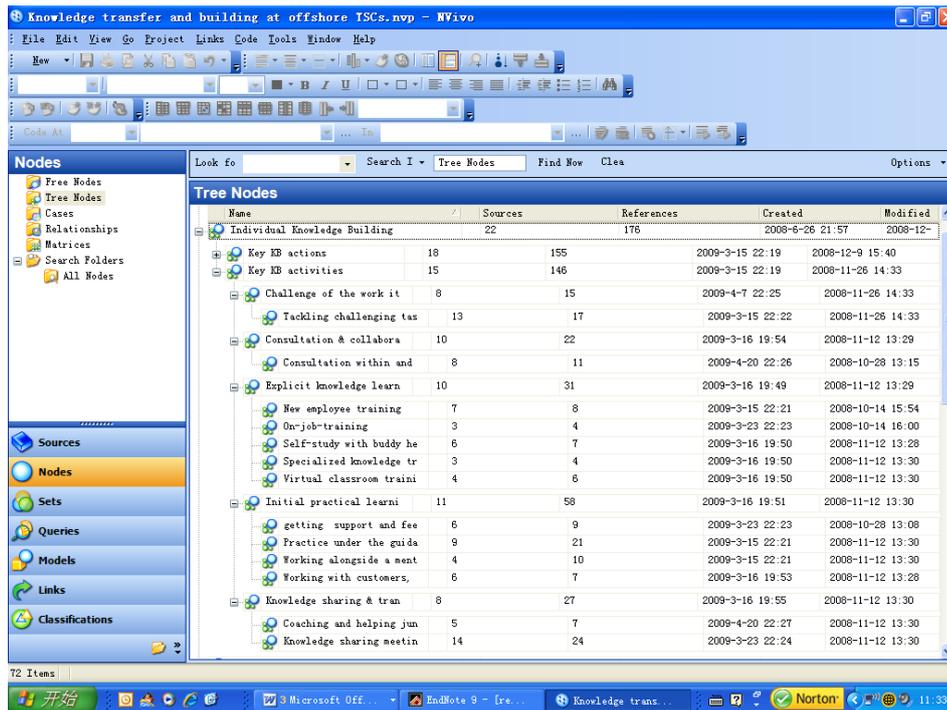


Table 3.4 shows an example of a two-level coding tree. In the tree, level one, the lowest level, codes repeating ideas, and level two codes themes.

Table 3.4 An Example of a Two-level Coding Tree

Themes	Repeating ideas
Explicit knowledge learning	New employee training Self-study with buddy help Virtual classroom training Specialized knowledge training On job training
Initial practical learning	Working alongside a mentor, Working with customers, business partner and colleagues Practice under the guidance of mentors Learn-by-trial, & learn-by-doing learn-by-error Getting support and feedback from management team
Challenge of the work itself	Tackling challenging tasks and roles
Consultation & collaboration	Consultation within and outside the working group,
Knowledge sharing & transfer	Knowledge sharing Coaching and helping new TSEs

#### Phase four--Pattern Isolation and Generalisation

The author browsed through all the themes generated in Phase three, and collected her thoughts on the emerging story. The author manually isolated patterns and processes, commonalities and differences, and gradually elaborated a set of generalisations to cover each case. For example, *unstructured copy* was widely adopted by advanced beginners, *unstructured adaptation* was mainly utilized by those at the competency level, and *unstructured fusion* was preferred by recipients at the proficiency level.

#### Phase five--Pattern Integration

In Phase four, the author manually integrated the findings with her interpretation and key concepts in a pattern. Some relevant categories across all of the interviews and job observations were merged into a generic category or pattern. For example, *unstructured copy* was widely adopted by advanced beginners to transfer encoded and embodied knowledge, *unstructured adaptation* was mainly utilized by those at the competency level to transfer embodied and embedded knowledge, and *unstructured fusion* was also preferred by recipients at the proficiency level to transfer embodied and embedded knowledge.

During the cross-case pattern analysis step, based on the knowledge transfer and knowledge building process, the author compared the similarities and differences among the three cases. In this process, the author deduced repeated categories and concepts, searching for similarities and contradictions and summarizing the broad categories. Then, the author gradually elaborated a small set of generalizations, and finally confronted those generalizations with a formalized body of knowledge in the form of constructs or theories.

### **3.5 TRUSTWORTHINESS**

Lincoln and Guba (1985) suggest four checks that can be used to evaluate the validity

and reliability of qualitative data: credibility, transferability, dependability and conformability. This section provides a brief overview of some of the trustworthiness issues in the light of these four checks.

### **3.5.1 Credibility**

Credibility is basically concerned with ensuring that the research is conducted in a correct manner (Collis & Hussey, 2009). Collis and Hussey identify three tactics that can be used to increase the credibility of case studies: prolonged engagement, triangulation, and peer critique. First, prolonged engagement requires the researcher to spend an extended period of time in the research site (Collis & Hussey, 2009). In this study, the author spent one year conducting participant observation and document review in the research sites, and six months interviewing 48 interviewees making sure that the participants' experiences had been explored in sufficient detail that an in-depth understanding had been achieved. Second, Collis and Hussey (2009) recommend using multiple data sources and collection methods, because triangulation of data can provide a more complete and contextual portrait of the subject. In this study, in order to achieve high credibility, document review, participant observation and semi-structured interview methods were used to collect data. Triangulation of evidence was achieved by examining documents, observing and participating in the technical support engineer knowledge transfer process, and when interviewing different staff asking the same questions in different ways at different times to confirm their opinions. Third, Collis and Hussey (2009) suggest using peer debriefing by colleagues on a continuous basis to confirm that the subject is correctly identified and described. In this study, peer debriefing was based on supervisors' critique and review in the thesis composition stage.

### **3.5.2 Transferability**

Transferability means that the research findings are able to be generalized beyond the immediate case study and can be applied to other situations which are deemed to be sufficiently similar (Collis & Hussey, 2009). In order to achieve transferability, the

research's results should be accepted by a much larger number of similar organizations. In order to achieve high transferability, the study used multiple case studies, so that a case result could be tested through replications of the findings in the three organizations. Similar results were achieved. Also, when selecting the research sites, the case sites were selected carefully to make sure that they were representative of the wider community.

### **3.5.3 Dependability**

Dependability concentrates on “whether the research processes are systemic, rigorous, and well documented” (Collis & Hussey, 2009, p. 182). Yin (1989) suggests that having the draft case study report reviewed by key informants can increase dependability. In this study, after finishing each interview, the author wrote a draft case study report and asked the key organizational participants to confirm its validity. This enabled any misrepresentations to be identified and corrected. A pilot study can also be used to assess dependability and help to correct problems (Straub & Carison, 1989). In this study, seven pilot interviews were used to test whether the semi-structured research questions could achieve the research objectives. Each pilot interview was treated as a real interview except that the participant was asked to provide feedback on a number of issues discussed within the interview. Ambiguous questions were revised and the interview design refined as a result of the pilot study.

### **3.5.4 Conformability**

Conformability is concerned with ensuring that the research process is fully described to make it possible for another researcher to assess that the results stem from the data collected, and to test if the same results could be obtained when the analysis is carried out by another person (Collis & Hussey, 2009). In this investigation, in order to achieve high conformability, the same interview question outlines were used across all three case studies. The interview question outline enforced a similar structure and questions during interviews with the different organizational members. In addition, ambiguous questions had been revised through the pilot study. Also

information from different sources had been obtained for consistency across a variety of perspectives. Yin (1989) suggests that establishing a chain of evidence can be used to increase conformability. In this study, all raw data were documented, so that another researcher could examine the data and conclude similar findings.

### **3.6 CHAPTER SUMMARY**

This chapter discussed the design of this research. Section 3.1 presented the purpose of this research and the research questions. Section 3.2 argued the need for adopting the interpretive research paradigms in conducting this research, and the use of the case based research methodology. Section 3.3 discussed the case study design, the three case sites selected, and the three data collection techniques: document review, participant observation and semi-structured interview. Section 3.4 presented the data analysis strategy using the Nvivo software. Finally, Section 3.5 explained the trustworthiness issues of the designed research.

## **CHAPTER 4 FINDINGS AND DISCUSSION: PREFACE**

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The presentation of research findings and discussion is organized into four chapters. Chapter 4 is a general introduction to the research findings and explains why the findings have been divided into the different chapters, and why the findings are presented in this way. Chapters 5, 6, and 7 correspond to the three research questions. Chapter 5, Knowledge Transfer, develops the knowledge transfer type adoption model based on the research findings about the different knowledge levels of the offshore TSE knowledge transfer process and analysis of the influential factors. Chapter 6, Individual Knowledge Building, generalizes an individual tacit knowledge building process and identifies the factors affecting individual knowledge building. Chapter 7, Organizational Knowledge Building, investigates how offshore TSC organizations build up their organizational knowledge after knowledge has been transferred from onshore TSCs, and the factors affecting the organizational building process.

The following section will present the differences and interactions between knowledge transfer and knowledge building, individual knowledge building and organizational knowledge building.

## **4.1 DIFFERENCES BETWEEN KNOWLEDGE TRANSFER AND KNOWLEDGE BUILDING, AND INDIVIDUAL AND ORGANIZATIONAL KNOWLEDGE BUILDING**

In this study, knowledge transfer and knowledge building are different terms. Knowledge transfer covers a process which involves five key elements: knowledge provider, knowledge recipient, knowledge types, knowledge transfer mechanisms and knowledge transfer context. It involves the relationships among the five key elements of the knowledge transfer process, and the selection strategies for the knowledge transfer approaches and knowledge provider. In contrast, knowledge building is more focused on the knowledge recipient, and covers a set of internal knowledge learning and constructing processes that include knowledge acquisition, knowledge assimilation, knowledge verification, knowledge refinement and modification and knowledge recreation. It aims at individual behavior changes and performance improvement. The knowledge building process involves knowledge building actions such as observation, practice, experience, communication, reflection, and transformation of meaning perspectives. Also this process involves new knowledge creation and old knowledge replacement and forgetting.

Individual knowledge building is different from organizational knowledge building. Individual knowledge building focuses on the building of individual 'TSEs' meaning perspective (i.e., frameworks and routines). Individual knowledge building is an individual internal knowledge building process, whereas organizational knowledge building is collective knowledge building, but it is not just a sum of the knowledge of its members. Organizational knowledge building is a continuous knowledge construction and improvement process for adapting to changes in the organizational environment. The continuous knowledge construction and improvement is based on knowledge transferring, sharing, utilizing, reflecting, building and distributing.

Organizational knowledge building views the organization as an entity. It focuses on how the individual knowledge building links to group and organizational knowledge building, how the knowledge flows in and out of the three levels (i.e., individual level, group level and organization level) of knowledge building, and how the knowledge assets are built in the organization.

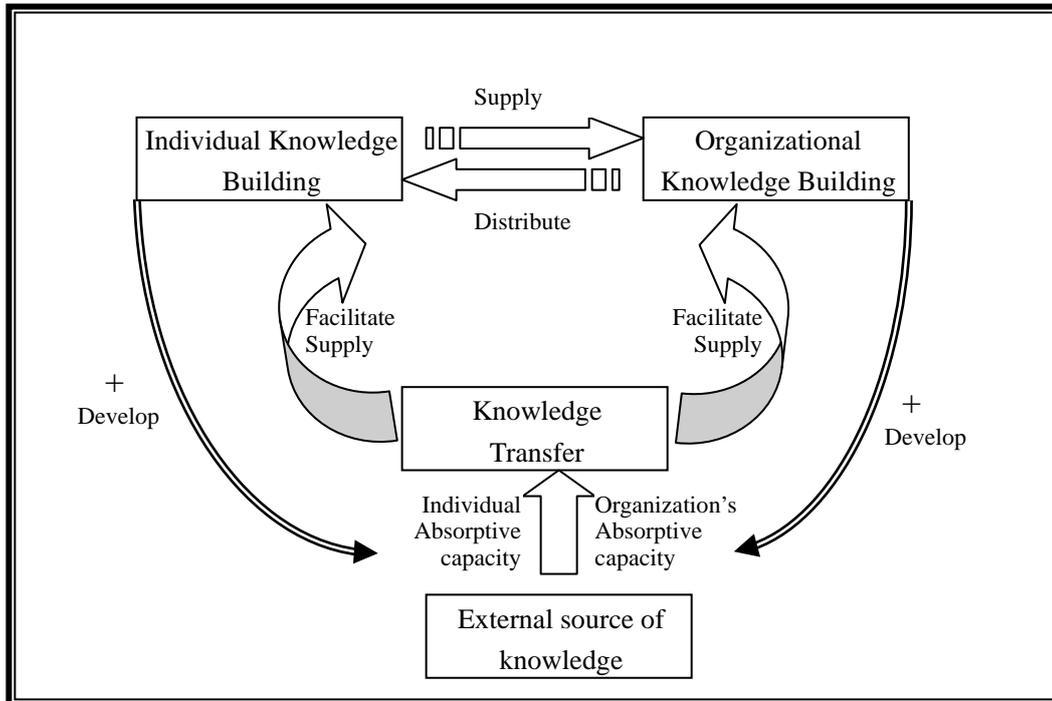
The analysis of the field data showed that knowledge transfer and knowledge building are the basis for sustaining competitive advantage at the offshore TSC. The offshore TSC and its members' knowledge can be expanded by acquiring or absorbing knowledge from the onshore TSC or by building new knowledge themselves. The interaction between knowledge transfer and knowledge building enables individual and organizational knowledge to increase continuously.

## **4.2 INTERACTIONS BETWEEN KNOWLEDGE TRANSFER AND BUILDING, AND INDIVIDUAL AND ORGANIZATIONAL KNOWLEDGE BUILDING**

The analysis of the field data showed the process of knowledge transfer and the integration of this transferred knowledge by learning are prerequisites for knowledge building that leads to an increase in individual and organizational knowledge. Absorptive capacity determines the effectiveness of knowledge transfer and knowledge building. The interactive relationship amongst knowledge transfer, absorptive capacity and knowledge building is presented in Figure 4.1. This figure suggests that absorptive capacity influences the amount of knowledge acquired and assimilated in the knowledge transfer process. The acquired and absorbed knowledge from external sources forms the background knowledge for building new individual and organizational knowledge building. The new knowledge increases the stock of knowledge, which could improve the individual and organizational absorptive

capacity. In turn, it facilitates further knowledge transfer and knowledge building.

**Figure 4.1 The Interaction between Knowledge Transfer and Knowledge Building at Three TSCs**



### 4.2.1 Interaction between Knowledge Transfer and Knowledge Building

Knowledge transfer and knowledge building are interrelated through absorptive capacity. The individual or organization's absorptive capacity indicates its ability to assimilate and replicate new knowledge gained from external sources (Cohen & Levinthal, 1990), and, in turn, the influence on knowledge building. The absorptive capacity of an individual or organization enables the organization and individual to acquire, assimilate, transform and exploit external knowledge through the knowledge transfer process (Zahra & George, 2002). Due to differences in their knowledge access and absorptive capacity, individuals and organizational units have different capabilities in identifying, assimilating and exploiting external knowledge in the knowledge transfer process; these differing capabilities have a significant impact on

their knowledge building and performance. If an organization has a high level of absorptive capacity, it can identify, acquire and understand more external knowledge that is critical to its knowledge building than can those with a low level of absorptive capacity. This study has found that the individuals with a high level of absorptive capacity are likely to combine the knowledge acquired from outside with their own knowledge to create new knowledge.

The external knowledge enriches the individual and organizational knowledge stock, and facilitates assimilation and exploitation of new knowledge. The knowledge acquired and absorbed from the knowledge transfer process is integrated into individual knowledge and forms the background necessary to develop and build up new individual knowledge. The knowledge acquired from the external source of knowledge in the knowledge transfer process continually supplies and facilitates individual new knowledge building. Thus, the process of knowledge transfer and the integration of this transferred knowledge by learning are prerequisites for knowledge building.

The new knowledge being built in the individual knowledge and organizational knowledge building process extends both the individual and the organization's knowledge stock, which forms the content of an individual and organization's absorptive capacity. It would enable the individual or organization levels knowledge recipient to share more prior knowledge with the knowledge provider, which could improve the individual and the organization's absorptive capacity. The improved level of absorptive capacity broadens communication and interactions among individuals who possess diverse and different knowledge structures. This can enhance individual and organizational knowledge acquisition and assimilation through the knowledge transfer process.

Absorptive capacity can be developed cumulatively through individual and organizational knowledge building processes. With an increase of the amount of the

individual's or the organization's knowledge stock of prior knowledge, the individual and the organization's absorptive capacity would be developed, which would enable the individual or the organization to acquire and assimilate more knowledge in the transfer of knowledge from the external source. This then facilitates new ideas and new knowledge generation, and further increases the stock of knowledge.

Overall, knowledge transfer and knowledge building are interrelated through absorptive capacity. The absorptive capacity influences the amount of knowledge being transferred and built. The higher the level of absorptive capacity, the more knowledge acquired and assimilated in the knowledge transfer, and the more knowledge built in the knowledge building processes. Knowledge building enables individuals and organizations to accumulate a stock of knowledge. With an increase in the stock of knowledge, the absorptive capacity will increase, and enable the individual or the organization to acquire and assimilate more knowledge than those with a low level of absorptive capacity which, in turn, facilitates further knowledge building and stock of knowledge accumulation.

## **4.2.2 Interactions between Individual and Organizational Knowledge Building**

The analysis of the field data showed that the relationships between individual knowledge building and organizational knowledge building is that the latter is dependent on individual knowledge building. In the individual knowledge building process, an individual continually produces new knowledge, and this will be transferred to or shared with other individuals in a group. Once a group member internalizes the knowledge, it could become group knowledge. Once the group knowledge is transferred to or shared with other groups, it could become organizational knowledge. The individuals continually provide new knowledge for their groups and their organization, which is the foundation for developing and building up the organizational knowledge. At the same time, the organizational knowledge is transferred to the group, and leveraged to individual members. After

the organizational knowledge has been distributed, the individual would try to assimilate and acquire the knowledge, and integrate and internalize it into their personal knowledge stock, eventually using it to facilitate new individual knowledge building. The new individual knowledge building process will generate new knowledge, which will be transferred and shared around the organization, and eventually enrich the organizational knowledge stock.

Therefore, the relationship between individual knowledge and organizational knowledge is that the organization distributes the individual knowledge that has been built by individual members in the organization, and the individual absorbs the organizational knowledge and facilitates organizational knowledge building.

In summary, absorptive capacity significantly affects individual and organizational knowledge transfer as well as knowledge building. The analysis of the field data suggests that a high absorptive capacity is associated with a better chance of successfully acquiring and assimilating the external knowledge, which facilitates new knowledge building. The building of new knowledge enables the individual and the organization to accumulate a stock of knowledge. With an increase in the stock of knowledge, the absorptive capacity of the individual or the organization will be developed, which will enable the individual or organization to acquire and assimilate more knowledge. In turn, this helps the individual or the organization to generate new ideas and build up new knowledge.

With regard to the interaction between individual and the organizational knowledge building, the organization's knowledge building is dependent on individual knowledge building, by which the individual produces knowledge, and shares this with organization members, and enables the individual knowledge to become organizational knowledge. At the same time, the organization distributes the organization's knowledge around the organization, which enables individuals to acquire the organizational knowledge that will facilitate new individual knowledge

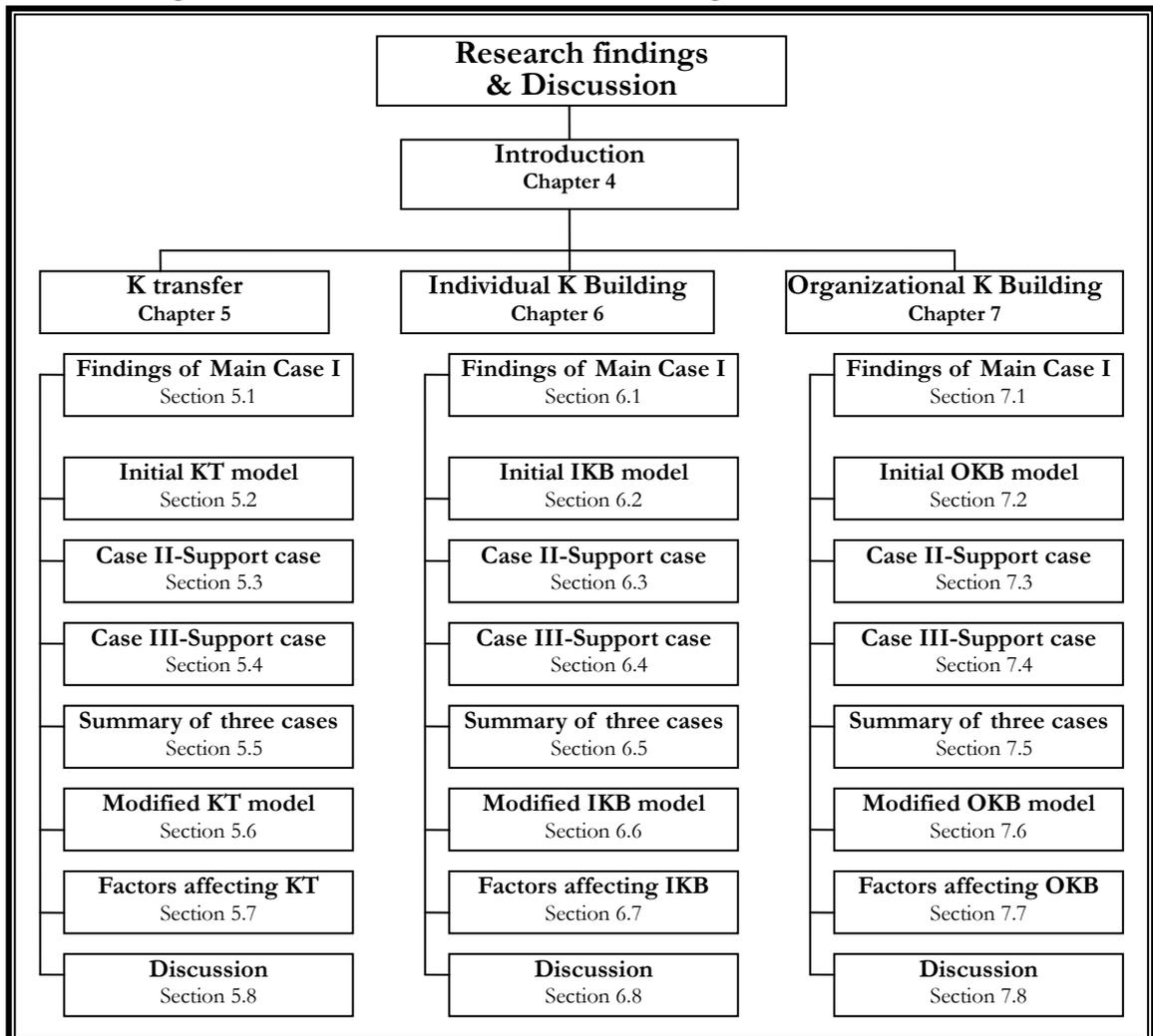
building.

## **4.3 STRUCTURE OF RESEARCH FINDINGS AND DISCUSSION**

The presentation of research findings and discussion is organized into three chapters. Since knowledge transfer is a prerequisite for knowledge building, Chapter Five on knowledge transfer is presented before Chapter Six on knowledge building. Chapter Six on individual knowledge building provides the necessary knowledge to facilitate the building up of organizational knowledge; thus Chapter Seven on organizational knowledge building is presented after Chapter Six. For this reason, Chapter Five discusses knowledge transfer at the organizational and individual level. Chapter Six discusses the individual knowledge building process and factors affecting individual knowledge building. Chapter Seven addresses organizational knowledge building.

An outline of the research findings and discussion is presented in Figure 4.2 below.

Figure 4.2 A Structure of the Research Findings and Discussions



This study adopted a multiple asymmetric case design approach. The order of presentation of each chapter will present the research finding corresponding to the order of multiple asymmetric cases study process and the data analysis process. The presentation of each chapter starts with the research findings of the first case study, and then an initial model is developed based on the first case. This initial model is compared with the findings of the second and third case studies. After comparison, the initial model is modified based on the research findings of the second and third cases. Factors affecting knowledge transfer and building are identified. Each chapter closes with a discussion of the developed model and a linkage to previous literature.

# **CHAPTER 5 FINDINGS AND DISCUSSION: KNOWLEDGE TRANSFER**

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This chapter is the first chapter presenting the research findings and discussion of knowledge transfer undertaken at three offshore TSCs. These TSCs were formally granted a mission and resources by their parent organizations in the US. Since these centers were new, they had new employees, new customers, new business processes, new technical knowledge and new knowledge repository transferring from the US-based support center. This chapter focuses on the process of structured and unstructured knowledge transfer and the factors affecting knowledge transfer at the TSCs. The following sections will present details of these three TSCs' knowledge transfer processes and their impact factors. The structure of the chapter is as follows.

Section 5.1 Research findings of knowledge transfer at Alpha

Section 5.2 Initial knowledge transfer type adoption model

Section 5.3 Comparing knowledge transfer at Alpha and at Beta

Section 5.4 Comparing knowledge transfer at Alpha and at Gamma

Section 5.5 Summary of research findings at the three case studies

Section 5.6 Modified knowledge transfer type adoption model

Section 5.7 Factors affecting knowledge transfer

Section 5.8 Discussion

Section 5.9 Chapter summary

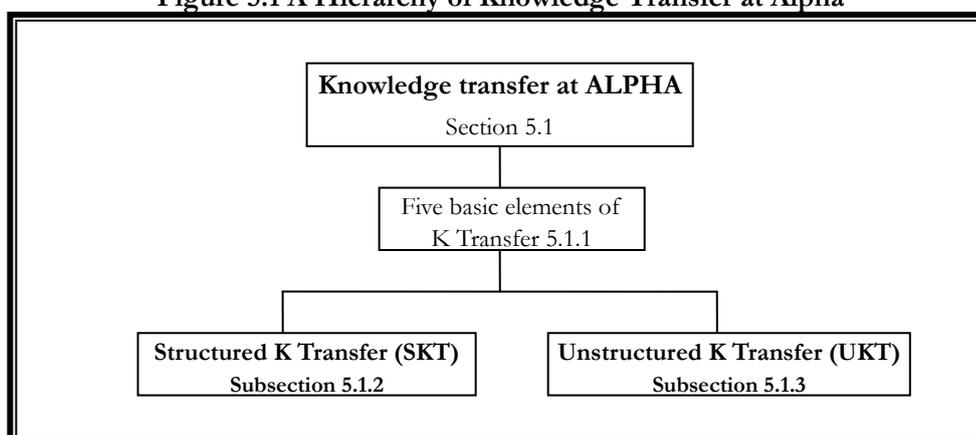
The results and discussion are presented simultaneously and are supported by the

interview transcriptions and observation notes and document review notes which were collected at Alpha, Beta, and Gamma.

## 5.1 RESEARCH FINDINGS OF KNOWLEDGE TRANSFER AT ALPHA

According to the data collected from participant observation, document review and semi-structured interviews at Alpha, the knowledge transfer process can be divided into two groups, namely structured and unstructured knowledge transfer. This section will present the details of these two knowledge transfer processes and the factors affecting the knowledge transfer at Alpha. The section is organized into three subsections. It begins by presenting the five basic elements in the knowledge transfer process at Alpha. The second part will address the structured knowledge transfer process and factors that impact on it. The third part will describe the unstructured knowledge transfer process and factors that impact on it (see Figure 5.1).

Figure 5.1 A Hierarchy of Knowledge Transfer at Alpha



### 5.1.1 Five Basic Elements of Knowledge Transfer

The analysis of the field data identified five important elements in the knowledge transfer process at Alpha: knowledge provider, knowledge recipient, knowledge types,

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knowledge transfer mechanisms and knowledge transfer context. In the following sections, these key elements will be described separately.

### 5.1.1.1 Knowledge Provider

The analysis of the field data indicated that American business process trainers, technical trainers, an American culture coach and American mentors were the key knowledge providers in the structured knowledge transfer process at Alpha. The *American business process trainers* provided organizational culture, vision, concept and business process training, which was classroom-based and face-to-face. The *American technical trainers* provided computer hardware and software training, organizational products features training, troubleshooting and problem solving skill training, which was also physical classroom-based training. The *American culture coach* was responsible for culture training, and for familiarizing offshore TSEs with American culture to close the cultural gap between the American customer and the Chinese TSE. American mentors were experienced TSEs who worked in the onshore TSC, and they provided onsite one-to-one coaching at the China center. American mentors showed novices how to handle a call, and the novice TSEs observed and imitated the way that how their mentors provided a satisfactory service to customers on the phone. The *American quality auditor* took responsibility for monitoring the offshore TSEs' call handling process, analyzing the call to find out whether the TSEs had made mistakes during the call handling process, and then gave feedback to them. They also provided one-to-one coaching through a conference call, and developed an action plan to help TSEs improve their skills.

However, as the China-based TSEs became qualified support engineers, some of the American personnel involved in the knowledge transfer process at the China-based TSC withdrew from their positions (see Table 5.1). Qualified China-based TSEs were considered to have grasped all the necessary knowledge at this position. They could solve most customers' problems successfully and provide a high quality service to customers. When some outstanding China-based TSEs could deliver training to new

employees, the American trainers' positions were gradually taken over by the newly qualified China-based TSEs.

**Table 5.1 People Involved in the Structured Knowledge Transfer Process at Alpha**

KT Activities	People Involved in Knowledge Delivery					
	1~3 Months	3~6 Months	6~9 Months	9~12 Months	12~18 Months	18~24 Months
Culture training	American culture coach					
Process Training	HQ Trainer	Local Trainer				
Technical Training	Alpha HQ Trainer		Local Trainer			
Quality Audit	Alpha HQ Quality Auditor				Local Quality Auditor	
Tier 2 Backline support	American Backline					Indian Backline
Virtual on-going class Training	Alpha HQ Trainer					
Physical on-going class training	Local Trainer, Alpha HQ Trainer					
Mentoring	US mentor (onsite)	US mentor (IP phone)	Local Mentor			
Calibration meeting	Alpha World Wide technical leader, management team and organizational knowledge worker					

Note: HQ stands for headquarters

Others who played an important role in the unstructured knowledge transfer process included senior technicians at the global contact center (GCC), US backline TSEs, US colleagues, Indian backline TSEs, local technical leaders, local group leaders, supervisors, local colleagues, and local quality auditors.

### 5.1.1.2 Knowledge Recipient

The research findings indicated that the structured knowledge transfer was mainly adopted by new hired employees (knowledge recipients). China-based TSEs at this support center were recruited locally (China), and from overseas. The local people recruited by the China-based support center came from the local universities (55%) where English was predominantly a foreign language, and while they had reasonable English skills, they lacked the experience of working in an English language business environment. The support center also recruited English-speaking Chinese returnees (55%) who had studied abroad, typically in the US, Canada, Australia, New Zealand and Great Britain. There were also non-Chinese nationals (10%) from native English

speaking countries such as the US and Canada, and from countries such as the India, Philippines and South Africa where English is predominantly used in the work environment.

Based on the Dreyfus knowledge model (e.g., Dreyfus & Dreyfus, 1986), the knowledge levels of TSEs were defined by the length of work experience and level of absorptive and retentive capacities. At the organization studied in this research, it appears that TSE expertise movement levels were predominately based on time frames. The average time spent by a new employee to become a novice TSE from date of starting was around 6 months. An advanced beginner was at that level for approximately 6 to 12 months from starting, stayed 12 to 18 months at the competency level, and after 18 months, moved to the proficiency level. The number of novice TSEs at the call center was 10% of all staff, advanced beginners 25%~35%, competency level 50%~60%, and proficiency level 10%~15% (see Table 5.2).

**Table 5.2 Summary of the Knowledge Recipient Levels at Alpha**

Knowledge levels	Percentage of population	Main Characteristics	Moving forward Time frame	Moving forward condition
Novice	10%	Has a fundamental level of absorptive and retentive capacities, can understand, assimilate and apply basic concept. Rigid adherence to taught rules or steps to do their work.	<6 months	Has ability to see similarities and differences between situations
Advanced beginner	25%~35%	Have an elementary level of absorptive and retentive capacities, can understand, assimilate and apply systemic knowledge in knowledge repositories. Have an ability to apply pre-existing solution in a similar situation.	6~12 months	Has ability to try new rules to cope with new situations
Competency	50%~60%	Has an intermediate level of absorptive and retentive capacities, can make a deep discussion with senior technicians and can understand, assimilate and apply the knowledge learned from them. Have the ability to recognize problem pattern, and can flexibly apply the pre-existing solution in different situations.	12~18 months	Decision-making less labored

Knowledge levels	Percentage of population	Main Characteristics	Moving forward Time frame	Moving forward condition
Proficiency	10%~15%	Has an advanced level of absorptive and retentive capacities, can coordinate with senior technicians to solve challenges and novel problems while following the rules that he/she learned in practice. Can see what is most important in a situation. Recognizes deviations from the normal pattern.	> 18 months	Has extensive experience and knowledge, often acts without planning or making assessments. No longer needs to decide, but automatically discriminates between a vast repertoire of examples.

### 5.1.1.3 Knowledge Transfer Mechanisms

According to a review of the knowledge transfer mechanism literature, the knowledge transfer mechanisms can be divided into three major types (see Table 5.3): codified transfer, inter-personal transfer, and communities and networks. At Alpha, the significant knowledge transfer mechanisms employed in the structured knowledge transfer process were the codified transfer mechanism, the inter-personal transfer mechanism and the communities and networks mechanism. The codified transfer mechanism included manuals, documents, and reports, Web based training materials and knowledge repositories that contained many solutions for general issues. The inter-personal transfer mechanism included face-to-face conversation, mentoring, apprentice, role-playing and storytelling. The communities and networks mechanism included communities of practice (group meeting, electronic group discussion) and knowledge networks. US knowledge providers used these three types of knowledge transfer mechanism to help offshore TSEs understand the US-based organization's business culture, vision, concepts and processes, and help the China-based TSEs build their basic technical skills and knowledge about the products they would be supporting.

**Table 5.3 Mechanisms Adopted in the Knowledge Transfer at Alpha**

<b>Mechanism of knowledge transfer</b>	<b>Communication Methods</b>	<b>Media Choice</b>
Codified transfer mechanism	Technology- assisted communication Training method Documentation	Intranet, Email, Knowledge repositories, Search engine, e-learning Training manuals Printed publications
Inter-personal transfer mechanism	Technology- assisted communication  Meeting Training method	Telephone, Email (Dyadic), Instant message (e.g. Jaber or MSN), Corporate directories, Face-to-face conversation Mentoring, Apprentice, Storytelling
Communities and networks mechanism	Technology- assisted communication Meeting	Email (broadcast), communities of practice (online), knowledge forum Meeting, virtual network meeting, communities of practice

In the three types of knowledge transfer mechanism, information technology (IT) played a critical role in the knowledge transfer and knowledge building processes. Due to its convenience and accessibility, IT was a useful and effective tool to facilitate a TSE's process of knowledge transfer and knowledge building. The research findings illustrated that the most important IT tools used to transfer and build up knowledge were knowledge repository, email, virtual meetings, and instant messaging. The less important IT tools were e-learning, knowledge forum, and online chat.

#### **5.1.1.4 Four Types of Knowledge**

Drawing on the data collected from participant observation, document review, call sample listening and interviews at Alpha, the types of knowledge transferred from the US-based support center to the China-based support center could be classified into four categories: conceptual knowledge, systemic knowledge, experiential knowledge and routine knowledge (see Table 5.4).

**Table 5.4 Different Types of Knowledge and Their Knowledge Transfer Approaches at Alpha**

Knowledge types		Example	Knowledge transfer approaches			
			STD transfer	USTD Copy	USTD Adaptation	USTD Fusion
Explicit knowledge	Conceptual knowledge	The mechanism of computer working principal, computer composition	Very common			
	Systemic knowledge	“Best practice” in knowledge repositories Organization rules, work instructions, business process and regulations, new employee manuals.	Very common	Very common		
Tacit knowledge	Experiential knowledge	Call handling skills, social communication skills, call center telephone using skills, information gathering skills, trouble-shooting skill, diagnosis skill, and advice giving skills	Common	Very common	Very common	Very common
	Routine knowledge	Routines, norms, organization culture		Common	Very common	Very common

Notes: STD stands for structured; USTD stands for unstructured

During the knowledge transfer process, conceptual knowledge was primarily transferred through *structured transfer stages*. This type of knowledge helped recipients build up their basic understanding of computer fundamentals. Systemic knowledge was transferred through *structured transfer stages* and *unstructured copy*. This type of knowledge related to organizational product lines, work instructions, business processes and general issues they were required supposed to ask about while on the phone. Experiential knowledge was predominately transferred through learning-by-doing on *unstructured copy*, *unstructured adaptation* and *unstructured fusion*. This knowledge helped recipients to develop an ability to deal with customers from different countries who speak different languages and who have a very different cultural background from the TSEs. The knowledge also helped recipients build technical skills about the products they would be supporting. Routine knowledge was largely transferred through collective learning and working on *unstructured adaptation* and *unstructured fusion*, and it helped recipients to understand US-based organization’s business culture, vision, concepts and processes.

### **5.1.1.5 Knowledge Transfer Context**

The research focused on the knowledge transfer from the US-based TSC to the China-based TSC. The knowledge transfer context was cross-cultural knowledge transfer. The national culture plays an important role in the knowledge transfer process.

The following sections discuss the structured knowledge transfer process. They provide details about how the above five elements affect knowledge transfer and how the four types of knowledge were transferred through three types of transfer mechanisms between knowledge providers and recipients in a cross-cultural business context.

### **5.1.2 Structured Knowledge Transfer**

The knowledge transfer process at the offshore TSC started with structured knowledge transfer. This section addresses the structured knowledge transfer process and the factors which impact on the transfer process.

Structured knowledge transfer was mainly used for transferring conceptual and systemic knowledge. The transfer processes uncovered by this research can be described as a sequence of four stages. Stage One--Initiation: The China-based support center searches for qualified knowledge providers at the US-based support center; Stage Two--Implementation: The knowledge recipient learns knowledge from the knowledge provider; Stage Three--Ramp-up: The knowledge recipient applies the acquired knowledge; and Stage Four--Integration: The knowledge recipient integrates what has been learned so that they can take over the full responsibility of a TSE.

Table 5.5 shows a summary of the structured knowledge transfer process for novices at Alpha.

Table 5.5 Structured Knowledge Transfer Process for Novice TSEs at Alpha

Stage	Knowledge Provider	Knowledge Recipient	Knowledge Types	Knowledge transfer mechanism	Knowledge Transfer Activities
<b>Stage One Initiation</b>	N/A	N/A	N/A	N/A	Searching for knowledge providers at the US-based support center Setting up the offshore knowledge transfer group
<b>Stage Two Implementation</b> (2~3 months)	US culture coach, Process & technical trainers	Novice	Conceptual knowledge, Systemic knowledge	one to many group knowledge transfer, and codified Knowledge transfer	Culture training Process training Technical training <i>Teaching approach:</i> role play, case study, call sample listening and Lab experiment, written tests or quizzes
<b>Stage Three Ramp-up</b> One-to-One coaching (1~3 months)	US Mentors	Novice	Systemic knowledge Experiential knowledge	Inter-personal knowledge transfer	Job shadowing Mock call User Accepted Test <i>Teaching approach:</i> Mock call simulation, case study, one-to-one coaching, real call listening and Lab experiment.
<b>Stage Four Integration</b> (2 weeks)	US Mentors, Backline TSE	Novice	Systemic knowledge Experiential knowledge	Inter-personal knowledge transfer	Practice Two weeks monitoring by mentor Dynamic assessment

### ***Stage One--Initiation***

Initially, a US offshore project manager and a China-based TSC operation manager recruited qualified knowledge resource people from the US-based TSC who had the necessary cultural, technical, and business process knowledge to assist with the development of the offshore support group in China. The people involved in the knowledge transfer process at the offshore TSC were US business process and technical trainers, a US culture coach and US mentors.

### ***Stage Two--Implementation***

The goal of Stage Two, the initial knowledge acquisition process, was to transfer conceptual and systemic knowledge so that novices could understand the basic concepts required for the technical support job. The knowledge transferred at this stage included the basic concepts about how computers work, trouble shooting steps,

“best practice” in knowledge repositories, organizational rules, work instructions, business processes and regulations, new employee manuals, and knowledge repository searching skills. At this stage, the US trainers went to the China-based support center and provided face-to-face classroom based training to the novices.

In this stage, the US trainers provided three types of training: culture awareness training, business process training and technical training, which took 6~12 weeks to complete. The methods of knowledge transfer at this stage consisted of presentations, role plays, real call listening, case studies, lab experiments and written tests and quizzes. *Presentations* were used as the key knowledge transfer mechanism at the beginning of the transfer. These made novices aware of the basic knowledge. *Role play* was used to simulate a real scenario and help novices understand what they were supposed to do in a real situation. *Call sample listening and case studies* used agents' previous call samples, and asked novices to identify what the agent had done incorrectly during the call handling process. In each case study, the trainer could show novices the correct procedure for handling a call, and draw their attention to potential problems in the communication, and thus increase their understanding of the required communication skills needed to enhance customer service quality. *Lab experiments* were used to give novices some hands-on practice with the computer hardware and software used to support customer calls. *Written tests or quizzes* were used by the trainer to assess whether the novices had grasped the important points of the learning session.

### ***Stage Three--Ramp-up***

Once the trainee passed the Stage Two examinations, they were assigned to a group on the live call center floor to practise applying the acquired knowledge. Each group had one US mentor who took responsibility for coaching three or four trainees. The knowledge transferred at this stage included systemic and experiential knowledge such as applying pre-existing knowledge (i.e., systemic knowledge) to a real problem, call handling skills, telephone usage skills, information gathering skills,

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trouble-shooting skills, diagnostic skills, and advice giving skills. At the ramp-up stage, US mentors provided three types of training: job shadowing, mock call training and User Accepted Test (UAT).

#### *Job Shadowing*

Job shadowing was a training program where novices learnt about a job by sitting beside an experienced TSE or a mentor as they go through a normal day on the job. The novice was able to observe the work environment and occupational skills in practice. Novices could observe their mentor handling a customer's real problem on a call, find out how their mentor coordinated with other colleagues and how the mentor created a case in the CRM system. This training helped the novices to understand what they were supposed to do in their jobs.

#### *Mock Call Training*

Mock call was similar to role play, but played out in a real situation, where the mentee had a headset on his/her head and all knowledge repository and support tools were open on their computer screens and ready for use. Their mentor, playing the role of a customer, called the mentee and gave them a tough scenario in which the mentee had to find a solution for a problem. Mock call training allowed novices to apply the knowledge gained from Stage One in a real scenario. Mock calling enabled mentees to imitate their mentors to do things. The more mock calls the novices did, the better they were prepared for calls from real customers.

#### *User Accepted Test*

User Accepted Test (UAT) was a test to assess whether a novice's services would be accepted by American customers. In order to pass the UAT and become a qualified TSE, the novices had to have very good communication skills and the ability to communicate well with American customers. The document review showed that TSEs' soft skills (communication skills, familiarity with client business processes) were considered to be more important than their hard skills (technical skill, trouble

shooting skill). If the novices had some previous customer service work experience, this would help them to pass the UAT. In addition, according to the data collected through a document review of the Myers Briggs personality test taken by new employee, trainees with an extroverted personality (68%) found it easier to pass UAT than the trainees with an introverted personality (42%).

During the knowledge transfer process, organizational knowledge repositories played a critical role in transferring “best practices” (i.e., the successful solutions for general issues that have been solved previously) from the US-based support center to the China-based support center. The knowledge repositories used by the TSC in this case were a searchable IT-based repository which stored and indexed successful solutions, and made them available to the TSE to assist them solving their problems. Each solution provided the knowledge or information about the subject of issue, a problem symptom description, resolution/solution, service action, and recommended action. The organizational knowledge repositories provided the TSE with access to expert problem solutions, no matter what his or her current expertise level was. The process and experience of applying the systemic knowledge in repositories to a real problem sharpened the TSE’s problem solving skills and diagnostic logic and helped new employees ramp up their skills more quickly (El Sawy & Bowles, 1997). During the knowledge transfer process, US knowledge providers taught recipients how to use the knowledge repositories, how to search for solutions in the knowledge repositories, and trained them to use the systemic solutions to solve customers’ problems. Knowledge repositories “enable staff to be more *learningful* in that they build on each other’s knowledge and on that of more experienced senior colleagues and smart customers”(El Sawy & Bowles, 1997, p. 474).

### ***Stage Four--Integration***

Stage Four was the knowledge integration process. Once trainees had passed the UAT, they were ready to take over full responsibility with a little US-based TSE's support. They would start to handle real calls by themselves, and would apply what they had learned in doing their daily job. Eventually, the acquired knowledge was internalized and was taken for granted as part of their own tacit knowledge. The goal of this stage was to transfer systemic and experiential knowledge so novices would be able to perform the basic functions required in their job. At the integration stage, the trainees would be supervised by mentors and a quality auditor. The methods of knowledge transfer at this stage consisted of monitoring and quality auditing. In monitoring, the mentor supervised the trainees' call handling processes, and provided support when the trainee needed help. Quality auditing was an on-going TSE assessment process carried out by the quality auditor. The quality auditor would give feedback to the TSE and provide one-to-one coaching, as well as develop an action plan to help the TSE overcome his/her weaknesses.

### *Two Weeks Monitoring*

At this integration stage, novices went live and handled real customers' calls by themselves, but were supervised by their mentor. The group leader or mentor would sit beside the novices and monitor their call handling processes. When a novice encountered a problem, their mentor or group leader would give him/her some suggestions. If the novice handled their calls smoothly in these two weeks of monitoring, they would then move to the next stage and handle calls completely by themselves.

### *Dynamic Assessment*

Once the novices could handle a real call completely by themselves, they were referred to as support engineers, and made the transition to regular duties. Quality auditing was an on-going TSE assessment process carried out by the quality auditor, and was a two-way process involving interaction between the quality auditor and the

TSE. The quality auditor sampled the calls of all the TSEs, and evaluated the observed the quality of call transaction to generate a score for each agent. If the score was low (less than 85), the quality auditor would set up a quality auditing meeting with the TSE. The quality auditor would give feedback to the TSE and provide one-to-one coaching, and as well, would develop an action plan to help the TSE overcome his/her weaknesses.

These four stages of structure knowledge transfer enabled the novice TSEs to gain some basic knowledge and skills to do their job.

### **5.1.3 Unstructured Knowledge Transfer**

After the TSEs had acquired some basic concepts or knowledge background through the structured knowledge transfer process at Alpha, they were able to acquire knowledge through the unstructured knowledge transfer process. In the following section, I will discuss the unstructured knowledge transfer process and the factors affecting this process.

Unstructured knowledge transfer processes occur in daily work. These processes played a very important role in the transfer of knowledge from the US-based support center to the China-based support center and from experienced TSEs to a new TSE. In the unstructured knowledge transfer process, the knowledge recipient played a critical role, because the recipient determined what knowledge provide he/she was going to ask for, and what kind of transfer mechanism and transfer approach he/she would adopt. Therefore, the following section focuses on the knowledge recipient and discusses how knowledge recipients, at different knowledge levels, acquire knowledge from different knowledge providers in the unstructured knowledge transfer process, and what factors influence the selection of the knowledge provider, transfer mechanisms and approaches.

Unstructured knowledge transfer was the dominant knowledge transfer approach for knowledge recipients at the advanced beginner, competency and proficiency levels.

### ***Advanced Beginner Level***

When a novice became a qualified TSE, he/she might move forward to the second level -- advanced beginner. The most important knowledge transfer method for advanced beginner was *unstructured copy*. TSEs at this level had acceptable communication skills and could handle most general issues. The goal at this stage was to familiarize advanced beginners with general issues and improve their problem-solving skills and speed. The boundary between the advanced beginner and the competency levels was whether they could solve problems flexibly and could modify a pre-existing solution to fit a new situation. The types of knowledge transferred were systemic knowledge (i.e., “best practice” in knowledge repositories) and experiential knowledge. They had to access the systemic knowledge in knowledge repositories and apply the encoded solution to a similar problem. The systemic knowledge improved their problem solving skills and diagnostic ability and helped them ramp up their skills more quickly. The experiential knowledge was acquired by repetitively reusing systemic knowledge, or by observing and imitating, and by participating in discussions with colleagues or senior technicians.

TSEs at this level preferred to search internal and external knowledge repositories, where 50~80% of general issues could be found. Advanced beginners had a basic absorptive capacity and could understand text-based solutions, and knew how to apply pre-existing solutions to customers’ real problems. In 10~20% of the general issues, they needed to ask local technical leaders or experienced colleagues whether the solution they had found in a knowledge repository was correct or not. When advanced Chinese beginners encountered a tough problem, they preferred to ask local tech leaders or colleagues around them for a solution, because local tech leaders or colleagues were more accessible, and might be a better teacher than the American expert. This is because the knowledge gap between the knowledge provider and the

knowledge recipient was not as great. Also, they had a stronger relationship with the local Chinese senior technicians than with the US technicians. If they could not get any help from the Chinese technicians, they would call the US backline group. In fact, they rarely sought help from the US source, because the knowledge gap, communication and cultural difference made it difficult for them to absorb the knowledge from the US backline through the telephone. At times, the communication between the knowledge provider and the recipient might lack depth due to the recipients' low absorptive and retentive capacities. They could not engage in a deep discussion with senior technicians and were not able to understand the solution that the senior technician might suggest. For a new or tough issue, the only way for advanced beginners to deal with a new problem was to escalate it to senior technicians.

A summary of five basic elements of knowledge transfer for the advanced beginner is shown in Table 5.6.

**Table 5.6 Summary of Five Basic Elements of Knowledge Transfer for the Advanced Beginner**

<b>Elements</b>	<b>Characteristics at Alpha</b>
<b>Transfer approach</b>	Unstructured copy
<b>Knowledge provider</b>	Local technical leader, local technician at same group
<b>Knowledge types</b>	Systemic knowledge and experiential knowledge
<b>Transfer context</b>	Same culture, general issue
<b>Transfer mechanism</b>	Codified transfer: knowledge repository; Inter-personal transfer: Face-to-face, telephone, Instant message

### ***Competency Level***

The TSE at the competency level had more than 12 months work experience and very good communication skills. They were familiar with business processes, were confident in handling most types of customers, and could solve common problems flexibly. There was no need for them to search for a common problem in the knowledge repository because they could remember these common problems and

their solutions. The most important knowledge transfer method adopted by those at the competency level is *unstructured adaptation*. They found a solution through discussing the problem with a senior technician who had solved a similar problem before. In the discussion, the recipient was able to pose questions, probe, and clarify the relevance of the senior technician's knowledge to the recipient's current problem. The results of this study confirm findings in studies conducted by Gray and Meister (2006). With the senior technician's help, the TSE could modify the previous solution and adapt it to the current situation to solve the customer's problem. With this type of transfer, the recipient had to share tacit knowledge to build mutual understanding with an expert and had the absorptive capacity to benefit from the senior technician's guidance. Competency level recipients could think on their own to find a solution, but on many occasions could not resolve unanticipated problems that occurred.

When competency level recipients encountered a tough issue, the Chinese recipients usually (60~70% of tough issues) asked the Chinese Tech leader for a solution via face-to-face communication. This was because they had a good relationship with local tech leaders, who were more accessible and took more responsibility for the problems than the American backline did. In 30~50% of the tough issues, the Chinese recipient would ask the US backline for a solution by telephone when the Chinese tech leader was not available or local technical leaders could not inspire him/her to think of a new idea to solve the problems. However, sometimes an ambiguous resolution was transferred from the US backline to the Chinese recipient because the US technician did not mind trying out some uncertain solutions with their customers because of the US low uncertainty avoidance culture. If the Chinese recipient felt the solution was uncertain, he/she did not argue with the US backline and he/she would not say that he/she disagreed with the US backline, but would spend some time searching for a better solution or talking to experts and finding a safe resolution. Chinese recipients were reluctant to agree with an uncertain resolution provided by US TSEs to customers straight away. This tendency would probably be caused by the Chinese high uncertainty avoidance and large power

distance culture.

The goal of this stage was to improve the TSE's problem solving flexibility, efficiency and effectiveness. Some of them were able to respond to a familiar problem automatically as they have become increasingly tacit through repetition. This increased their speed and productivity in problem-solving. The boundary of moving forward from the competency level to the proficiency level was whether they had developed intuitive decision-making skills through repetition. The types of transferred knowledge at this level were experiential and routine knowledge, such as logical thinking skills, diagnostic skills, pattern matching skills and social communication skills. Experiential knowledge was transferred through guided 'learning-by-doing' and interactive problem solving. Routine knowledge was transferred through social interaction with group members at the China-based and US-based support centers.

Competency level recipients had a high absorptive capacity and could discuss a very complicated problem with senior technicians. With the senior technician's help, they could think by themselves, and create a new solution for a new problem. The communication between them was deeper than that of the advanced beginner and the competency level recipient could pose some difficult questions to the senior technician. The competency level recipient was not only ready to accept knowledge, but more deeply involved in thinking than an advanced beginner. A TSE at the competency level stated:

*... something you deal with on the daily basis, in day of day out, I can remember that pretty well, so there is no point for me going there (knowledge base)...*

*...because when the problem gets that technical I can't fix it, which means probably it's very unique. General issues I can fix when I was half asleep. But when it gets very technical, that means there is a high chance it's not in the SAW (knowledge*

repository). So I rather prefer face-to-face communication with somebody, not only to ask them about it, but also to voice my thoughts, and help me to think a little bit better, because sometimes when you have something inside, it's bottom up, if you don't speak out, doesn't seem right. So when I go to face-to-face, not necessarily to ask a question, but I discuss with somebody who solved this kind of problem before "what do you think, do you think that might be the solution?" he might just suggest something that just makes me think even further. So for me, that is very useful...

Therefore, the competency level recipient who had the motivation for acquiring knowledge and seeking new ideas to solve problems can be defined as "active". The relationship and trust between senior technician (knowledge provider) and competency level recipient were important to enhance the transfer of tacit knowledge.

Table 5.7 is a summary of five basic elements of knowledge transfer for the competency level TSE.

**Table 5.7 Summary of Five Basic Elements of Knowledge Transfer for Competency Level TSE**

Elements	Characteristics at Alpha
<b>Transfer approach</b>	Unstructured adaptation
<b>Knowledge provider</b>	Majority: Local technical leaders or colleagues; Minority: US Tier 2 senior technicians.
<b>Knowledge types</b>	Systemic, experiential and routine knowledge
<b>Transfer context</b>	Same culture and cross cultural
<b>Transfer mechanism</b>	<i>Inter-personal transfer</i> : face-to-face, Internet, telephone, and Jaber

### ***Proficiency Level***

The final level is proficiency, where the TSE had more than 18 months work experience. TSEs at this level were quick learners, with a strong technical base of knowledge about the products, and know how to interact with customers. They could cope with unexpected problems, and think on their own to find a solution.

The most significant knowledge transfer method adopted by TSEs at the proficiency level was *unstructured fusion*. At this level, TSEs could solve most problems, and only a few unanticipated problems could not be handled by them. The way for them to solve a tough problem was to search external and internal knowledge repositories, find and read some relevant articles, or to discuss the problem with a group of high level Global Contact Center (GCC) senior technicians through conference calls. This discussion would inspire the TSE to develop new ideas to find a solution. The TSEs at the proficiency level had the ability to fuse the ideas that they had absorbed from knowledge repositories or from a group discussion, and then apply deep thinking processes in which the knowledge goes through a re-creation process in the mind (El Sawy, Eriksson, Carlsson, & Raven, 1998). Based on the observation, TSEs at the proficiency level had excellent cross-cultural communication skills and a high level of knowledge absorptive capacity, there was little cultural difficulty and knowledge gap. This meant that TSEs at the proficiency level could solve a problem through cross-cultural group collaboration, such as a group discussion among US senior technicians, Indian technicians and Chinese technicians. Therefore, at this level, Chinese recipients and the Canadian recipient selected the same knowledge provider and transfer media.

Since the US and Indian senior technicians were far away from the TSE at the proficiency level in China, contact was made through telephone, email, MSN, and conference call. MSN was not useful for discussing deep issues because of the weak relationship between the two parties. Replies to email took time, and a conference call needed to be set up. Telephone communication was not ideal because of the different time zones. Thus, proficient recipients always used email to send information about the issues, and set up a time for a conference call. A conference call allowed a group of senior technicians to have a deep discussion.

The boundary of moving forward from proficiency level to expert is whether the

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TSE had developed the ability to intuitively grasp situations based on deep tacit understanding and could act without planning or making assessments. The types of knowledge transferred at this level were experiential and routine knowledge, such as logical thinking skills, innovation skills, and cooperation and leadership skills and so on. Experiential knowledge was transferred through deep group discussion with experienced colleagues. Routine knowledge was transferred through intensive and extensive social interaction and coordination with group members at the China-based and US-based support centers.

In the knowledge acquiring process, the TSE at the proficiency level had ‘proactive’ motivation for acquiring knowledge and creating new knowledge to solve the problem. In this process, trust and strong relationships between the TSE at the proficiency level and senior technicians were very important to enhance the transfer of tacit knowledge.

Table 5.8 summarizes the five basic elements of knowledge transfer for proficiency level TSEs.

**Table 5.8 Summary of Five Basic Elements of Knowledge Transfer for Proficiency Level TSEs at Alpha**

Elements	Characteristics at Alpha
<b>Transfer approach</b>	Unstructured fusion
<b>Knowledge provider</b>	US Tier 3 senior technicians; Indian branch senior technicians; Knowledge repositories
<b>Knowledge types</b>	Experiential and routine knowledge
<b>Transfer context</b>	Cross-culture
<b>Transfer mechanism</b>	<i>Inter-personal transfer</i> : email and telephone <i>Communities and networks transfer</i> : group discussion through Internet meeting and conference call

Table 5.9 is a summary of the knowledge transfer processes for offshore TSEs at the different knowledge levels.

**Table 5.9 Knowledge Transfer Processes for the TSEs at the Different Knowledge Levels at Alpha**

Knowledge Level	% of problem solved on own	The major way acquiring knowledge	Knowledge provider/sourcing	Dominant Knowledge Transfer approach
Novice	10%	Acquire conceptualization knowledge through training and asking trainers/mentors via face-to-face communication.	Trainer	Structured Transfer Stages
Advanced beginner	50%~80%	50~80% of knowledge gained from knowledge repository. 10% from asking experienced colleagues who sit around them.	Knowledge repositories, Local technical leaders or colleagues	Unstructured: Copy
Competency	80%~90%	Gain knowledge through discussing with group leader or senior agent via face-to-face communication or telephone to modify the previous solution and adapt it to the current situation.	Major: Local technical leaders or colleagues; Minor: US Tier 2 senior technicians	Unstructured: Adaptation
Proficiency	95%~99%	Gain knowledge through fusing the ideas that they have absorbed from knowledge repositories or from a group discussion through conference call.	Chinese senior technician; US Tier 3 senior technicians; Indian branch senior technicians; Knowledge repositories	Unstructured: Fusion

To sum up, the analysis of the field data demonstrated that the unstructured knowledge transfer processes were mainly used by the higher levels of qualified TSEs namely advanced beginner, competency and proficiency, to acquire knowledge. It was found that copy was widely adopted by advanced beginners, adaptation was mainly utilized by those at the competency level, and fusion was preferred by recipients at the proficiency level.

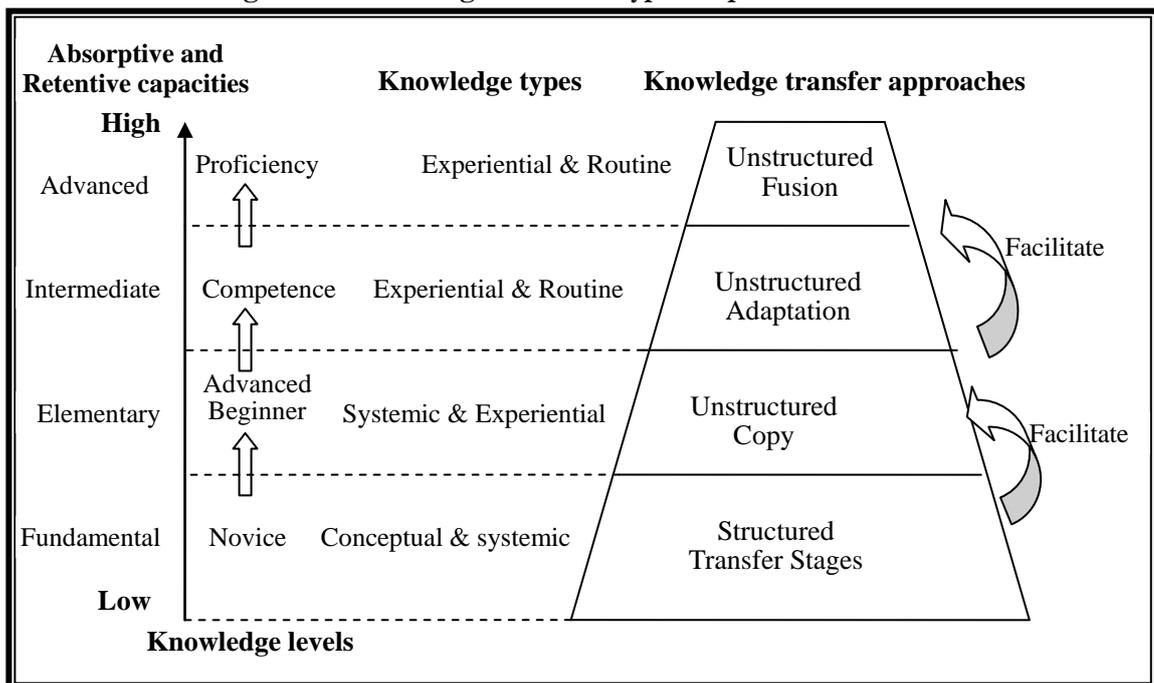
## 5.2 INITIAL KNOWLEDGE TRANSFER TYPE ADOPTION MODEL

Based on the analysis of field data collected at Alpha, *structured transfer stages* were primarily utilized by novices to gain conceptual knowledge and systemic knowledge

which would enable them to perform the basic functions required in their jobs. While *unstructured copy* was widely adopted by advanced beginners to transfer systemic and experiential knowledge, *unstructured adaptation* was mainly utilized by those at the competency level to transfer experiential and routine knowledge, *unstructured fusion* was preferred by recipients at the proficiency level to transfer experiential and routine knowledge. This research developed the knowledge transfer type adoption model that provides a compelling explanation of the knowledge acquisition processes adopted by different knowledge levels of recipients.

A knowledge transfer adoption model is presented in Figure 5.2. The absorptive and retentive capacities of knowledge recipients play an important role in the knowledge transfer process. The knowledge recipient should have the appropriate level of absorptive and retentive capacities to acquire the knowledge transferred from the knowledge provider (Gupta & Govindarajan, 2000). A lack of absorptive and retentive capacities has been shown to be a significant barrier to knowledge transfer (Joshi & Sarker, 2003; Szulanski, 1996). As a result, the knowledge transfer adoption model is described in four levels based on the recipient's absorptive and retentive capacities; namely, fundamental level, elementary level, intermediate level and advanced level, which correspond to the novice, advanced beginner, competency and proficiency levels described earlier.

Figure 5.2 Knowledge Transfer Type adoption model



At the bottom of the trapezoid, *structured transfer stages* provides some conceptualization knowledge (conceptual knowledge and systemic knowledge) transferred from knowledge providers to novices, so that they have a basic ability to assimilate and use new knowledge. Novices do not have sufficiently similar knowledge stocks and norms compared to the knowledge provider; there is a wide gap between them and the knowledge provider. Their absorptive and retentive capacities are low; they cannot absorb all the knowledge given by the provider. Rather, the knowledge from the provider may be regarded as the seeds of knowledge, which form the background necessary for the recipient to develop to the *unstructured copy* level.

*Unstructured copy* requires basic absorptive and retentive capacities. It forms the background necessary to develop and interpret *unstructured adaptation* and *unstructured fusion*. The linkage of these four types of transfer suggests that individuals can successfully transfer knowledge only at the *structured transfer stages* and *unstructured copy*, and gain some cognitive tacit knowledge from using the acquired knowledge repetitively. The tacit knowledge gained from the *structured transfer stages* and

*unstructured copy* can also facilitate an effective transfer of knowledge at *unstructured adaptation* (intermediate level). *Unstructured adaptation* requires higher absorptive and retentive capacities than *unstructured copy* (Chen & McQueen, 2010). Extensive long-term coordination with a specific onshore senior technician and China-based technical leaders, will enhance the absorptive capacity, the problem-solving capacity, and the ability of competency level TSEs to create new knowledge within that context (Szulanski, 2003). When the recipient's tacit knowledge has progressed and extended the underlying received knowledge, then the proficiency level recipient has the ability to facilitate a transfer of knowledge from themselves to others through the *unstructured fusion* process (advanced level) as long as a certain degree of commonality exists between them.

In terms of the types of knowledge transferred in the knowledge transfer process, the results confirmed similar findings of studies conducted by Lam (1997), who emphasized that the degree of tacitness, complexity and ambiguity of the knowledge sought affects the selection of knowledge transfer approaches. The analysis of the field data showed that simple and explicit knowledge was more likely to be transferred by formal and structured transfer approaches, whereas tacit and complicated knowledge was more likely to be transferred through personal, unstructured and informal knowledge transfer approaches. In this study, explicit knowledge (i.e., conceptual and systemic knowledge) such as the concept of computer components, the mechanism of how computers work, and the features and specifications of organizational products was transferred from the onshore knowledge provider to novices through a structured knowledge transfer approach. This approach allowed novices to gain conceptual knowledge and build up their fundamental level of absorptive and retentive capacities to reach a higher level of knowledge (i.e., experiential and routine knowledge). Advanced beginners accumulated experiential knowledge through repetitive use of systemic knowledge stored in organizational knowledge repositories by adopting the *unstructured copy* knowledge transfer process. The experiential knowledge they built enabled them to

improve their problem-solving efficiency and move forward to the competency level. At the competency level, the TSEs continued to acquire experiential knowledge through 'learning-by-doing' and interactive problem solving, through communicating with colleagues and advanced customers, such as having a deep discussion with a senior technician to develop a solution for a new problem. The competency level TSE gained routine knowledge through social interaction and coordination with the Chinese senior technicians. After they become a proficiency level TSE, they could acquire more tacit experiential and routine knowledge through group discussions and coordination, and fuse the ideas they learnt from group discussions to solve a novel problem.

This model identifies the relationships among the characteristics of the knowledge recipient, knowledge types and the knowledge transfer approaches. *Structured transfer stages* is employed by the novice to transfer conceptual and systemic knowledge; *unstructured copy* is widely adopted by those at the advanced beginner level to transfer systemic and experiential knowledge; *unstructured adaptation* is utilized by those at the competency level to transfer experiential and routine knowledge, and *unstructured fusion* is the dominant process used by those at the proficiency level to transfer experiential and routine knowledge. This model also illustrates the mutually interdependent relationships between the four types of knowledge and four types of knowledge transfer approaches. Conceptual and systemic knowledge transferred through *structured transfer stages* forms the background knowledge for developing systemic and experiential knowledge through adopting the unstructured copy transfer approach. The systemic knowledge further forms the foundation for developing and interpreting experiential knowledge and routine knowledge through the *unstructured adaptation* and *unstructured fusion* knowledge transfer approaches. The model also identified that the knowledge recipient's absorptive and retentive capacities determine the type of knowledge transfer approach adopted, thus it provides new insights into the knowledge transfer process for the different levels of knowledge acquisition in a cross-cultural business context.

## **5.3 COMPARING THE KNOWLEDGE TRANSFER PROCESSES AT ALPHA AND AT BETA**

The Beta onsite case study was carried out after the Alpha (main case) had been studied. As already mentioned, the “multiple asymmetric case design” approach was adopted. The Beta case was employed to verify the model generated from the Alpha case study and to generalize a research model which suited the three cases.

In the following section, the author will compare the similarities and differences in Beta and Alpha’s knowledge transfer processes.

### **5.3.1 Comparing the Five Basic Elements of Knowledge Transfer at Alpha and at Beta**

A comparison of the five basic elements of knowledge transfer at Alpha and at Beta found that they adopted similar knowledge transfer mechanisms (i.e., codified transfer mechanism and inter-personal transfer mechanism and communities and networks mechanism) to transfer four types of knowledge (i.e., conceptual knowledge, systemic knowledge, experiential knowledge and routine knowledge). The main differences were knowledge provider, knowledge recipient and knowledge transfer context.

#### ***Knowledge Provider***

Two types of knowledge providers were involved in the structured knowledge transfer at Beta. One type was senior technicians who had worked at other branches and had many years’ working experience in the field. They went to the China-based TSC and provided onsite knowledge transfer to TSEs for one to two weeks. Another type was outsourcing trainers from an outsourced training company or Beta

University, who provided some certification-based training and specialized knowledge training. This is different from Alpha. Alpha's trainers such as business process trainers, technical trainers, culture coaches, mentors and quality auditors came from the US-based TSC. However, Alpha knowledge providers in the position were not professionals. They were appointed as trainers because they had developed expertise through years of practice at the TSC, and not because they were good at teaching or had expertise in mentoring. This is consistent with the findings from Swap, Leonard, Shields, & Abrams's (2001) study.

The people involved in the unstructured knowledge transfer at Beta included senior technicians at the US, India, and Hungary Backline TSEs, local technical leaders, local group leaders, supervisors, local colleagues, and local quality auditors.

### ***Knowledge Recipient***

At Beta, the knowledge recipients had some level of absorptive capacity, because new employees recruited by this TSC had more than two years work experiences at a TSC, therefore they had basic technical knowledge and customer service skills. This was different from Alpha as the new employees at Alpha were mainly recruited from new graduates, and most did not have any work experiences. Thus Beta's new employees had a higher level of knowledge acquisition ability and higher absorptive capacity for knowledge than new employees who worked at Alpha.

At Beta, the recipients' knowledge levels were divided into four groups based on the length of work experience and level of absorptive and retentive capacities – novice, advanced beginner, competency and proficiency. This was the same as Alpha. A comparison of the moving forward time frame showed that Beta novice TSEs spent less time at this stage than Alpha TSEs. The average time taken by a new employee (novice) to become an advanced beginner from date of starting was around 1 month. An advanced beginner was at that level for approximately 2 to 12 months from starting, then 12 to 25 months at the competency level, and after 18 months, some

excellent TSEs could move to the proficiency level. The percentages of TSEs at each level were novice (5-10%), advanced beginners (20%~25%), competency level (60%~65%), and proficiency level (5%~10%).

### ***Knowledge Transfer Context***

At Beta, the knowledge transfer context was similar to that of Alpha. It was a cross-culture knowledge transfer, but Beta's knowledge transfer context was more complicated than Alpha's. Alpha's knowledge transfer happened between US-based TSC and China-based TSC, whereas, Beta's knowledge transfer occurred among many branches of Beta TSCs such as the US, India, Singapore, and Australia.

## **5.3.2 Comparing the Structured Knowledge Transfer**

### **Process at Alpha and at Beta**

Beta provides some structured knowledge training for individual TSEs, because the organizational culture of Beta emphasizes self-motivated study. In other words, acquiring knowledge is a personal responsibility; individual TSEs need to have a proactive attitude to learning including learn-by-trial, learn-by-doing, and learn-by-error. This section will compare the structured knowledge transfer processes and the factors impacting on the transfer processes of Alpha and Beta.

A comparison of the structured knowledge transfers at Alpha and Beta revealed that Alpha provided a longer and more extensive new employee training than Beta. Alpha provided more than 2~3 months' structured new employee training, covering culture, business process and technical training. In contrast, Beta provided only one week formal new employee training for new employees, and some short term specialized knowledge training and onsite knowledge transfer. The significant reason for this is that the fundamental knowledge request for new employees in these two companies (Alpha and Beta) is different. For Alpha, the prospective employees are new graduates, while Beta seeks candidates who have two years' TSC work experiences,

basic technical knowledge and customer service skills. Since the new employees at Beta had a higher level of knowledge acquisition ability and higher absorptive capacity for knowledge, Beta did not provide formal structured new employee training. Therefore, at Beta, whether the new employees can pick up their job quickly or not really depends on their previous work experiences and their proactive self-learning skills. If the person has a passion to learn and is proactive in asking questions of their colleagues, they can learn more from colleagues, and pick up their jobs quickly.

**Table 5.10 Comparing the New TSE's Knowledge Transfer Process at Alpha and at Beta**

Stage	Knowledge Transfer Activity at Alpha	Knowledge Transfer Activity at Beta
<b>Stage One Initiation</b>	Searching for knowledge providers at the US-based support center Setting up the offshore knowledge transfer group	Transferring knowledge repository, combining training material, and preparing e-learning material
<b>Stage Two Implementation</b>	Culture training Process training Technical training <i>Teaching approach:</i> role play, case study, call sample listening and Lab experiment, written tests or quizzes	One-week-mentoring Self-study: learned from documents and manual, and e-learning
<b>Stage Three Ramp-up</b>	Job shadowing Mock call User Accepted Test <i>Teaching approach:</i> Mock call simulation, case study, one-to-one coaching, real call listening and Lab experiment.	Applying the pre-existing knowledge to real problems Specialized knowledge training Onsite knowledge transfer <i>Teaching approach:</i> Presentation, case study and lab experiment
<b>Stage Four Integration</b>	Practice Two weeks monitoring by mentor Dynamic assessment	Applying the pre-existing knowledge to real problems

A comparison between the new TSE's knowledge transfer process at Alpha and at Beta is summarized in Table 5.10. The following subsection will describe the main differences between knowledge transfer activities at the two TSCs.

### ***One-week-mentoring***

In the first week, the new employees were assigned a mentor to help them become familiar with the environment of the TSC, its people, and the organization's business processes and software applications. The mentor would demonstrate and teach new

employees how to do the basic tasks of their job, tell them where they could find solutions and information, and who they could contact. During this process, the new employees were supposed to ask the mentor as many questions as possible.

### ***Self-study and Application***

At Beta, new employees were expected to gain initial key conceptual knowledge from documents, e-learning material, and manuals by themselves. Having acquired the core conceptual knowledge, they started to apply the knowledge into a real world problem. For example, new employees were assigned some simple or basic job, such as answering simple inquiries or solving a general problem on the phone. During this stage, they applied the pre-existing knowledge into a real problem, and gradually built up their basic knowledge through handling basic jobs.

### ***Specialized Knowledge Training***

After a few months' experiential learning and practice, the new employees became advanced beginners. They were assigned some corporate customers and took care of one or two products. If a TSE had two products to look after he/she would be specialised in one product, and has a general knowledge of another product. The training was focused on individual skills to fit the TSE's career path. The kind of training depended on the TSE's job. If the person lacked some knowledge or skills required by his/her work, the company would arrange for the individual to attend a training course provided by Beta University or an outsourcing company. In addition, Beta has its own certification achievement system which included Beta Associate Certification, Beta Certified Specialist, and Beta Certified Expert. The company motivated employees to achieve a high level certification. According to the company policy, if the employee achieved a high level of certification, the company would raise his/her salary to reflect his/her knowledge skills. This policy motivated a certification-driven learning.

At Beta, each employee had some opportunities to attend specialized knowledge

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training and certification based training. The employee could select a course which he/she wanted to attend and get approval from his/her operation manager to enrol. He/she would be released from their work to take on the training. The training could last one or two weeks and could be held in any country around the world, such as Hong Kong, Singapore, and Australia. The knowledge provider of these courses would be professional trainers. This training enabled trainees to build relationships and social networks with other TSEs from different Beta TSCs who were doing a similar job. The training style of the course was usually presentations and case-study based. Many TSEs felt this kind of training was very helpful for their career and enhanced their skills and knowledge. There were three reasons for this view. First, they took the course after a few months' experiential learning and practice in their jobs. They had an appropriate level of absorptive capacity to absorb the knowledge delivered on the training. Second, during the first few months working at Beta, they had encountered some questions and queries that puzzled them, and this training provided them with a good opportunity to seek some answers from trainers and other TSEs. Third, the trainers were professional trainers with both technical and teaching skills.

### ***Onsite Knowledge Transfer***

Knowledge was also transferred on site at Beta. Knowledge was provided by Singapore and Australian trainers, who regularly (three or four times a year) came to China to provide onsite training. Each training session lasted one or two weeks. All the skills related TSEs were eligible to participate in the training. The main training styles included presentation, case study, and lab experiment.

A comparison between the structured knowledge transfer at Beta and at Alpha showed that the main difference was the start time of the knowledge transfer. The structured knowledge transfer at Alpha started when new employees had just entered the company and had no impression of their jobs. In contrast, the structured knowledge transfer at Beta started after new employees had worked at the company

for a few months. Therefore, the Alpha structured knowledge transfer could be seen as pre-job training, the kind of training to help new employees build up basic knowledge. Since the Alpha new employees had a low absorptive capacity they could not absorb some types of knowledge very well at the beginning. They paid attention to what the trainer directed them to learn. In interviews, they commented that at times they did not know why they should learn the knowledge, how the concepts or basic knowledge related to their job, how the knowledge could be applied to a real world problem, and how important and useful the knowledge was that they learnt from the training. These would be the reasons why they did not think about or reflect on the knowledge in depth when they attended the training course (according to the data collected from participant observation). In contrast, the structured knowledge transfer at Beta started after the employees had some experience and absorptive capacity, so they could understand and absorb knowledge better than the employees at Alpha could. They knew what kind of information or knowledge was important for their job, and could pay more attention to important information when they attended the structured knowledge transfer training.

### **5.3.3 Comparing the Unstructured Knowledge Transfer**

#### **Processes at Alpha and at Beta**

This section presents a comparison of the unstructured knowledge transfer process and the factors affecting this transfer process at Alpha and at Beta.

Unstructured knowledge transfer played a critical role in the transfer of knowledge from the US, India, Singapore, and Australia TSCs to the China-based TSC and in the transfer of knowledge from experienced TSEs to junior TSEs (i.e., novices and advanced beginners). During the unstructured knowledge transfer process, the knowledge recipient decided which knowledge provider he/she was going to request and what kind of transfer mechanism and transfer approach he/she would adopt. Therefore, the following section focuses on the knowledge recipient and discusses

how knowledge recipients, at different knowledge levels, acquire knowledge from different knowledge providers in the unstructured knowledge transfer process, and what factors affect the selection of knowledge provider, transfer mechanisms and approaches.

In unstructured knowledge transfer, Beta had a similar pattern to Alpha's transfer in terms of approaches. *Unstructured Copy* was widely adopted by those at the advanced beginner level to transfer systemic and experiential knowledge, *Unstructured Adaptation* was utilized by those at the competency level to transfer experiential and routine knowledge, and *Unstructured Fusion* was the dominant process used by those at the proficiency level to transfer experiential and routine knowledge.

### ***Advanced Beginner***

At Beta and Alpha, the advanced beginners adopted the *Unstructured Copy* knowledge transfer approach. They applied the pre-existing knowledge (i.e. the "best practice" stored in the organizational knowledge repository) into the real world problem, or they applied the solution they acquired from other TSEs through face-to-face communication or e-mail. In this process, the advanced beginners copied codified pre-existing solutions or other people's pre-existing solution, as they could not think of solutions by themselves. The main difference at Alpha and at Beta (see Table 5.11) is that Beta TSEs started to acquire knowledge from TSEs in other groups at Beta at the advanced beginner level. This is because only a few people supported the same product in one group. This pushed the TSEs to seek knowledge from other groups at the advanced beginner level.

**Table 5.11 Comparing the Five Basic Elements of Knowledge Transfer for Advanced Beginner at Alpha and at Beta**

Elements	Characteristics at Alpha	Characteristics at Beta
<b>Transfer approach</b>	Unstructured copy	Unstructured copy
<b>Knowledge provider</b>	Local technical leader, local technician at same group	local technical leader, <b>local technician at different group</b>
<b>Knowledge types</b>	Systemic knowledge and experiential knowledge	Systemic knowledge and experiential knowledge
<b>Transfer context</b>	Same culture	Same culture
<b>Transfer mechanism</b>	<i>Codified transfer</i> : knowledge repository; <i>Inter-personal transfer</i> : Face-to-face, Instant message	<i>Codified transfer</i> : knowledge repository; <i>Inter-personal transfer</i> : Face-to-face, Instant message, <b>Email</b>

### *Competency Level*

After attending specialized knowledge training and having one year practice, TSEs at Beta were competent to solve general issues by themselves and could think of a solution by themselves. If they confronted a tough issue such as an urgent or serious problem, they would search knowledge repositories for an answer, and then discuss the problem with experienced colleagues who were specialized in the product to find a solution.

At Beta, the type of experienced TSEs that competency level TSEs discussed with was broader than at Alpha (see Table 5.12). At Alpha, they were mainly local technical leaders and local senior technicians, but at Beta, the experienced TSEs came from different countries and from different branches such as India, Australia, Singapore and US. Therefore, the competency level TSEs at Beta had broader communication and discussions than TSEs at Alpha. This is because in one group a product may be supported by only a few people.

**Table 5.12 Comparing the Five Basic Elements of Knowledge Transfer for the Competency Level TSE at Alpha and at Beta**

Elements	Characteristics at Alpha	Characteristics at Beta
<b>Transfer approach</b>	Unstructured adaptation	Unstructured adaptation
<b>Knowledge provider</b>	Majority: Local technical leaders or colleagues; Minority: US Tier 2 senior technicians.	Majority: <b>cross-branch colleagues, such as India, Australia, Singapore and US senior technician</b> ; Minority: local technical leaders or colleagues.
<b>Knowledge types</b>	Systemic, experiential and routine knowledge	Systemic, experiential and routine knowledge
<b>Transfer context</b>	Same culture and cross cultural	Same culture and cross cultural
<b>Transfer mechanism</b>	<i>Inter-personal transfer</i> : face-to-face, Internet, telephone, and Jaber	<i>Inter-personal transfer</i> : face-to-face, Internet meeting, telephone, and Microsoft office communicator.

### *Proficiency Level*

The TSEs at the proficiency level at Beta adopted the same knowledge transfer approach (unstructured fusion) as those at Alpha (see Table 5.13). When TSEs reach the proficiency level, they are at the highest level of technician at the China-based TSC. Thus, if they encountered a difficult issue, they did not have a knowledge source to draw from locally. There were two options for them to solve the problem. The first was to use codified knowledge fusion through searching the global knowledge repository, and finding the relative solution or a similar problem. This approach could inspire the TSE at the proficiency level to think differently and develop a new solution. The second was group knowledge fusion, a solution generated through group discussion, in which a group of senior technicians from different branches discussed the issue in a virtual conference call.

**Table 5.13 Comparing the Five Basic Elements of Knowledge Transfer for the Proficiency Level TSE at Alpha and at Beta**

Elements	Characteristics at Alpha	Characteristics at Beta
<b>Transfer approach</b>	Unstructured fusion	Unstructured fusion
<b>Knowledge provider</b>	US Tier 3 senior technicians; Indian branch senior technicians; Knowledge repositories	Indian Tier 3 senior technicians; Singapore, Australian branch senior technicians; Knowledge repositories
<b>Knowledge types</b>	experiential and routine knowledge	experiential and routine knowledge
<b>Transfer context</b>	Cross-culture	Cross-culture
<b>Transfer mechanism</b>	<i>Inter-personal transfer:</i> email and telephone <i>Communities and networks transfer:</i> group discussion through Internet meeting and conference call	<i>Codified transfer:</i> Codified knowledge fusion <i>Communities and networks transfer:</i> group discussion through Internet meeting and conference call.

To sum up, the main differences between unstructured knowledge transfer at Alpha and at Beta were at the advanced beginner level and the competency level. At the advanced beginner level, the BETA TSE contacted and communicated with colleagues who were working at the different local groups. At the competency level, the Beta TSE contacted and communicated with TSEs at different branches through personal social networks. At Alpha, the TSE only contacted TSEs in the same group and local senior technicians at the advanced beginner level and competency level.

The following section compares the differences between the factors affecting selections of knowledge providers and transfer media in unstructured knowledge transfer at Alpha and at Beta.

### 5.3.4 Summary

To sum up, this section compared the knowledge transfer processes at Alpha and at Beta. With regard to structured knowledge transfer, the analysis of the field data showed that new employees at Beta experienced more difficulty in the structured knowledge transfer process than those at Alpha, due to Beta's short knowledge transfer time-frame and less structured knowledge transfer processes.

With regard to unstructured knowledge transfer, the analysis of the field data indicated that Beta had a similar pattern to Alpha. The unstructured knowledge transfer processes were mainly used by the higher levels of qualified TSEs namely advanced beginner, competency and proficiency, to acquire knowledge. *Unstructured copy* was widely adopted by advanced beginners, *unstructured adaptation* was mainly utilized by those at the competency level, and *unstructured fusion* was preferred by recipients at the proficiency level.

## **5.4 COMPARING THE KNOWLEDGE TRANSFER PROCESSES AT ALPHA AND AT GAMMA**

The Alpha case developed a basic model of knowledge transfer at the offshore TSC. The Beta onsite case study confirmed most parts of the initial knowledge transfer type adoption model. The Gamma onsite case was done after the Alpha and Beta cases had been studied. This case was employed to verify the model generated in the Alpha and Beta cases and to generalize a research model which suited the three cases. In the following section, the author will compare the knowledge transfer processes at Gamma and at Alpha.

### **5.4.1 Comparing the Five Basic Elements of Knowledge Transfer at Alpha and at Gamma**

A comparison of the five basic elements of knowledge transfer at Alpha and at Gamma revealed that they adopted similar knowledge transfer mechanisms (i.e., codified transfer mechanism and inter-personal transfer mechanism) to transfer the four types of knowledge (i.e., conceptual knowledge, systemic knowledge, experiential knowledge and routine knowledge). The main differences were the knowledge provider, and the knowledge recipient, and knowledge transfer context.

In the structured knowledge transfer process at Gamma, the knowledge providers were local experienced colleagues (buddies), and virtual classroom trainers. Local experienced colleagues were non-professional knowledge providers who could provide basic job-related knowledge to new employees. Virtual classroom trainers were professional knowledge providers from Gamma University. They provided conceptual and systematic knowledge for new employees. However, since the training was online based, the communication between knowledge recipient and provider was one-way communication. If new employees had some questions about the training material, they could not ask the knowledge provider directly; this reduced efficiency of the knowledge transfer.

In the unstructured knowledge transfer process at Gamma, the knowledge providers were local technical leaders, local group leaders, supervisors, local colleagues and senior technicians at the Indian, Australia and US TSC.

Knowledge recipients at Gamma were similar to those at Beta. They had some level of absorptive capacity, because new employees recruited by this TSC had more than two years work experiences at a TSC, therefore they had basic technical knowledge and customer service skills. Thus they had a higher level of knowledge acquisition ability, and a higher absorptive capacity for knowledge than those at Alpha had.

At Gamma, the recipients' knowledge levels were divided into four groups based on the length of work experience and level of absorptive and retentive capacities: novice, advanced beginner, competency and proficiency. Alpha had a similar arrangement. A comparison of the moving forward time frame showed that Gamma novice TSEs spent less time at each level than Alpha TSEs did. The average time taken by a new employee to reach an advanced beginner level from date of starting was around 1 month. An advanced beginner was at that level for approximately 2 to 12 months from starting, then 6 to 18 months at the competency level, and after 12 months,

some excellent TSEs could move to the proficiency level. The percentages of TSEs at each level were 5-10%, advanced beginners 15%~25%, competency level 65%~75%, and proficiency level 5%~10%.

The knowledge transfer context, at Gamma was the same as that at Alpha. It was cross-culture knowledge transfer, but Gamma's knowledge transfer context had more breadth than Alpha's, and was similar to that at Beta. Alpha's knowledge transfer occurred between the US-based TSC and China-based TSC, whereas, Gamma's knowledge transfer occurred among the many branches of Gamma TSCs in India, Australia, and the US.

#### **5.4.2 Comparing the Structured Knowledge Transfer Processes at Alpha and at Gamma**

The organizational culture of Gamma emphasized self-motivated study and self-service, which is in contrast to the organizational culture at Alpha which was other directed and very structured. At Gamma, individual TSEs took responsibility for acquiring knowledge and building up their personal knowledge with the organization providing training materials through an e-learning program and applications. Gamma did not offer well-structured knowledge transfer, in comparison to Alpha. This section will discuss the structured knowledge transfer process and the factors impacting on the transfer process at Alpha and at Gamma.

A comparison of structured knowledge transfer at Alpha and Gamma found that Alpha provided a well-structured and longer new employee training than Gamma did. Alpha provides 2~3 months' formal new employee training, covering culture, business processes and technical training. The knowledge transfer techniques adopted at Alpha included physical classroom training, job shadowing, apprentice training, culture coaching, lab experiment, and virtual mentoring. In contrast, at Gamma, knowledge transfer mechanism focused on codified knowledge transfer

(knowledge repository, and e-learning). Gamma only provided the transfer one-week-of-buddy-help, virtual classroom training, conference call or networking training for new employees.

**Table 5.14 Comparing New TSE's Knowledge Transfer Processes at Alpha and at Gamma**

Stage	Knowledge Transfer Activities at Alpha	Knowledge Transfer Activities at Gamma
<b>Stage One Initiation</b>	Searching for knowledge providers at the US-based support center Setting up the offshore knowledge transfer group	Transferring knowledge repository, preparing e-learning material and setting up virtual classroom.
<b>Stage Two Implementation</b>	Culture training Process training Technical training <i>Teaching approach:</i> role play, case study, call sample listening and Lab experiment, written tests or quizzes	One-week-of-buddy-help E-learning Virtual classroom training Conference call or network training
<b>Stage Three Ramp-up</b>	Job shadowing Mock call User Accepted Test <i>Teaching approach:</i> Mock call simulation, case study, one-to-one coaching, real call listening and Lab experiment.	Applying the pre-existing knowledge to real problems
<b>Stage Four Integration</b>	Practice Two weeks monitoring by mentor Dynamic assessment	Applying the pre-existing knowledge to real problems

A comparison of the new TSE's knowledge transfer process at Alpha and at Gamma is summarized in Table 5.14. The following subsection will discuss the main differences between the knowledge transfer activities at the two TSCs.

### ***One-week-of-buddy-help***

Unlike Alpha which provided more than 2~3 months well-structured training, Gamma only provided one-week-of-buddy-help for new employees. The reason for the significant difference is that the fundamental knowledge required in new employees at Alpha and at Gamma. Gamma like Beta, focused on candidates who had two years of TSC work experiences who would therefore have the basic technical knowledge and customer service skills. At Alpha, the prospective employees were new graduates. The most important skills and knowledge were transferred and

built through new employee training. Since the new employees at Gamma had a higher level of experience knowledge and a higher level of knowledge absorptive capacity, Gamma transferred knowledge to new employees through online virtual classroom training and e-learning to familiarise them with organizational business processes organizational culture and policies and some basic technical skills. At the same time, each new employee was assigned a buddy to help them. Buddies were TSEs who had one or two years work experience at Gamma. They had their own work duties, therefore did not solely focus on coaching the new employee. The buddy provided basic information and knowledge to the new employee such as where to find information and solutions, who the employee could contact when encountering a problem and some basic work processes. He/she provided support only when the new TSE encountered a difficult issue that the TSE could not handle alone. Since this organization encourages self-study and self-regulation, the new TSE was supposed to learn by themselves, learn by doing and learn by error and not take too much of the buddy's time when seeking support.

The disadvantage of a self-study and self-regulation organizational culture is that the new employees might become frustrated and give up the job quickly if they are passive learner or have poor self-study ability. However, if a TSE was a proactive learner and had some level of self-study ability, the Gamma organizational culture could help TSEs build their self-study habits and problem-solving skills. The knowledge learned from trial and error could be more impressive than that learned from straightforward knowledge transferring. For example, a TSE said,

*My knowledge is built through practical experience. The longer I worked here, the more experience I have and the more knowledge I gained. I gained knowledge through solving problems by myself. When I encounter a problem, I am not supposed to ask somebody for a solution, you know, everyone is busy at their work, I am not supposed to ask them stop doing their job to help me. So I always search the possible solution from knowledge repository or share folder. After finding a solution,*

*I try it. If it doesn't work, I move to another possible solution. Yes, It would takes me a lot of time to find a right solution to solve a problem, but it is worth while to do it, because in the problem solving process, I tried a lot of solutions, I knew which solution works perfect on the problem, which one doesn't, and which one can be modified to solve the problem. Next time, when I encounter a similar problem, I don't need to ask anybody, I know exactly which solution can perfectly solve the problem, which one doesn't.*

### ***E-learning and Virtual Classroom Training***

Another structured knowledge transfer was online knowledge transfer including online classroom and e-learning. Online training and e-learning materials were developed by Gamma University. The pre-record training class could be downloaded from the organization's intranet by the TSEs. E-learning covered a wide range of training content including organizational culture and values, business process, software application training, product training and customer service mindset training and so forth. The e-learning format also included multi-media training material such as audio and video recordings. For online classroom training, the TSE needed to sign in to the class at the particular time, when trainer would offer some product training such as teaching TSE how to use a new application or informing them about some new features of new products. The e-learning material and online training covered a wide range of knowledge and skills required on the job. The advantages of e-learning and virtual classroom training were convenience, accessibility and no-time-limitations. TSEs could access e-learning material at any time they wanted to. The disadvantage of e-learning and virtual classroom training is communication difficulty. If a TSE at Gamma encountered any difficulty in learning from the training material, he/she was not able to ask the knowledge provider directly.

### ***Conference Call or Networking Training***

Conference call or networking training was widely used in on-job-training at Gamma. For example, new products training, new work process training and basic software

application training were provided through conference call, this kind of training greatly saving the trainers' travelling cost and time. Since the knowledge transferred through product training and work process training was not hard to absorb, the TSEs could gain considerable knowledge through the training, therefore, this mechanism of knowledge transfer was popular at Gamma due to its effectiveness and efficiency.

A comparison of the structured knowledge transfer at Gamma and at Alpha showed that Gamma's was codified-oriented knowledge transfer, and Alpha's was interpersonal-oriented knowledge transfer. Gamma's structured knowledge transfer relied on the knowledge repository and e-learning. Alpha's structured knowledge transfer depended on interpersonal contacts, in which transfer involved many interactions between knowledge providers and knowledge recipients.

### **5.4.3 Comparing the Unstructured Knowledge Transfer**

#### **Processes at Alpha and at Gamma**

This subsection presents a comparison of Alpha and Gamma's unstructured knowledge transfer processes and the factors impacting on these transfer processes. Since the TSE working at Gamma took complete ownership for the customer case, he/she could not escalate the customer case to any other group and the customer's problem had to be solved at the local organization, no matter how difficult the problem was. Therefore, unstructured knowledge transfer played a significant role in this organization. It was the dominant knowledge transfer approach for those knowledge recipients at the advanced beginner, competency and proficiency levels.

For the unstructured knowledge transfer, Gamma had a similar pattern to Alpha in terms of the characteristics of the knowledge recipient, knowledge types and the knowledge transfer approaches. *Unstructured Copy* was widely adopted by those at the novice and advanced beginner level to transfer systemic and experiential knowledge, *Unstructured Adaptation* was utilized by those at the competency level to transfer

experiential and routine knowledge, and *Unstructured Fusion* was the dominant process used by those at the proficiency level to transfer experiential and routine knowledge.

### *Advanced Beginner Level*

At Gamma, and Alpha advanced beginners adopted the *Unstructured Copy* knowledge transfer approach (see Table 5.15). They applied the pre-existing knowledge such as the “best practice” stored in the organizational knowledge repository into the real world problem, or applied the solution they acquired from the local TSEs through face-to-face communication. However, at this stage, they could not think of solutions by themselves.

**Table 5.15 Comparison of the Five Basic Elements of Knowledge Transfer for Advanced Beginners at Alpha and at Gamma**

Elements	Characteristics at Alpha	Characteristics at Gamma
<b>Transfer approach</b>	Unstructured copy	Unstructured copy
<b>Knowledge provider</b>	Local technical leader, local technician at same group	Local technical leader, local technician at same group
<b>Knowledge types</b>	Systemic knowledge and experiential knowledge	Systemic knowledge and experiential knowledge
<b>Transfer context</b>	Same culture	Same culture
<b>Transfer mechanism</b>	<i>Codified transfer</i> : knowledge repository; <i>Inter-personal transfer</i> : Face-to-face, Instant message	<i>Codified transfer</i> : knowledge repository; <i>Inter-personal transfer</i> : Face-to-face, Email

### *Competency Level*

At Gamma, the competency level TSEs were confident and competent to solve general issues by themselves and could think of a solution by themselves. The main difference between competency level TSEs at Alpha and those at Gamma (see Table 5.16) was the breadth of their social communication and knowledge transfer networks. At Alpha, the communication mainly involved the local TSEs at the competency level. In contrast, at Gamma, there was much communication and discussion among TSEs located in the different social communities around the world. This is because the Gamma TSEs’ job focused on global oriented tasks so they had to co-operate and coordinate with TSEs in other branches.

**Table 5.16 Comparison of the Five Basic Elements of Knowledge Transfer for the Competency Level TSE at Alpha and at Gamma**

Elements	Characteristics at Alpha	Characteristics at Gamma
<b>Transfer approach</b>	Unstructured adaptation	Unstructured adaptation
<b>Knowledge provider</b>	Majority: Local technical leaders or colleagues; Minority: US Tier 2 senior technicians.	Major: cross-branch colleagues, such as Australia, Indian and US TSEs; Minor: local technical leaders or colleagues.
<b>Knowledge types</b>	Systemic, experiential and routine knowledge	Systemic, experiential and routine knowledge
<b>Transfer context</b>	Same culture and cross cultural	Same culture and cross cultural
<b>Transfer mechanism</b>	<i>Inter-personal transfer:</i> face-to-face, Internet, telephone, and Jaber	<i>Inter-personal transfer:</i> face-to-face, Internet meeting, telephone, and Email.

### *Proficiency Level*

At Gamma, the TSEs at the proficiency level adopted the same knowledge transfer approach (unstructured fusion) as Alpha TSEs did. When they encountered a difficult issue, they acquired a solution either through codified knowledge fusion or group knowledge fusion. A comparison of five basic elements of knowledge transfer for proficiency at Alpha and at Gamma is in Table 5.17.

**Table 5.17 Comparison of the Five Basic Elements of Knowledge Transfer for the Proficiency Level TSE at Alpha and at Gamma**

Elements	Characteristics at Alpha	Characteristics at Gamma
<b>Transfer approach</b>	Unstructured fusion	Unstructured fusion
<b>Knowledge provider</b>	US Tier 3 senior technicians; Indian branch senior technicians; Knowledge repositories	Senior technicians from different branches
<b>Knowledge types</b>	experiential and routine knowledge	experiential and routine knowledge
<b>Transfer context</b>	Cross-culture	Cross-culture
<b>Transfer mechanism</b>	<i>Inter-personal transfer:</i> email and telephone <i>Communities and networks transfer:</i> group discussion through Internet meeting and conference call	<i>Codified transfer:</i> Codified knowledge fusion <i>Communities and networks transfer:</i> group discussion through Internet meeting and conference call

To sum up, the main differences between the unstructured knowledge transfer at Alpha and at Gamma were at the competency level. Gamma TSEs at the competency

level contacted and communicated with TSEs located in the different branches around the world. At Alpha, the TSEs only contacted the local senior technicians.

#### 5.4.4 Summary

This section compared the knowledge transfer processes at Alpha and Gamma. With regard to structured knowledge transfer, the analysis of the field data showed that Gamma's new employees experienced more difficulty than those at Alpha, because Alpha provided a more structured knowledge transfer process than Gamma.

With regard to unstructured knowledge transfer, the analysis of the field data indicated that Gamma had a similar pattern to Alpha's knowledge transfer in transfer approach. The unstructured knowledge transfer processes were mainly used by the higher levels of qualified TSEs namely advanced beginner, competency and proficiency, to acquire knowledge. It was found that *unstructured copy* was widely adopted by advanced beginners, *unstructured adaptation* was mainly utilized by those at the competency level, and *unstructured fusion* was the knowledge transfer type preferred by recipients at the proficiency level.

In terms of the selections of knowledge provider and transfer media in unstructured knowledge transfer, the research findings showed that these two TSCs had similar patterns; the only difference was in personal ties and personal social networks. TSEs at Gamma had broader social networks than those at Alpha did. Also, TSEs at Gamma were more likely to use email to seek knowledge than the TSE's at Alpha.

### 5.5 SUMMARY OF RESEARCH FINDINGS IN THE THREE CASE STUDIES

This section presents a summary of the research findings in the three case studies. It is organized into two subsections. This section begins by presenting three types of

structured knowledge transfer process, and ends with identifying three types of unstructured knowledge transfer processes.

### **5.5.1 Three Types of Structured Knowledge Transfer**

#### **Processes**

Three types of structured knowledge transfer process were identified through the analysis of the three case studies: interpersonal oriented transfer, semi-interpersonal oriented transfer and codified oriented transfer.

##### *Interpersonal Oriented Transfer Approach*

Alpha adopted an interpersonal oriented transfer approach. At Alpha, the successful knowledge transfer from US-based TSC to China-based TSC was based on the inter-personal transfer mechanism. During the structured knowledge transfer process, the US knowledge provider went to the China-based TSC and spent six months onsite providing face-to-face inter-personal knowledge transfer. The knowledge transfer process included classroom based training (culture training, business process training, and technical training), mentoring, job shadowing, mock call practice, one-to-one coaching, and quality auditing.

##### *Semi-Interpersonal Oriented Transfer Approach*

Beta adopted a semi-interpersonal oriented transfer approach. At Beta, successful knowledge transfer from onshore and other branch TSCs to China-based TSC was based on codified knowledge transfer and inter-personal knowledge transfer. Codified knowledge transfer refers to the “best practice” solutions were converted into explicit knowledge, codified and stored in the organizational knowledge repository. This codified knowledge was shared with the China-based TSC and learned by the TSEs through self-study. Inter-personal knowledge transfer happened after the TSEs had more than one month’s self-study of codified knowledge. The interpersonal oriented knowledge transfer was provided by professional knowledge

providers, who went to Beta to transfer knowledge through presentation, case study and lab experiments. In some instances, TSEs from different branches physically gathered together in one classroom and the knowledge provider transferred knowledge to TSEs from different branches at the same time.

#### *Codified Oriented Transfer Approach*

Gamma adopted a codified oriented transfer approach. At Gamma, the successful knowledge transfer from the US-based TSC to the China-based TSC was based on codified knowledge transfer. At Gamma, all the “best practice” solutions, business processes, software application training, organizational values and visions were codified into knowledge repositories, e-learning and online training materials. This organizational culture emphasized self-study and self-regulation. The codified knowledge was learned by TSEs through self study, e-learning and virtual class training.

The question is why these three TSCs chose different structured knowledge transfer processes. Alpha adopted interpersonal oriented transfer, because of the low absorptive capacity of new employees. At Alpha, the new employees were recruited from new graduates, and they did not have any prior work experience at a TSC. A codified knowledge transfer process would not be suitable for a low absorptive capacity recipient in a cross-culture business context. Beta adopted semi-interpersonal oriented transfer, because new employees had some level of absorptive capacity for new knowledge as they had at least two years work experience at a TSC. However, the technical knowledge required at Beta was specialized and complex and it was impossible for TSEs to learn all the new technical knowledge by themselves. It was necessary for the organization to provide some level of interpersonal knowledge transfer for new employees. Thus Beta adopted semi-interpersonal oriented transfer. Gamma adopted codified oriented transfer, because new employees had at least two years work experience at a TSC, and also because the job duty of the China-based TSC was simple and not too much technical

related knowledge was required.

Briefly, the new employees' absorptive capacity and prior work experience, and the tacitness of the knowledge determined the type of structured knowledge transfer process adopted at the TSCs in the study. Clearly, interpersonal oriented transfer is suitable for an organization where the transferred knowledge is tacit and the knowledge recipient has a low level of absorptive capacity. Semi-interpersonal oriented transfer is suitable for an organization where the transferred knowledge is tacit, but the knowledge recipient has a high level of absorptive capacity. Codified oriented transfer is suitable for an organization where the transferred knowledge is more explicit, and the knowledge recipient has a high level of absorptive capacity.

## 5.5.2 Three Types of Unstructured Knowledge Transfer

### Process

The analysis of the field data demonstrated that the unstructured knowledge transfer processes were mainly used by the higher levels of qualified TSEs namely advanced beginner, competency and proficiency, to acquire knowledge. This study identified three types of unstructured knowledge transfer: *unstructured copy*, *unstructured adaptation*, and *unstructured fusion*. It was found that *unstructured copy* was widely adopted by advanced beginners, *unstructured adaptation* was mainly utilized by those at the competency level, and *unstructured fusion* was the knowledge transfer type preferred by recipients at the proficiency level.

*Unstructured copy* requires basic absorptive and retentive capacities. At a TSC, *unstructured copy* can be used by an advanced beginner who knew some basic concepts or had the knowledge background to acquire pre-existing knowledge (systemic knowledge), to imitate it and apply it in a similar scenario. The organizational knowledge repositories played a critical role in transferring “best practice” to the advanced beginner. Knowledge repositories enabled advanced beginners to become

familiar with the general issues, sharpened their problem solving skills, and increased their absorptive and retentive capacities, so they could move forward to the competency level. The *unstructured copy* formed the background necessary to develop and interpret the *unstructured adaptation* and *unstructured fusion*.

*Unstructured adaptation* requires higher absorptive and retentive capacities than *unstructured copy*. With extensive long-term coordination with specific onshore senior technicians and China-based technical leaders, the competency level TSE could increase absorptive capacity, problem-solving capacity, and their ability to create new knowledge within that context (Szulanski, 2003). The higher absorptive capacity helped the competency level TSE recognize the more valuable tacit knowledge existing in the social communication with senior technicians. Without some form of shared experience, it is extremely difficult for people to share and understand each others' thinking processes (Nonaka, 1994).

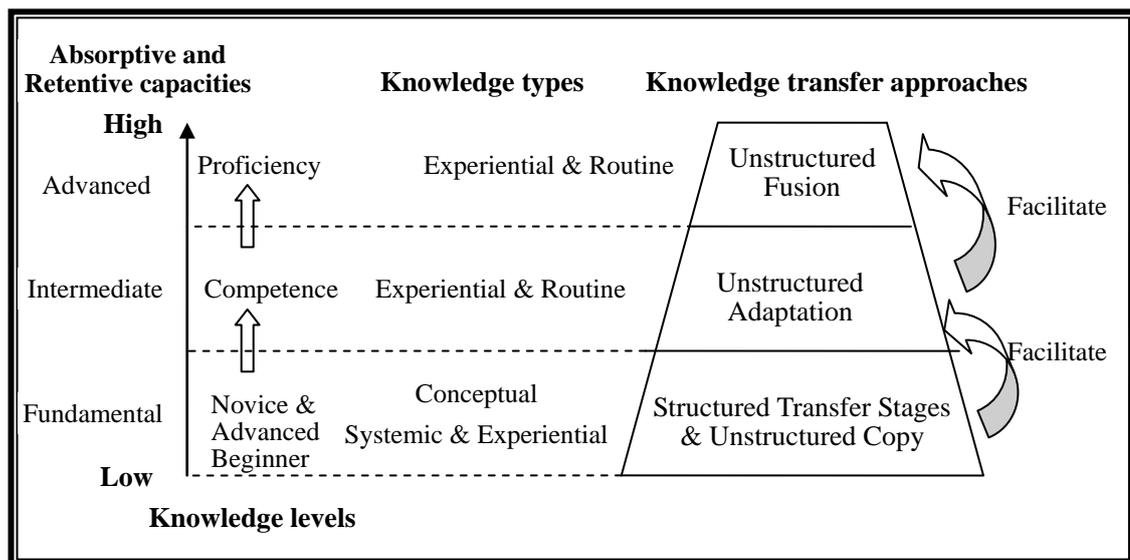
For *unstructured copy* and *unstructured adaptation*, after transfer, the recipient repetitively reused the knowledge gained, and the individual's tacit knowledge was developed through this reuse. As the tacit knowledge began to accumulate, the recipient's knowledge absorptive capacity was enhanced gradually. When the recipient's tacit knowledge had progressed and extended the underlying received knowledge, then the proficiency level recipient had the ability to facilitate a transfer of knowledge from themselves to others through the *unstructured fusion* process (advanced level) as long as a certain degree of commonality exists between them. According to the research results, it is clear that there is a positive association between absorptive and retentive capacities, and knowledge transfer. The higher the absorptive and retentive capacities of a recipient, the higher the levels of knowledge acquisition (from novice to proficiency), and the higher the levels of knowledge transfer type adoption (from *structured transfer stages* to *unstructured fusion*).

## 5.6. MODIFIED KNOWLEDGE TRANSFER TYPE ADOPTION MODEL

Through analysis and comparison of the Alpha, Beta and Gamma case studies, it was found that even though there were some differences in knowledge transfer processes among the three TSEs, the knowledge transfer approach adopted by the different knowledge level TSEs was similar. The *structured transfer stages* were primarily utilized by novices to gain conceptual knowledge and systemic knowledge which enabled them to perform the basic functions required in their jobs. *Unstructured copy* was widely adopted by novices and advanced beginners to transfer systemic and experiential knowledge, *unstructured adaptation* was mainly utilized by those at the competency level to transfer experiential and routine knowledge, and *unstructured fusion* was preferred by recipients at the proficiency level to transfer experiential and routine knowledge.

The modified knowledge transfer type adoption model is presented in Figure 5.3. Readers will note that the modified model merges the novice and advanced beginner levels into one knowledge level. The analysis of the field data collected from Beta and Gamma showed that it took novices only a short time to move to advanced beginner because the TSEs, who had at least two years prior work experience at support center had a higher level of knowledge acquisition ability and absorptive capacity. There is little difference in the knowledge transfer activities of novice and advanced beginners at Beta and at Gamma. Thus they have been grouped in the same category. As a result, the knowledge transfer adoption model is described in three levels based on the recipient's absorptive and retentive capacities: fundamental level, intermediate level and advanced level, which correspond to the novice and advanced beginner level, competency level and proficiency levels described earlier.

Figure 5.3 Modified Knowledge Transfer Type Adoption Model



At the bottom of the trapezoid, *structured transfer stages* and *unstructured copy* have been combined to acquire the conceptual, systemic and experiential knowledge. The research evidence from Beta and Gamma showed that novice TSEs started to apply pre-existing knowledge into their job, so there was no obvious difference in the knowledge transfer type adoption between novice and advanced beginner. Both adopted the *structured transfer stages* and *unstructured copy* to acquire conceptual, systemic and experiential knowledge. Even though they differed from the TSEs at Alpha who only adopted *unstructured copy* at the advanced beginner level, the knowledge transfer approach still fits the modified model. Therefore, the modified model is more suitable for the three cases.

## 5.7 FACTORS AFFECTING KNOWLEDGE TRANSFER

The analysis of the field data showed many factors affected structured knowledge transfer and unstructured knowledge transfer. For structured knowledge transfer, the national cultural difference emerged as the main factor affecting structured knowledge transfer in the cross-cultural business context. For unstructured

knowledge transfer, four significant factors were found to affect the priority of the selection of knowledge provider and transfer media: personal ties, trust, location distance and cultural difference.

## **5.7.1 National Culture Impacts on Structured Knowledge Transfer**

Structured knowledge transfer involves many interactions between knowledge recipient and knowledge providers. The research findings show that national culture is the crucial factor that affects the structured knowledge transfer process, because the knowledge transfer occurs in the cross-cultural business context, the knowledge provider and recipient are from different countries, and belong to different culture dimension. The next discusses how national culture affects the knowledge transfer process at Alpha.

### **5.7.1.1 The Effect of National Culture on Structured Knowledge Transfer at Alpha**

The author observed knowledge transfer processes with two distinct groups of participants at Alpha. Group 1 included the first batch of China-based TSEs who had experienced knowledge transfer from the US-based support center to the China-based support center. This group included three US trainers, five mentors, two quality auditors and twenty trainees (i.e. eighteen Chinese trainees and two Canadian trainees). The author observed the knowledge transfer process in this group for a year. Group 2 comprised the first batch of China-based TSEs who had experienced knowledge transfer from experienced Chinese trainers who took on the US trainers' position when the original US providers withdrew. This group consisted of two Chinese trainers, one US culture coach, five Chinese mentors, one quality auditor and fifteen trainees (i.e. fourteen Chinese trainees and one Canadian trainee). The author observed the knowledge transfer process in this group for a period of 6 months

during the research investigation.

A comparison of the knowledge transfer process between Group 1 (US knowledge providers to Chinese recipients and Canadian recipients) and Group 2 (Chinese knowledge providers to Chinese recipients and one Canadian recipient) revealed that these two groups followed the same knowledge transfer procedure and used the same knowledge transfer materials. However, the transfer results were different.

### ***Group 1: US-to-Chinese/US-to-Canadian***

*The training style of the US knowledge provider in Group 1:* First, when transferring knowledge to the China-based trainees, US providers regarded themselves as equal to the trainees, welcomed different opinions, and encouraged trainees to express their opinions directly. This might be because of the US's small power distance culture. Second, the US providers preferred to encourage trainees to learn something by themselves, and preferred them to carry out self-study or personal learning, and to find a solution by themselves. The US providers were less willing to be actively involved in the trainees' learning processes. This might result from America's individualistic culture. According to Hofstede's (2005) research, American people have an individualistic orientation; they are concerned about themselves and focus on self-interest rather than group interest. They believe that individuals have personal freedom and autonomy to pursue their own goals. Third, US providers' presentations were short, concise and bullet pointed. They did not give much contextual information or explanations to recipients.

### *Chinese Recipients in Group 1*

The research findings showed that Chinese recipients found it hard to acquire knowledge from the US provider, since they had a large knowledge gap and communication difficulties. The knowledge gap and communication difficulties that existed between a provider and a recipient created a situation of distinct disadvantage for the recipient.

The knowledge gap resulted from the recipient having difficulty in absorbing the knowledge transferred from the provider, because of the recipient's low absorptive capacity. Absorptive capacity is an ability to acquire and assimilate new knowledge based on prior knowledge including basic skills, previous experiences or even a shared language (Cohen & Levinthal, 1990). In this study, most of the Chinese recipients were new graduates from the local universities or were returnees from overseas. Some recipients did not have any educational background in IT and none had work experience in a TSC. Because of the lack of IT educational background and TSC work experience, the Chinese recipients had a low level of absorptive capacity, which greatly increased the knowledge gap between the US providers and themselves.

Communication difficulties may result from misunderstandings when people communicate with each another. For example, when sending a message the US provider did not encode the message in a way to 'fit' the cultural expectations of the Chinese recipient. The Chinese recipient of the message did not decode the message in such a way as to ensure accuracy of interpretation (Hollensen, 2001). The effectiveness of the knowledge transfer depends on the ability of the knowledge provider to accurately encode a meaningful, complete message, and the ability of the recipient to decode and understand the message as it is intended (Welch & Welch, 2008).

The cultural difficulties severely hampered the communication between the US provider and the Chinese recipients. First, the Chinese trainees considered that the US providers' presentation was not detailed enough for them to understand the content. Second, even though the American providers welcomed different opinions and encouraged trainees to express their opinions directly, Chinese trainees were quiet and silent. They passively accepted the transferred knowledge from trainers, because they considered that the trainer has a high level of power, so they should not

challenge their trainer. Sometimes, even though a Chinese trainee disagreed with the trainer's opinion, he/she did not say any thing but tried to reconcile with the trainer's thoughts. This behavior might result from the Chinese large power distance culture. Chinese trainees see knowledgeable people as superiors whom they should not question or challenge (Hofstede & Hofstede, 2005), and believe that the people who have knowledge have a high level of power. In addition, due to a lack of shared linguistic and absorptive capacity, there was a large knowledge gap between the US providers and Chinese recipients. The Chinese recipients seldom asked questions of the US providers because the terms used by the US providers to explain the issues were hard to understand and made Chinese trainees more confused. Moreover, the US providers lacked patience to explain matters to Chinese trainees, often telling them where they could find related material and encouraging them to study by themselves. Surprisingly, it was found that Chinese trainees preferred to ask the Canadian trainee (group mate) rather than ask the US provider.

#### *Canadian Recipient in Group 1*

The transfer of knowledge from US providers to the Canadian recipient was more effective than to the Chinese recipients. There was little communication difficulty, but a great knowledge gap because of the Canadian recipient's low level of absorptive capacity. However, the Canadian trainee was a proactive learner. He asked the US provider as many questions as possible in class and actively joined in the classroom discussion. In addition, he often chatted with the US providers in free time and built a good relationship with them. These activities greatly helped the Canadian recipient to overcome his difficulties.

*Comparing Chinese and the Canadian recipients in Group 1*, Chinese recipients experienced some difficulties in the transfer process due to a large knowledge gap, and cultural and communication difficulties.

The cultural difference along the power distance dimension between the US

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providers and the Chinese recipients impeded the potential for successful knowledge transfer. The Chinese recipients have a large power distance culture; people along this cultural dimension are supposed to passively accept the transferred knowledge from trainers, and the quality of learning is highly determined by the excellence of the knowledge provider (Hofstede & Hofstede, 2005). In contrast, the US providers had an individualistic culture, in which knowledge recipients are expected to show initiative, and they expected trainees to ask questions when they did not understand something. The US knowledge provider appeared to be less willing to be actively involved in the recipients' learning process. The quality of learning is extremely dependent on the excellence of the recipients (Hofstede & Hofstede, 2005). Because of the cultural difference along the power distance dimension between the US providers and Chinese recipients, the supposed two-way communication between provider and recipient could not be established, so the transfer of knowledge was less effective. On the other hand, the Canadian recipient had a similar culture (small power distance and individualistic) to the US provider; he knew how to build two-way communication with the US providers, and thus he could successfully acquire knowledge from the US providers even though there was a large knowledge gap between him and the US provider.

The analysis of the field data indicates that differences in these cultural dimensions hindered knowledge transfer between provider and recipient. Several studies of knowledge transfer activities between Americans and Japanese have shown that cultural difference impedes successful knowledge transfer and slows down the achievement of the objectives of the knowledge transfer (Inkpen, 1996; Kurokawa, Iwata, & Roberts, 2007). This is also found in a study of learning culture regarding Asian students who studied in Australia; Asian students were passive, unreflective rote learners, and the cultural difference between the provider and recipient negatively affected knowledge transfer (Biggs, 1997).

From this analysis, the first finding is synthesised as follows:

*Finding 1: An environment which involves the transfer of knowledge from a knowledge provider in a small power distance culture to a recipient in a large power distance culture in an individualistic learning environment will have a negative impact on explicit knowledge transfer in a structured knowledge transfer process.*

To overcome these difficulties, the Chinese trainees collected many documents and training materials from the US providers, and continued with much self-study. Also, they often participated in group studies and sought peer-to-peer help. Peer-to-peer help and knowledge sharing were the most effective ways to overcome the difficulties. Firstly, from the trainees' point of view, group mates who were proximate in experience might have been better teachers than the US trainer because the knowledge gap was not as great and the level of absorptive capacity was similar (Swap, Leonard, Shields, & Abrams, 2001). Secondly, as there was a small power distance among group mates, Chinese trainees had little difficulty in challenging and arguing with group mates. The small power distance among group mates explains why they preferred to ask the Canadian trainee (a group mate) rather than the US provider. Thirdly, shared language and culture among Chinese trainees helped them greatly in sharing knowledge and understanding each other.

### ***Group 2: Chinese-to-Chinese/Chinese-to-Canadian***

*The training style of Chinese knowledge providers in group 2: When Chinese knowledge providers facilitated the training, their training presentations usually contained much background information and long explanations. They were actively involved in the trainees' learning processes and took more responsibility for teaching. If a trainee could not gain some knowledge or skills, the trainers would think that something could be wrong with their teaching ability. They considered that the trainer and trainees were a group and they should work together, and that the trainer should help trainees grasp the necessary knowledge quickly. The style of knowledge transfer performed by the Chinese trainers may partially reflect the relative collectivism of the Chinese culture, where a person sees herself/himself as part of a group rather than*

an individual (Hofstede & Hofstede, 2005). This finding is also similar to Chen and McQueen (2008, 2009), who found that Chinese consider themselves primarily as members of a group and tend to look after one another.

#### *Chinese Recipients in Group 2*

The research found that a transfer of knowledge from a Chinese provider to a Chinese recipient was the most effective in these two groups. The training approach of the Chinese trainers was ideal for the Chinese trainees. Firstly, they had few communication barriers, even though the training was delivered in English. For example, if a Chinese trainee asked a question in Chinese, the Chinese provider would answer the question in that Chinese language. Secondly, the knowledge gap between the Chinese trainers and trainees was not great because the Chinese trainer had had similar previous experience to the Chinese trainee. They knew how to deliver training that would meet the needs of trainees at that knowledge level. Thirdly, the Chinese trainees developed a good personal relationship with the Chinese trainer. This good relationship may have eliminated power distance between the trainer and the trainee, and enabled further interpersonal exchanges of knowledge.

#### *Canadian Recipient in Group 2*

A transfer of knowledge from the Chinese knowledge provider to the Canadian recipient was less effective than to the Chinese recipients because the Canadian recipient not only had a knowledge gap, and but also communication and cultural difficulties with the Chinese providers. The Canadian recipient did not appreciate the Chinese provider's presentation style, and said that he quickly became impatient and disengaged when Chinese providers gave a presentation in class. The Chinese presenter provided a lot of background information or long explanations, and tried to help the recipients gain a deeper understanding of the logical process for trouble shooting. He preferred the presentations to be short, concise and bullet pointed with a fast track toward conclusions. Moreover, he complained that Chinese providers seemed unhappy when he tried to challenge them. This might have been caused by

the Chinese having a large power distance culture, so they see knowledgeable people as superiors who should not be questioned or challenged.

Fortunately, the Canadian recipient was a proactive learner; he liked to ask the Chinese provider as many questions as he could, and he respected Chinese providers and did not challenge them. He was a good self learner, so it was no problem for him to gain knowledge at this stage. Also, his Chinese group mates were keen to help him, so he learnt a great deal through peer-to-peer help.

*Comparing Chinese and Canadian recipients in Group 2:* The transfer of knowledge from Chinese providers to Chinese recipients was very successful because of their cultural similarity, small knowledge gaps, and few communication difficulties. In contrast, knowledge transfer from Chinese providers to the Canadian recipient was less effective due to their cultural differences and knowledge gap. However, the Canadian recipient came from a small power distance culture, and was a proactive learner, and the Chinese providers were keen to help trainees and became actively involved in the trainee's learning process. Therefore, the Canadian recipient could acquire knowledge and overcome the cultural difficulty reasonably well. Several studies of knowledge transfer along different power distance dimensions of the cultural index have shown that if the knowledge provider enjoys large power distance and the recipient enjoys small power distance, then the recipient's success is highly dependent upon the provider's keenness to transfer knowledge (Kedia & Bhagat, 1988; Lucas, 2006). In this study, because of Chinese providers' collectivistic culture and focus on their group's well-being, they were more willing to transfer knowledge and had a strong motivation to do so. That might be the reason why the Canadian trainee could cope with this knowledge transfer process.

*Finding 2: An environment which involves the transfer of explicit knowledge from a knowledge provider in a large power distance culture to a recipient in a small power distance culture in a collectivistic learning environment will have a positive impact on the likelihood of successful explicit*

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knowledge transfer in a structured knowledge transfer process.

Figure 5.4 shows a summary of the impact of national culture on Stage Two - Implementation of the structured knowledge transfer.

**Figure 5.4 National Culture Impacts on the Implementation Stage Knowledge Transfer**

	<b>US Provider</b> Individual, Small PD, Strong UA	<b>Chinese Provider</b> Collective, Larger PD, Weak UA
<b>Canadian Recipient</b> Individual, Small PD, Strong UA	Most effective, few barriers: knowledge gap	Effective, a few barriers: cultural and communication difficulties, knowledge gap
<b>Chinese Recipient</b> Collective, Larger PD, Weak UA	Less effective, some barriers: cultural and communication difficulties, weak relationship, knowledge gap	Most effective, few barriers: knowledge gap

A comparison of the knowledge transfer processes between Group 1 and Group 2 at the Stage Three—Ramp-up and Stage Four—Integration showed that the two groups followed the same knowledge transfer procedure and used the same knowledge transfer materials, but the transfer results were different.

**Group 1: US-to-Chinese/US-to-Canadian**

*The training style of the US knowledge provider:* At the ramp-up stage, the US mentor required trainees to undertake most of learning by observation (e.g., job shadowing), by trial (e.g., mock call), by self reflection and by feedback. The mentor encouraged a self evaluation after a trainee had finished the mock call. The self-reflection encouraged deeper exploration of the issues the trainee has, and clarified what critical skills the TSE lacked. Feedback from the mentor and group mates on good aspects of the task performed by the trainee confirmed in a trainee’s mind that they had actually absorbed knowledge, and this helped to build up the trainee’s confidence.

This feedback identified any weaknesses in the delivery of the task which the trainee needed to improve.

At the integration stage, trainees received little supervision from the US mentor. He trusted the trainees' ability, pushed hard to have trainees take on more responsibilities, allowed trainees to make mistakes, and then asked them to correct mistakes by themselves. He provided support only when the trainee encountered a tough problem. This approach might have its roots in the American strong uncertainty avoidance culture.

The US quality auditor paid close attention to the trainee's tone, pronunciation and the words they used. They offered frequent one-to-one coaching on correct speaking, listening, empathy, tone, and business processes.

#### *Chinese Recipients in Group 1*

The transfer of knowledge from the US providers to the Chinese recipients was challenging at these two stages. Firstly, the large knowledge gap and communication difficulties impeded successful knowledge transfer. US provider had difficulty in communicating with the Chinese recipients and had some difficulties in expressing himself clearly about how to serve American customers. At the same time, the Chinese recipient found it difficult to gain the knowledge that the US mentor provided. Björkman, Barner-Rasmussen, and Li (2004) found in their study that the greater the cultural differences, the greater the difficulty in transferring knowledge from provider to recipient, and the greater the difficulty for the recipient in absorbing and using that knowledge.

Secondly, cultural difference was another significant barrier to knowledge transfer. This research found that, since US providers and Chinese recipients were in different uncertainty avoidance cultural dimensions; there was significant resistance to the knowledge transfer process. For instance, when the Chinese recipients encountered

tough problems, they expected their US trainers to be the experts who knew all the solutions and who could provide one correct solution to a problem. They could not accept a US trainer who says, “I don’t know, you’d better find the answer by yourself.” For example, a Chinese recipient said:

*... when I ask a question from an US mentor, if he can't tell me an answer directly, he would say "that's a good question, to be honest, I don't know the answer to the question, I suggest you read something such as bla bla, or I can introduce you to bla bla who is an expert in this area. You can contact them and discuss this kind of issue. So you can see that he won't bother to work it out for you. But if he is a Chinese mentor and he doesn't know how to solve the problem, he will say "let me do some research and think about it." Then, he will work it out for you and give you an answer directly when he got a solution....*

These findings indicated that the Chinese recipients were influenced by their strong uncertainty avoidance culture, in that they preferred structured learning situations and were concerned with the right answers; they expected that knowledge providers had all the answers. This is inconsistent with Hofstede’s study, in which he stated that China’s uncertainty avoidance index score is very low (30) and therefore it would have been expected about most recipients would accept, a knowledge provider who says, “I don’t know”, recipients would be comfortable with open-ended learning situations and would enjoy good discussions. This research found a reverse result to Hofstede’s study.

The support center had many internal regulations controlling the work process, but there were some difficulties in transferring rules or regulations from the US-based support center to the China-based support center. The Chinese recipients considered that regulations could be bent and broken in some situations and that following regulations should consider on a case by case basis. For example, according to the company’s out-of-warranty support regulation, TSEs were not supposed to support

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the customer if a customer's computer was out-of-warranty unless the customer was happy to pay the service fee. However, if the trainee had been in a good mood, had had a good conversation with the customer, or if the customer had been angry or did not feel that the problem was particularly difficult, many Chinese trainees would like to provide a free service. In these situations, they would break the company's rule, but they did not feel that there was anything wrong with this. The US mentors felt frustrated about this attitude. The Chinese trainees' attitude might have been caused by the Chinese weak uncertainty avoidance culture with regard to following regulations, in which people are flexible, have an open mind and rely on social control instead of formal rules (Hofstede, 1997; Lucas, 2006).

Due to the knowledge gap, and cultural and communication difficulties, Chinese recipients experienced many difficulties in acquiring the tacit knowledge transferred from US providers. They became very frustrated and upset when they had to take mock calls or real calls with little supervision from the US mentors.

#### *Canadian Recipient in Group 1*

A transfer of knowledge from US mentors to the Canadian trainee at these two stages was not as easy as at the Stage Two, but it was easier than for the Chinese trainees. The knowledge transferred at this stage was tacit. There was a great knowledge gap between mentor and trainees. The biggest difficulties for the Canadian trainee at these two stages were logical thinking and logical trouble shooting. He knew how to communicate with American customers, but he did not know how to carry out logical trouble shooting to isolate the issue and solve the problem.

To overcome this problem, the Canadian trainee picked up as many real calls as possible, and had many discussions with the US mentors when he encountered a tough issue. He believed that he would encounter more tough issues if he picked up more calls and that the more discussions he had with mentors would lessen the

knowledge gap between the mentors and himself.

To sum up, because of Chinese recipients' strong uncertainty avoidance in the learning environment and weak uncertainty avoidance in following regulations, both the US providers and the Chinese recipients experienced some difficulties. It made the Chinese recipients frustrated when the US mentors said, "I don't know", and there was no one correct solution for a problem. On the other hand, the US providers felt frustrated that Chinese trainees did not follow the formalized rules consistently and broke them frequently. This result showed that the uncertainty avoidance dimension significantly impacted on the tacit knowledge transfer. This is consistent with Lucas (2006) who pointed out that uncertainty avoidance dimension will have an effect on successful inter-subsidary knowledge transfer.

*Comparing the Chinese and Canadian recipients in this group*, the Chinese recipients experienced more difficulties than the Canadian recipient. They felt frustrated during the tacit knowledge transfer process. This was caused by cultural and communication difficulties between the US providers and the Chinese recipients due to lack of language proficiency and a large power distance culture. These cultural and communication difficulties led to misunderstanding and distrust between the US providers and the Chinese recipients, and resulted in a weak relationship. The weak relationship without interpersonal communication between providers and recipients severely hampered successful tacit knowledge transfer. For instance, a Chinese trainee said:

*I felt very frustrated, you know, when I listened to the real call between my mentor and a customer. I had trouble with the difficulty of words being used, and the accents. When we had a discussion and I spoke in English, my mentor quickly stopped paying attention and finished my sentences. After the mock call training, I did not really understand what was agreed to, and what I had to do. I hoped the mentor would hand out a context document so that I could take my time in absorbing the information from*

*the training, but he didn't. I'm very upset; two weeks have gone by, but I still can't imitate my mentor's way of handling a customer's call. My group mate suggested I do some home work to overcome this problem. The mate made some efforts, such as recording the mentor's call and listening to the call as many times as possible to try to copy the mentor's tone, to find the key words he used, to remember the useful sentences and to get familiar with the call flow. He said he felt much better now after he practised these (i.e. tone, key words, call flow) a lot on the mock call practices. Probably, I'll do the same thing.*

While Canadian recipients experienced some difficulties such as knowledge gaps, they established a strong relationship with the US providers, and had a close personal discussion with them, which enabled them to overcome transfer difficulties effectively. Several studies showed that it is easier to transfer knowledge within a strong relationship and more difficult to transfer knowledge in a weak relationship (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Reagans & McEvily, 2003).

*Finding 3: A weak relationship between a knowledge provider and a recipient, created by cultural differences, negatively impacts on tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 4: A strong relationship between a knowledge provider and a recipient, created by similarity in culture, positively facilitates tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 5: Where a knowledge provider and a recipient are in different uncertainty avoidance cultural dimensions, there will be a negative impact on the likelihood of successful tacit knowledge transfer in a structured knowledge transfer process.*

As tacit knowledge transfer generally requires extensive personal contact (Davenport & Prusak, 2000), the operation manager at the China-based support center facilitated some joint activities such as group building or social entertainment activities to enable the Chinese trainees to spend some time with US providers. The aim was to

help the TSEs develop a good personal relationship with the US providers to facilitate tacit knowledge transfer which is best transferred through interpersonal communication. The Chinese trainees also made more efforts with self-study and practice. They listened to many good calls and imitated the way that experienced agents handled the call. Thirdly, group studies and peer-to-peer help and knowledge sharing effectively assisted the Chinese trainees to acquire tacit knowledge.

### ***Group 2: Chinese-to-Chinese/Chinese-to-Canadian***

*The training style of the Chinese knowledge providers in Group 2:* The Chinese mentors used similar coaching methods to the US mentors to enable trainees to learn by doing, learn by observing, learn by thinking, and learn by self-reflection. Besides these methods, the Chinese mentors also tried converting tacit knowledge to explicit knowledge. They worked with the culture coach and summarized the standard call script (a better way to communicate with customers, helped the Chinese agents express themselves clearly on the phone), and handed out many call scripts to the Chinese trainees, in order to let them practise and remember the techniques.

Following is an example of the basic call flow script:

*Thank you for calling XX Commercial Desktop Support.*

*My Name is \_\_\_\_\_*

*May I have your name please?*

*Is this call regarding a new case or would this be an existing case today?*

*IF NEW CASE*

*May I have the serial number of your computer?*

*IF EXISTING CASE*

*May I have the case number?*

*PROCEED WITH TROUBLESHOOTING*

*How may I help you today?*

*IN CASE OF HOLD:*

*May I place you on hold for a few minutes while I research on this issue?*

*Thanks for holding.*

*CLOSING:*

*Is there anything else I can assist you with?*

*Thanks for calling XX services.*

*Have a great day \_\_\_ <caller's First Name>.*

At the integration stage, the Chinese mentor sat beside a trainee and kept an eye on the trainee's call handling process. If the trainee made a mistake, the mentor would interrupt the trainee and let him/her correct the mistake on the phone immediately. This is attributed to Chinese weak uncertainty avoidance culture, in that Chinese would not like to take risks. In that situation, the Chinese trainer would rather spend plenty of time monitoring the trainee as a way of reducing the trainee's possibility of making an error.

As far as the Chinese quality auditors were concerned, they paid close attention to the troubleshooting process and business process. They offered frequent one-to-one coaching on correct listening, empathy, technical and business processes.

#### *Chinese Recipients in Group 2*

A transfer of knowledge from the Chinese mentors to the Chinese trainees at this stage was more effective than the transfer from the US mentors to the Chinese trainees had been. It was found that the scripts handed out by the Chinese mentors helped the Chinese trainees greatly. They enabled them pick up the job more quickly than the Chinese trainees in Group 1 had been able to. However, there was a disadvantage in using the scripts. When an American customer was talking to a

Chinese TSE (who was following the script), it would sound as if they were talking to a robot.

At the integration stage, the Chinese trainees felt safe when the Chinese mentors sat beside them. During the call handling process, they could ask the mentor for a solution at any time they wanted. Also, asking a question during the call handling process enabled the trainee to better retain the knowledge that they had gained from the mentor. This finding is similar to Swap, Leonard, Shields, & Abrams (2001), who found that “when people actively participate in learning new material they are much more likely to remember it” (p. 101). However, since the Chinese mentors became much involved in the trainees’ call handling process, it was found that Chinese trainees in Group 2 were more likely to rely on their mentors and were more diffident than the Chinese trainees in Group 1.

At this stage, the Chinese trainees had some difficulties in logical speaking, thinking and trouble shooting. They overcame these difficulties by having many discussions with Chinese mentors to find a good way to do something, by picking up more calls, and by learning through cases and good examples.

#### *Canadian Recipient in Group 2*

A transfer of knowledge from the Chinese mentors to the Canadian trainee in this group was harder than that of the US mentor to the Canadian trainee. The script handed out by the Chinese providers could have helped the Canadian trainee to become familiar with the call flow, but he did not seem to be interested in using the script language and preferred to use his own words. Moreover, he was not happy with the Chinese mentor keeping an eye on him. It seemed that he could not do his job independently because the Chinese mentor did not trust his ability. He said he wished his mentor would supervise him less closely and provide him with more opportunity to do work independently. This attitude might result from his individualistic culture.

However, the Canadian recipient had a great knowledge gap and communication difficulties with the Chinese providers. Despite his negative response to them, Chinese providers tried many ways to help the Canadian recipient to overcome the difficulties. These efforts would emanate from their collectivist culture and concern about the well-being of the group. For example, when the Canadian trainee had some difficulties in logical thinking and logical trouble shooting, the Chinese mentor provided one-to-one coaching to him, carried out many case studies with him, provided him with many good examples, let him imitate them, offered him many opportunities for mock call and real call practices, and also had many discussions with him. The Canadian trainee also had many discussions with Chinese tech leaders and group mates, and made much effort in self-study and practices.

*Comparing the Chinese and Canadian recipients*, it was found that the transfer of knowledge from the Chinese providers to the Chinese trainees was significantly successful. Even though there were some difficulties such as knowledge gaps, the Chinese providers knew how to transfer knowledge to the Chinese trainees and help them to overcome the difficulties. Their help included converting tacit knowledge to explicit knowledge, closely supervising the Chinese recipients and providing as much support to them as possible. However, the tacit knowledge transfer from the Chinese providers to the Canadian recipient was less effective because of the cultural and communication difficulties between the provider and recipient. The Chinese providers and the Canadian recipient invested much effort during the knowledge transfer process, and they overcame the difficulties.

In comparing the Chinese and US providers in two groups, it is clear that the collectivistic attitudes dominant in the culture of the Chinese providers gave them a better ability to transfer knowledge that was tacit. This is consistent with Bhagat et al's. (2002) study of cross-border transfer of organizational knowledge. Since the Chinese providers focused on their group's well-being, they were more willing to

transfer their skills and had strong motivation to do so during the tacit knowledge transfer process. This willingness was reflected in two ways: first, they were more likely to share the tips which they had gained from their many years of practice, so that many trainees could internalize their skills quickly. Second, they were patient and very willing to take responsibility for helping trainees and becoming actively involved in the trainees' learning process. The proactive teaching attitude of the Chinese providers positively impacted on the transfer of tacit knowledge. This is consistent with the theory that tacit learning is not merely 'learning by doing' or experiential learning, but frequently involves the active involvement of the knowledge provider (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Lane & Lubatkin, 1998).

*Finding 6: Where a knowledge provider comes from a strongly collectivist-orientated culture, there will be a greater likelihood of successful tacit knowledge transfer in a structured knowledge transfer process.*

Figure 5.5 summarizes the impact of national culture on Stage Three - Ramp-up and Stage Four - Integration of the structured knowledge transfer.

**Figure 5.5 The Impacts of National Culture on the Ramp-Up and Integration Stages of Knowledge Transfer**

	<b>US Provider</b> Individual, Small PD, Strong UA	<b>Chinese Provider</b> Collective, Larger PD, Weak UA
<b>Canadian Recipient</b> Individual, Small PD, Strong UA	Effective, a few barriers: knowledge tacitness & knowledge gap	Effective, some barriers: knowledge tacitness, knowledge gaps, cultural & communication difficulties, knowledge gap
<b>Chinese Recipient</b> Collective, Larger PD, Weak UA	Less effective, major barriers: cultural & communication difficulties, weak relationship, knowledge tacitness, great knowledge gap	Most effective, few barriers: knowledge tacitness, knowledge gap

*A comparison of Group 1 and Group 2*

Comparing the two groups' the explicit and tacit knowledge transfer processes, it was found that knowledge transfer was more likely to be effective if a knowledge

provider and a recipient were located in similar cultural contexts. Where a knowledge provider and a recipient were located in different cultural contexts, knowledge transfer was likely to be less effective. For instance, during the explicit knowledge transfer, the transfer of knowledge from the US providers to Canadian recipients was more effective than the transfer to the Chinese recipients. Also, the transfer of knowledge from a Chinese knowledge provider to a Canadian recipient was less effective than that of a Chinese provider to Chinese recipients. During the tacit knowledge transfer, the transfer of knowledge from the US mentors to Canadian trainees was easier than for the Chinese trainees. In addition, the transfer of knowledge from Chinese mentors to the Canadian trainee was harder than that of the US mentor to the Canadian trainee. The study findings are consistent with previous studies on knowledge transfer in a cross-cultural business context (Bhagat, Kedia, Harveston, & Triandis, 2002; Gonzalez, Gasco, & Llopis, 2006; Lucas, 2006).

*Finding 7: The transfer of knowledge will be more effective if knowledge provider and recipient are located in similar cultural contexts rather than in different cultural contexts.*

Table 5.18 is a summary of the impact of national culture on structured knowledge transfer.

Table 5.18 The Impact of National Culture on Structured Knowledge Transfer

Group Comparison	The Initiation and Implementation Stages (explicit knowledge transfer)	The Ramp-up and Integration Stages (tacit knowledge transfer)
<b>Group 1</b>		
Training style of US providers	Short, concise presentation, encourage self-study.	Positive encouragement, demonstration and feedback. Less supervision, trusted trainees' ability, pushed hard to have trainee take on more responsibilities.
US→Chinese	<b>Less effective, some barriers:</b> cultural and communication difficulties, weak relationship, and knowledge gap <b>Overcome barriers:</b> Self-study, learnt from peer-to-peer help	<b>Less effective, high difficulties:</b> cultural and communication difficulties, weak relationship, great knowledge gap and knowledge tacitness. <b>Overcome barriers:</b> facilitated some social joint activities between provider and recipients, developed a good personal relationship with US provider. took more effort with practice, looking for peer-to-peer help
US→ Canadian	<b>Most effective, few barriers:</b> knowledge gap <b>Overcome barrier:</b> Self-study, proactive learner, built a good relationship	<b>Effective, a few barriers:</b> knowledge tacitness, knowledge gap, logical thinking and trouble shooting <b>Overcome barrier:</b> more practice, many discussions with US provider, self-study
<b>Group 2</b>		
Training style of Chinese Providers	Presentation with lots of background information and long explanations. Took more responsibility for teaching, involved in recipients' learning processes	Demonstration, self-reflection, and feedbacks. Converted tacit to explicit knowledge, used many scripts Kept an eye on trainees, interrupted trainees' work when trainees made a mistake to avoid customers' complaining.
Chinese→Chinese	<b>Most effective, few barriers:</b> knowledge gap <b>Overcome barrier:</b> learnt from peer-to-peer help, established a good interpersonal relationship with Chinese trainer and had a further interpersonal exchange of knowledge.	<b>Most effective, a few barriers:</b> knowledge tacitness, knowledge gap, logical speaking, thinking and trouble shooting, diffidence, relied on mentor too much <b>Overcome barrier:</b> many discussions with Chinese provider, remembered scripts and learnt from case study and practices.
Chinese→Canadian	<b>Effective, a few difficulties and barriers:</b> cultural and communication difficulties, knowledge gap <b>Overcome barrier :</b> Learnt proactively	<b>Effective, some barriers:</b> knowledge tacitness, knowledge gap, communication and communication difficulties. <b>Overcome barriers:</b> many discussions with Chinese provider, taking much effort in self-study and practices

Seven research findings identified in this section provided insight into the cultural issues implicated in the structured knowledge transfer process. The study findings were not only consistent with previous theoretical studies on knowledge transfer in a cross-cultural business context but also went further. There was strong evidence that different individualism/collectivism, power distance, and uncertainty avoidance cultural dimensions significantly impacted on knowledge transfer in a cross-cultural transfer of organizational knowledge.

### **5.7.1.2 The Effect of National Culture on Structured Knowledge Transfer at Beta and at Gamma**

A comparison the effect of national culture on the structured knowledge transfer processes at Alpha and at Beta showed that Beta TSEs experienced similar difficulty, but to a lesser extent than those at Alpha. There were three reasons. Firstly, at Beta, the knowledge recipients had some level of absorptive capacity and good English communication skills due to their prior work experience at the multi-cultural TSC. Secondly, the knowledge providers at Beta were professional trainers. They had some experience in transferring knowledge in a cross-cultural business context, so could transfer knowledge better than the trainers at Alpha who were not professionals. Thirdly, at Beta, the knowledge providers transferred only technical knowledge and product knowledge. They used the same technical language to communicate with each other, without language barriers. Therefore, the knowledge transfer was made much easier than it was at Alpha.

A comparison of the impact of national culture on the structured knowledge transfer processes at Alpha and at Gamma revealed that these two TSCs experienced similar difficulty, but TSEs who worked at Gamma experienced it to a greater extent than those at Alpha did. At Gamma, the organizational culture was self-study and more individualistic. However, the Chinese TSEs have a more collectivist oriented culture, so some culture shock occurred in the early stages of employment at Gamma. New employees expected somebody to help them gain some knowledge when they were initially working at Gamma.

In summary, this exploratory study provided strong evidence that knowledge tacitness, knowledge gaps, cultural and communication difficulties and weak relationships were the critical barriers to successful structured knowledge transfer in a cross-cultural knowledge transfer context. It was found that the lower the degree of tacitness, the less the knowledge gap, the fewer the cultural and communication

difficulties and the stronger the relationship, the more effective the knowledge transfer was. In contrast, the higher the degree of tacitness, the greater knowledge gap, the greater the number of cultural and communication difficulties, and the weaker the relationship, the less effective the knowledge transfer was. It was also found that when a provider and a recipient were located in different individualism/collectivism, power distance and uncertainty avoidance cultural dimensions, there was a reduced likelihood of successful knowledge transfer in a structured knowledge transfer process.

## **5.7.2 Factors Affecting the Selections of Knowledge**

### **Providers and Transfer Media in Unstructured Knowledge Transfer at the Three TSCs**

For unstructured knowledge transfer, the knowledge recipients are more able to self-determine their choice of a knowledge provider than they have for structured knowledge transfer. It was found that recipients at different knowledge levels had different patterns of priority for selecting knowledge provider and transfer media. This study identified four significant factors affecting the selection of the knowledge provider and transfer media at the three TSCs: personal ties, trust, location distance and cultural difference.

In this study, the issues that TSEs encountered at their TSC were divided into three groups: urgent and serious issues, moderately urgent and serious issues and general issues, based on the urgency and severity of issues. The urgent and serious issues refer to health and safety issues that had resulted in personal injury or property damage, such as fire coming out of a machine, electrical shocks, a machine needing to be taken away or smoking coming out when powering on. The moderately urgent and serious issues included many machines (i.e., more than 20) that suddenly had the same problems; a computer needing to be repaired more than three times in a month; and multiple parts dispatched to one location. The general issues included

information requests, and pre-existing issues, which could be solved locally.

The following sections will present how the factors affect the selection of the knowledge provider and transfer media when TSEs at the four knowledge levels encountered the different urgent and severity levels of issues.

***Personal Ties:***

There are two types of personal ties. One is strong personal ties and another is weak personal ties. Strong ties refer to direct relationships and extensive communication such as friends, colleagues, and group-mates. Weak ties are defined as distant and infrequent relationships such as acquaintances or friends of friends (Hansen, 1999). In this study, it was found that the different knowledge levels of TSEs had different numbers of ties at various levels of tie strength. For example, an advanced beginner TSE had a number of ties. He/she might have strong ties with colleagues who were seated around him/her, his/her friends, mentors, trainers and a group technical leader. Weak ties would be with cooperation colleagues working in other groups (such as US customer relations, status group), US backline senior technicians, and Indian colleagues. The kind of personal ties the TSE would use depended on the number of ties he/she had, the level of tie strength he/she had, and the severity level of the issue he/she encountered.

With regard to strong ties, Granovetter (1982) suggests that “strong ties have greater motivation to be of assistance and are typically more easily available” (Granovetter, 1982, p. 209). TSEs who were in an urgent situation turned to strong ties since they were more easily accessible and willing to help. Many participating TSEs stated that in the first instance they prefer to contact a person who had strong ties with them. However, it was also found that the people with whom they had strong ties with might not provide much useful information. This research finding is consistent with Granovetter’s study that suggests that these people might only provide limited information because people tend to pick and choose friends who are very similar to

themselves. As a result, people who are among a small group with strong ties tend to know what the others know (Hansen, 1999). This is likely to lead to redundant information. For example, a TSE said:

*When I confront a difficult problem, I always try to ask Judy first, who is my best friend at this company. We entered the company at the same day. Her cubic is next to me. When I ask for a solution, even through most of the time she cannot provide a straight away solution for the problem, she can give me some advice about who I can ask for, who are good at solving this kind of problem.*

On the other hand, “weak ties provide people with access to information and resources beyond those available in their own social circles (Granovetter, 1982, p. 113).” Weak ties are efficient for knowledge sharing because they provide access to non-redundant information. This leads to greater knowledge exchange than from strong ties (Hansen, 1999; Levin & Cross, 2004). Weak ties bridge the knowledge gap between disconnected groups and individuals in an organization. For example, a group of TSEs in a laptop group that works frequently and closely with a group of TSEs in a US backline group were over time, likely to be introduced to the working relationships of the other group of engineers, resulting in a circle of engineers who all knew one another. The weak inter-group ties are more likely to provide non-redundant contacts than strong ties would (Hansen, 1999; Levin & Cross, 2004).

In this study, personal tie strengths were divided into four tie levels: strong, moderate strong, moderate weak and weak. For TSEs, people with strong ties were colleagues who were of similar status to them and who were seated nearby. Further, people with moderately strong ties were group members who sat far away from them, group technical leaders, and mentors. People with moderately weak ties were TSEs from other groups at the same location, and senior technicians from backline support

groups at different locations. The people with weak ties were technicians from different branches at the different locations. It was found that the different knowledge levels of TSEs had different tie strengths with the knowledge provider group. Table 5.19 shows the four tie strengths for TSEs at different knowledge levels.

**Table 5.19 The Tie Strengths of the TSEs at Different Knowledge Levels**

<b>Tie strength knowledge levels</b>	<b>People with strong ties</b>	<b>People with moderately strong ties</b>	<b>People with moderately weak ties</b>	<b>People with weak ties</b>
<b>Novice</b>	Local junior TSEs and group members who seating around	Local supervisor, group leader, group technical leader; quality auditor; mentor, trainer	local other group colleagues; US back line	US GCC, status group, customer care, Indian colleagues
<b>Advance beginner</b>	Local junior TSEs and group members who seating around	Local supervisor, group leader, group technical leader; quality auditor; mentor, trainer	local other group colleagues; US back line	US GCC, status group, customer care, Indian colleagues
<b>Competency</b>	Local similar status colleagues, Group technical leader and mentor and group members who seating around	Local supervisor, manager, trainer	local other group colleagues; US back line	US GCC, status group, customer care, Indian colleagues
<b>Proficiency</b>	Local senior TSEs, technical leader, trainer, mentor, and group members who seating around	Local supervisor, manager, local other group senior colleagues	US back line; US GCC senior technicians; Indian backline technicians	US status group, US customer care, Indian senior colleagues

#### *The Selection of Knowledge Provider*

With regard to the selection of knowledge provider, the analysis of the field data showed that people with moderately strong ties and moderately weak ties were most likely to provide useful solutions, while people with strong ties and weak ties were less likely to provide a useful solution, because people with strong ties had similar knowledge to the TSEs and could not provide novel knowledge for them. People with weak ties have not developed trust between knowledge provider and recipients.

Trust relationships lead to greater knowledge exchange. When trust exists, people are more willing to give useful knowledge (Andrews & Delahay, 2000).

For the different levels of severity and urgency of the issues, it was found that the choice of knowledge provider by the different knowledge levels of TSEs depended on the level of severity of the issues.

The urgent and serious issues require speedy response, thus, contacting person who has the right knowledge is the most important consideration. When the novice, advanced beginner and competency levels TSEs encountered this type of issue, they would escalate the issue to their group leader or supervisor, because they did not have a broad relationship with experienced senior technicians, and did not have the knowledge to handle this kind of problem. The proficiency level TSEs would choose people with whom they had moderately strong ties such as the US global contact center (GCC) senior technician to find a solution. There were two reasons why they selected people with moderately strong ties. First, the people with strong ties such as local technical leaders could not solve the urgent and serious problems, because they had similar knowledge to that of the TSEs at the proficiency level. Thus, there was no point in asking them for a solution in an urgent circumstance. Second, the people with moderately strong ties were not only willing to help, but also capable of helping.

The moderately urgent and serious issues, which the junior technician (i.e., novice and advance beginner) could not solve, were escalated to local senior technicians. The competency level TSEs would seek people with moderately weak ties such as the US back line for a solution and if they could not solve the issue, they would contact the US GCC senior technician or an Indian senior technician for a solution. The proficiency level senior technicians had a broad relationship with local and global senior technicians so they would have a face-to-face discussion with local senior technicians who had strong ties with them. If a local discussion could not solve the problem, the proficiency level technicians would arrange a group virtual meeting with

global senior technicians (who had moderately strong ties with them) to discuss the issue.

General issues could be solved locally. The novice TSEs had a few usable contacts in their discipline and typically relied on mentors and trainers or group leaders who knew them and had a good understanding of their work. It was found that the proportion of new TSEs using strong ties for solutions was high. The previous trainer or mentor was always the top priority for new TSEs who encountered a problem, because they had built up a good relationship with them through the training process, they knew each other well, they had similar knowledge background, and they were able to understand each other. For the advanced beginner, knowledge repository was the first option, and they would also ask local competency level TSEs. The competency and proficiency levels of TSEs were easily able to solve general issues by themselves.

#### *The Selection of Knowledge Transfer Media*

From the selection of knowledge transfer media perspective, most of the TSEs pointed out that people with strong personal ties would be less likely to use a formal knowledge transfer media such as telephone or email. If they had a close relationship, knew each other quite well, they would use informal mechanisms frequently such as face-to-face contact if they were in close proximity. Face-to-face communication is indispensable for relationship building (Pauleen & Yoong, 2001a). If they were geographically dispersed, they would use instant message (Jaber or MSN) to ask a question.

Strong ties with a face-to-face interaction transfer mechanism facilitate a two-way interaction between the knowledge provider and the recipient (Leonard-Barton & Deepark, 1993). This allows for the assimilation of tacit knowledge. Polanyi (1966) pointed out that a recipient does not acquire the knowledge completely during the first interaction with the knowledge provider but needs multiple opportunities to

absorb it. The strong tie gives people multiple opportunities to communicate. For example, a TSE said

*I prefer to ask a person questions who has a close relationship with me, because when I follow the person's suggestion to solve the problem, I may encounter some unexpected problems, and this requires me to ask the person several times. If I have a good relationship with the provider, he is always easy to access, and also I would not feel uncomfortable when I asked him the same questions several times.*

If TSEs had weak ties, that is infrequent and distant relationships (Hansen, 1999) with a knowledge provider, in other words, if they did not know each other and only found them from an organizational contact list, the knowledge seeker would be more than likely to use formal contact media such as email or telephone to contact the knowledge provider, rather than using face-to-face interaction.

### ***Trust***

Trust is a critical factor affecting the selection of a knowledge provider. The concepts of trust relevant to this study include competence-based trust and benevolence-based trust. Benevolence-based trust is where one party trusts another party because of a some degree of belief in the kindness of the other party (Levin & Cross, 2004). This type of trust is more likely to be associated with strong ties (Glaeser, Laibson, Scheinkman, & Soutter, 2000). This study found that if the knowledge seeker liked the knowledge provider with whom they had strong ties, he/she would ask that knowledge provider for a solution even though the person might not be able to provide a useful solution straightaway because they had the same level of knowledge.

On the other hand, competence-based trust is when one party trusts another party based on some degree of belief in the competence of the other party (Levin & Cross, 2004). In this study, it was found that if the knowledge seeker trusts the knowledge provider's competence, he/she would be likely to ask the knowledge provider's for

solutions or advice again and again. The research finding is consistent with Levin & Cross's (2004) study, who found that if knowledge recipients trust a knowledge provider's competency, and trust his/her suggestions, they are more likely to listen to, absorb, and act on that knowledge. For example, if a knowledge provider had a good reputation for providing knowledge to recipients, the knowledge recipient would trust the provider's ability and ask for help. A previous good experience with the knowledge provider would encourage a knowledge seeker to ask him/her again. For example, a knowledge provider was competent and knowledgeable about some particular problems. He/she was patient and could clearly describe and demonstrate his/her knowledge. These factors would drive the knowledge seeker to choose this knowledge provider again when he/she encountered a difficult problem. This kind of trust was built through repetitive successful interactions. In contrast, if a knowledge recipient had a negative experience with a knowledge provider previously, for example, the knowledge recipient had spent considerable time with the provider, and in the end not solves the problem, or the knowledge provider had not known how to transfer knowledge or express himself/herself clearly, this knowledge provider would not be perceived favourably. Since the knowledge recipients could not trust the provider's competence, they would not seek knowledge from him or her in the future.

From the trust perspective, it was found that the choice of knowledge provider by the different knowledge levels of TSEs depended on the level of severity of the issues. The novice and advanced beginner who could only solve general issues, choose the people with benevolence-based trust first, and then people with competence-based trust when they encountered difficult issues.

Competency level of TSEs can solve most general issues and a few moderately urgent and serious issues by themselves. When they encountered a difficult moderately urgent and serious issue, they sought the people with competence-based trust first because they knew that the people with benevolence-based trust could not

solve this kind of issue. For a general issue, they would ask the people with benevolence-based trust first, and then people with competence-based trust.

The main duty of TSEs at the proficiency level is to solve most of urgent and serious issues and a few urgent and serious issues. It was found that TSEs at the proficiency level always chose the people with competence-based trust first.

### ***Location Distance***

Distance between knowledge providers and knowledge recipients influenced the selection of knowledge provider and knowledge transfer mechanism. In this study, it was found that the closer the distance between the knowledge provider and recipient, the easier it was for the knowledge provider to understand the contexts of the query, and easier it was for the knowledge provider to transfer the knowledge to the recipient, and to provide more reasonable and effective solutions for the recipient.

Also location proximity builds shared “linguistics”. When knowledge providers transfer the knowledge, the words they use are easy to understand. This is confirmed by Nonaka (1994), who suggests that close distance people use similar metaphors to express the tacit knowledge. “The essence of metaphor is understanding and experiencing one kind of thing in terms of another” (Lakoff & Johnson, 1980, p. 5). This shared “linguistics” enabled the TSE to have a greater absorptive capacity for the knowledge transferred by a provider at close proximity to him/her. Moreover, at close distance it was easier for knowledge provider and recipient to build strong ties. For example, novice TSEs were likely to select a local knowledge provider for two reasons. Firstly, they had a close relationship with local knowledge provider who was willing to transfer knowledge to them. Secondly, the local knowledge provider knew the TSE’s knowledge acquisition level, what kind of knowledge they wanted, and the way to transfer knowledge so they could easily acquire it.

From the knowledge transfer media selection perspective, it was found that when

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knowledge providers and recipients were in close distance, the face-to-face communication was given top priority. They would have frequent face-to-face interaction. Decarolis and Deeds (1999) pointed out that location proximity promotes the natural exchange of ideas through the networks they are established. When knowledge recipient and knowledge provider were in close proximity, they were more likely to talk to each other because they had a mutual understanding of both the context of the query and the technical advice needed.

When knowledge recipient and knowledge provider were at a long distance (i.e. geographically dispersed), they preferred to use machine based mechanism, such as email. Email was the most convenient way of knowledge transfer, because there was no time barrier, and the recipient could send an email to a potential knowledge provider anytime he/she wanted, even they were not in the same time zone. However, the response to email was slow and it was only suitable for non-urgent issues. If TSEs wanted a quick response, telephone and Instant Message were good choices. Telephone allowed people to have deep conversation, and this was good for difficult issues. Instant message was a popular way to transfer informal knowledge between two people with strong ties. This finding is in line with Pauleen and Yoong's (2001a, 2001b) study of communication channels in virtual groups. They noted that instant message (i.e. ICQ) can be used to build personal relationships in virtual groups and to set up opportunities for informal spontaneous information and knowledge exchange between virtual group members. As well as this, conference call appeared to be a popular way of group knowledge transfer if the two parties involved in the transfer were at great distance apart. At the offshore TSC, conference calls were used to facilitate regular meetings with worldwide technical engineers for sharing information and knowledge. In addition, it was found that the TSC not only used conference calls to hold a weekly worldwide meeting, but also used it to provide on-job-training for TSEs, group discussions for finding solutions and virtual mentoring for junior TSEs.

When the knowledge to be transferred was tacit knowledge, low media rich mechanisms such as email, instant message were not suitable, rich media mechanisms such as face-to-face contacts, video conference call, and telephone were options. Video conference communication was the medium of choice for long distance tacit knowledge transfer. When the knowledge to be transferred was explicit knowledge, email and instant message were seen as suitable.

### ***Cultural Difference***

Cultural differences between knowledge provider and recipient affected the success and effectiveness of knowledge transfer. It was found that cultural difference had an impact on selection of knowledge provider. TSEs liked to choose knowledge providers from the same cultural background because of the shared language. They were less likely to choose a provider from a different cultural background. Davenport and Prusak (2000) point out that a shared language is essential in any communication-intensive knowledge transfer process. Grant (1996b) confirms that the lack of a common language among workers in multinational corporations is a significant barrier to the introduction of integration intensive techniques and knowledge.

Cultural dimension was another most important factor affecting the selection of knowledge provider, because the TSEs considered that people who had the same cultural dimension were more likely to have the similar beliefs and behaviors and this could help them reach a mutual understanding easily. Cultural difference led to communication difficulties, especially for novice TSEs who did not have any experience in communicating with knowledge providers from a different cultural dimension. This was a big challenge for them to overcome. This is why most of the novices chose a provider who spoke the same or similar languages, and was in the same cultural dimensions. In this way, the knowledge transfer was more effective (Davenport & Prusak, 2000; Grant, 1996b).

In this study, it was clear from the comments made by participants that the lower the knowledge levels of the recipient, the greater the impact of cultural difference on the selection of knowledge provider. The lower the level of knowledge that the recipients had, the more likely they were to choose a less culturally different knowledge provider. For example, Chinese knowledge providers were given top priority when novices Chinese TSE were seeking knowledge. However, at the proficiency level of knowledge recipient, cultural difference was not the most important factor affecting their selections of knowledge providers. Knowledge usefulness became the top factor to be considered. In other words, a Chinese proficiency level recipient would choose a competent overseas expert, if the expert could provide more useful knowledge than the Chinese knowledge provider.

In terms of selection of knowledge transfer mechanism, cultural difference also affected the selection of transfer media. If the knowledge provider and recipient had a different cultural background, face-to-face communication would be given top priority as a transfer media. However, if face-to-face communication was not available, the TSE's individual language ability (such as the ability of speaking, listening, reading, and writing) affected the knowledge transfer media selection. For example, if the Chinese TSE was good at oral English, he/she might prefer to use telephone, rather than email. If the Chinese TSE had good written English skills, he/she might choose email or instant message, instead of the telephone.

Table 5. 20 summarizes priority selections of the knowledge provider and transfer media selections for the different knowledge levels of recipients.

**Table 5.20 The Priorities in Selecting Knowledge Provider and Transfer Media for the Recipients at a Different Knowledge Level at the Three TSCs**

Knowledge seeker	Severity level of issues	Factors affecting the selection of knowledge provider				Transfer media
		Personal ties	Trust	Location distance	Cultural difference	
Novice & Advanced beginner	Serious & urgent issue	Escalation				
	Moderately serious & urgent issue	Escalation				
	General issue	1.strong ties (i.e. colleagues who sitting around) 2.moderately strong ties(local Chinese tech leader)	1.Benevolence-based trust 2.Competence-based trust	1.close distance (local)	1. Same first language and same cultural dimension	1.Face-to-face 2.telephone
Competency	Serious & urgent issue	Escalation				
	Moderately serious & urgent issue	1.moderately weak ties (US back line) 2.weak ties (US GCC senior tech, Indian senior tech)	1.Competence-based trust 2.Benevolence-based trust	1.long distance	No other choice, must be cross cultural, different language	1.telephone 2.instant message
	Not applicable as there is no any difficult for competent TSEs to handle a general issue by themselves.					
proficiency	Serious & urgent issue	1.moderately strong ties (U.S. GCC senior tech)	1.Competence-based trust 2.Benevolence-based trust	1. long distance	No other choice, must be cross cultural, different language	1.telephone instant message
	Moderately serious & urgent issue	1.moderately strong ties (U.S. backline, local cross-group senior technicians) 2.moderately weak ties (U.S. GCC senior tech, Indian senior tech)	1.Competence-based trust 2.Benevolence-based trust	1.close distance 2.long distance	Does not matter	1.telephone instant message 2. conference call
	General issue	Not applicable as there is no any difficult for TSEs at the proficiency level to handle a general issue by themselves.				

Note: "1" stands for the first option. "2" stands for the second option.

It was found that the different knowledge levels of recipients had different priority of the selection of knowledge provider and transfer media. With regard to the selection of knowledge provider, the research findings identified two types of knowledge provider selection trends: personal-tie oriented selection and competence-based-trust oriented selection.

#### *Personal-Tie Oriented Selection*

For general issues, the TSEs prefer adopted personal-tie-oriented selection. The lower the knowledge level of TSEs, the more likely they would be to ask someone

with whom they had strong personal ties. For example, if novice or advanced beginner confronted a difficult issue, personal tie would be given the top priority in the selection of knowledge provider. In other words, TSEs would think about the people with strong ties first, and then consider the other factors such as trust, location distance, and cultural difference.

#### *Competence-based-Trust Oriented Selection*

For serious and urgent issues, the TSEs adopted competence-based-trust oriented selection. The higher the knowledge level of TSEs, the more likely they would be to choose those with whom they had competence-based trust. For example, when competency and proficiency levels TSEs confronted a tough issue, they would consult people with higher competence-based trust. The competence-based-trust determined other factors such as location distance, personal tie and cultural difference.

The findings demonstrate that personal ties play a critical role in the selection of knowledge provider. In some situations, personal ties determine the selection of knowledge provider, and affect the other factors (i.e., trust, location distance and cultural difference) impacting on the knowledge provider's selection. A comparison of the three cases shows that organizational structure affected the building of personal ties. For example, Alpha and Gamma had a similar organizational structure where TSEs in the same group supported the same product. When a TSE encountered a tough issue, there were a large number of TSEs at different knowledge levels in the same group to be selected from. At this type of organization, most of the novice, advanced beginner and competency level TSEs selected the local knowledge provider in the same group. Thus, TSEs at Alpha and Gamma normally had a wide range of local personal ties in the same group. They had little contact with overseas TSEs. In contrast, at Beta, TSEs in the same group supported different products. When a TSE encountered a tough issue, only a limited number of knowledge providers were available for selection in the same group. In order to find

a solution, they had to contact TSEs in other groups or contact TSEs in other branches. As a result, junior TSEs at Beta had a wide range of local contacts across different groups and senior TSEs had a wide range of contacts across different branches.

Based on the research findings from the three cases, it was noted that distance location, trust and culture difference affected personal relationship building. In terms of distance location, the research findings indicated that the closer the distance between the knowledge provider and knowledge recipient, the easier it was to build personal relationships. In this study, strong ties were with local TSEs, and weak ties were with TSEs from other branches. In terms of trust, it was found when people trusted each other; they were more willing to establish a good relationship. In this study, if a knowledge provider was willing to help a recipient, and provided useful knowledge, the recipient would trust the knowledge provider and be interested in building a good relationship with them. In terms of cultural difference, the research findings indicated that the less the cultural difference was between knowledge provider and recipients, the greater likelihood of building a good relationship. For example, this study found that people in different cultural dimensions would have communication difficulties and that this difficulty would block good relationship building.

Therefore, among the four factors: personal ties, distance location, trust and culture difference, personal ties were central to the selection of knowledge provider, because they affected the other factors (i.e., trust, location distance and cultural difference) impacting on the selection of knowledge provider. At the same time, the other factors (i.e., trust, location distance and cultural difference) also affected the building of personal ties.

With regard to the selection of transfer media, the research findings showed the most popular unstructured knowledge transfer media at these three TSCs were

face-to-face communication, telephone, conference call or network meetings and email. Face-to-face communication was always given top priority for transferring knowledge at local TSEs. Telephone was the medium of choice for the transfer of knowledge from different branches. Conference call or network meetings were chosen by senior technicians at different branches for group discussions and knowledge fusion. Email was used to overcome the time zone issue when communicating between different branches.

## **5.8 DISCUSSION**

This Chapter has investigated structured and unstructured knowledge transfer at the offshore TSCs and developed the knowledge transfer type adoption model based on the research findings. This model identifies the relationships between the types of knowledge, the knowledge levels and the type of knowledge transfer approaches. The model indicated that the knowledge recipient's absorptive and retentive capacities determine the adoption of knowledge transfer type. The lower the level of the recipient's absorptive and retentive capacity, the more difficulty the recipient will have in acquiring tacit and complex types of knowledge, and the more formal the structured knowledge transfer approach the recipient will need to adopt.

There are seven areas where this study can contribute to a better understanding of structured and unstructured knowledge transfer.

The first contribution is that this study confirms prior research that explicit knowledge is transferred easily through a knowledge repository (Schulz, 2001), and that tacit knowledge can be built only through experiential learning and action practice (Sternberg et al., 2000). The research evidence showed that the pre-existing knowledge in a knowledge repository can be easily copied and applied into a real problem. This finding confirms Davenport & Prusak (2000) and Szulanski's (2003) findings that explicit knowledge can be transferred easily (e.g., Davenport & Prusak,

2000; Szulanski, 2003). In contrast, the transfer of tacit knowledge could cause difficulty and frustration in learning, raise barriers to imitation, and significantly influence the speed of transfer of knowledge (e.g., Simonin, 1999a, 2004; Szulanski, 1996). This study found that it is difficult to transfer tacit knowledge. It was transferred through job shadowing, mock calls, practice under the guidance of mentors, and quality auditors' feedback and support. The tacit knowledge transfer process involves observation, imitation and practices. Because of the stickiness of tacit knowledge, some scholars argue that tacit knowledge cannot be transferred, but built only through experiential learning and action practice (D'Eredita & Barreto, 2006; Ribeiro & Collins, 2007; Sternberg et al., 2000; Tsoukas, 2003). This research finding substantiates prior research suggesting that tacit knowledge is built through experiential learning and action practice.

The second contribution is that this study confirmed that absorptive capacity plays a critical role in the knowledge transfer process. Many researchers (Cohen & Levinthal, 1990; Gupta & Govindarajan, 2000; Joshi & Sarker, 2003; Zahra & George, 2002) have indicated that absorptive capacity affects the recipient's acquisition, assimilation and internalization of knowledge when the knowledge is transferred from a provider. Gupta and Govindarajan (2000) identify two reasons for differences between organization's absorptive capacities: the extent of prior related knowledge, and the extent of inter-organizational homophily. This study confirmed that prior related knowledge and inter-organizational homophily were the main factors affecting the level of absorptive capacity, especially in the early stage of knowledge transfer from the onshore TSC to offshore TSC. The TSE at the offshore TSCs experienced some difficulties in acquiring the knowledge from the onshore TSC due to a lack of prior related knowledge and shared mental models, and a mutual cultural language. However, with increasing communication, interactions and knowledge transferring between onshore TSEs and offshore TSEs, and the shared experience in the same technologies as well as ongoing attempts to solve the same sort of problems, the TSEs at offshore TSCs gradually developed shared values, attitudes and interpretative

schemes with the onshore TSC, which helped the offshore organization to improve its absorptive capacity. This has been suggested by Bathelt et al. (2004) that interaction and communication facilitate the development of shared values, attitudes and interpretative schemes.

The third contribution is that this study confirmed that Szulanski's knowledge transfer process model is a useful guide to structured knowledge transfer. There has been an increasing amount of offshore outsourcing TSCs in developing countries (Datamonitor, 2006; Palvia, 2003), but as already noted there has been a little attention given to the knowledge transfer process in the academic literature. Only Szulanski (1996) introduced a four-stage knowledge transfer process in transferring best-practice inside the firm: initiation, implementation, ramp-up, and integration. The study adopted this model to investigate knowledge transfer processes from an onshore TSC to an offshore TSC. Based on the research findings and observations made in this research, Szulanski's process model was confirmed as a useful guide to structured knowledge transfer processes. This study pointed out that these structured knowledge transfer processes provide conceptualization knowledge for novices, and enable them to perform the basic functions required in their jobs.

The study findings not only confirmed that Szulanski's knowledge transfer process model is a useful guide to structured knowledge transfer but also went further. It identified three types of knowledge transfer process: interpersonal oriented transfer, semi-interpersonal oriented transfer and codified oriented transfer. The three types of knowledge transfer process could be adopted by the different organizations according to their new employees' absorptive capacity and the tacitness of the knowledge to be transferred.

The fourth contribution is the identification of three types of unstructured knowledge transfer. As discussed in Section 2.2, there is little research on the unstructured knowledge transfer process. Even though Davenport and Prusak (2000)

note that unstructured knowledge transfer is important to an organization's success, few studies explicitly indicate how unstructured knowledge transfer takes place. The three types of unstructured knowledge transfer processes developed by the author in the literature review, namely *copy*, *adaptation* and *fusion*, seem to fit with the data that emerged from the field observations. This study demonstrated that unstructured knowledge transfer processes were used by TSEs to learn on the job, learn from their colleagues and learn through their social networks. These knowledge transfer processes played a critical role in extending the recipient's explicit and tacit knowledge, which then could be applied to their daily work, and into higher levels of support capability.

The fifth contribution is that this study explored the impact of national culture on the structured knowledge transfer at TSC. As discussed in Chapter Two, there is relatively a little empirical or exploratory research regarding how national culture affects structured knowledge transfer across culture dimensions, and only a few researchers have proposed a theoretical framework on the cross-cultural knowledge transfer (i.e., Bhagat, Kedia, Harveston, & Triandis, 2002; Lucas, 2006). This study explored the impact of national culture on the structured knowledge transfer from a US-based (onshore) TSC to an offshore TSC in China. The knowledge transfer processes of two groups were compared: Group One: US providers to Chinese recipients and a Canadian recipient; Group Two: Chinese providers to Chinese recipients and a Canadian recipient. The research findings show that the different cultural dimensions of individualism/collectivism, power distance and uncertainty avoidance significantly impacted on knowledge transfer in a cross-cultural transfer of organizational knowledge.

This study was not only consistent with previous theoretical studies on knowledge transfer in a cross-cultural business context but also extended them. The study identified that knowledge gap, and communication and cultural difficulties hamper the knowledge transfer from onshore knowledge providers to China-based

knowledge recipients. Because of the Chinese recipient's lower absorptive capacity, lack of common language and lack of a common cultural background with the onshore knowledge provider, recipients have difficulty in absorbing the knowledge transferred from the provider. Cultural training, and joint activities among onshore providers and Chinese recipients such as group building or social activities can enable knowledge recipients and providers to build better understanding, communication, and relationships, which may assist in decreasing these difficulties. In addition, encouraging peer-to-peer help and group knowledge sharing will help recipients share and grasp each other's knowledge because they have similar experiences, the knowledge gap would not be as great and the level of absorptive capacity would be similar. The study findings provide new insights into the knowledge transfer process in a cross-cultural business context.

The sixth contribution is that this study identified four significant factors affecting the priority of the selection of knowledge provider and transfer media in the unstructured knowledge transfer process: personal ties, trust, location distance and cultural difference. Many studies (e.g., Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Hansen, 1999; Levin & Cross, 2004) have focused on relationship and trust in knowledge transfer. They claim that strong relationships could facilitate frequent interaction and increase trust, as a way to accelerate the knowledge transfer process. This research finding is consistent with prior research suggesting that people with strong ties would be easily accessible and willing to help, but that people with weak ties would provide non-redundant information (Levin & Cross, 2004), and useful knowledge (Hansen, 1999). In addition, this study suggests that the lower the knowledge level of the knowledge recipients, the more likely they are to use a provider with whom they have strong personal ties. From the trust perspective, Levin and Cross (2004) recognize two types of trust: benevolence-based trust and competence-based trust. This research finding indicates that the higher the knowledge level of the recipients, the more likely they are to choose competence-based trust, and the lower the knowledge level of recipients, the more

likely they are to choose benevolence-based trust.

In terms of location distance and cultural difference, Decarolis and Deeds (1999) consider that location proximity promotes knowledge transfer and sharing. People at close distance would be easier to contact and communicate with, so there would be more chances for building strong ties with them than with those providers who are a long distance away. Cultural difference has a negative impact on the knowledge transfer (Davenport & Prusak, 2000; Grant, 1996a). This study confirmed that the knowledge providers from the same cultural background would be given top priority by the low knowledge level recipients when they need knowledge.

The seventh contribution is that this study developed a knowledge transfer approach model. This model identifies the relationships between the knowledge levels of recipients and knowledge transfer type adoption (i.e. *structured transfer stages* is employed by novices; *unstructured copy* is widely adopted by those at the advanced beginner level; *unstructured adaptation* is utilized by those at the competency level; and *unstructured fusion* is the dominant process used by those at the proficiency level). It is difficult to link this finding to previous literature. Even though Dreyfus and Dreyfus (1986) indicated four knowledge levels of people, and Szulanski (1996) suggests that four elements are involved in knowledge transfer: knowledge, knowledge source, knowledge recipient and knowledge transfer context, little prior work has recognized the relationship amongst the knowledge levels of knowledge recipients, the types of knowledge and the knowledge transfer approaches.

This model also illustrates the mutually interdependent relationships between the four types of knowledge and four types of knowledge transfer approaches. Embrained and encoded knowledge transferred through *structured transfer stages* forms the background necessary to develop encoded and embodied knowledge by adopting the *unstructured copy* transfer approach. The encoded knowledge provides the foundation for developing and interpreting embodied knowledge and embedding

knowledge through the *unstructured adaptation* and *unstructured fusion* knowledge transfer approaches. It is difficult to link this finding to previous literature. Even though four types of knowledge (Blackler, 1995; Collins, 1993; Lam, 2000) have been identified in the knowledge transfer process, little previous research has tended to focus on the mutually interdependent relationship among the four types of knowledge, or concentrated on how the knowledge transfer approaches facilitate these four types of knowledge transfer. This model contributes to an understanding of the relationships between the four types of knowledge and four types of knowledge transfer approaches.

## 5.9 CHAPTER SUMMARY

This chapter presented the research findings and discussion of knowledge transfer undertaken at three offshore TSCs. Section 5.1 addressed the research findings of knowledge transfer at Alpha. This section demonstrated the structured and unstructured knowledge transfer process. Based on the research findings generated at Alpha, Section 5.2 developed an initial knowledge transfer type adoption model. Section 5.3 compared the structured and unstructured knowledge transfer at Alpha and at Beta. Section 5.4 presented the difference in knowledge transfer processes at Alpha and Gamma. Section 5.5 summarized research findings of the three cases. Section 5.6 modified the knowledge transfer type adoption model. Section 5.7 identified the main factors affecting structured and unstructured knowledge transfer. Section 5.8 discussed the linkage of the knowledge transfer model to previous literature.

# **CHAPTER 6 FINDINGS AND DISCUSSION: INDIVIDUAL TACIT KNOWLEDGE BUILDING**

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The previous chapter presented the knowledge transfer process from onshore to offshore TSCs. This chapter focuses on individual tacit knowledge building. It discusses the research findings about individual knowledge building undertaken at three TSC organizations. This chapter aims to answer the second research question: *how do individuals build up tacit knowledge in work place?* This chapter is organized into nine sections. The structure of the chapter is as follows.

Section 6.1 Research findings of individual knowledge building at Alpha

Section 6.2 The initial model of individual basic knowledge building process

Section 6.3 Comparing individual knowledge building at Alpha and at Beta

Section 6.4 Comparing individual knowledge building at Alpha and at Gamma

Section 6.5 Summary of research findings of the three case studies

Section 6.6 The modified model of the individual tacit knowledge building process

Section 6.7 Factors affecting individual knowledge building

Section 6.8 Discussion

Section 6.9 Chapter summary

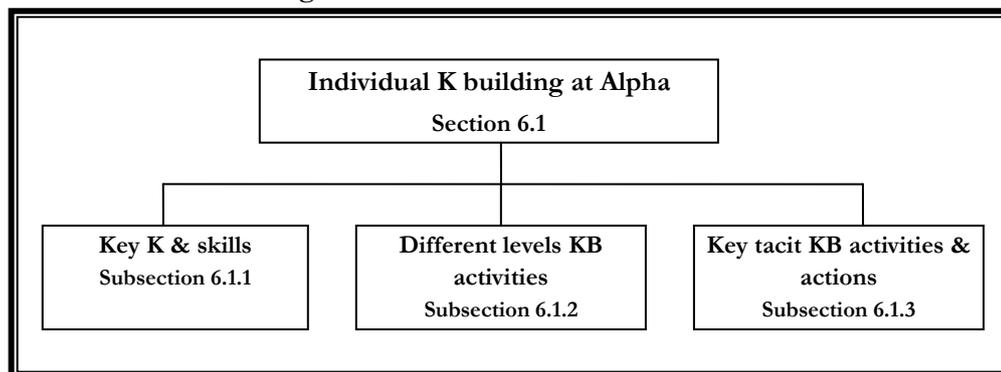
The results and discussion are presented simultaneously and are supported by the interview transcriptions and observation notes and document review notes which

were collected at Alpha, Beta, and Gamma.

## 6.1 RESEARCH FINDINGS OF INDIVIDUAL KNOWLEDGE BUILDING AT ALPHA

This section examines individual tacit knowledge building at Alpha based on the data collected from participant observation, document review and semi-structured interviews at Alpha. The section is organized in three parts. This section begins by presenting the key knowledge and skills required at Alpha. Then it addresses the tacit knowledge building activities at the different knowledge levels of TSE. The section ends by summarizing the key tacit knowledge building activities and actions (see Figure 6.1).

Figure 6.1 The Structure of Section 6.1



### 6.1.1 Key Knowledge and Skills Required at Alpha

Based on the analysis of field data, the knowledge and skills required by qualified TSEs in a typical call handling process are summarized in Table 6.1 below.

**Table 6.1 Knowing Constituted in the Practice**

Call handling stages	Action	Knowledge and skills	Knowledge type
<b>Opening</b>	<ul style="list-style-type: none"> <li>✦ Develop social communication and rapport with the customer.</li> <li>✦ From the customer's speaking speed and tone, determine customer's emotional state (happy, angry, urgent, panic...) and technical skill level (high, low...), and adjust language to the correct levels.</li> </ul>	<ul style="list-style-type: none"> <li>Social communication</li> <li>Facilitating social relations</li> <li>Perceptual skills</li> </ul>	<ul style="list-style-type: none"> <li>Experiential knowledge</li> </ul>
<b>Information gathering</b>	<ul style="list-style-type: none"> <li>✦ Symptom awareness</li> <li>✦ Ask the right questions:                             <ul style="list-style-type: none"> <li>When did the problem first occur?</li> <li>What was customer doing when the problem occurred?</li> <li>Can the problem be recreated?</li> <li>Is the problem intermittent or constant?</li> <li>Were any hardware changes made?</li> <li>Were any software changes made?</li> <li>What was the mode of failure?</li> </ul> </li> <li>✦ Understand how the computer will react in a failure scenario</li> <li>✦ While the TSEs are asking a customer questions and listening to the answers, they are typing the notes on the screen and evaluating the situation severity level and customer technical level.</li> </ul>	<ul style="list-style-type: none"> <li>Software and hardware knowledge;</li> <li>Product knowledge;</li> <li>Question asking, Trouble shooting skill</li> <li>Listening</li> <li>Typing</li> <li>Searching</li> <li>Logical thinking</li> <li>Multi-tasking</li> </ul>	<ul style="list-style-type: none"> <li>Conceptual knowledge</li> <li>Experiential knowledge</li> </ul>
<b>Diagnosis</b>	<ul style="list-style-type: none"> <li>✦ After collecting the facts and identifying the symptoms, agent needs to think aloud about all the possible causes and then ask the customer questions and guide the customer through trouble-shooting steps in a way that matches the customer's technical level, so that the agent can:                             <ul style="list-style-type: none"> <li>--Determine which subsystem, components, or software could be causing the problem</li> <li>--Remove any extra devices (for example, PC Cards or Multi Port modules). Reduce the computer to its minimum configuration and replace the components one at a time. If a computer fails to boot when hardware is installed, remove the newly installed hardware.</li> <li>--Swap a suspected faulty component with a known working one if available</li> <li>--Remove the notebook battery or disconnect power</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Diagnosis</li> <li>pattern matching</li> <li>Decision making</li> <li>Logical thinking</li> <li>Multi-task</li> </ul>	<ul style="list-style-type: none"> <li>Experiential knowledge</li> </ul>

Call handling stages	Action	Knowledge and skills	Knowledge type
<b>Analysis (pattern match)</b>	<ul style="list-style-type: none"> <li>✦ Based on their evaluation of the data, they need to determine possible root causes for the failure. During this process, they may ask senior colleagues for help to identify possible solutions for each of those root causes. For each possible solution, they need to check the customer's description to see whether it contains facts that support or contradict that diagnosis.</li> <li>✦ Use a best-fit strategy—in other words, to treat the difficult problem as if it were an easy one that could be solved by matching symptoms with known patterns.</li> </ul>	<p>Problem analysis            Generating and evaluating options            Decision making under pressurized conditions            Using knowledge resources (human, paper-based, electronic )            Seek help            Peer cooperation</p>	<p>Experiential knowledge</p>
<b>Develop action plan</b>	<ul style="list-style-type: none"> <li>✦ Develop action plan:               <ol style="list-style-type: none"> <li>1. Identify the steps necessary to implement it.</li> <li>2. Prioritize solutions by balancing the time and cost to implement each solution against the likelihood that it will fix the issue or provide valuable information even if it fails.</li> </ol> </li> <li>✦ Compile all the steps into a master action plan. It is important to be specific when creating the action plan. Eliminate redundancy and ensure that they are only manipulating one variable at a time.</li> </ul>	<p>Business process, regulation            Generating and evaluating options            Decision making</p>	<p>Experiential knowledge</p>
<b>Implement the action plan</b>	<ul style="list-style-type: none"> <li>✦ When they are implementing the action plan:               <ul style="list-style-type: none"> <li>--Identify a specific set of steps and then carefully implement each one.</li> <li>--Record the results of each step, including any error messages.</li> </ul> </li> <li>✦ Observe the results of each problem-solving step and reduce the possibilities until they can pinpoint the problem and resolve it.</li> </ul>	<p>Logical speaking            Listening            Notes taking            Quick responding to the unanticipated problem</p>	<p>Experiential knowledge</p>
<b>Closing</b>	<ul style="list-style-type: none"> <li>✦ When they have solved the problem, they will               <ul style="list-style-type: none"> <li>--Explain the root cause of the problem to the customer. Explain repair information to the customer in simplified terms and make sure they adapt their language to the correct technical level.</li> <li>--Identify and perform the steps necessary to prevent the problem recurring.</li> <li>--Recommend a course of action to prevent similar failures.</li> </ul> </li> <li>✦ Determine customer's feeling: happy customer? any concerns? Use social communication</li> </ul>	<p>Social communication,            Facilitating social relations            Evaluate customer feeling</p>	<p>Experiential knowledge</p>
<b>Post-action reflection</b>	<ul style="list-style-type: none"> <li>✦ Self reflection: Did I do the right thing? How can I do things better next time?</li> <li>✦ Add the pre-decision circumstances, the decisions and actions taken, and the subsequent consequences of the decision to the store of past history of linkages between circumstances, alternatives, actions and outcomes.</li> </ul>	<p>Theoretical thinking</p>	<p>Experiential knowledge</p>

The following section will explain how the different knowledge levels of TSEs build up this knowledge and skills.

## 6.1.2 Knowledge Building Activities for TSEs at Different Knowledge Levels

TSEs at different knowledge levels built up their knowledge through different knowledge building activities. At the beginning, a novice and advanced beginner learnt many normative rules expressed as declarative knowledge. As they became more experienced, they learnt by seeing how others act when they handled a customer's problem. They tried out various solutions for the problem with varying results and subsequently acted differently the next time. When they have become truly proficient, other less experienced TSEs asked for their help. TSEs had learned not only how to solve various types of problems, but also had improved their communication and coordination skills.

### *Novice Level*

At the novice level, the purpose of knowledge building was to grasp the basic concepts and theory to perform the basic functions required in their jobs. Therefore, novice TSE's knowledge building activities focused on conceptual knowledge building. At this level, the TSE's trial and practice was conducted under the guidance of mentors. Table 6.2 shows the main knowledge and skills which were built at the novice level.

**Table 6.2 Knowledge and Skills Building at the Novice Level**

<b>Knowledge types</b>	<b>Knowledge &amp; skills</b>
Conceptual knowledge	Computer software and hardware knowledge; products knowledge; business process, regulation
Experiential knowledge	Question asking, trouble shooting skill, diagnosis, logical speaking, listening, typing, note taking, searching, theoretical thinking, using knowledge resources (human, paper-based, electronic), and peer cooperation.

Based on the data collected from participant observation, the tacit knowledge

building of novice level TSEs started from working alongside a mentor. They observed how the mentor worked, and then imitated their mentor's behavior for a number of days. They completely relied on their mentor's instructions and followed these rigidly. They did not know what key point to focus on and what part of the information they could simply ignore. In addition, they could not quickly identify the most probable reason for the problem and they spent too much time investigating it. At this level, they could solve only a few common issues by themselves.

The analysis of the field data showed that the majority of knowledge building activities at the novice level included new employee training, working alongside a mentor, practice under the guidance of mentors, and tackling challenging tasks and roles.

### ***Advanced Beginner Level***

After gaining some experience, the novice TSEs could gradually solve more and more common issues by themselves, and were able to recognize similarities and differences between different situations. At this stage they were at the advanced beginner level. The goal of knowledge building for the advanced beginner was to reinforce conceptual knowledge and improve common problem-solving skills. Therefore, advanced beginners' knowledge building focused on explicit knowledge learning and implicit practical learning. Trial and practice tended to be based on the routine job. Table 6.3 shows the main knowledge and skills which were built at the advanced beginner level.

**Table 6.3 Knowledge and Skills Building at the Advanced Beginner Level**

<b>Knowledge types</b>	<b>Knowledge &amp; skills</b>
Experiential knowledge	Facilitating social relations, trouble shooting skill, diagnosis, logical speaking, logical thinking, listening, searching, theoretical thinking, multi-task, pattern matching, decision making, generating and evaluating options, using knowledge resources (human, paper-based, electronic ), peer cooperation.

After a period of time of trial and practice in their daily work, the advanced

beginners became more confident about the general problem-solving process. Even so, they still relied on their conscious acquisition of information and followed the instructions to solve problems. They had some flexibility in solving the general problems. In internal reflection, the advanced beginner like the novice, focused on content reflection. With the help of quality auditors, senior technicians and colleagues, they could review the way they carried out each step of problem-solving by themselves. This reflection helped them improve their skills and ability.

The analysis of the field data indicated that the key knowledge building activities were on-job-training, tackling challenging tasks and roles, getting support and feedback from management team and knowledge sharing activities.

### ***Competency Level***

With an increasing number of problems solved, an advanced beginner could respond to most requests and solve the problem quickly and effectively. They could think independently and solve most problems by themselves. The goal of knowledge building for the competency level TSEs was to improve their ability to solve unanticipated problems and their knowledge conceptualization. Therefore, the competency level TES's knowledge building activities focused on the challenges provided by job itself, cooperation with others and coaching new employees. Table 6.4 shows the main knowledge and skills which were built at the competency level.

**Table 6.4 Knowledge and Skills Building at the Competency Level**

<b>Knowledge types</b>	<b>Knowledge &amp; skills</b>
Experiential knowledge	Social communication, facilitating social relations, coordination and cooperation skill, mentoring and coaching skills, perceptual skills, trouble shooting skills, diagnostic, logical speaking, logical thinking, theoretical thinking, multi-task, pattern matching, decision making, generating and evaluating options, using knowledge resources (human, paper-based, electronic ), peer cooperation, quick responding to the unanticipated problem.

TSEs at the competency level were confident in solving most general issues and knew how to handle most customers. They could think independently in practice and had the extra mental resources to solve unfamiliar issues or improve previously

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ignored skills. At this level, they had achieved flexibility and could rely on non-conscious acquisition of information for solving most general issues, and no longer referred back to the explicit description of the procedure. This explicit knowledge became redundant and was eventually forgotten. This enabled them to deal with problems more quickly and automatically, and to handle more complicated situations than advanced beginners could. In the internal reflection, competency level TSEs also had started to reflect on how they went about problem-solving, particularly in terms of procedures and assumptions they made. This reflection enabled them to convert tacit knowledge explicit. The analysis of the field data identified that the key knowledge building activities were on-job-training, challenge of the work itself, consultation within and outside the working group, and coaching and helping new TSEs.

### ***Proficiency Level***

By learning to accommodate the pre-existing knowledge to a new situation repeatedly for a few years, the TSEs developed their own rules for solving most problems by intuition. This knowledge and skills enabled TSEs to reach the proficiency knowledge level. In comparison with the competency level TSE' knowledge building, which aimed at improving their ability to solve unanticipated problem and their knowledge conceptualization, the proficiency level TSEs had more free mental resources to think more deeply about a problem, and thus progress their problem solving skills. Therefore, the proficiency level TSEs' knowledge building focused on internal reflection and meaning perspective transformation. Table 6.5 shows the main knowledge and skills which were built at the proficiency level.

**Table 6.5 Knowledge and Skills Building at the Proficiency Level**

<b>Knowledge types</b>	<b>Knowledge &amp; skills</b>
Experiential knowledge	Social communication, facilitating social relations, coordination and cooperation skill, mentoring and coaching skills, theoretical thinking, decision making, generating and evaluating options, quick responding to the novel problem.

TSEs at the proficiency level were very confident in what they were doing. They

could target the source of the potential cause of the problem immediately and thus solve the problem efficiently and effectively. They could also grasp other TSE's key points quickly in discussions with them and contribute towards solving other TSEs' problems. They had developed their own rules for doing their job and used them flexibly to solve different types of problems. In addition, they could solve problems by intuition and no longer needed to refer back to the explicit description of the procedure. The explicit description of the procedure became redundant and eventually forgotten. As far as internal reflection was concerned, they focused on challenging and questioning their fundamental theories, rules, beliefs, and the process of premise reflection.

The analysis of the field data showed that the majority of knowledge building activities was challenges in the work itself, consultation within and outside the working group, and coaching and training junior TSEs.

Table 6.6 summarizes key knowledge building activities for the four knowledge levels of TSEs.

**Table 6.6 Key Knowledge Building Activities and Actions for TSEs at the Four Knowledge Levels**

Knowledge level	Main knowledge building activities
Novice	New employee training Working alongside a mentor Practice under the guidance of mentors Tackling challenging tasks and roles
Advanced beginner	On-job-training Tackling challenging tasks and roles Getting support and feedback from management team Knowledge sharing meeting
Competency	On-job-training Challenges of the work itself Consultation within and outside the working group Coaching and helping new TSEs
Proficiency	Challenges of the work itself Collaboration within and outside the working group Coaching and helping junior TSEs

The results show that the different knowledge levels of TSEs built up their

knowledge through different knowledge building activities. For novice and advanced beginners, the key knowledge building activities were job training, practice, being mentored and coached, working alongside others, and tackling challenging tasks and roles. For the competency level TSEs, the key knowledge building activities were consultation within and outside the working group, coaching and helping new TSEs, and the challenges of the work itself. For the proficiency level TSEs, the key knowledge building activities were the challenges of the work itself and coaching and helping junior TSEs.

Overall, the nine key tacit knowledge building activities are identified in this study, including new employee training, on job training, working alongside a mentor, practising under the guidance of mentors, learning from feedback and support, attending knowledge sharing meetings, tackling challenging tasks and roles, consulting within and outside the working group, and coaching and helping junior TSEs. The following section will address each of knowledge building activity, and discuss what kind of knowledge building actions were undertaken to build knowledge in each knowledge building activity.

### **6.1.3 Key Tacit Knowledge Building Activities and Actions**

#### *New Employee Training*

The organization generally provided three months new employee training. The new employee training emphasized knowledge seeding and conceptual knowledge learning. During this training, the *presentation, role play, call sample listening, case study, lab experiments, and written tests or quizzes* training techniques were used to help TSEs construct their knowledge. TSEs learnt some basic skills in the training such as knowledge repository searching skills, information collecting skills, basic diagnostic skills, multi-tasking skills, listening and communication skills.

The analysis of the field data collected from participant observation and interview

showed that the key tacit knowledge constructing actions for TSEs in the new employee training program included attention-drawing, interpretation, remembering, interpersonal communication, internal reflection, and formation of action scripts (meaning schemes). Initially, the knowledge provider (trainer) directed the attention of the TSE to the core knowledge needed for the job. The TSE paid attention to this kind of knowledge and tried to understand it and remember it in order to pass the weekly written tests or quizzes. During the training, the TSEs had many opportunities to start a conversation with trainers or colleagues to verify understanding and to check for any misunderstandings. When the new knowledge learned from the training was related to a TSE's memory of similar issues or situations, he/she might recall these memories, and try to use the new knowledge to interpret them. In this way, the new knowledge would be more likely to be remembered by the TSEs than other knowledge which had not drawn their attention. This training assisted TSEs to develop an initial action script for problem diagnosis and problem solving.

#### *On-Job-Training*

Alpha provided continually on-job-training for employees, which focused on practical knowledge learning. In this training process, the new knowledge included new issues and solutions found for problems with old products and latest released products. The knowledge learned from the training could draw TSE's attention in the specific situation. For example, if a TSE encountered a new issue which had been mentioned by a trainer in the on-job-training, he/she might recall the trainer's words and this would draw his/her attention to the important aspects of the issue to check if the current issue's symptoms match the symptoms of the issue mentioned in the training. If it does, he/she would apply the solution to solve the problem and learn something from the new problem-solving. The new knowledge learnt on the job training updated old knowledge and led to new conceptual knowledge building. Thus, the key knowledge building actions included attention-drawing, interpretation, interpersonal communication, internal reflection, formation of action scripts, and

strengthening or transformation of meaning schemes.

#### *Working Alongside a Mentor*

Working alongside a mentor, also called “job shadowing” was a training program in which novice learnt about a job while working as a shadow to an experienced TSE or a mentor. This training is a linkage between theoretical learning and practical learning. It allowed the novices to observe their mentors’ problem-solving process and to experience the work environment and occupational skills in practice. A new TSE said:

*Job shadowing gave me the first chance to go to the work floor and feel the work atmosphere and look at the work environment closely. Now, I have a clear picture what I’m supposed to do in my job. It’s really a good learning experience. I listened to the conversation between my mentor and customer. I observed what my mentor did when she handled the call. I know exactly what the call handling process looks like and what I’m supposed to do on the call. She (mentor) was amazing, she could ask very logical questions to isolate the problem, and got the problem solved quickly. Also I noticed she was typing the key points on the screen quickly, and searching for the information online while she’s talking to the customer. Also she spoke English very fluently and understood everything that customer talked about. I hope one day I can work like her.*

The analysis of field data showed that the main knowledge building actions of TSEs, when working alongside a mentor, were observation, interpretation, trial and practice, experience, comparison, communication, reflection, and strengthening or transformation of meaning schemes. During the “job shadowing”, the TSE learned from the mentor’s behavior through observation. Interpretation enabled the novice TSEs to understand the meaning of their observation, to recall past theoretical (semantic) memories of similar issues or situations, and to create a relationship between prior theory memories to real issues, and to associated actions within the specific context. Comparison was the process of looking for any differences between

theoretical understanding and practical understanding. The comparison might lead the TSEs to question previous understandings based on conceptual learning. Communication allowed the novice TSEs to check for misunderstandings, and to confirm if others had the same understanding. Working alongside a mentor gave novice TSEs many opportunities to question their mentors. Reflection helped the novice TSEs to review their previous meaning schemes or action scripts. In the end, this process might lead to strengthening or transformation of meaning schemes.

#### *Practice under the Guidance of Mentors*

Practice is a polymorphic action of systemically applying one's knowledge and skills to a real job task in the social context. During the mentoring process, a mentor who had a few years work experience and held some tacit knowledge sat beside novices and kept an eye on the novice's call handling process. He/she guided the novice to actively apply their initial action script to a real problem. This activity enabled the novice TSEs to make the linkage between theory and practice. When the novice encountered a tough problem or made a mistake, the mentor would provide support. After the novice had finished a call handling, the mentor would give feedback and provide one-to-one coaching. This mentoring and coaching process provided many opportunities for the novices to learn from their mentor, and to ask their mentor questions about problems they encountered in practice. Also, it allowed the TSE to confirm that he/she had a correct perception or action script. Mentoring and coaching were common knowledge transfer mechanisms to help novice TSEs build up their tacit knowledge in practical activities. These mechanisms also helped the TSEs refine, revise or generate new action scripts.

The main knowledge building actions under the guidance of mentors were observation, trial and practice, experience, interpretation, communication, reflection and strengthening or transformation of meaning schemes. The TSE gained some concrete experience within a particular context through practice. The concrete experience was interpreted by his/her meaning schemes, constructed by prior work

experience, education and training. The interpreting of the specific experience enabled a new or a revised meaning scheme (i.e., action scripts) to be generated, or facilitated current meaning schemes to be strengthened. The communication with the mentor could verify action scripts, and also enable the TSE to learn something new from the mentor's experiences. The reflection helped the TSE think about what was wrong and what was right in practice, and to correct their behavior. This process of reflection might strengthen or transform meaning schemes.

### *Feedback and Support*

The purpose of feedback and support provided by management teams was to point out TSEs' weaknesses, correct their misunderstandings and mistakes, and help them build up correct meaning schemes (action scripts). The analysis of field data showed that *feedback and support* played a critical role in helping novice and advanced beginner TSEs build their tacit knowledge. For example, the quality auditor would evaluate the call quality and give a score and feedback based on the TSE's call transaction monitoring. If a TSE was given a low score (<86), the quality auditor would set up a quality audit meeting with the TSE (conference meeting). During the meeting, the quality auditor would give feedback to the TSE, provide one-to-one coaching, and develop an action plan to help the TSE overcome his/her weaknesses. The quality auditor's feedback and support enabled the TSEs to calibrate their action scripts, rethink and refine their scripts, or create a new action script.

The following conversation shows how a culture coach helped a junior Chinese TSE to make small social talk with US customers. The culture coach said:

*I found you don't know how to start a small talk with US customers. I listened to some of your sample calls. It seems you like to ask questions about matters the customer doesn't want to talk about on the call, such as, "oh, have you ever been in China?" "Oh, what do you think about Olympics." These types of questions that I don't think add value to the customers. Please don't talk about things that customers do not understand, or have a very*

*limited understanding of. You can talk about things like pop culture with American customers, for instance, if you know all people in American Idol, or you know five basketball teams, those types of things, I would say, yeah, you really understand communication with American customers. We serve Americans, Canadians, Australians and New Zealanders, and especially the first two, they are not gonna so interested in talking about things they do not have an understanding of. They have a problem with their computer, they want to fix it, usually in 16 minutes. Otherwise, they gonna feel like why you are wasting their time. Not so much “Are they interested in China”. “Do they want to come and visit Dalian?” These types of things are not appropriate, for most American customers, especially talking about this on the phone to someone, whose computer is broken. Maybe, this kind of conversation should be with someone you meet randomly on the street, things like that. Americans or Canadians are not interested in these types of things. Someone has a business, their computer is not working, and it’s little bit different about mindset. So you should understand that.*

A TSE said:

*Oh, really. I didn’t realize American customer don’t like to talk about that kind of thing. You know, in China, people like to introduce their hometown and invite people to come, to show their hospitality. Just like “have you been to China?” we are happy to introduce our country and hometown to people. Uhhh... Sorry, I don’t realize this. In future, I’ll try to talk about something the American customer is interested in. I’m gonna learn something about American idol and basketball teams to fit their tastes, so that I can have a small social communication with them. Thanks for telling me. That’s really helpful.*

This example demonstrates how a culture coach can help TSEs to restructure their mental model about how to start a small social conversation with US customers.

The main knowledge building actions in the *feedback and support* knowledge building activities included communication, calibration, internal reflection and strengthening

or transformation of meaning schemes. Communication was used to express their ideas. It enabled TSEs to check if others had similar idea to them. Calibration was a process that enabled TSEs to adjust and modify their action scripts, and ensure their meaning schemes were on the right track (i.e., their behavior would be accepted by an organization or a group of people). In order to revise or modify their action scripts, they must reflect on the way they have consciously applied ideas in implementing each phase of action. Internal reflection might result in TSEs transforming their meaning schemes.

#### *Knowledge Sharing Activity*

A knowledge sharing meeting was also known as a knowledge reciprocation meeting. People often learn best by sharing their theories and experiences with each other (Raelin, 1997). The junior TSEs (i.e., novice and advanced beginner) could always learn something from weekly knowledge sharing meetings, as they had some experience from practice, and had gained a basic level of absorptive capacity to understand senior technicians' discussions. In the meeting, they could use the technical language they had learned to discuss new solutions from different angles. Thus, they could absorb new ideas and pick up problem-solving tips from others in the meeting.

In the knowledge sharing activity, the key knowledge building actions included communication, verification, reflection and strengthening or transformation of meaning schemes. Communication encouraged TSEs to share their knowledge with each other. It enabled TSEs to present their ideas on how to handle the problem in their own ways. During the sharing process, their ideas were discussed and evaluated by other group members. The others' suggestions or recommendations could encourage TSEs to think about and reflect on their mental models or meaning schemes.

*Tackling Challenging Tasks and Roles*

In their daily work, each TSE encountered some challenging tasks and jobs. At the novice level, TSEs tried to apply pre-existing knowledge into a real world problem. During this process the environment played an important role in shaping the TSEs' ideas and intentions. For example, TSEs might have followed the instruction from senior technician rigidly or tried to apply the solution learned from a knowledge repository to a customer's problem. Sometimes, the instruction or solution did not work very well (i.e. some unexpected thing happened), because the knowledge codified in the knowledge repository was generalized and therefore did not work in a particular situation (the context was not exactly same as the situation mentioned in the document). If an unexpected situation occurred, the novice level TSEs did not have the knowledge to make a judgment. They had to ask experienced colleagues what to do next. These challenges in application of theory or pre-existing knowledge provided opportunities for novice TSEs to obtain practical experience and build some tacit knowledge during the problem-solving process.

At the competency level, TSEs had free mental resources so that they were able to invest mental resources in learning about more difficult issues. Mental resources refers to "whatever it is that limits the size of mental task we can handle" (Bereiter & Scardamalia, 1993 p. 84). For a beginner, the demand on mental resources was much greater than for experienced skilled people. For skilled people, a great deal of mental activity was not resource-demanding. In other words, there was little or no effect on the resources available for thinking. For example, as a support engineer, TSEs had to deal with several skills at once, such as searching, typing, listening, speaking and thinking during the problem-solving process. The novice TSE and advanced beginner did not have a reasonable level of skills, and the demand on mental resources was considerable. When a beginner handles a problem on the phone, he/she had to start by drawing on remembered facts and rules and piecing together already-available knowledge. At the same time, procedures had to called up separately, such as checking out unfamiliar technical terms that customer

mentioned in the knowledge database, figuring out who might know the solution to the problem, searching for this person's telephone number, or MSN account, calling them, and putting the customer on hold. At the same time, they needed to find an alternative option, in case the first option did not work. All these actions required mental resources. However, a competency level TSE could deal with all these actions at the same time, because they could handle some aspects of the problem more or less automatically. As their pattern matching and procedural operating skills improved, the TSEs might no longer be aware that their actions involve thinking about the possible causes for the problem, and searching for key words in the knowledge repositories while he/she is having some social communication with the customer. By handling some aspects of a problem more or less automatically, the competency level TSE had the mental resources to spare for paying more attention to other aspects of the problem that previously had to be ignored, such as developing a good social conversation with the customer. The competency level TSE expanded their knowledge in ways that brought more complexities to light. In summary, trial, experience and reflection reinforce the tacit knowledge acquired in practice, and increase the TSEs' speed in problem solving. As a result, they had free mental resources to focus on more complicated issues.

The TSEs at the proficiency level had a different knowledge building process from those at competency level, novice and advanced beginner. For them, most problems were solved effortlessly without much thinking. Occasionally they might encounter an unfamiliar complex problem. The proficiency level learner would adopt a progressive problem-solving strategy. They would try to construct new concepts and methods for unfamiliar problems, unlike the competency level TSE, who might adopt a problem-reducing strategy to solve a new problem, and handle the new problem as routine procedures in order to reduce the work of developing new solutions. Problem reduction refers to "the commonplace view of problems as things to be gotten rid of, to be reduced in number and severity. It also represents a common way in which problems are handled" (Bereiter & Scardamalia,

1993 p. 99). The proficiency level TSEs would put more effort into solving the unfamiliar complex problems. They knew that the newly recognized complex problem could not be simply resolved by a problem-reducing strategy, but only by constructing new knowledge, because they were aware of the inconsistencies between existing means schemes and new knowledge. During the progressive problem solving process, there was an intention to create new knowledge. They could recognize that prior mental schemes (i.e. action script) were inadequate as a basis for advances in complexity and that they had to transform the meaning schemes to overcome the problem. Therefore, the proficiency level of TSEs approached the new way of problem-solving through fusing the knowledge acquired and ideas inspired from the group discussions and actions to formulate new knowledge. In other words, instead of fitting the task to their existing competence, the proficiency level of TSEs extended their existing competence in order to fit the requirements of the task. Since more efforts were put in the progressive problem solving process, they learnt more from the experience than other levels of TSEs.

In the tackling of challenging tasks, the main knowledge building actions of TSEs were trial and practice, experience, interpretation, communication, and reflection, calibration, and meaning schemes transformation. In the process, TSEs experienced some difficulties in using old action scripts or meaning schemes to understand new situations or to solve new issues. During the process, there were many conflicts between the previous meaning schemes and new issues. To solve this kind of issue, the TSE had to critically reflect on his/her previous meaning schemes and action scripts. Many communications were made with experienced colleagues, and many trials and practices conducted. In the end, he/she might transform his/her meaning schemes or action scripts, and thus gained some new experiences in the new situation.

*Consultation Within and Outside the Working Group*

At the competency level, TSEs needed to consult with technical leaders in the working group or even with US senior technician outside the working group to get advice when dealing with some issues they could handled by themselves. The consultation activity helped the TSEs to collectively solve the issues with the senior technicians. The TSEs might have some discussions with the senior technician and obtain some new solution (knowledge) from senior technicians directly. This enabled the TSEs to expand their knowledge and gain some new perspectives for problem-solving, which could inspire them to generate new ideas to solve the difficult problem. This activity also enabled TSEs to build their social network communication skills and coordination and cooperation skills.

In the consultation process, the key knowledge building actions included interpersonal communication, trial and practice, experience, internal reflection, and strengthening or transformation of meaning schemes. The interpersonal communication helped TSEs to acquire senior technicians' new ideas and new solutions. Trial and practice involved applying the new solution acquired from senior technician to the problem with the understanding that some solutions may work and others may not. This specific experience enabled TSEs to reflect on their prior meaning schemes. In the end, they might modify their prior meaning schemes or reinforce their prior meaning schemes.

*Coaching and Mentoring Junior TSEs*

Some TSEs at the competency and proficiency levels were qualified to coach and train junior TSEs. Coaching and mentoring activities required the TSE mentors or trainers to express their knowledge clearly and logically. This meant they needed to systematically examine the procedures and assumptions they made when problem solving. Coaching and mentoring activities also provided an opportunity for the TSE mentors or trainers to reinforce their tacit knowledge through articulating the knowledge. They could challenge and test the assumptions underlying their action in

situations. Furthermore, this coaching activity also helped the mentors or trainers to improve their communication, mentoring and coaching skills.

In the coaching and mentoring process, the key knowledge building actions for the proficiency level TSEs included communication, internal reflection, and strengthening or transformation of meaning schemes. Communication aims to express their prior experience and knowledge through metaphors, analogies, or actions in the junior TSE coaching and training process. If junior TSEs challenged their understandings and explanations, the proficiency level TSEs needed to reflect on the way that they had consciously implement each step of problem-solving. In addition, by coaching and mentoring junior TSEs, they could also make their personal tacit knowledge explicit. It could assist in strengthening or transforming their meaning schemes.

Table 6.7 summarizes key knowledge building activities and knowledge building actions identified at Alpha.

**Table 6.7 A Summary of Key Knowledge Building Activities and Actions at Alpha**

<b>Main Knowledge Building Activities</b>	<b>Main Knowledge Building action</b>
New employee training	attention-drawing, interpretation, remembering, interpersonal communication and internal reflection, and formation of action scripts (meaning schemes)
On-job-training	attention-drawing, interpretation, interpersonal communication, internal reflection, formation of action scripts, and strengthening or transformation of meaning schemes
Working alongside a mentor	observation, interpretation, trial and practice, comparison, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes
Practice under the guidance of mentors	observation, trial and practice, experience, interpretation, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes
Getting support and feedback from management team	interpersonal communication, calibration, and internal reflection, and meaning schemes transformation
Knowledge sharing meeting	interpersonal communication, verification, and internal reflection, and strengthening or transformation of meaning schemes
Tackling challenging tasks and roles	trial and practice, experience, interpretation, interpersonal communication, internal reflection, calibration, and meaning schemes transformation
Consultation within and outside the working group	interpersonal communication, trial and practice, experience, internal reflection, and strengthening or transformation of meaning schemes
Coaching and helping new TSEs	interpersonal communication, internal reflection, and strengthening or transformation of meaning schemes

## **6.2 The Initial Model of Individual Basic Knowledge Building Process**

Drawing upon the analysis of the data collected from individual TSEs' interviews and participant observation at Alpha offshore TSC, the research findings identified the TSEs' key knowledge building activities and knowledge building actions, which are summarized in Table 6.8. In this study, the knowledge building process consists of a series of activities that enable individual tacit knowledge building. Activities comprise a series of actions which can help to build up tacit knowledge, such as new employee training, and working alongside a mentor. Actions include a set of subtasks, which contribute to individual tacit knowledge building activity, such as observation,

trial and practice, and internal reflection. The relationship among actions, activities and processes is the process of individual knowledge building comprises a number of activities, each activity involving a series of actions.

It was noted that TSEs built up their tacit knowledge at Alpha through nine key knowledge building activities.

**Table 6.8 A Summary of Main Knowledge Building Actions in the Key Knowledge Building Activities at Alpha**

Key Knowledge Building Activities	Main Knowledge Building Action													
	AD	CA	CP	E	I	IC	AS	IR	STM	O	INR	TP	V	
New employee training	✓				✓	✓	✓	✓			✓			
On-job-training	✓				✓	✓	✓	✓	✓		✓			
Working alongside a mentor			✓	✓	✓	✓		✓	✓	✓		✓		
Practicing under the guidance of mentors				✓	✓	✓		✓	✓	✓		✓		
Gaining support and feedback from management team		✓				✓		✓	✓					
Tackling challenging tasks and roles		✓		✓	✓	✓		✓	✓			✓		
Consultation within and outside the working group,						✓		✓	✓				✓	
Knowledge sharing meeting				✓		✓		✓	✓			✓		
Coaching and helping new TSEs						✓		✓	✓					
Total frequency:	2	2	1	4	6	9	2	9	8	2	2	4	1	

AD: Attention-drawing,

CA: Calibration

CP: Comparison

CE: Concrete Experience

I: Interpretation,

IC: Interpersonal Communication

AS: Formation of Action Scripts

IR: internal reflection,

STM: strengthening or transforming meaning schemes

INR: Interpretation & Remembering,

O: Observation

V: Verification

TP: Trial and Practice

Knowledge building actions have been divided into three groups according to frequency: primary knowledge building actions, secondary knowledge building actions and occasional knowledge building actions. The primary knowledge building actions consist of internal reflection (IR: 9), strengthening or transforming meaning schemes (STM: 8), interpersonal communication (IC: 9), interpretation (I: 6), trial and practice (TP: 4), and concrete experience (E: 4). The secondary important knowledge building actions include attention-drawing (AD: 2), calibration (CA: 2), formation of action scripts (AS:2), observation (O: 2), and interpretation and remembering (INT: 2). The occasional knowledge building actions consist of comparison (CP: 1) and verification (V: 1). Since occasional knowledge building action is not important, it has

been ignored.

Analysis of the interview data showed that most respondent TSEs had a similar knowledge building experience. They started by learning some basic conceptual knowledge in the new employee training and applied this conceptual knowledge into their work. They gained some skills and knowledge through their daily-job-based practice and experience. They communicated with others to confirm if others had the same understanding and feelings about the experience, and then corrected any misunderstandings through reflection. The TSEs considered that this constituted a continuous improvement process (This process is elaborated in the following subsection 6.2.1 and 6.2.2).

Based on the analysis of the key knowledge building activities and actions identified from the case study and interview data collected at Alpha, a basic tacit knowledge building process model has been developed (see Figure 6.2). In this diagram, the primary knowledge building actions are compulsory steps, while the secondary knowledge building actions are selective steps. Each step in the individual tacit knowledge building process will be addressed in detail in the following sections.



knowledge seeding is the process of planting the core conceptual knowledge through prior work experience and education, or through organization training programs, manual or document learning, and e-learning.

The organization training programs included basic computer concepts, basic problem-solving rules, steps in problem diagnosis, organizational structure, and problem escalation rules. The knowledge seeding process delivered a broad range of conceptual knowledge and skills in the various fields. The basic concept knowledge included the composition of computer and its working principles. The basic work related terms included computer terms such as BIOS (Basic Input and Output Systems), CMOS (Complementary Metal-Oxide Semiconductor), and SATA (Serial Asynchronous Terminal Adapter). Other topics covered included how to clear CMOS, how to reseat a memory stick, and familiarization with basic trouble-shooting steps.

### ***Explicit Learning Loop***

The knowledge acquired during explicit learning is verbally describable (Hayes & Broadbent, 1988). This definition was developed by Hayes and Broadbent, who identified two independent systems of learning in humans: explicit learning and implicit learning. The explicit learning refers to the learning that proceeds with the subject's awareness of what is being learned. The implicit learning refers to the learning that takes place without the learner's awareness that he or she is learning. The knowledge acquired during implicit learning is tacit knowledge, which is deeply rooted in action.

In the case of explicit learning, it was found that the non-experienced TSEs needed to learn some core conceptual knowledge related to their job through a trainer or mentor. Trainers drew their attention to some core conceptual knowledge, the TSEs learnt the new concepts, used this prior knowledge to interpret the new concepts, and then remembered them. They could discuss their understanding of the new

concept with trainers or colleagues, see if others had the same understanding of the conceptual knowledge, internally reflect on what they had learnt and as an outcome, develop their initial meaning schemes and action scripts.

This model shows a continual four-stage conceptual knowledge learning loop. This loop builds up basic conceptual knowledge through knowledge awareness and attention, knowledge interpretation and remembering, communication and internal reflection. Maclagan (1995) emphasizes that conceptual knowledge make it possible for individuals to use the theories to help them communicate with others. This basic conceptual knowledge provided TSEs with a basic absorptive capacity, which enabled them to communicate with knowledge providers and reduce the knowledge gap with the knowledge provider.

The explicit learning loop builds the core conceptual knowledge and upgrades previous meaning schemes and frame action scripts, that is, event sequence schemes (Mezirow, 1991). Upgrading meaning schemes or framing actions scripts is a process of examining prior meaning schemes, and using a prior interpretation to construct new conceptual knowledge in order to frame action scripts to guide future action.

#### *Awareness and Attention*

During the conceptual knowledge learning process, the TSE is exposed to a considerable amount of knowledge. However, the TSE cannot pay attention to everything that is taught in the organizational training. Therefore, the trainers drew the TSEs' attention to the core conceptual knowledge. However, many TSEs said that only the knowledge that could be recognized and matched previous memories of similar knowledge attracts their TSE's attention. Once the knowledge had drawn their attention, they were likely to spend more time in learning it and remembering it. Mezirow (1991) suggests that meaning schemes (i.e. previous unreflective assumptions) "determine the focus of attention and what will enter our awareness" (p. 49). D'Eredita & Barreto (2006) have a similar view of "drawing attention", in

suggesting that the mentor/trainer both guides the apprentice's attention to the relevant knowledge, and helps them relate the knowledge to previous experience.

Following is an example of how a previous bad experience enabled a TSE to realize the importance of the knowledge, which encouraged the TSE to learn a particular skill. A TSE said:

*I learnt lots of things from the new employee training. Before I worked here (Alpha), I thought my prior knowledge was good enough to handle this job. After two months training, I realized there were some new things (knowledge) that I hadn't paid much attention to in the past, for example, logical troubleshooting steps, before I took this training program, I would say I can solve some problem by myself, but the problem-solving process always took too much time as I spent much time finding the possible reasons that cause the problem in different ways. After this training, I realized that troubleshooting is actually a logical thinking process. I paid much attention to logical thinking skill, because I think this skill can help me solve the problem more effectively than I did before.*

#### *Knowledge Interpretation and Remembering*

The knowledge drawn to the TSE's attention would be interpreted by their prior meaning schemes which have been built by previous experience and educational background. Through this process, the interpretation of new knowledge may confirm, change, extend, reject or strengthen prior meaning schemes. The new perceptions and explanations of the meaning of new knowledge would be remembered by integrating them with prior knowledge, which will guide the TSE's future actions.

#### *Communication*

After some learning, TSE had acquired some new knowledge, and had new perceptions and understandings of the new knowledge. In order to verify the

correctness of their understanding and perceptions, many TSEs said that they liked to talk about their understanding with colleagues and trainers. The communicative action allowed TSEs to discuss the meaning of new knowledge instead of passively accepting knowledge defined by others. The communication helped TSEs arrive at an understanding about the meaning of a common experience. Communicative action can also help TSEs reinforce what they learned through communication.

### *Internal Reflection*

As already noted in this study, internal reflection plays an important role in learning. Mezirow (1991) suggests that the internal reflection can take us into new meanings. He identified three forms of reflection based on the object of the reflection itself: content reflection, process reflection and premise reflection (see Section 2.4.2).

After the TSE had acquired some new perceptions through communication, the TSEs reviewed their understanding of conceptual knowledge, problem solving strategies and steps. The review activated a correction of any misunderstandings and misconstrued meaning schemes. At this stage, the type of internal reflection was adopted by TSEs is content reflection.

The upgraded meaning perspectives as a result of internal reflection may enable the TSE to pay attention to some new knowledge, and the new knowledge awareness triggers a new loop of explicit learning.

After the Phase One of knowledge seeding and explicit learning loop, the storage of the conceptual knowledge in the semantic memory and the upgrading of the TSE's meaning schemes were combined into action scripts. After the action scripts built, the implicit knowledge building process began.

### **6.2.2 Phase Two—Implicit Learning Loop:**

The received knowledge (i.e., conceptual knowledge) learned from Phase One is isolated individual concepts; there is no internal relationship between the isolated concepts or theories. In Phase One, many TSEs said that although they had learnt some core knowledge related to their job through the training program, they could not solve a real world problem. There are two reasons for this. First, they did not know how to apply the theoretical knowledge into a real world problem. Second, they did not know how to combine the theory or core knowledge together to solve a real world problem. At the Phase Two, the implicit learning loop would help TSEs to shift their minds from seeing part of picture to seeing the whole picture, to understand and find the relationships among the isolated core knowledge, so they can integrate all concepts and theories learnt from the explicit learning loop into a thinking systems or rule system of habitual expectation (orientations, personal paradigms), and meaning schemes (knowledge, beliefs, value judgments, and feelings that constitute a specific interpretation). These rule systems will enable TSEs to solve the real-world problem systematically.

Based on the analysis of data collected from interviews and participant observation and a review of knowledge building literature, this research identified that the implicit learning loop begins with the formation of action scripts (meaning schemes) and ends with meaning perspectives transformation. It consists of ten building actions: formation of action scripts, observation, interpersonal communication, internal reflection, active trial and practice, concrete experience, interpersonal communication, internal reflection, calibration loop and meaning perspectives transformation.

The “no video” problem-solving process will be used as an example to demonstrate how the TSEs build up their tacit knowledge in the implicit learning loop. This is a synthesized example derived from many live case examples. The steps are described

in the boxes to follow. In this example, the TSE is a novice, who has just finished new employees training, and has grasped some basic concept knowledge and developed his call handling scripts. He has just been assigned to a group on the live call center floor. The following section describes each knowledge building action in detail.

### ***1. The Initial Action Script Developed Through Training Program***

*Step 1: The initial action script developed through training program*

The novice has an action script of how to solve this problem, the script based on the knowledge he has learnt from training, manuals and a knowledge repository. He has never applied this script into a real problem, so he does not know what will happen when this script is implemented. The following is the action script the TSE built for this particular problem (i.e., no video problem).

- (1) Monitor is not turned on and the monitor light is not on. Turn on the monitor and check that the monitor light is on.*
- (2) The cable connections are not correct. Check the cable connection from the monitor to the computer and check the electrical outlet.*
- (3) Reconnect monitor*
- (4) The brightness needs adjusting. Adjust the brightness control.*
- (6) Swap with a known good monitor.*

In the discourse example, the initial “no video” problem-solving action script is a set of linked diagnostic and action procedural steps, built in the knowledge seeding and explicit knowledge learning phase. It has not been tested or tried in a real world problem by the TSE. Thus, the initial action steps have not been combined with a specific context.

### ***2. Observation***

During the observation, the TSE observed how his mentor handled a real problem with a real customer, how he/she responded to a customer’s questions, how he/she worked out a solution, and how the problem-solving action script worked with a real problem. This observation helped the TSE to understand what he was supposed to do in his job.

*Step 2: Observation*

In the job shadowing program, he sat beside his mentor and observed his mentor's problem-solving process. He thinks his mentor did very well in the problem-solving process. His mentor isolated the possible reason in two steps of trouble-shooting. However, he found that his mentor did not exactly follow the script because the mentor asked the customer to reconnect power cable and video cable, and then she found the reason for the problem by asking the customer to swap with a known good monitor. She did not ask the customer to check if the monitor was powered on, and did not ask the customer to adjust brightness.

Bandura (1986) points out that people usually learn behavior from observing others before they perform the behavior themselves. During this learning process, the experienced TSEs demonstrated the call handling process and work procedures to new TSEs. The job observation (i.e. job shadowing) increased new TSEs' job awareness, helped them to develop a mental model through examples, and helped new TSEs link the classroom learning to the work requirement. This finding is consistent with Paris and Mason's (1995) study. Thus the TSE learnt a great deal through observing the experienced TSE's behavior.

### **3. Interpersonal Communication**

#### *Step 3: Interpersonal communication*

After his mentor finished the call, he asked his mentor:

*Novice: “during your trouble-shooting steps I noticed you didn’t ask the customer to power on monitor and did not ask him to adjust brightness. How do you know they are not the possible reasons for the problem?”*

*Mentor: “yeah, that’s right, I didn’t do those two trouble-shooting steps because the customer said he turned on his computer this morning, and everything had worked fine that hadn’t made any changes to his computer, and after lunch, he came back to his office, he found his computer had no display. That means he hadn’t adjusted the brightness control. According to the customer description, I can see there could be two reasons for the problem. First, it could be disconnection of the monitor power by accident. Second the monitor could be faulty. So I did these two trouble-shooting steps and found the reason.”*

*Novice: “Ok, I see, based on the customer’s description, you eliminated two possible reasons.”*

*Mentor: “yes, you have to listen to the customer carefully. The customer will give you some clues, and according to the clues, do some deduction and logical thinking, and you will find an easy way to solve the problem.”*

During the job observation process, the TSE had some discussions with his mentor about why she had not follow the action script exactly and had omitted two steps. The communication enabled the TSE to better understand how to apply his initial scripts to a real world problem. The interpersonal communication also allowed the TSE to know if others would have done the same in these circumstances.

### **4. Internal Reflection**

After observing his mentor’s call handling process and discussing this with his mentor, the TSE started to check his initial script through internal reflection, which helped him to compare his initial assumptions with what he actually saw when someone else demonstrated the activity.

*Step 4: Internal reflection*

After having communicated with mentor, the TSE realized that the trouble-shooting script only gave some directions for problem diagnoses. The script should be used flexibly, and adapted to the particular situation.

The internal reflection helped the TSE correct and refine his initial script and to develop a practical mental picture of the problem-solving process. Once the script was confirmed, the TSE could then try it.

**5. Trial and Practice**

After job observation, interpersonal communication and internal reflection, the novice TSE had developed mental models and cognitive maps to guide his trial. However when he applied the script into a real problem, he confronted a difficulty as his action script did not help him solve the problem. This difficulty was caused by an inconsistency between theory and practice. Argyris and Schon (1974) refer to this inconsistency as a difference between one's "espoused theory" and one's "theory-in-use." Espoused theory is the conceptual knowledge with which one enters a situation. In this example, the TSE put the conceptual knowledge (i.e., action scripts or schemes) into action within a particular context. He encountered an unexpected situation which was not mentioned in the manual or knowledge repository. Thus, he had to modify or adapt the conceptual knowledge to the circumstances at hand.

*Step 5: Trial and practice*

On another day, the novice TSE was asked to solve a problem of “no display” on the telephone. This is the first time that he had encountered this real problem.

*Diagnosis process*

Based on the trouble-shooting script, he did following things to diagnose the problem.

- (1) *Asked customer if the monitor is turned on. Customer said she saw the monitor light is on.*
- (2) *Asked customer if the cable connects from the monitor to the computer, the customer said yes.*
- (3) *Asked customer to reconnect the power cable to electrical outlet and reconnected the video cable from the monitor to the computer. Customer said same thing, problem still there.*
- (4) *Asked customer if the video cable connect to the right video card, the customer said only one video card, should be correct.*
- (6) *Asked customer found another known good monitor to connect to computer. The customer said it's same problem.*

*Asking for help*

He tried his diagnosis script. Unfortunately, he did not isolate the mode of failure. Then he put the customer on hold, and went to ask the technical leader for a solution.

Tech leader asked him to collect more information.

*Go and ask the customer if she can power on the computer or not,*

*Check with the customer if the power LED is on or off,*

*Check if she hear the fan spinning.*

He went back to ask the customer

*Customer said: “this morning, when she powered on the computer, she saw the power LED was on, and she heard the fan spinning, then the fan stopped, the LED off, screen went blank. When she tried to power on the computer the second time, nothing happened, the power LED did not flash, and there was any noise.”*

The Tech leader asked him to guide customer to “dry boot” (i.e. remove battery and AC power, press and hold power button for one minute and then power on computer). Then computer could be powered on and had a screen display. The problem was solved.

He asked the tech leader why “dry boot” could solve the problem.

*The tech leader said that “if computer cannot power on properly, you should consider isolating the power problem first. This problem could be caused by the unstable power environment, press and holder power button can discharge electrostatic, refresh BIOS setting. So the problem could be solved.”*

## 6. Concrete Experience

### *Step 6: Concrete experience*

In the call handling process (step 3 trial and practice), the novice TSE realized that his initial script did not cover all possible cause. Also, he realized that the power supply issue could also cause the screen problem. Further, he was aware that static electricity affects the power supply, which could lead to computer booting up failure. In addition, he knew “dry boot” was an easy and quick way to solve the power on problem.

In the discourse example, the novice TSE gained some direct perception or immediate apprehension through the call handling process. This perception or immediate apprehension is a subjective process, which cannot be known by others because the apprehension is acquired through a here-and-now experience. In the trial and practice process, the TSE encountered an inconsistency between theory and practice. This inconsistency brought some challenges and he gained some new experience and some new learning opportunities. The new experience was interpreted through the TSE’s prior meaning perspectives (formed by prior work experience, education, and structured new employee training) to generate a new or a revised interpretation of the meaning of the experience, or strengthen the current meaning schemes or perspectives. The new or revised meaning schemes would be used to guide future action, and the new experience and the event would be remembered by integrating them with past experience (Mezirow, 1991).

## 7. Interpersonal Communication

In the example, the novice TSE gained some concrete experience through the call handling process. This experience might lead the TSE to revise or reinforce his meaning schemes or action script. The change or reinforcement of the action script could involve the TSEs in interpersonal discussions with mentors or experienced TSEs to find out if they had the same experiences.

*Step 7: Interpersonal Communication*

After he gained some experiences in the call handling process, he talked about this experience with his colleague during the coffee break. He told the colleague that he thought “dry boot” was the quickest way to solve “blank screen” problem. His colleague said

*“yes, in this particular case, the “dry boot” solved the problem. It is worthwhile trying “dry boot” before you do further trouble-shooting if you encounter a power on problem. It is an effective way to solve the problem, but in fact, “dry boot” can solve only a small percentage of power on problems. Most of time, it does not work.”*

Also, his colleague said

*“dry boot” can not solve the problem completely. I found that “dry boot” can work sometimes, but I cannot guarantee it works every time. I solved some power on problems by using “dry boot” on the phone, and I got happy customers initially. But, I found some customers called back again, because the power on problem was still there. The customer still could not power on their computer properly. They became get frustrated. So I suggest if you really want to solve customer’s problem, you need do further trouble shooting and find the real reason. Most of time, “dry boot” cannot really solve the power on problem.”*

After having chatted with his colleague, the TSE has new perception of “dry boot” and knows more about “dry boot”.

The communication also allowed the TSE to learn more about other people’s experiences, and to understand their experiences. In addition, interpersonal communication on his/her experiences may help the TSE make the tacit knowledge explicit that he has learnt from observation and achieved in practice, and bring the inherent tacit knowledge gained from experience to the surface.

## **8. Internal Reflection**

*Step 8: Internal reflection*

After exchanging the experience with colleagues through interpersonal communication, the new perception will lead to a reflection on the previous trouble-shooting process. He rechecked his initial script through internal reflection, and as a result, refined his previous script based on his new perception.

In the process of interpreting an experience or discussing a new assumption with mentor or colleagues, the TSE may find reasons to question their own assumptions, perceptions or meaning schemes. This question could trigger the TSE to critically reflect on his perceptions, thinking, feelings and action. The internal reflection would involve a critique of assumptions about the content or process of problem solving. The internal reflection would enable the TSEs to think about what they had done, and assess how they are doing it and then to decide how they could improve. The TSE's internal reflection could also involve a review of the way he/she has consciously applied ideas when implementing each phase of solving a problem, and how he/she goes about problem solving in relation to the procedures and assumptions he/she made when problem solving. The internal reflection may lead the TSE to transform his meaning schemes. It may result in an elaboration, confirmation, or creation of meaning schemes.

### ***9. Re-Trial (Calibration Loop)***

If the TSE found some conflict between prior meaning schemes and new schemes during the internal reflection process, he/she would start a calibrating loop. In this loop, the TSE refines or revises the previous action script or seeks out a new action script, after a new script is framed. He/she then would try to apply the new script into a real situation to gain some concrete experience and reinterpret the meaning of the new experience. After having discussed it with colleagues, and some deep internal reflection, the TSE needs to decide whether to start another round of calibrating loop or not. The calibration loop is a confirmation or enhancement loop; the TSE's meaning schemes or action scripts would gradually improve during the running of the loop.

*Step 9: Re-trial (Calibration loop)*

A few days later, the novice TSE encountered a similar problem “there is no display on the computer”, and recalled his previous experience. After he had verified the customer’s problem, he found it was a power on problem. He tried his revised script for this problem, but the problem was not solved. Then he learned a new way to isolate the problem from technical leader (i.e., remove all accessories, and add one back at a time). In this case, it involved removing all the accessories (such as hard drive, audio card, optical drive, printer and so on) only leaving the CPU, motherboard, memory, power supply and video card in the computer, and then powering on the computer. If the base system cannot boot up the computer, the problem could be caused by the CPU, motherboard, memory, power supply and video card. If he can make sure that the base system is functioning properly. He can then, add back each accessory, and test the functionality after each one. This helped him easily identify the faulty accessory. Also, he found that this was a good technique for helping him to eliminate possible causes, and he also found that this technique could be applied in many troubleshooting processes. He acquired a new concrete experience from the problem-solving process. The new concrete experience will trigger a new loop of script calibrating, changing and recreating.

Each time when he encountered a new problem, he could learn some new ways to solve it and gain a new perception about the problem-solving process. Initially, the perceptions of problem-solving might be confined to situations where problems are occurring and then can reoccur. After the third, fourth... or even tenth trial application of the script, the problem handling capabilities of the TSE would become increasingly mature which would allow the TSE to identify the slight differentiation between issues and categorize the issues. The TSE would keep verifying, changing and recreating the script based on the trial experience until the script is articulated and developed in a concrete form.

### ***10 Meaning Perspectives Transformation***

*Step 10: Meaning perspectives transformation*

During the process, through an iterative process of trial, experience, communication, reflection, the script is changed, refined and recreated, and the confidence of TSE builds gradually, and the application of the revised script becomes tacit requiring no conscious thought. In the end, the TSE generates more refined and more general predications. The generalized rule suits most of the “no video” problem situations, thus, the TSE can solve a “no video” problem by intuition, with little thinking.

With multiple applications of script, experience, and much communication and internal reflection, along with the remembering of many events and contexts in which the tacit knowledge (meaning schemes) has been relevant, the initial meaning schemes or action scripts have been revised, changed, and refined into an advanced and applicable script, which can be applied in many situations with a few adjustments. With meaning perspectives (stored in the semantic memory), interpretation and internal reflection, the meaning schemes or action script eventually will be transformed into a new meaning perspective (abstract concept or theory). It can be used to make decisions and affect personal behaviors. After the formation of new meaning perspectives, a new round of new concept (script) application and tacit knowledge building loop will start since “knowledge based on exploratory perceptual systems” (Gibson, 1988, p. 36), and knowledge building is a process of seeking true belief (Hildreth & Kimble, 2002).

In the implicit learning process, tacit knowledge building starts by exploring the simple problems first to acquire some experience. The perceptions of problem solving initially might be confined to situations where interactions are occurring. After the third, fourth... or even tenth trial application of the action script to solve the similar problem, the problem handling capabilities of the TSE become increasingly mature and allow the TSE to identify slight differences in the issues and to make slight adjustments to the solutions for the respective issues. After having successfully explored the simple issues, TSEs will extend problem solving explorations further to more difficult issues. This is the looping path of knowledge building. During the knowledge building process, knowledge continues to grow.

This example illustrated the knowledge building process from formation of action scripts (i.e., meaning schemes) to meaning perspective transformation (rule systems of integrated concept code, meaning schemes, the procedural action scripts, and personal paradigms). This example also demonstrated that with the implicit learning loop moving forward, the action scripts and meaning schemes are continually

reviewed and revised or reinforced, and this ultimately results in the transformation and strengthening of the meaning perspective. Eventually, it will become a true belief. Over time, these beliefs may become truths if they can be justified and are useful in coordinating individual action (Nonaka & von Krogh, 2009).

To sum up, individual knowledge building process from knowledge seeding to meaning perspective transformation goes through two dynamic loops: an explicit learning loop, and an implicit learning loop. These two loops enable the individual's tacit knowledge to become larger in scale and more accurate in application. This knowledge building process is an upward loop process, starting with knowledge seeding, moving to the individual tacit knowledge development through trial and practice, and then finally to the new refined meaning perspective.

The analysis of the Alpha field data identified the key knowledge building activities, knowledge building actions and the basic individual knowledge building model at Alpha. The Beta and Gamma onsite case studies were conducted after the Alpha case had been studied. These two cases were employed to verify the findings generated in the Alpha case study and to generalize a research model which suited the three cases. The following sections will present the details of the similarities and differences among the three cases.

### **6.3 COMPARING THE INDIVIDUAL KNOWLEDGE BUILDING PROCESS AT ALPHA AND AT BETA**

The following sections will compare the individual knowledge building processes at Beta and at Alpha.

### **6.3.1 A Comparison of Required Knowledge and Skills at Alpha and at Beta**

The main job duties of TSEs at Beta:

- ◆ Deal with customer inquiries
- ◆ Collect information including when and where the problem happened, the symptoms of the issue, and the contact person
- ◆ Create a case for the customer, take ownership of the case, and follow up the case until the case is closed
- ◆ Provide a problem diagnosis for the customer and give some advice to solve customer's problems
- ◆ Assign the different case to different group according to the type of product, customer and issues
- ◆ Assign a case to subcontracting company, contact subcontracting company and seek the onsite engineer's contact information and log in the case
- ◆ Follow up case handling progress and speed up the problem solving process
- ◆ Log all information on the case and release it onto the company website
- ◆ Facilitate a conference call among customers, onsite contract engineer and Tier 3 senior engineers. If there is communication difficulty such as language barrier between the customer and Tier 3 engineers, the TSE works as interpreter to help them communicate with each other
- ◆ Actively offer assistance to subcontract onsite engineer to solve customer's problem.

The key knowledge and skills required to this job at Beta included:

- ◆ Good language, communication and people skills
- ◆ Good knowledge about products, business processes, and local onsite engineer specialist, and local subcontracting company
- ◆ Knowledge of the customer's product history, such as maintenance and repair

history

- ◆ Question asking, diagnostic and trouble shooting skills, logical thinking, speaking, and listening skills
- ◆ Multitasking ability in decision making; options generating and evaluating; using knowledge resources (human, paper-based, electronic); peer cooperation; quick responding to the unanticipated problem
- ◆ Ability to learn about tools and processes quickly

The difference in knowledge and skill required at Beta compared to Alpha is in the level of communication, cooperation and technical skills. Beta requires their TSEs to have a higher level of communication skill, because the TSE is the single point of contact with the responsibility for facilitating communication among customers (business customers from Australia, Singapore, Hong Kong), Tier 3 engineers (engineers from Indian and Hungary) and local onsite subcontract engineers (such as Australia, Singapore, Hong Kong), the conversation involving three parties over two or three countries. Therefore, the TSE has to have excellent communication skills and coordinating skills. In contrast, at Alpha, the TSE only has one-to-one communication. So the TSE's job is relatively easier than that at Beta. Secondly, TSEs working at Beta require a higher level of diagnostic and trouble shooting skills than those at Alpha do.

A TSE from Beta said:

*It is very difficult to solve a problem on the phone, because there are many possible reasons for the problem. For example, a customer from a commercial bank call center called in and reported that the CMS (call management system) report had some problems. The CMS generate the report through retrieving the data from a server. So the problem could be caused by the CMS application, or caused by the server, for instance, the server has a problem in providing the right data. As all the problems are related to each other, it is really hard to isolate the problem on the phone.*

Thirdly, the business process is more complicated at Beta than at Alpha. Beta's support center has operated for less than two years in China, so their business process had some weaknesses, for example, on some occasions, TSE would handle a problem according to the business process, but the business process did not work properly, so the problem was not solved. In addition, Beta supported a wide range of products, each product supported by one or two TSEs in one group, with each TSE supporting two products. If they were not familiar with the products and did not know the different group's problem handling processes, it was very difficult for the TSE to assign a case to particular senior technicians or onsite engineers. This is different from Alpha which has a simple organizational structure. At Alpha, each group supported the same product and each TSE supported one product. Therefore, the TSEs working at Alpha had much easier job than those at Beta.

### **6.3.2 Comparing Knowledge Building Activities for TSEs at Different Knowledge Levels at Alpha and at Beta**

The analysis of field data showed that the different knowledge levels of TSEs at Beta had a similar pattern of knowledge building activities to those at Alpha. For novice and advanced beginner, the key knowledge building activities were *self-study with one-week-mentoring, specialized knowledge training, working with customers, business partners and colleagues, learning-by-trial, learning-by-error, tackling challenging tasks and roles and knowledge sharing*. Even though the key knowledge building activities at the novice and advanced beginner at Beta were similar to those at Alpha, the TSEs at Beta did not experience the knowledge building activity of *working alongside a mentor*.

For the competency and proficiency level of TSEs, the majority of knowledge building activities were *consultation within and outside the working group*, which focused on interpersonal communication and reflection knowledge building actions; the *challenge of the work itself*, which focused on trial, practice and concrete experience; *coaching and*

*helping junior technician*, which focused on interpersonal communication, internal reflection and meaning perspective transformation. The following section presents details of the differences in knowledge building activities for TSEs at Alpha and those at Beta for each knowledge level (see Table 6.9).

**Table 6.9 Comparing the Knowledge Building Activities for the Different Knowledge Levels of TSEs at Alpha and at Beta**

Knowledge level	Main Knowledge Building Activities At Alpha	Main Knowledge Building Activities At Beta
Novice & Advanced beginner	New employee training On-job-training Working alongside a mentor, Practice under the guidance of mentors Tackling challenging tasks and roles Support and feedback from management team Knowledge sharing	Self-study (document, manual, e-learning) One-week-mentoring Specialized knowledge training Working with customers, business partners and colleagues Learning by trial, learning by error Tackling challenging tasks and roles Knowledge sharing
Competency	On-job-training Challenge of the work itself Consultation within and outside the working group Coaching and helping new TSEs	Challenge of the work itself Consultation within and outside the working group Coaching and helping new TSEs
Proficiency	Challenge of the work itself Collaboration within and outside the working group Coaching and helping junior TSEs	Challenge of the work itself Collaboration within and outside the working group Coaching and helping junior TSEs

### 6.3.2.1 Novice and Advanced Beginner Levels

At Beta, it took novice a short time to move to advanced beginner because the TSEs had at least two years prior work experience at a TSC and had thus a higher level of knowledge acquisition ability and absorptive capacity. In the knowledge building activities at Beta, as there was little difference between the novice and advanced beginner so those two levels of learners have been grouped together.

At the novice and advanced beginner levels, TSEs aimed to become familiar with organizational products, customers and business processes, which would enable them to handle customers' common issues, and to perform the basic functions required in their jobs. The main difference in knowledge building activity at Alpha and at Beta at the novice and advanced level is in each organization's new employee training system.

Alpha provided a formal structured training system, where TSEs could get significant support and feedback from trainers, mentors and quality auditors during their knowledge building process and had many opportunities to discuss the issue with trainers or mentors to verify their understanding. In contrast, TSEs at Beta had to study by themselves. The knowledge building process at Beta tended to be based on *self-study, one-week-mentoring, specialized training, learn-by-trial, and learn-by-error*. TSEs carried out internal reflection as a way of challenging their assumptions.

**Table 6.10 Comparing the Required Knowledge and Knowledge Building Activities for the Novice and Advanced Beginner at Alpha and at Beta**

Required K & K building activities		Alpha	Beta
<b>Knowledge &amp; skills</b>	Conceptual knowledge	Computer software and hardware knowledge, products knowledge, business process and regulation	IP Phone infrastructure knowledge, products knowledge, business process and regulation, software applications knowledge
	Experiential knowledge	Question asking skill, facilitating social relations; trouble shooting skill; diagnosis; logical speaking; logical thinking; listening; searching; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; using knowledge resources (human, paper-based, electronic ); peer cooperation	People, language and communication skills; peer cooperation skill; diagnostic skill; logical speaking; listening; note taking; searching; theoretical thinking
<b>Knowledge building activity</b>	Conceptual knowledge building	New employee training On-job-training	Self-study with one-week-mentoring Specialized knowledge training
	Experiential knowledge building	Working alongside a mentor Practice under the guidance of mentors Tackling challenging tasks and roles Support and feedback from management team Knowledge sharing	Working with customers, business partner and colleagues Learn by trial, learn by error Tackling challenging tasks and roles Knowledge sharing

Table 6.10 shows a comparison of the basic required knowledge and knowledge building activities for the novice and advanced beginner levels at Alpha and at Beta.

It is found that the novice and advanced beginner levels of TSEs at Beta had the same knowledge building activities as those at Alpha did. The only difference between the Beta TSEs and the Alpha TSEs is whether they had some prior work experience related to their current job.

At Beta, the individual TSE had his/her own career path. Each TSE took care of two types of products and several corporate customers. For these two types of products, the TSE needed to be specialised in one, and have a general knowledge of the other. The training focused on developing individual skills to fit his/her career path. The core knowledge learned in the job training included IP Phone infrastructure knowledge; product knowledge, business processes, regulations, and software applications knowledge. TSEs obtained the knowledge through self-study, e-learning, one-week-mentoring, specialized knowledge training, and US senior technician onsite knowledge transfer.

At the novice and advanced beginner level, TSEs built up their knowledge through learn-by-trial and learn-by-error. They tried to apply the pre-existing knowledge (such as solution they found at the knowledge repository or manual) into a real world problem. Through this process, they learned how to apply a general knowledge in a specific situation, and how to adjust the general knowledge to adapt to situation changes. They critically reflected on the way they had solved the problem such as thinking what they did, and assessing how they did and then deciding how they could improve this. During this process, their general knowledge was gradually transformed to personal tacit knowledge rooted in individual experience, actions and involvement in a specific context.

### **6.3.2.2 Competency Level**

For the competency level TSEs, the knowledge building process was based on handling new unexpected problems. Since the unexpected problems were different from the general issues they usually handled, they needed to modify a pre-existing

solution until it could solve the new problem. Therefore, the main knowledge building activities for the competency level TSE at Beta were challenge of the work itself, consultation within and outside the working group, and coaching and helping new TSEs.

**Table 6.11 Comparing the Required Knowledge and Knowledge Building Activities for the Competency Level TSEs at Alpha and at Beta**

Required K & K building activities		Alpha	Beta
<b>Knowledge &amp; skills</b>	Experiential knowledge	Social communication, facilitating social relations; coordinate and cooperation skill; mentoring and coaching skills; perceptual skills; trouble shooting skill; diagnosis; logical speaking; logical thinking; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; using knowledge resources (human, paper-based, electronic); peer cooperation; quick responding to the unanticipated problem.	Coordinate and cooperation skill; social network communication skill; mentoring and coaching skills; perceptual skills; diagnosis skill; logical speaking, logical thinking; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; quick responding to the unanticipated problem.
<b>Knowledge building activity</b>	Experiential knowledge building	Challenge of the work itself Consultation within and outside the working group, Coaching and helping new TSEs	Consultation within and outside the working group Coaching and helping new TSEs; Challenge of the work itself

Table 6.11 is a comparison of the main required knowledge and knowledge building activity at the competency level at Alpha and at Beta. It is found that competency level TSEs at Beta have the same knowledge building activities as those at Alpha did. The only difference is whether they had any prior work experience through consultation within and outside the working group, and through coaching and helping new TSEs.

At the competency level, the TSEs at Beta have had some prior work experience through consultation within and outside the working group, and coaching and

helping new TSEs, so they can recall prior experience, reject, change and refine prior knowledge, and adapt it to the new scenarios. Thus, the knowledge building process for TSEs at Beta is to strengthen, refine and improve previous knowledge or skill through the knowledge building activities. In contrast, the TSEs at Alpha who are at the competency level normally do not have any experience in consultation within and outside the working group and coaching and helping new TSEs. Since most TSEs are recruited from graduates, their knowledge building process starts from scratch. It takes them more time and effort to build up knowledge and skills.

### 6.3.2.3 Proficiency Level

The TSEs at the proficiency level at Beta were senior technicians. They were the highest level technician in the group so they were supposed to handle the novel issues that junior technicians (i.e., novice, advanced beginner, and competency) could not solve. These issues could not be solved by directly applying and modifying pre-existing knowledge. TSEs had to create new knowledge or solutions. The main knowledge building activities for proficiency level TSEs were challenge of the work itself and coaching and training junior TSEs. Table 6.12 shows a comparison of the required knowledge and knowledge building activities for the proficiency level TSEs at Alpha and at Beta.

**Table 6.12 Comparing the Required Knowledge and Knowledge Building Activities for the Proficiency Level TSEs at Alpha and at Beta**

Required K & K building activities		Alpha	Beta
<b>Knowledge &amp; skills</b>	Experiential knowledge	Social communication, facilitating social relations; coordinate and cooperation skill; mentoring and coaching skills; theoretical thinking; decision making; generating and evaluating options; quick responding to the novel problem.	Coordinate and cooperation skill; social network communication skill; mentoring and coaching skills; theoretical thinking; decision making; generating and evaluating options; quick responding to the novel problem.
<b>Knowledge building activity</b>	Experiential knowledge building	Challenge of the work itself, Collaboration within and outside the working group, Coaching and helping junior TSEs	Challenge of the work itself, Collaboration within and outside the working group, Coaching and helping junior TSEs

The research findings showed that at the proficiency level, the TSEs working at Beta and Alpha had the same knowledge building activities.

### 6.3.3 Comparing the Key Knowledge Building Activities and Actions at Alpha and at Beta

At Beta, the analysis of field data identified seven key tacit knowledge building activities: self-study, specialized knowledge training, working with customers, business partners and colleagues, knowledge sharing, tackling challenging tasks and roles, consulting within and outside the working group, and coaching and helping junior TSEs.

Table 6.13 compares knowledge building activities at Alpha and at Beta in five categories: explicit knowledge learning, initial practical learning, challenge of the work itself, consultation and collaboration, knowledge sharing and transfer. Two main differences areas can be seen in terms of explicit knowledge learning and initial practical learning. In the explicit knowledge learning category, at Beta, the key knowledge building activities for explicit knowledge learning were *self-study with one-week-mentoring* and *specialized knowledge training*. The self-study at Beta was different from the new employee training provided at Alpha. The main difference is that no trainer directed the attention of the TSE to the knowledge required. In order to become a qualified TSE, the TSEs needed to set their own goals and focus their attention on the knowledge and skills needed to achieve their goal. Therefore, in the self-study activity, there was no *attention-drawing by trainer* and no *communication with trainer* knowledge building actions. However, the specialized knowledge training at Beta is similar to Alpha's on-job-training.

Table 6.13 Comparing the Key Knowledge Building Activities and Actions at Alpha and at Beta

Category	Main K Building Activity	Alpha Main K Building action	Main K Building Activity	Beta Main K Building action
Explicit knowledge learning	<u>New employee training</u>	<u>Attention-drawing</u> , interpretation, remembering, <u>interpersonal communication</u> internal reflection, and formation of action scripts (meaning schemes)	<u>Self-study with one-week-mentoring</u>	<u>Drawing-attention</u> , interpretation, remembering, internal reflection, and formation of action scripts (meaning schemes)
	<u>On job training</u>	Attention-drawing, interpretation, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes	<u>Specialized knowledge training</u>	Attention-drawing, interpretation, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes
Initial practical learning	<u>Working alongside a mentor</u>	<u>Observation</u> , <u>interpretation</u> , trial and practice, experience, <u>comparison</u> , interpersonal communication, internal reflection and strengthening or transformation of meaning schemes	<u>Working with customers, business partner and colleagues</u>	Trial and practice, experience, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes
	<u>Practice under the guidance of mentors</u>	<u>Observation</u> , <u>trial and practice</u> , <u>experience</u> , <u>interpretation</u> , <u>interpersonal communication</u> , <u>internal reflection and strengthening or transformation of meaning schemes</u>	N/A	N/A
	Getting support and feedback from management team	<u>Interpersonal communication</u> , <u>calibration</u> , and internal reflection, and meaning schemes transformation	Learn-by-trial, learn-by-doing, & learn-by-error	<u>Trial and practice</u> , <u>experience</u> , internal reflection and meaning schemes transformation
Challenge of the work itself	Tackling challenging tasks and roles	Trial and practice, experience, interpretation, interpersonal communication, and internal reflection, and meaning schemes transformation	Tackling challenging tasks and roles	Trial and practice, experience, interpretation, interpersonal communication, and internal reflection, and meaning schemes transformation
Consultation & collaboration	Consultation within and outside	Interpersonal communication, trial and practice, experience, internal	Consultation within and outside the working group	Interpersonal communication, trial and practice, experience, internal

Category	Alpha		Beta	
	Main K Building Activity	Main K Building action	Main K Building Activity	Main K Building action
	the working group	reflection, and strengthening or transformation of meaning schemes		reflection, and strengthening or transformation of meaning schemes
Knowledge sharing & transfer	Knowledge sharing	Interpersonal communication, verification, and internal reflection, and strengthening or transformation of meaning schemes	Knowledge sharing	Interpersonal communication, verification, and internal reflection, and strengthening or transformation of meaning schemes
	Coaching and helping new TSEs	Interpersonal communication, internal reflection, and strengthening or transformation of meaning schemes	Coaching and helping new TSEs	Interpersonal communication, internal reflection, and strengthening or transformation of meaning schemes

Note: the main difference at Alpha and at Beta has been highlighted by underlining

In the initial practical learning category, it can be seen that the key knowledge building activities at Beta did not include *practice under the guidance of mentors*, because as already noted Beta TSEs had prior work experience at a TSC before they worked at Beta, so they had a basic level of knowledge acquisition ability and knew what they were supposed to do on the job. The TSEs' initial practical knowledge was *learned by trial and error*, and *working with customers, business partners and colleagues*. Therefore, the TSEs' individual tacit knowledge building process at Beta omitted the *observation, interpretation, and comparison*. During the process of learn-by-trial and learn-by-error, the TSEs constructed their knowledge through trial, reflection on experience and strengthening or transformation of action scripts or meaning schemes. The process of working with customers, business partners and colleagues developed interpersonal communication skills since TSEs had to cooperate with business partners and colleagues around the world to solve customers' problems. They also learned some diagnostic, trouble-shooting and problem-solving skills from colleagues through collaboration and communication with business partners and colleagues. These activities also helped the TSEs to build up their communication and cooperation tacit knowledge.

In challenge of the work itself, consultation and collaboration, knowledge sharing and transfer categories, the analysis of field data at Beta showed that TSEs there had the similar pattern of knowledge building to those at Alpha.

In summary, the research findings show that TSEs at Beta experienced similar knowledge building activities to those at Alpha, at the competency and proficiency level. However, there was a difference at the novice and advanced levels. Alpha TSEs received more professional support and feedback through structured training, coaching and mentoring from trainers, mentors and quality auditors, whereas TSEs at Beta built up their knowledge through self-study, specialized knowledge training, learn-by-trial and learn-by-error, but had no *practice under the guidance of mentors*.

## **6.4 COMPARING THE INDIVIDUAL KNOWLEDGE BUILDING ACTIVITIES AT ALPHA AND AT GAMMA**

The Alpha case study identified key knowledge building activities for TSEs at different knowledge levels at the offshore TSC. The Beta onsite case study confirmed most parts of the model generated from the Alpha case study. The Gamma onsite case study was conducted after the Alpha and Beta cases had been studied. The following sections will compare the individual knowledge transfer processes at Alpha and at Gamma.

### **6.4.1 A Comparison of Required Knowledge and Skills at Alpha and at Gamma**

The main job duties of TSEs at Gamma were:

- ◆ Handling customer enquiries by phone, e-mail and web portal

- ◆ Collecting customer information including when and where the problem happened, the symptom of the problem, contact person, and account information
- ◆ Creating a case for the customer, taking ownership of the case, and following up the case handling progress, speeding up the problem solving process
- ◆ Providing a basic and simple diagnosis of the problem, trouble shooting for the customer and giving some advice to solve the customer's problems
- ◆ Assigning the case to a different group according to the type of product, customer and issues
- ◆ Logging all the information in the case and releasing it on the company website

The key knowledge and skills required for this job at Gamma were:

- ◆ Good knowledge about products, and business processes
- ◆ Good customer service skills
- ◆ Good communication skills both oral and writing, which enable them to co-operate and communicate well with colleagues in other departments or support centers in different countries, and speed up the case handling process
- ◆ Question raising, and trouble shooting skills; diagnostic; logical thinking and listening skills
- ◆ Multi-tasking ability; decision making; generating and evaluating options; using knowledge resources (human, paper-based, electronic ); peer cooperation; quick responding to unanticipated problems
- ◆ Ability to learn quickly about tools and processes

A comparison of knowledge and skills required at Alpha and at Gamma showed that these two TSCs required their TSEs to have similar knowledge and skills. The difference is that Alpha focused on the technical skills such as diagnostic skills, solution advising skills, whereas Gamma required basic and simple diagnostic and trouble-shooting skills. TSEs at Gamma needed a higher level of communication

(both oral and writing) and cooperation ability.

## 6.4.2 Comparing Knowledge Building Activities for TSEs at Different Knowledge Levels at Alpha and at Gamma

The analysis of the field data showed that the different knowledge levels of TSEs at Gamma have the similar pattern of knowledge building activities to those at Alpha. At Gamma, the major knowledge building activities for novices and advanced beginners were *self-study, one-week-of-buddy-help, learn-by-trial, learn-by-doing and learn-by-error, working with customers, business partners and colleagues, knowledge sharing, and tackling challenging tasks and roles*. The key knowledge building activities for competency and proficiency level TSEs were *virtual classroom training, consultation within and outside the working group, challenge of the work itself, and coaching and helping junior technicians*. Table 6.14 shows the knowledge building activities for different knowledge level TSEs at Alpha and at Gamma.

**Table 6.14 Comparing the Knowledge Building Activities for TSEs at the Different Levels at Alpha and at Gamma**

Knowledge level	Main Knowledge Building Activities At Alpha	Main Knowledge Building Activities At Gamma
Novice & Advanced beginner	New employee training On-job-training Working alongside a mentor Practice under the guidance of mentors Tackling challenging tasks and roles Supports and feedbacks from management team Knowledge sharing	Self-study One-week-of-buddy-help Virtual classroom training (e-learning, conference call or network training) Learn-by-trial, learn-by-doing and learn-by-error Working with customers, business partner and colleagues Tackling challenging tasks and roles Knowledge sharing
Competency	On-job-training Challenge of the work itself Consultation within and outside the working group Coaching and helping new TSEs	Virtual classroom training (conference call or network training) Challenge of the work itself Consultation within and outside the working group Coaching and helping junior TSEs
Proficiency	Challenge of the work itself Collaboration within and outside the working group, Coaching and helping junior TSEs	Challenge of the work itself Collaboration within and outside the working group Coaching and helping junior TSEs

### 6.4.2.1 Novice and Advanced Beginner Level

At Gamma, the novices progressed rapidly to the advanced beginner level due to their prior work experience and knowledge absorptive capacity. Thus they were categorized in the same group, similar to the situation at Beta.

The main type of knowledge building activities for the novice and advanced beginner level of TSEs are summarized in Table 6.14. Table 6.15 shows a comparison of the key required knowledge and knowledge building activities at the novice and advanced beginner level for Alpha and Gamma.

**Table 6.15 Comparing the Required Knowledge and Knowledge Building Activity for the Novice and Advanced Beginner at Alpha and at Gamma**

Required K & K building activities		Alpha	Gamma
<b>Knowledge &amp; skills</b>	Conceptual knowledge	Computer software and hardware knowledge; products knowledge; business process, regulation	Database knowledge; products knowledge; business process, organizational regulations, web portal and software applications knowledge
	Experiential knowledge	Question asking skill, facilitating social relations; trouble shooting skill; diagnosis; logical speaking; logical thinking; listening; searching; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; using knowledge resources (human, paper-based, electronic ); peer cooperation	People, language and communications skills; peer cooperation skill; diagnosis skill; logical speaking; listening; notes taking; searching; theoretical thinking;
<b>Knowledge building activity</b>	Conceptual knowledge building	New employee training On-job-training	Self-study One-week-of-buddy-help Virtual classroom training (e-learning, conference call or network training)
	Experiential knowledge building	Working alongside a mentor, Practice under the guidance of mentors Tackling challenging tasks and roles Supports and feedbacks from management team Knowledge sharing	learn-by-trial, learn-by-doing and learn-by-error Working with customers, business partner and colleagues; Tackling challenging tasks and roles Knowledge sharing

At the novice and advanced beginner level, one key difference between Alpha and

Gamma in knowledge building was new employee training. Gamma did not provide well-structured training for new employees. The knowledge building process tended to be based on *self-study*, *one-week-of-buddy-help*, *e-learning* and *virtual classroom training*. Therefore, the TSEs at Gamma had fewer opportunities to communicate with experienced TSEs than TSEs at Alpha where trainers and mentors were assigned to help them. Also TSEs at Gamma received less feedback and support from experienced TSEs than TSEs at Alpha. As they mainly learned by themselves, they encountered more difficulties and gained more misinterpreted knowledge than TSEs at Alpha did. They corrected their misunderstood knowledge through the critical reflections on their assumptions.

TSEs at Gamma built up their knowledge through learn-by-trial, learn-by-doing and learn-by-error. They appeared to experience difficulty in applying the pre-existing knowledge (such as solution they learned from the knowledge repository or manual) into a real world problem. However, in the pre-existing knowledge application process, even through they encountered some difficulties and made some mistakes, they could learn from the mistakes through reflecting on the way they solved the problem such as thinking what they had done, and assessing how they are doing. Then they could decide on how they could improve. Thus, the knowledge acquired by TSEs at Gamma through learn-by-error was greater than the knowledge gained by TSEs at Alpha through other's guidance.

#### **6.4.2.2 Competency Level**

The main type of knowledge building activities for the competency level TSEs were *challenge of the work itself*, *consultation within and outside the working group*, and *helping junior TSEs*. Table 6.16 presents the main required knowledge and knowledge building activities for the competency level TSEs at Alpha and Gamma.

**Table 6.16 Comparing the Required Knowledge and Knowledge Building Activities for the Competency Level TSEs at Alpha and at Gamma**

Required K & K building activities		Alpha	Gamma
<b>Knowledge &amp; skills</b>	Experiential knowledge	Social communication, facilitating social relations; coordinate and cooperation skill; mentoring and coaching skills; perceptual skills; trouble shooting skill; diagnosis; logical speaking; logical thinking; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; using knowledge resources (human, paper-based, electronic ); peer cooperation; quick responding to the unanticipated problem.	Coordinate and cooperation skill; social network communication skill; mentoring and coaching skills; perceptual skills; diagnosis skill; logical speaking, logical thinking; theoretical thinking; multi-task; pattern matching; decision making; generating and evaluating options; quick responding to the unanticipated problem.
<b>Knowledge building activity</b>	Experiential knowledge building	Challenge of the work itself Consultation within and outside the working group, Coaching and helping new TSEs	Challenge of the work itself Consultation within and outside the working group Coaching and helping junior TSEs;

Competency level TSEs at Gamma had similar knowledge building activities to those at Alpha. The complexity of the consultation within and outside the work group at Alpha and Gamma was similar. However, Alpha focused on the technical skills such as diagnostic skills, solution advising skills, whereas Gamma paid more attention to communication and cooperation skills. Competency level TSEs at Gamma built up their skills in their daily work through cooperating and communicating with colleagues located in different departments, and in different branches around the world.

### 6.4.2.3 Proficiency Level

For the proficiency level TSEs, the main knowledge building activities were *challenge of the work itself*, which focused on trial, practice, concrete experience and reflection on knowledge building actions; *collaboration within and outside the working group*, which focus on interpersonal communication, trial and practice, experience, internal reflection, and strengthening or transformation of meaning schemes; and *helping and mentoring junior TSEs* which focused on interpersonal communication, internal reflection and meaning perspective transformation. Table 6.17 shows the main required knowledge and knowledge building activities for the proficiency level at Alpha and at Gamma.

**Table 6.17 Comparing the Required Knowledge and Knowledge Building Activities for the Proficiency Level TSEs at Alpha and at Gamma**

Required K & K building activities		Alpha	Gamma
<b>Knowledge &amp; skills</b>	Experiential knowledge	Social communication, facilitating social relations; coordinate and cooperation skill; mentoring and coaching skills; theoretical thinking; decision making; generating and evaluating options; quick responding to a novel problem.	Coordinate and cooperation skill; social network communication skill; mentoring and coaching skills; theoretical thinking; decision making; generating and evaluating options; quick responding to the novel and complex problem.
<b>Knowledge building activity</b>	Experiential knowledge building	Challenge of the work itself, Collaboration within and outside the working group, Coaching and helping junior TSEs	Challenge of the work itself, Collaboration within and outside the working group, Coaching and helping junior TSEs

The research findings showed that the TSEs at Gamma at the proficiency level experienced similar knowledge building activities to those at Alpha. They tackled the challenges of their work. They solved novel complex problems through fusing group knowledge and codified knowledge, and critically reflected on the old ways of problem-solving to create new knowledge. They helped and coached junior TSEs through reflecting on their experience and rules, and made them explicit in order to communicate with junior TSEs.

### 6.4.3 Comparing the Key Knowledge Building Activities and Actions at Alpha and at Gamma

The analysis of the field data at Gamma identified eight key tacit knowledge building activities: *self-study with one-week-of-buddy-help*, *virtual classroom training*, *working with customers, business partners and colleagues*, *learn-by-trial*, *learn-by-doing* and *learn-by-error*, *knowledge sharing*, *tackling challenging tasks and roles*, *consulting within and outside the working group*, and *coaching and helping junior TSEs*. A comparison of knowledge building activities at Alpha and at Gamma revealed two main different areas in terms of explicit knowledge learning and initial practical learning.

Table 6.18 shows a comparison of knowledge building activities at Alpha and at Gamma in five categories: explicit knowledge learning, initial practical learning, challenge of the work itself, consultation and collaboration, and knowledge sharing and transfer. In the explicit knowledge learning category, it was noted that the key knowledge building activities at Gamma were *self-study with one-week-of-buddy-help* and *virtual classroom training*. Gamma did not provide well-structured training for new employees. The knowledge building process tended to be based on *self-study with one-week-of-buddy-help*, *e-learning* and *virtual classroom training*. The self-study at Gamma was similar to self-study at Beta, but different from the new employee training at Alpha. The main difference was that there was no trainer directing the attention of TSEs. The TSEs at Gamma needed to set their own goals and focus their attention on the knowledge and skills which would enable them to become a qualified TSE at Gamma. The *buddy help* group involved two people, one an experienced TSE, the other a new TSE. The experienced TSE was not dedicated to coaching the new TSE, but only provided support when the new TSE encountered a difficult issue that he/she could not handle. Therefore, the TSEs at Gamma had fewer opportunities to discuss matters and communicate with experienced TSEs than those at Alpha, where trainers and mentors were assigned help new TSEs. In the self-study activity, there were no *attention-drawing by trainer* and no *interpersonal communication with trainer* actions.

The virtual classroom training at Gamma is similar to Alpha's on-job-training, but there was no *interpersonal communication with trainer* actions at Gamma.

In the initial practical learning category, the key knowledge building activities at Gamma did not include *practice under the guidance of mentors*, because the TSEs at Gamma are similar to Beta's TSEs, having prior work experience at a TSC before they worked at Gamma, so they have a basic level of knowledge acquisition ability and a knowledge of what they are supposed to do on the job. The TSEs' initial practical knowledge is *learned by trial and error*, and *working with customers, business partner and colleague*. Therefore, the Beta TSEs' individual tacit knowledge building process did not involve the two steps of *observation and interpersonal communication*, moving directly to *trial and practice*. Since TSEs at Gamma built up their knowledge through *learn-by-trial, learn-by-doing and learn-by-error*, they experienced more difficulties and made more mistakes than TSEs at Alpha. For example, when they applied the pre-existing knowledge (such as solution they learned from the knowledge repository or manual) into a real world problem, they made mistakes due to their misunderstanding of the solution they had learned from the text manual or knowledge repository, or due to their misinterpreted knowledge through *self-study*. However, they could correct the misunderstood or misinterpreted knowledge through *internal reflection* on their assumptions during the trial and practice process. They reflected on the way they solved the problem by thinking what they did, and assessing how they did it and then deciding how they could improve. TSEs at Gamma considered that the knowledge acquired through *learn-by-error* was greater than the knowledge gained from others' guidance.

Table 6.18 Comparing Key Knowledge Building Activities and Actions at Alpha and at Gamma

Category	Main K Building Activity	Alpha Main K Building action	Main K Building Activity	Gamma Main K Building action
Explicit knowledge learning	New employee training	<u>Attention-drawing</u> , interpretation, remembering, <u>interpersonal communication</u> internal reflection, and formation of action scripts (meaning schemes)	<u>Self-study with one-week-of-buddy-help</u>	<u>Drawing-attention</u> , interpretation, remembering, reflection, and formation of action scripts (meaning schemes)
	<u>On job training</u>	Attention-drawing, interpretation, <u>interpersonal communication</u> , internal reflection and strengthening or transformation of meaning schemes	<u>Virtual classroom training</u>	Attention-drawing, interpretation, internal reflection and strengthening or transformation of meaning schemes
Initial practical learning	<u>Working alongside a mentor</u>	<u>Observation</u> , <u>interpretation</u> , trial and practice, experience, comparison, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes	<u>Working with customers, business partner and colleagues</u>	Trial and practice, experience, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes
	<u>Practice under the guidance of mentors</u>	Observation, trial and practice, experience, interpretation, interpersonal communication, internal reflection and strengthening or transformation of meaning schemes	NA	NA
	<u>Getting supports and feedbacks from management team</u>	<u>Interpersonal communication</u> , <u>calibration</u> , and internal reflection, and meaning schemes transformation	<u>Learn-by-trial, &amp; learn-by-doing learn-by-error</u>	<u>Trial and practice, experience</u> , internal reflection and meaning schemes transformation
Challenge of the work itself	Tackling challenging tasks and roles	Trial and practice, experience, interpretation, interpersonal communication, and internal reflection, and meaning schemes transformation	Tackling challenging tasks and roles	Trial and practice, experience, interpretation, interpersonal communication, and internal reflection, and meaning schemes transformation
Consultation & collaboration	Consultation within and outside the working group,	Interpersonal communication, trial and practice, experience, internal reflection, and strengthening or transformation of meaning schemes	Consultation within and outside the working group	Interpersonal communication, trial and practice, experience, internal reflection, and strengthening or transformation of meaning schemes

Category	Main K Building Activity	Alpha Main K Building action	Main K Building Activity	Gamma Main K Building action
Knowledge sharing & transfer	Knowledge sharing	Interpersonal communication, verification, and internal reflection, and strengthening or transformation of meaning schemes	Knowledge sharing	Interpersonal communication, verification, and reflection, and strengthening or transformation of meaning schemes
	Coaching and helping new TSEs	Interpersonal communication, internal reflection, and strengthening or transformation of meaning schemes	Coaching and helping new TSEs	Interpersonal communication, internal reflection, and strengthening or transformation of meaning schemes

Note: the main difference at Alpha and at Gammahas has been highlighted by underlining.

The TSEs at Gamma gradually learnt interpersonal skills through their cooperation with business partners and colleagues located in different countries around the world. These skills enabled them to understand customers, their problems and requests better. Also, in the process of working with business partners and colleagues, they learned some diagnostic, trouble-shooting and problem-solving skills from other people through collaboration and communication. These activities also helped the TSEs to gradually build up their basic communication and cooperation tacit knowledge.

In the categories of challenge of the work itself, consultation and collaboration, knowledge sharing and transfer, the analysis of the field data at Gamma showed that Gamma TSEs had a similar pattern of knowledge building activities and actions to those of Alpha TSEs in these three categories.

In summary, the research findings show that TSEs at Gamma had similar knowledge building activities to those at Alpha, especially at the competency and proficiency levels. The main difference between the knowledge building activities at Alpha and Gamma at the novice and advanced levels were in the new employee training. Gamma did not provide formal structured new employee training, but instead provided self-study with one-week-of-buddy-help, e-learning and virtual classroom

training for new employees. Therefore, the TSEs at Gamma received less feedback and support from experienced TSEs and encountered more difficulties than those at Alpha did.

## **6.5 SUMMARY OF RESEARCH FINDINGS IN THE THREE CASE STUDIES**

The next section summarizes the research findings at the three case studies. It is organized into four sub-sections. The section begins by discussing three types of individual knowledge building approaches. The second subsection 6.5.2 will address three main behaviour changes during the knowledge building process. The third subsection 6.5.3 will describe the different knowledge levels of 'TSEs' knowledge building.

### **6.5.1 Three Types of Tacit Knowledge Building Approaches**

According to the research findings of the individual basic tacit knowledge building process, it can be seen that tacit knowledge is built through experiential learning and problem based learning. The research findings show that resolving the issues encountered in daily work is a TSE's main practical experience at all three TSCs. In daily problem-based learning, TSEs encounter a range of issues. This study has divided the issues into three groups: repetitive issues, modified issues and novel issues based on the frequency and the difficulty of the issue occurring. Repetitive issues are frequently occurring issues. These comprise 80% of the issues that TSEs encounter at the support center. They can be handled by TSEs as a routine job as solutions can be found in knowledge repositories or by asking experienced colleagues. A modified issue is a new issue, but has some connection to a pre-existing issue. This solution may need to change to adapt to a change in the environment. Solving this kind of issue requires the conscious use of prior knowledge, recognition of the

situation by comparison with similar situations encountered previously, and then responding to the modified issue with an adapted solution. A novel issue is a brand new issue, which the TSE has not encountered before in any form. Solving this kind of issue involves combining prior knowledge, and creating new knowledge to solve the problem by insight (Bereiter & Scardamalia, 1993).

Since the efforts that TSEs made to solve the three groups of issues were different and the amount of knowledge produced also differed. Three types of knowledge building approaches were identified: cumulative knowledge building, intensive knowledge building and intentional knowledge building, in corresponding to three groups of issues solved in TSEs' daily work.

#### **Type One: Cumulative Knowledge Building**

Cumulative knowledge building refers to the semi-conscious knowledge building process those results from following similar problem-solving procedures repeatedly. In this knowledge building, knowledge is gained by accumulating the knowledge acquired through routine and daily work practice (i.e. repetitive issues solving). During this process, TSEs did not have the intention of building knowledge and were not aware that they were building up their knowledge. The accumulated knowledge enabled the TSEs problem-solving activity to become increasingly tacit, and thus increased its speed and productivity (Eraut, 2000). This type of knowledge building enabled TSEs to respond to a particular issue more specifically and quickly.

#### **Type Two: Intensive Knowledge Building**

Intensive knowledge building is a conscious knowledge building process. This type of knowledge building process involves modifying existing knowledge to solve new issues. In this process, TSE selected a possible solution and then checked out the description to see whether it contained facts that would fit with the current problem diagnosis. After having found the best-fit solution, the TSE would try to adapt the pre-existing solution to the new problem. The successful modified solution for the

new problem will be remembered and integrated into the TSE's tacit knowledge. It will be tried and tested when this problem happens again. In this process, the action scripts (i.e., meaning schemes) do not change fundamentally; they are compatible with existing solution, but extend its scope in order to solve the new problem. In this process, the TSE gained knowledge from the experience of applying prior knowledge in a new circumstance with a slight modification, and gained some knowledge about how to modify a known solution to solve a new problem.

### **Type Three: Intentional Knowledge Building**

The intentional knowledge building process involves creating a new knowledge to solve novel issues. Novel issues are new, complex, and difficult issues. The TSE may have experienced a difficulty in using an old way (meaning scheme) to understand and to solve a problem. Generally, the TSE could not solve the problem by himself or herself. The problem could only be solved through a new solution created by knowledge fusion in group discussions. To solve this level of issue, TSEs needed to communicate with a group of people in order to fuse the group knowledge, and then critically reflect on this knowledge or action script, and finally transform the meaning schemes or solution through a reorganizing of prior meaning schemes. The new knowledge was gained by critically reassessing the assumptions or meaning schemes. This reassessment resulted in new knowledge and new meaning schemes. During this process, there is an intention to create new knowledge, and awareness of new knowledge building up. This process provides TSEs with a new meaning schemes or action scripts to guide future action.

In this study, these three types of knowledge building approach were adopted by the different knowledge level TSEs. For novice and advanced beginners, the main type of knowledge building approach was cumulative knowledge building. For competency level TSEs, intensive knowledge building was the common knowledge building approach. Proficiency level of TSEs mainly adopted the intentional knowledge building approach.

## **6.5.2 Behaviour Changes**

Through an iterative process of practice/trial, concrete experience, reflection and knowledge reinforcement, creation or upgrade, the TSE's performance improved and their behaviour changed. Three major behaviour changes during the knowledge building process were confidence, flexibility and forgetting.

### ***Confidence***

Confidence equates with a belief in a person's abilities and can appear as self-assurance. Confidence is a positive empowering emotion that must grow from within a person. It generally develops over time and is dependent on previous experience, either directly with a situation or with a related experience (Jarvis, 1993). During the knowledge building process, the confidence of new TSEs is built, they no longer require the aid of a person (e.g., mentor) or checklist, they can apply the knowledge in the familiar situation, and they have gained good feedback from customers, group leaders and the quality auditor. This finding confirmed Eraut's (2004) statement that self-confidence arises from successfully meeting challenges in one's work. The competency and proficiency levels TSEs' self-confidence was built through feeling in control of the problem-solving process, being given more responsibility such as mentoring new employees, and supporting and helping junior TSEs, and being asked to solve the most difficult problems.

### ***Flexibility***

The TSE built flexibility through the experience of applying their knowledge to varying situations. They can intuitively use the prior experience to understand a situation and make decisions. In the end, the TSE could rapidly make intuitive decisions and build new knowledge drawing on their tacit understanding of people and situations, routinised actions and the tacit rules.

### ***Forgetting***

During the knowledge building process, knowledge forgetting occurs. It could occur after the TSEs have gained some experience through repeated application. The TSEs no longer need to refer back to the scripts, so these scripts are quickly forgotten and overwritten in memory. This is consistent with Eraut's (2004) view, who states that when people internalize the explicit description of a procedure, the explicit knowledge becomes redundant and eventually falls into disuse.

Furthermore, if action scripts are never used and never reinforced through successful action, or some parts of experience are not drawn on, they will be forgotten after a while. We forget when an event is no longer recognizable because of changes in context or transformations in the meaning schemes and perspectives that provide our conceptual categories. Thus, forgetting can be a positive facet of knowledge building by removing irrelevant and incorrect tacit knowledge.

## **6.5.3 Tacit Knowledge Building for the Different Knowledge Levels of TSEs**

The research findings indicated that the different knowledge levels of TSEs built up their knowledge through different knowledge building activities and actions. Table 6.19 summarizes the tacit knowledge building processes for the different knowledge levels of TSEs.

**Table 6.19 A Summary of Tacit Knowledge Building Processes for the Different Knowledge Levels of TSEs**

Knowledge level	KB Approach	KB Activities	Behavior changes
<b>Novice Level</b>	Cumulative knowledge building	New employee training, self-study with one-week-mentoring or buddy help, working alongside a mentor, learn-by-trial, learn-by-doing and learn-by-error, under the guidance of mentors, working with customers, business partner and colleagues, tackling challenging tasks and roles	<i>Confidence:</i> from no confidence to confident in basic task with colleagues help. <i>Flexibility:</i> no flexibility, follow the instruction rigidly. <i>Reflection:</i> content reflection
<b>Advanced beginner Level</b>	Cumulative knowledge building	On-job-training, specialized knowledge training, virtual classroom training, tackling challenging tasks and roles, knowledge sharing meeting, supports and feedbacks from management team	<i>Confidence:</i> confident in solving some common issues. <i>Flexibility:</i> a little flexibility of applying pre-existing knowledge. <i>Reflection:</i> content reflection
<b>Competency Level</b>	Intensive knowledge building	On-job-training, consultation within and outside the working group, coaching and helping new TSEs, challenge of the work itself	<i>Confidence:</i> confident in solving most common issues. <i>Flexibility:</i> achieve flexibility in solving most of common issues. <i>Forgetting:</i> no longer referred back to the concept knowledge <i>Reflection:</i> process reflection
<b>Proficiency Level</b>	Intentional knowledge building	Challenge of the work itself, collaboration within and outside the working group, coaching and helping junior TSEs	<i>Confidence:</i> confident in solving all issues. <i>Flexibility:</i> achieve flexibility in solving all issues. <i>Forgetting:</i> issues solved by intuition, no longer referred back to the concept knowledge <i>Reflection:</i> Premise Reflection

The most common knowledge building process for novices and advanced beginners was cumulative knowledge building. The main knowledge building activities were job training, being mentored and coached, working alongside others, tackling challenging tasks and roles, and working with customers. The knowledge building actions focus on knowledge seeding, explicit learning loop, observation, trial and practice, and concrete experience.

At the competency levels, the most common knowledge building approach was

intensive knowledge building. The key knowledge building activities were consultation within and outside the working group, coaching and helping new TSEs and challenge of the work itself. The knowledge building actions focused on knowledge seeding, trial and practice, concrete experience, and internal reflection.

Proficiency level TSEs adopted the intentional building approach. The key knowledge building activities were challenge of the work itself and coaching and helping junior TSEs. The knowledge building actions focus on trial and practice, concrete experience, internal reflection, and meaning perspective transformation.

## **6.6 THE MODIFIED MODEL OF THE INDIVIDUAL TACIT KNOWLEDGE BUILDING PROCESS**

The analysis of the field data collected from Beta and Gamma confirmed most of the research findings from Alpha in terms of individual tacit knowledge building activities, and knowledge building actions. There were a few differences. Five knowledge building actions identified at Beta and Gamma, but not at Alpha were self-study with one-week-mentoring or buddy help, specialized knowledge training, virtual classroom training, working with customers business partners and colleagues, learn-by-trial learn-by-doing and learn-by-error. Knowledge building activities recognized at Alpha, but not at Beta and Gamma, were new employee training, on-job-training, working alongside a mentor, and practice under the guidance of mentors.

Table 6.20 summarizes TSEs' key knowledge building activities and knowledge building actions in the three offshore TSCs. It is noted that there are fourteen key knowledge building activities at the three offshore TSCs.

**Table 6.20 A Summary of the Main Knowledge Building Actions in the Key Knowledge Building Activities at the Three Offshore TSCs**

Main Knowledge Building Activities	Main Knowledge Building Action													
	AD	CA	CP	CE	I	IC	AS	IR	STM	O	INR	TP	V	
New employee training	✓				✓	✓	✓	✓			✓			
Self-study with one-week-mentoring or buddy help					✓		✓	✓			✓			
On-job-training	✓				✓	✓	✓	✓	✓		✓			
Specialized knowledge training	✓				✓	✓	✓	✓	✓		✓			
Virtual classroom training	✓				✓	✓	✓	✓	✓		✓			
Working alongside a mentor			✓	✓	✓	✓		✓	✓	✓		✓		
Working with customers, business partner and colleagues				✓		✓		✓	✓	✓		✓		
Learn-by-trial, learn-by-doing and learn-by-error		✓		✓				✓	✓			✓		
Acting under the guidance of mentors				✓	✓	✓		✓	✓	✓		✓		
Gaining support and feedback from management team		✓				✓		✓	✓					
Tackling challenging tasks and roles		✓		✓	✓	✓		✓	✓			✓		
Consultation within and outside the working group,						✓		✓	✓				✓	
Knowledge sharing meeting				✓		✓		✓	✓			✓		
Coaching and helping junior TSEs						✓		✓	✓					
Total frequency:	4	3	1	6	8	11	6	14	12	3	6	6	1	

AD: Attention-drawing,

CP: Comparison

I: Interpretation,

AS: Formation of Action Scripts

STM: meaning schemes/meaning perspective strengthening or transformation

O: Observation

TP: Trial and Practice

CA: Calibration

CE: Concrete Experience

IC: Interpersonal Communication

IR: internal reflection,

INR: Interpretation &amp; Remembering,

V: Verification

It can be seen from this table that the primary knowledge building actions identified at the three cases are *internal reflection* (IR: 14 occurrences), *strengthening or transformation of meaning schemes* (STM: 12), *interpersonal communication* (IC: 11), *interpretation* (I: 8) *trial and practice* (TP: 6), *concrete experience* (E: 6), *formation of action scripts* (AS: 6) and *interpretation and remembering* (INT: 6). In these seven primary knowledge building actions, *formation of action scripts* has been moved from a secondary building action to a primary building action because the frequency of *formation of action scripts* (AS:6) occurred in Table 6.19 is much higher than the frequency of *formation of action scripts* (AS:2) occurred in Table 6.8 (i.e., main knowledge building actions at Alpha). The other six knowledge building actions were found in the Alpha case study. The secondary knowledge building actions of attention-drawing (AD: 4), calibration (CA: 3), and observation (O: 3) were found in the Alpha case study. Also, as found in the

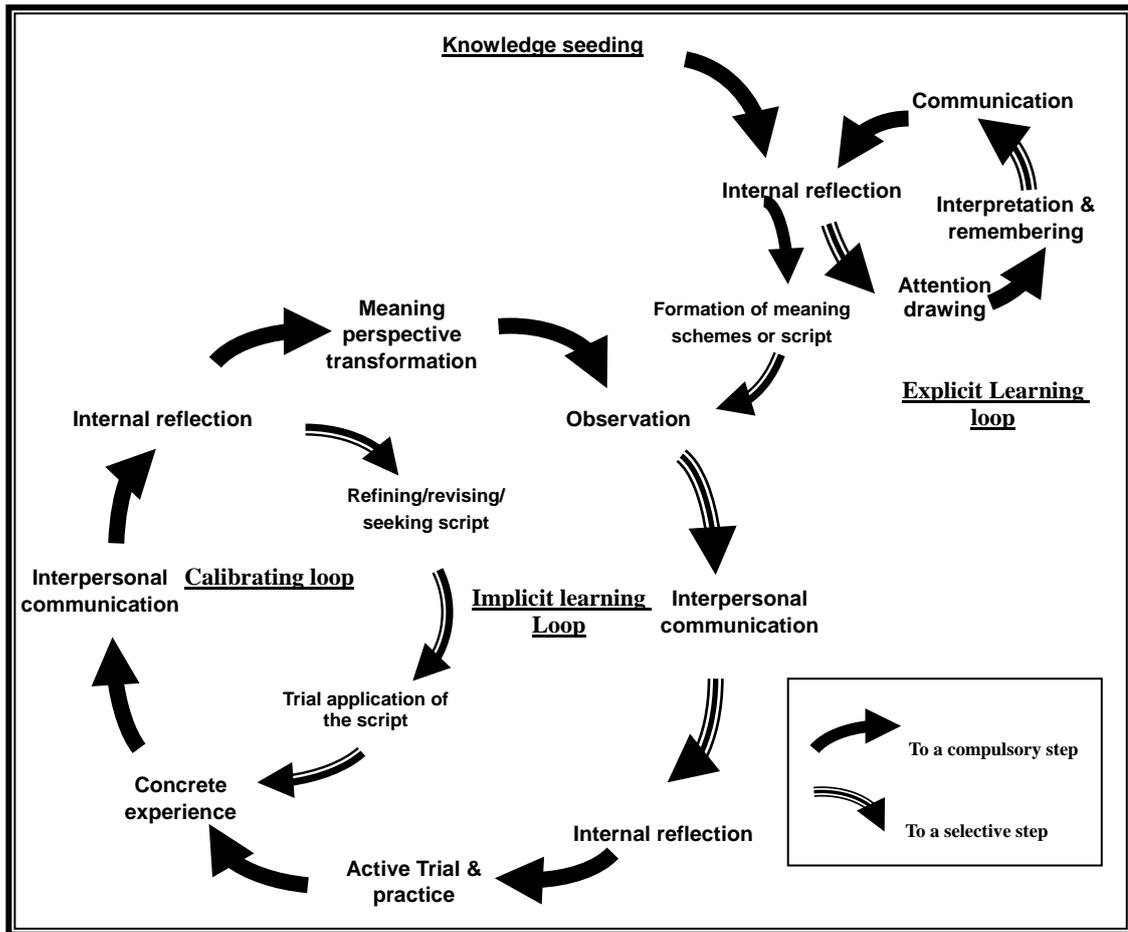
Alpha case study that the two occasional knowledge building actions (i.e. CP and V) only occur once so they have been ignored.

Also, based on the comparison on the individual tacit knowledge building activities and actions amongst Alpha, Beta and Gamma, it can be seen that the key knowledge building activities at Beta did not include *practice under the guidance of mentors*. The TSEs' initial practical knowledge was *learned by trial and error*, and *working with customers, business partner and colleague*. Therefore, the Beta TSEs' individual tacit knowledge building process omitted the three steps of *observation, interpersonal communication and internal reflection*, and moved forward to the step of *trial and practice*.

Moreover, it is found that the key knowledge building activities at Gamma did not include a well-structured training programmed for new employees in the explicit knowledge learning category, the key knowledge building activities being *self-study* and *virtual classroom training*. In the self-study activity, there is no *attention-drawing* by trainer and no *communication with trainer* knowledge building actions. The virtual classroom training at Gamma was similar to Alpha's on-job-training. Therefore, with regard to the individual tacit knowledge building process, the Gamma TSEs omitted the three steps of *attention & awareness, interpretation & remembering and communication*, and moved forward from *internal reflection* to *formation of meaning schemes or action scripts*.

In addition, it is found that the key knowledge building activities at Gamma and at Beta did not include *practice under the guidance of mentors* in the initial practical learning category, because the TSEs at Gamma were similar to Beta's TSEs, in having prior work experience at TSC before they worked at Gamma. The TSEs' initial practical knowledge was *learned by trial and error*, and *working with customers, business partners and colleagues*. Therefore, the Beta TSEs' individual tacit knowledge building process omitted the three steps of *observation, interpersonal communication and internal reflection*, and moved forward to the step of *trial and practice*.

Figure 6.3 Modified Model of the Basic Individual Tacit Knowledge Building Process



Therefore, two modifications have been made to the initial model of the individual tacit knowledge building process (see Figure 6.3). Firstly, the steps of *formation of meaning schemes or scripts* and *interpretation and remembering* have been changed from a selective step to a compulsory step, because the evidence found in the Beta and Gamma cases showed these steps were important in the knowledge building process. Secondly, the three steps of *observation*, *interpersonal communication* and *internal reflection* have been changed from compulsory steps to selective steps, because the evidence found from the Beta and Gamma cases showed that TSEs' individual tacit knowledge building process can omit the *observation*, *interpersonal communication* and *internal reflection*, and move forward to the step of *trial and practice*. As they are not compulsory steps, they have been placed in the selective category.

In summary, it is not necessary to adopt the knowledge building process step by step. For example, in the implicit learning loop, the steps of *observation, interpersonal communication and internal reflection* need only to be followed by the new employees or when a TSE has to learn something new. Experienced people can move directly into an implicit learning loop without moving through the explicit learning loop. For example, at the knowledge seeding step, if the experienced support engineers can reflect on what they have gained from knowledge seeding and form their meaning schemes or action scripts, they can enter the implicit learning loop without moving through the explicit learning loop. Also the evidence found from the Beta and Gamma cases showed that some support engineers jumped to the *observation* step straightaway in their tacit knowledge building process without adopting of the knowledge seeding and explicit learning loop. Even through some steps are omitted, some are essential in the tacit knowledge building process, such as *active trial and practice, concrete experience, interpersonal communication, internal reflection and transformation of meaning perspective*.

## **6.7 FACTORS AFFECTING INDIVIDUAL TACIT KNOWLEDGE BUILDING**

The analysis of the data collected from the three offshore TSCs identified some factors which affect individual tacit knowledge building. These factors are divided into two categories. The first category is the organizational environment, which provides time, resources, people and support for TSEs to build up their knowledge. The second category is personal characteristics, which determine the TSE's subjective willingness to build up knowledge.

### **6.7.1 Organizational Environment**

The organizational environment plays a critical role in providing knowledge resources (e.g., people, time) to help TSEs build up and improve their knowledge.

During the tacit knowledge building process, four kinds of organizational environment factors affect TSE's knowledge building: workload, job complexity, encounters with people, support and feedback, social networks and organizational learning culture.

### ***Workload***

At a TSC, the workload may be the greatest barrier preventing TSEs from building up knowledge. Work overload meant TSEs had less time to think about a problem, or to discuss an issue with colleagues thoroughly. As a result, they were more likely to adopt a problem reduction strategy, rather than a progressive problem-solving strategy to solve a problem, because problem reduction strategy involved less time and effort than the progressive problem-solving strategy, but at the same time, it reduced the knowledge that would have been gained from using this problem-solving strategy. Sometimes, TSEs complained that they missed opportunities to learn from other TSEs because the management team reduced the number of knowledge sharing meeting from weekly to monthly due to the heavy workload. They also did not have enough time for a one-to-one coaching with their culture coach. As the culture coach from Alpha said:

*Because the time I have to work with them [TSEs] is really limited. Honestly, I mean even just a half hour working with the support engineer is a difficult thing to do, because they get a call that is supposed to be taken, they have an another training, and other people want their time, not just from my perspective need their time.*

The TSEs at Beta, especially the new TSEs, complained they had faced high work pressure just to survive in the job since no formal structured training was offered to new TSEs. The overload in job duties kept them busy in completing the job tasks that were assigned to them by the manager. They did not have extra time and energy to extend their knowledge in the first year of working at Beta.

### ***Job Complexity***

The job complexity can affect the amount of effort TSEs put into their job. For example, if a TSE does the same simple job each day, he/she may feel the job is easy and not challenging, so he/she will get bored and not put effort into it, and then his/her knowledge will not expand. In contrast, if a TSE feels the job is challenging, and he/she has to put more effort into it, he/she will learn more from the job, and build up his/her knowledge. Therefore, the more efforts TSE make, the more knowledge they gain.

### ***Encounters with People***

In the TSC, TSEs can learn from people who work around them. For example, in order to solve a difficult problem, a TSE often needs to ask his/her colleague for help to find the solution. This research found that the knowledge level and type of person a TSE encountered determined how much the TSE could learn. For example, the TSE could learn more from senior technicians than from colleagues at the same knowledge level as him or her. In addition, the TSE could learn more from a patient senior technician than from impatient technicians. TSEs could learn more from an expert who was willing to provide support and advice, especially if the TSE had the opportunity to observe and work alongside the expert in a work project. Eraut (2004) points out that the allocation and structuring of work affects the opportunities for meeting, observing and working alongside people who have more or different expertise, and for forming relationships that might provide feedback, support or advice.

### ***Support and Feedback***

In this study, Alpha provided some technical support for TSEs, and each group had a technical leader to provide technical support for TSEs, but the support was not regarded as sufficient. In this study, it was noticed that when TSEs encountered a challenging problem, most would seek a solution by asking the technical leader. If

they did not get an answer from technical leader, they would give up and escalate the challenging problem to a TSE with a higher expertise level. Even though solving a challenging problem was a good opportunity for TSEs to learn something new, and to expand their knowledge, very few TSEs were prepared to take on the challenge, because there was not sufficient support to encourage TSEs to seek others' views.

Alpha provided two types of feedback to TSEs. One is short-term, task-specific feedback. Another is long-term, strategic feedback on general progress (Eraut, 2004). Task-specific feedback was provided by quality auditors, who monitored the TSEs call transactions every day. They evaluated the call quality, gave feedback and provided one-to-one coaching. They also developed an action plan to help the TSE overcome his/her weaknesses. This kind of support and feedback played a vital role in helping TSEs to improve their knowledge and to correct their mistakes and errors. The long-term feedback was provided by supervisor, who evaluated the TSEs' performance, and had regular one-to-one meetings with TSEs to talk about their work performance and future work objectives. They provided a longer-term, strategic feedback, which helped the TSEs clarify their goals for work and career progress.

### ***Social Networks***

Social networks played a pivotal role in the individual knowledge building process. This study found that if a TSE had a wide range of social networks, he/she had more opportunities to acquire knowledge than TSEs who had a narrow social network. For example, the proficiency level TSEs generally had a wide range of social networks, which covered local technical leaders, local colleagues, US backline support engineers, Indian senior technicians and global contact center senior technicians. A social network can expand a TSE's personal knowledge because they bring information or knowledge from different parts of a wider network. The information and knowledge acquired from the social network could inspire a TSE to create new knowledge to solve a customer's problem. In contrast, the novice level of TSEs had a narrow social network, which only involved the local group, so they were

in a weaker position to acquire new knowledge as they lacked connections with outside groups and other branches.

### ***Organizational Learning Culture***

The organization's learning culture refers to a combination of values and norms that support personal and professional knowledge growth (Skerlavaj, Song, & Lee, 2010; Ward & McCormack, 2000). This culture is characterized by psychological safety, openness to diverse opinions, and values creativity, experimentation and innovation. In this study, it was found that the three TSCs had an affirmative learning culture and a positive learning atmosphere. This learning culture and learning atmosphere supported collaborative learning and group work, in which TSEs were encouraged to assist each other in solving problem, and to learn new knowledge and skills from each other. For example, there were many small mentor-to-mentee support groups in these organizations. One of these was a language support group. In this group one person was good at English communication. They met weekly focusing on English communication. After two or three months of meeting weekly, the group members with poor language communication skills had improved greatly.

The group knowledge sharing meeting is another example of a positive learning culture in the organization. In the meeting, all TSEs were encouraged to share their opinions and knowledge with group members, and senior technicians helped the junior technicians to solve their problems. This learning culture and learning atmosphere encouraged TSEs to not only learn from each other, but also learn by themselves in order to contribute their knowledge to others.

## **6.7.2 Personal Characteristics**

The TSEs working at the China-based support center started their support engineer career almost at the same time. The question is why people had different knowledge levels after they had one or two years work experiences. The research findings

revealed that personal characteristics play a pivotal role in the knowledge building process. The personal characteristics included prior work experiences and educational background, motivation, and personality.

### ***Prior Work Experience and Educational Background***

The research findings show that the novices who had some previous educational background in the IT field and had some work experiences in customer service had a higher level of knowledge absorptive capacity and acquired new knowledge more rapidly than those novices who did not have this past experience. Customer service experiences and IT educational background enabled these new employees to move to a higher level. For example, since the TSE's pre-requested knowledge at Beta is higher than that for Alpha, the TSE's prior work experience and educational background played a significant role in individual knowledge building at Beta. Also, it is found that TSEs who had a good communication skills and knowledge about business processes became qualified support engineers more rapidly than those who only had good technical and trouble shooting skills in their early career as a support engineer.

### ***Individual Personality***

In this study, the data collected through document review of the Myers Briggs personality test taken by new employees showed that the new employees with an extroverted personality (68%) found it easier to pass the UAT and become qualified TSEs than those with an introverted personality (42%) did. This is because TSEs with an extroverted personality were more willing to cooperate with colleagues and communicate with customers. They were more proactive in taking advantage of the learning opportunities available to them. They are more likely to move to the higher level of expertise than those who had an introverted personality.

### ***Motivation***

The research findings revealed that proficiency level TSEs were more willing to develop the expertise and to find a solution for a difficult problem than other levels of TSEs. There are two reasons for this. First, TSE at the proficiency level felt good when they spent a great deal of time challenging a difficult problem and building up their knowledge. They gained knowledge and satisfaction from solving a challenging problem. Second, the proficiency level TSEs felt obliged to solve the difficult problems because of their level of expertise and they did not want to fail in their duty. This is the value of their work in the social environment. It was also clear that the proficiency level TSE was keen to be seen as the troubleshooter who could help the group solve the most difficult problem. Thus the intense efforts made by proficiency level TSEs to solve problems not only benefited the support centers but also brought rewards and personal self-esteem. This motivation found in this study is driven by personal obligations and social identities (Akerlof & Kranton, 2000).

## **6.8 DISCUSSION**

This study has examined knowledge transfer processes at three offshore TSCs, and has developed a model of the basic individual tacit knowledge building process (see Figure 6.3). This model illustrates that TSEs build up their tacit knowledge in two phases. Phase one is knowledge seeding and an explicit learning loop. This phase involves the acquisition of core conceptual knowledge which will guide the tacit knowledge building. Phase Two is an implicit tacit knowledge building. In this phase, the TSE builds up his/her knowledge through trial, practice and experience to bridge the gap between explicit knowledge and tacit knowledge, and between theory and practice.

There are four areas where this study can contribute to a better understanding of individual knowledge building.

The first contribution is that this study has uncovered the basic individual tacit knowledge building process. This model emphasizes six key tacit knowledge building actions: observation, trial and practice, concrete experience, interpersonal communication, internal reflection and meaning perspective transformation. Kolb's (1984) experiential learning model identifies a four-stage cycle: concrete experience, reflective observation, abstract conceptualization, and active experimentation. This research finding therefore extends Kolb's four-stage experiential learning model. It confirms the importance of observation, trial, experience and abstract conceptualization in experiential learning. It also points out that interpersonal communication and internal reflection play a critical role in experiential learning. The interpersonal communication and internal reflection occur three times in the model of basic knowledge building process, which proves the significance of communication and reflection in tacit knowledge building. The question is why communication and reflection are so important in the individual knowledge building process. Interpersonal communication is collective level knowledge learning, which allows the TSEs to verify or calibrate their assumptions with others. Also it helps TSEs to acquire new perspectives. These new perspectives can stimulate TSEs to inquire into and reflect on their practical experience and thus trigger a new knowledge building process. The three levels of internal reflection enable TSEs to review their experiences from many perspectives, which leads them to question or challenge any faulty premises. Also the internal reflection makes the tacit knowledge explicit, and brings the inherent tacit knowledge of experience to the surface.

The second contribution is that this study affirms the importance of received knowledge in the tacit knowledge building process. Sternberg and his colleagues (2000) postulated a model of memory structures and knowledge acquisition pathways. They consider that tacit knowledge is acquired by episodic memory and personal experience. However, they did not explicitly address the importance of how received knowledge (explicit knowledge) affects the personal experience and episodic memory, and how the received knowledge indirectly influences the acquisition of

tacit knowledge (i.e., procedural memory). They consider that tacit knowledge (procedural memory) can be acquired either through experience alone or initiated by the communication of generalized knowledge based on someone else's experience (Sternberg et al., 2000). This research extends Sternberg and his colleagues' (2000) model and points out that received knowledge is the basis of tacit knowledge building. For example, at Phase One of the tacit knowledge building process, the *first formation of script* (i.e., meaning schemes) was generated based on the explicit knowledge learned from classroom training, manual and document reading, communication and reflection, and this explicit knowledge guided TSEs in framing their meaning schemes or action scripts (tacit knowledge) in practice. The received knowledge is used to guide TSE's choices of experiences and direct their attention to apprehended experience. It was also found that received knowledge (i.e. semantic memory) enables the experience (i.e. episodic memory) to become tacit knowledge (i.e. procedural memory). In other words, the received knowledge affects the comprehension of personal experience, and sequentially, affects tacit knowledge acquisition.

The third contribution is that this study confirms Mezirow's theory that meaning perspective and mental models (meaning schemes) are continuously transformed through content, process and premise reflections in the knowledge building process. Mezirow (1991) proposes two important concepts: meaning scheme and meaning perspective to interpret how individuals advance their frontier knowledge as they perceive. This study adopts these two concepts to explain the individual's tacit knowledge building process. The transformation of meaning perspective and meaning schemes depends on content, process or premise reflections. It is found that meaning perspective and meaning schemes are continuously reviewed, revised or reinforced in the implicit learning loop. However, Mezirow's (1991) theory does not unambiguously present how tacit knowledge or meaning perspective is acquired and built. In this study, the model of basic individual tacit knowledge building process demonstrates the tacit knowledge (i.e., meaning perspective) acquisition and building

process. In this process, tacit knowledge is acquired and built through continuous knowledge building loops: an explicit learning loop and an implicit learning loop. The explicit learning loop includes *knowledge seeding, attention and awareness, interpretation and remembering, communication and internal reflection*. The implicit learning loop includes *formation of meaning schemes or scripts, observation, interpersonal communication, internal reflection, active trial and practice, concrete experience, interpersonal communication, internal reflection, calibrating loop, and meaning perspective transformation*. These two loops enable the individual tacit knowledge to enlarge and become more accurate in application.

The fourth contribution is that this study in the three TSC organizations supports Raelin's (1997) model of work-based learning, and also demonstrates a systematic sequence of knowledge building processes in the work-based learning context. The research finding illustrates that the knowledge building process starts from building an initial "seed" action script through classroom learning, document reading and job observing, then applying this script to a real world problem thus bridging the gap between theory and practice. The experience enriches the action script. After repeated application, testing, adaptation, and successful outcomes, seed scripts are transformed into usable action scripts. With experience and multiple applications, communication and reflection, the useful seed script is gradually transformed to a personal theory or rule, which can guide TSE's actions and start a new loop in the knowledge building process. This sequential knowledge building process has important practical implications either for offshore organization or for individual TSE as they need to understand the methods for building individual tacit knowledge to develop an effective knowledge building process.

In summary, the model of the basic individual tacit knowledge building process developed in this study partially confirmed some prior studies on knowledge acquisition and learning theory. It bridges the knowledge gap of a lack of tacit knowledge building theory in the literature. This study has important practical implications for either employees or managers. It has some implications for

individuals as it demonstrates about how they can build up their tacit knowledge effectively. Also it provides some insights for managers about how to support employees in building up their tacit knowledge.

## **6.9 CHAPTER SUMMARY**

This chapter presented the research findings and discussion of individual tacit knowledge building undertaken at three offshore TSCs. Section 6.1 showed the individual knowledge building activities for TSEs at different knowledge levels at Alpha. Section 6.2 developed an initial model of the individual basic knowledge building process. Section 6.3 compared the individual knowledge building activities at Alpha and at Beta. Section 6.4 compared the individual knowledge building activities at Alpha and at Gamma. Section 6.5 summarized research findings at the three case studies. Section 6.6 modified the model of basic individual tacit knowledge building process. Section 6.7 identified the factors affecting individual knowledge building. Section 6.8 discussed the linkage of the knowledge building process model with previous literature.

# **CHAPTER 7 FINDINGS AND DISCUSSION: ORGANIZATIONAL KNOWLEDGE BUILDING**

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The previous two chapters analyzed the knowledge transfer process and the individual knowledge building process. This chapter will examine the research findings on the organization knowledge asset building process undertaken at the three offshore TSCs. This chapter aims to answer the third research question: *how does the offshore TSC build up its organizational knowledge after the knowledge has been transferred from the onshore TSC?* The chapter is organized into nine sections. It begins by presenting the research findings of organizational knowledge building at Alpha, and then develops an initial model of organizational knowledge building. Next, it compares the differences at Alpha and at Beta, and at Alpha and at Gamma in relation to their organizational knowledge building. After a consideration of the three cases, a modified model of organizational knowledge building is developed. This chapter ends with a discussion of the research findings by linking back to the literature. The structure of the chapter is as follows.

Section 7.1 Research findings of organizational knowledge building at Alpha

Section 7.2 Initial model of organizational knowledge building

Section 7.3 Comparing the organizational knowledge building at Alpha and at Beta

Section 7.4 Comparing the organizational knowledge building at Alpha and at Gamma

Section 7.5 Summary of research findings in the three cases

Section 7.6 Modified model of organizational knowledge building

Section 7.7 Factors affecting organizational knowledge building

Section 7.8 Discussion

Section 7.9 Chapter summary

The results and discussion are presented together and are supported by the interview transcriptions and observation notes and document review notes which were collected at Alpha, Beta, and Gamma.

## **7.1 RESEARCH FINDINGS OF ORGANIZATIONAL KNOWLEDGE ASSET BUILDING AT ALPHA**

At Alpha, the original organizational knowledge assets consisted of transferred knowledge from the US-based TSC. In order to achieve its core competitive advantage it was important for Alpha to effectively apply the existing knowledge assets and to continuously develop knowledge and build new knowledge. Nonaka (1994) emphasizes that the process of knowledge creation is dynamic because the environment changes, and new problems continuously arise. In order to survive in fast changing and unpredictable environments, organizations must adapt to these changes. The organization interacts with its environment, continuously creates and defines problems, develops and applies new knowledge to solve the problems, and then develops new knowledge through the actions of problem solving.

The analysis of the field data indicated that organizational knowledge assets (i.e., experiential knowledge assets, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets) were built in the three levels (individual level, group level, and organization level) of the SECI spiral. The shared mental models of organization members enabled individual knowledge building to link to group

knowledge building, and then to organizational knowledge building. This section will present four types of knowledge assets at Alpha, and then explain how these knowledge assets are built and developed in the three levels of the SECI spiral.

### **7.1.1 Four Types of Knowledge Assets at Alpha**

Four types of knowledge have been discussed in Chapter Five and Chapter Six: experiential knowledge, conceptual knowledge, systemic knowledge, and routine knowledge. Nonaka, Toyama, & Komo (2000) define these four types of knowledge assets as experiential knowledge assets, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets. The following section will address the four types of knowledge assets at Alpha.

#### *Experiential knowledge assets*

Experiential knowledge assets consist of the individual TSE's practical knowledge (i.e., tacit knowledge). The individual TSE's experiential knowledge was built and accumulated by individuals through experiences at work. It could include contextual experiences in working in this and other organizations, processes for working and interacting with other colleagues, superiors and subordinates, and customers. The shared individual experiential knowledge was built through shared hands-on experience amongst the TSEs in the organization, and customers.

#### *Conceptual knowledge assets*

Conceptual knowledge assets consist of individual explicit knowledge articulated through images, symbols and language. The conceptual knowledge assets include explicitly stated individual problem-solving solutions, best practice captured from daily based organizational activities, and individual tacit knowledge that has been transformed into an explicit form that can be stored and retrieved.

*Systemic knowledge assets*

Systemic knowledge assets consist of systemic and packaged collective explicit knowledge, such as technology descriptions, product specifications, manuals, and documented and packaged information about business processes and procedures. This type of knowledge asset initially was the most transferred knowledge asset around the organization.

*Routine knowledge assets*

Routine knowledge assets consist of the collective tacit knowledge that is routinised and embedded in the actions and practices of the organization. The collective tacit knowledge was built and accumulated through practice in the day-to-day business of the organization by organizational members. This type of knowledge asset included the organizational culture and organizational routines, certain patterns of thinking, and action which are reinforced and shared amongst organizational members.

In this study, the original organizational knowledge assets transferred from the US-based TSC to the China-based TSC were systemic knowledge assets and conceptual knowledge assets. Even though the organizational knowledge repository (stores systemic knowledge asset and conceptual knowledge assets) could be transferred from the US-based TSC to a China-based offshore TSC quickly, there was still much more important knowledge that was unsaid and unwritten, and embodied in the people rather than in the systems. Simon (1991) states that little is put down on paper or stored in computer memories. In this study, the China-based TSC recruited new local graduates who were not familiar with the organization to replace US-based TSC employees. The new individual employees had their own mental models that had no connection to the US-based TSC organizational memory (Kim, 1993). The key questions are: a) *how does the newly established China-based TSC build experiential knowledge assets and routine knowledge assets?* b) *how does the TSC expand and develop systemic knowledge assets and conceptual knowledge assets?*

The following section will address how these four types of knowledge assets were built and expanded at Alpha. This study employed Nonaka's (1994) four modes of knowledge creation and spiral of organizational knowledge creation theory to interpret the organizational knowledge assets building process at the three offshore TSCs. The four modes of knowledge creation (SECI) include *socialization* (from tacit knowledge to tacit knowledge), *externalization* (from tacit knowledge to explicit knowledge), *combination* (from explicit knowledge to explicit knowledge) and *internalization* (from explicit knowledge to tacit knowledge) (Nonaka, 1994). The four modes of knowledge conversion enabled organizational knowledge to become externalized and amplified. The spiral of organizational knowledge creation theory suggests that "organizational knowledge creation can be viewed as an upward spiral process, starting at the individual level moving up to the collective (group) level, and then to the organizational level" (Nonaka, 1994, p. 20).

### **7.1.2 Three Levels of the SECI Spiral in the Organizational Knowledge Assets Building Process at Alpha**

The analysis of the field data showed that four types of organizational knowledge assets were built in the three levels of the SECI spiral. It was found that organizational knowledge assets building started at the individual level, moved up to the group level, and then to the organizational level. Organizational knowledge assets were built by the organization's members, but independent of any specific member (Kim, 1993). In this process, the organization initiated individual tacit knowledge building and encouraged TSEs to interact with group members through conversation, dialogue, discussion, experience sharing, and observation. The contact and communication can involve considerable conflict and disagreement and thus stimulate employees' internal reflections which push them to query existing premises and make sense of their experience in a new way.

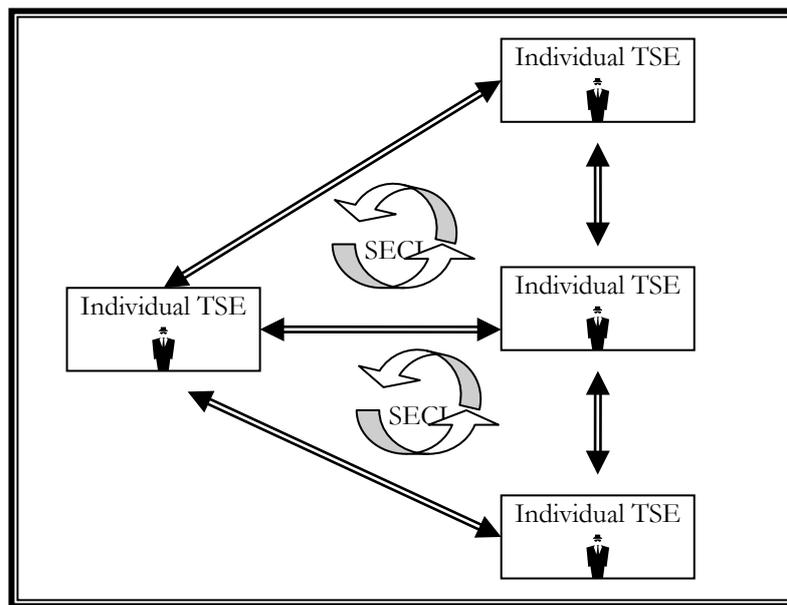
### 7.1.2.1 Individual Level of the SECI Spiral

Organizational knowledge assets building was dependent on individuals improving their tacit knowledge (mental models and technical know-how), converting this tacit knowledge into explicit knowledge was crucial to developing new shared mental models. This process allowed organizational knowledge assets building to be independent of any specific individual (Kim, 1993). The individual level of the SECI spiral was an upward process of individual knowledge building. This SECI spiral enabled TSEs to interact and communicate with different levels of experienced individual TSEs. This interaction and communication meant that different levels of TSEs could share and then transfer the experiential (tacit) knowledge and conceptual (explicit) knowledge to other individual TSEs. This interaction and communication enabled TSEs to share mental models and thus build group knowledge. Through the individual SECI spiral, an individual TSE could combine knowledge from others into his/her own knowledge stock, so that his/her knowledge could keep expanding. In this study, individual knowledge stock includes individual knowledge repository and individual's memory. Knowledge repository stores conceptual knowledge and systemic knowledge. Memory stores experience, received knowledge, experiential knowledge and routine knowledge.

At the individual level of the SECI spiral, the *socialization* process facilitates individual experiential knowledge building and shared experiential knowledge assets building. The *externalization* process facilitates individual conceptual knowledge asset building. The *combination* process enables individual and group systemic knowledge asset building, and the *internalization* process facilitates individual and group experiential knowledge asset and routine knowledge asset building.

The individual level of the SECI spiral is the individual TSE's knowledge stock building and expanding process (see Figure 7.1).

Figure 7.1 The Individual Level of the SECI Spiral



#### *Socialization at the Individual Level*

TSEs socialized with colleagues to accumulate their tacit knowledge at the individual level and to acquire and share tacit knowledge (mental models and technical skills) in the group. In *socialization*, the individual TSE worked with other individual TSEs, and improved his/her knowledge and skills through observation, imitation and practice to gain some knowledge from colleagues, group leader, technical leader and US senior TSEs. They shared their experiential knowledge (mental models) with colleagues and engaged in dialogue with customers on the working floor. For example, the TSE observed and imitated other members' ways of solving difficult problems and learned new ways or tips through working with them to solve customers' problems together. Also they gained some new knowledge through sharing experiences with other individual TSEs and the technical leaders. Eventually, the knowledge they observed on the working floor and the knowledge shared with other TSEs became part of their tacit knowledge stock. Massey & Montoya-Weiss (2006) has emphasized that personal subjective knowledge can be socially justified and combined with others knowledge so that knowledge keeps expanding. The *socialization* process enabled individual TSEs to work together, and to share their mental models and experiential knowledge. These activities helped individual TSEs

build individual experiential knowledge and share experiential knowledge.

#### *Externalization at the Individual Level*

After a few months or a few years' experiential learning, TSEs had accumulated a considerable amount of experiential knowledge. They had a certain level of tacit knowledge, and knew exactly how to perform certain behaviors or tasks. In *externalization*, the TSE was able to transcend the inner- and outer-boundaries of himself/herself, and articulate tacit knowledge by using different metaphors, analogies, concepts, and hypotheses. Through conversations and interactions with others, an individual's insight or idea could be explained to others because of the development of a shared language. This shared language enabled an individual to clarify the vague ideas or insights and develop a sense of shared understanding with others. The dialogue and interaction with others led to shared understandings amongst individuals, and mutually coordinated actions. Crossan, Lane, & White (1999) has concluded that the interpreting and integrating of individual insights or ideas facilitates the development of a shared understanding and action adjustment amongst individuals.

For example, when TSEs have a few years work experience at the support center, their tacit knowledge will be highly developed. They know step-by-step procedures for general problem solving. Their memory of various experiences may have become encoded as a set of complex procedural rules for how to respond to different situations. This encoded knowledge allows them to make improvements to their problem solving and call handling skills. Also, this encoded knowledge helps them to articulate their knowledge to other colleagues when they engage in dialogue with colleagues, or share their knowledge in a group such as a weekly group knowledge sharing meeting. The knowledge sharing meeting has benefits for both knowledge sharer and knowledge receiver. The individual TSE (knowledge sharer), who articulates his/her ideas or "best practices" in the meeting, is encouraged to think deeply. The dialogue between the TSE and the group members, or the group

members' collective reflection on the TSE's ideas could trigger the creation of conceptual knowledge. At the same time, group members (knowledge receivers) can learn something from the knowledge sharers' experience. Moreover, the knowledge shared by the individual TSE will become group conceptual knowledge assets. The group conceptual knowledge asset is built through fusing the accumulated individuals' knowledge and ideas from individual knowledge sharing at the group knowledge sharing meeting.

In the *externalization* process, individual TSEs work together to solve a difficult problem through personal communication. For example, when a TSE encounters a difficult problem, he/she will have a dialogue or discussion with TSEs who have strong personal ties with him/her. After effective communication and deep discussion on the problem, they may fuse their ideas and develop a new solution to solve the problem. This successful solution may be leveraged in the group and shared with other TSEs.

#### *Combination at the Individual Level*

In *combination*, the individual TSE collects explicit knowledge from many different sources such as training documents, organizational knowledge repository, and shared knowledge from group members, and personal field notes. He/she then edits them based on his/her personal knowledge, and combines them with his/her personal knowledge and incorporates it into personal systemic knowledge. The systemic knowledge is stored in his/her personal knowledge repository for solving general problems in the future. This personal systemic knowledge is new knowledge in the sense that it is a synthesis of information and knowledge from many different sources. The group leader/tech leader captures and synthesizes the knowledge of the group members and organizational knowledge repositories and incorporates it into group systemic knowledge assets which are available for group members to use.

*Internalization at the Individual Level*

*Internalization* is a process where TSEs embody shared explicit knowledge through their daily work practices. It is also a process of assimilating and accommodating the transferred or shared knowledge into an individual's tacit knowledge memory (This process is elaborated on Chapter 6). In the *internalization* process, the individual TSE embodies the explicit knowledge through trial and practice, concrete experience, interpretation, interpersonal communication and internal reflection in their daily work such as solving customers' problems on the phone. They continually challenge their old mental models through solving different problems in different situations in their daily work. In this process, the new knowledge they have learnt from training, documents, knowledge repositories, knowledge sharing meeting and their daily work practice could affect their mental models. The old mental models could be strengthened or transformed into new mental models. The new knowledge will gradually be assimilated or accommodated into their individual tacit knowledge memory. Eventually, the new knowledge will be taken for granted as part of the background of tools and resources necessary to do their jobs. The group routine knowledge and experiential knowledge would be built when a group of the individual TSEs' actions are based on a set of shared mental models or action scripts. Therefore, the *internalization* process also facilitated the building of individual and group experiential knowledge building and routine knowledge.

The new tacit knowledge and created knowledge accumulated at the SECI spiral needs to be socialized and shared with other individual TSEs, thereby starting a new spiral of individual knowledge asset building.

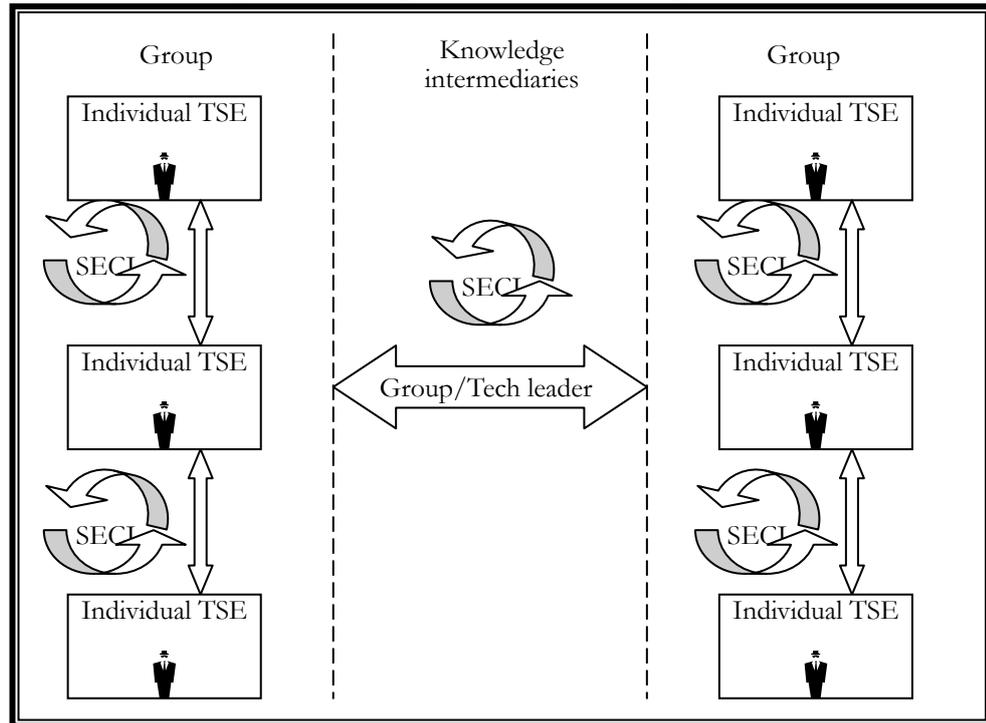
In summary, at the individual level of SECI spiral, the *socialization* process facilitated the building of individual and shared experiential knowledge. The *externalization* process enabled individual tacit knowledge to be explained to others through the development of language, and as a result, conceptual knowledge building took place. The *externalization* process bridged the individual and group levels. It moved beyond

the individual and enabled knowledge to become embedded within the workgroup. The *combination* process facilitated the integration and synthesis of individual and group knowledge which led to the building of systemic knowledge asset. The *internalization* step was the process of internalizing the group's systemic knowledge in their daily work through practice. *Internalization* facilitated the building up of individual and group experiential knowledge and group routine knowledge assets. In brief, during the SECI spiral, the new knowledge or action was built in *socialization*, shared in *externalization*, integrated into the old knowledge stock through the *combination* process, embodied in *internalization* process by individuals and applied in their work through practice.

### **7.1.2.2 Group Level of the SECI Spiral**

The group level SECI spiral illustrates the dynamic interaction between groups or amongst groups in the local organization. A group can be viewed as a collective individual, with its own set of mental models, which contributes to the organization's shared mental models and knowledge assets (Kim, 1993). In the upward spiral process, the group knowledge building process is based on the knowledge of a group of TSEs, The knowledge sharing, transferring and building occurs at the group level, then moves to the organizational level. At the same time, the organizational level of knowledge is transferred from the organizational level to the group level, and then back to the individual level.

Figure 7.2 Group Level of the SECI Spiral



At the group level, the group technical leader and the group leader play a pivotal role in sharing, transferring and building knowledge amongst the groups. They were the group knowledge intermediaries among the groups at the China-based TSC (see Figure 7.2). Knowledge intermediary is a person in an organization who has an appropriate network position to connect knowledge seekers with knowledge sources cross many extensive areas of divisions (Behboudi & Hart, 2008). The knowledge intermediary played the role of gatekeeper and boundary spanner in facilitating knowledge transfer across groups through effective communication and interaction. For example, the group leader/technical leader had a first hand knowledge about their group's best practices. All the efficient solutions and "best practices" built by the group members would be collected by the group leader/technical leader. This knowledge was not only shared in their group, but also was shared with other groups which supported the similar products through the group leaders/technical leaders' *socialization* and *externalization*. Similarly, the other groups also transferred knowledge to this group through the group leader/technical leader. This was a reciprocal process. For example, efficient solutions and "best practices" built by portable

computer support group would be transferred to the desktop computer support group through a group technical leader knowledge sharing meeting. Therefore, desktop support TSEs could gain some knowledge from the TSEs at the portable computer support group. Nonaka (1994) considers that groups or groups play a central role in the process of organizational knowledge building. The group knowledge intermediaries (i.e. group leaders) are at the intersection of the vertical and horizontal flows of knowledge in the organization.

#### *Socialization at the Group Level*

In *socialization*, the individual group leader and technical leader expanded their experiential knowledge through two means. One was working with group members together to solve customer problems. The group shared their experiential knowledge in the problem solving process and the collaboration process. Also the group leader or technical leader monitored their group 'TSEs' call handling processes. In the monitoring process, they could learn and acquire some experiential knowledge in their daily work from their group members. Another way was to socialize with different group leaders or technical leaders through group leaders/technical leaders meetings, or attended an organizational training program with other technical leaders/group leaders, thus provided opportunities to share experiences, feelings, emotions, and mental models with each other. In socialization, the group leader and technical leader's personal external social networks played an important role in acquiring knowledge from external sources. This could expand the group leader/technical leader's experiential knowledge stock and develop the shared experiential knowledge with other group leaders/ technical leaders. Thus, the *socialization* at the group level facilitated building of the group leader/technical leader's individual and group experiential knowledge.

#### *Externalization at the Group Level*

In *externalization*, the group leader/technical leader converts his/her group's experiential knowledge shared in his/her group, into the group's common

terminology, and articulates it as the group's conceptual knowledge. For instance, in the organizational group leader/technical leader meeting, group leader or technical leader shared knowledge and solutions generated from different groups. This meeting helped the group leaders and technical leaders assimilate information and knowledge across groups, which developed a large amount of organizational knowledge. For example, a portable technical leader brought a new solution generated by portable group members to the meeting, and shared this solution with other group's technical leaders. The other group technical leaders discussed the problem-solving process, collectively reflected on the solution, found out the conceptual theory behind the solution and as a result enriched the solution. These types of discussions may lead to the creation of new conceptual knowledge. The new solution would then be brought to different groups by their respective group leaders and technical leaders, and shared with their group members. In the end, this solution could become an organizational conceptual knowledge asset.

Also, in the group knowledge sharing meeting, the group leaders/technical leaders could work together to solve a group difficult problem through group discussion. For example, when a group encountered a difficult problem, which could not be solved in the group, the group technical leader would bring the problem to the technical leaders meeting. The technical leaders discussed the problem, and brainstormed some solutions. This collective discussion might inspire the technical leader's thinking and lead him/her to a new solution to solve the problem. If the new solution solved the problem, the solution would be leveraged in all groups of the organization.

#### *Combination at the Group Level*

In *combination*, the group knowledge intermediary (i.e., group leader/tech leader) synthesized information and knowledge captured from their group members in a group knowledge sharing meeting. He/she edited the knowledge and incorporated it into the group's systemic knowledge stock and released it on the group knowledge

share drive (or folds). This knowledge was easily transmitted to all group members in written form, and eventually it was available and accessible in the China-based TSC through the China-based organizational knowledge intermediary. The organizational knowledge intermediary collected information and knowledge from groups and put it together in a technical support engineer handbook and local organizational knowledge repository. The book and knowledge repository are new knowledge in the sense that they synthesize information from many different sources, such as the knowledge from group email sharing, from sharing folders, from shared knowledge repository, and from e-learning or web based training material. This knowledge was edited to meet China-based TSEs' request, categorized and combined together, and integrated into the local organizational knowledge repository to assist the China-based TSEs to solve their customers' problems. This *combination* process facilitated the building of group systemic knowledge and organization systemic knowledge.

#### *Internalization at the Group Level*

The new knowledge from group colleagues, technical leaders, other group TSEs, and the new knowledge released in the group and local organizational knowledge repository were leveraged in the group through on-job-training and group knowledge sharing meetings. The new explicit knowledge would draw the attention of TSEs who would like to learn it and apply it. It would be assimilated into group members' experiential knowledge stock through practice in their daily work. In the end, the new explicit knowledge would be embodied in the group TSE's actions and practice (see Chapter 6). The *internalization* at the group level would take place when the group members' actions were based on a set of shared mental models or action scripts. Therefore, *internalization* at the group level facilitated the development of group and organizational routine knowledge assets, and the building of group and organizational experiential knowledge.

The new organizational routine knowledge and organizational experiential knowledge

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generated by group members within organization would be shared and transferred from group leaders/technical leaders to other groups, thereby starting a new spiral of organizational knowledge asset building.

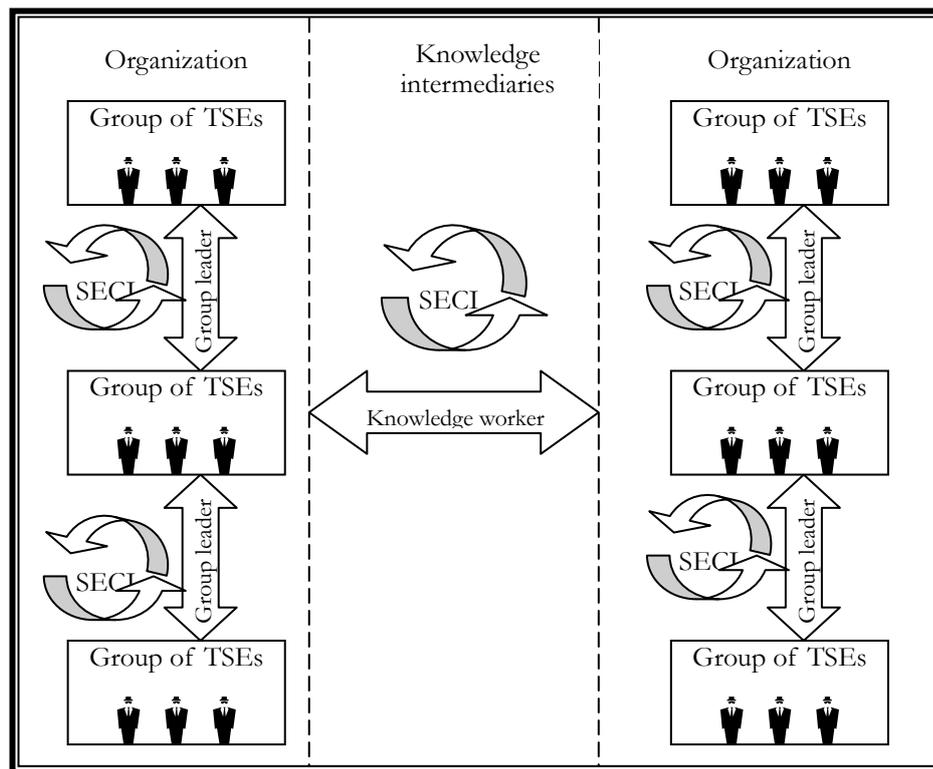
In summary, at the group level of SECI spiral, *socialization* facilitated the building of group leader's/technical leader's experiential knowledge asset and group experiential knowledge assets. The *externalization* process enabled the group leader and technical leader to explain, share, and clarify the experiential knowledge from the individuals and groups in their organization with other groups' technical leaders and group leaders through dialogue and conversations. The wider group's conceptual knowledge and the group leader/technical leader's conceptual knowledge were expanded as a result. The *externalization* process bridged the group and the organizational levels. It moved the knowledge asset beyond the group level and enabled the knowledge to become embedded within the organization through the group knowledge intermediary. The group level of *combination* facilitated the expansion and upgrading of group and organizational systemic knowledge assets. This *combination* process enabled the group's systemic knowledge and organizational knowledge to be leveraged in the group and the organization. *Internalization* was the process of internalizing the group's and the organization's systemic knowledge in the individuals' daily work through practice. It facilitated the building up of group and organizational experiential knowledge and routine knowledge asset.

### **7.1.2.3 Organizational Level of the SECI Spiral**

The organizational level of the SECI spiral illustrates the dynamic interaction among organizations or between organizations. In the upward spiral process, the organizational knowledge building process is based on group knowledge building. The knowledge sharing, transferring and building were at the organizational level then moved to the global level, and at the same time, the global level of knowledge would be transferred from the global level to the local organizational level, and then to the group level.

At the organizational knowledge building level, the organization's knowledge intermediary (i.e. local senior technician) took on an intermediary role when he/she facilitated the knowledge flows between the China-based TSC and other branch TSCs (see Figure 7.3). In other words, the China-based local knowledge was transferred from the China-based TSEs to the global knowledge center through the organization's knowledge intermediary. The knowledge intermediary was in charge of capturing and collecting the efficient solutions and "best practices" in the China-based TSC. This "best practices" knowledge was shared with the global knowledge center, and shared with the other branch TSCs through the China-based organization's knowledge intermediary. The knowledge intermediary was also in charge of leveraging the global knowledge from global knowledge center or other branch TSCs to the China-based TSC. For example, efficient solutions and "best practices" built by the India-based TSC would be transferred to the China-based TSC by the organization's knowledge intermediary. Therefore, the knowledge intermediary played a central role in the inter-organizational knowledge transferring and building processes.

Figure 7.3 Organizational Level of SECI Spiral



*Socialization at the Organization Level*

In *socialization*, the organization's knowledge intermediaries expanded their experiential knowledge through two means. One was working with the organization's members to solve customer problems. Experiential knowledge was shared in this process of collaboration. Also the organization's knowledge intermediary monitored the TSEs' call handling processes. In the monitoring process, they could learn and acquire some experiential knowledge through the daily work practices of the organization's members. Another way was to socialize with the knowledge intermediaries from different branches and senior technicians through global senior technician meetings or social activities that allowed them to spend some time with other organization's knowledge intermediaries. They could share experiences, feelings, emotions, and mental models with each other. For example, the China-based knowledge intermediary shared his ideas, images or experience directly with the India-based knowledge intermediary when the India-based knowledge intermediary visited the China-based TSC. The communication between knowledge intermediaries could expand the tacit knowledge stocks of both. Therefore, if the organization's

knowledge intermediary had extensive personal networks with other external organizations, this personal social network would help to expand the knowledge intermediary's knowledge and thus bring external knowledge to their organization. Overall, the organization level of *socialization* facilitated the building up of the organizational knowledge intermediary's shared experiential knowledge and organizational experiential knowledge.

#### *Externalization at the Organization Level*

In *externalization*, the China-based organization knowledge intermediary would take responsibility for converting the experiential knowledge of the organization members into organizational common terminology, and articulate it as organizational conceptual knowledge. The organizational conceptual knowledge such as "best practice" would be shared and transferred by the knowledge intermediary through dialogues with other branch knowledge intermediaries at the organization level of *externalization*. For instance, in the weekly global senior technician meetings, the organizations' knowledge intermediaries and senior technicians shared knowledge and solutions generated within their branches. This meeting helped the organization knowledge intermediaries acquire and assimilate information and knowledge across organizations. For example, the China-based knowledge intermediary brought a new organizational solution to a global senior technician meeting and shared it with the other branches' senior technician. In this meeting, the other branch senior technician critically inquired about the process of the problem-solving, collectively reflected on the solution to discern the conceptual theory behind the solution and thus enriched the solution. This discussion could trigger the creation of new conceptual knowledge. The new solution could be brought to other branches, and shared with other branches' TSEs. In the end, it could become a global conceptual knowledge asset.

In addition, the organization's knowledge intermediary could bring a difficult and complicated issue which could not be solved at the China-based TSC to the global senior technician meeting. In this meeting, the knowledge intermediary could gain

some advice and suggestions for solving the issue from other branches' senior technicians through discussing the issue at the meeting. The knowledge intermediary could acquire some new ideas from the GCC senior technicians and other branches' technical leaders. The new idea could inspire the creation of new knowledge. That could lead to a solution for the difficult issue. In the end, the knowledge intermediary could bring back some new knowledge to the China-based TSC, and share this with the local TSEs, which could greatly expand the local organization's conceptual knowledge assets.

*Combination at the Organization Level*

In *combination* at the organizational level, the knowledge intermediaries synthesized information and knowledge captured from organization members through observing and dialoguing with front line TSEs, from group knowledge sharing meetings and group email sharing, and from knowledge relating to solving local general problems excerpted from the global knowledge repository. They edited this knowledge and incorporated it into the organization's systemic knowledge repository or knowledge book. This knowledge can be easily searched for and accessed by a large number of TSEs in the China-based TSC. For example, it can be found in the local online knowledge repository and technical support engineer handbooks. Furthermore, the organizational knowledge will be collected by the GCC's knowledge intermediary through the global knowledge repository or global knowledge sharing meetings. The GCC knowledge intermediary will aggregate all the shared knowledge, and edit it into a systemic book or release it on the global knowledge repository. This knowledge can be easily transmitted to a large number of people in written form, and eventually the knowledge will be available and accessible to all TSC branches.

*Internalization at the Organization Level*

The new knowledge from the organization's senior technicians and knowledge intermediaries was leveraged in the organization through on-job-training and the organization's knowledge sharing meetings, or being shared in the organizational

knowledge repository or global knowledge repository. This new explicit knowledge would be drawn to the attention of TSEs who would be encouraged to learn, try and apply it. It would be converted into the individual members' experiential knowledge through practice in their daily work, and the new knowledge eventually would be embodied in the TSE's actions and practice. The organizational level of *internalization* would take place when the organization members' actions were based on a set of shared mental models or technical know-how. Therefore, the organizational level of *internalization* facilitated the building of organizational and global routine knowledge assets, and the building of organizational and global experiential knowledge assets.

The new organizational routine knowledge and individual experiential knowledge generated by organization members would be shared and transferred to other branches through the local organization's knowledge intermediary, thereby starting a new spiral of global knowledge asset building.

In summary, at the organizational level of the SECI spiral, the *socialization* process facilitated the building of organizational experiential knowledge and the knowledge intermediary's individual experiential knowledge asset. The *externalization* process enabled the organization's knowledge intermediary to explain, share and clarify their individual's and organization's experiential knowledge with other branches' knowledge intermediaries through dialogues and conversations. The organization's conceptual knowledge was expanded as a result. The *externalization* process bridged the organization and the global organization levels. It moved the knowledge asset beyond the organization level and enabled the knowledge to become embedded within the global organization's branches. The *combination* process at the organization level facilitated the expansion and upgrading of organizational and global systemic knowledge asset. The *combination* process enabled the organizational and global systemic knowledge to be leveraged in the organization and different branches. The *internalization* was the process of internalizing the organizational and global systemic knowledge in the individuals' daily work through practice. The *internalization* process

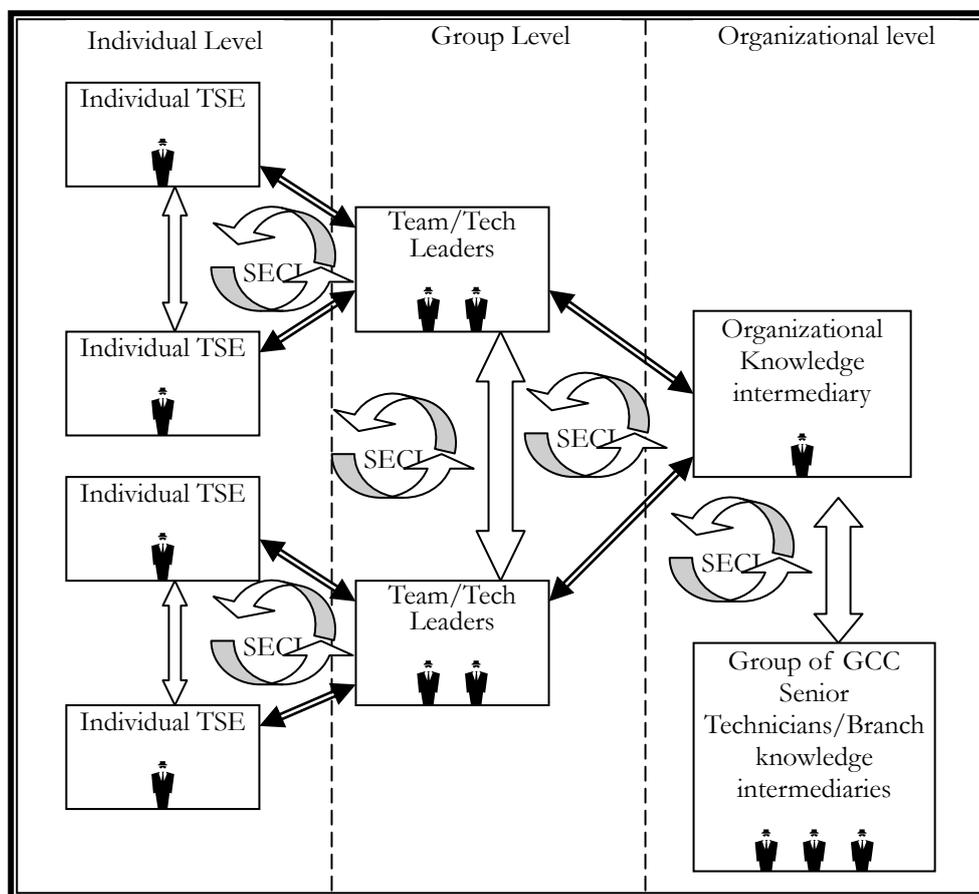
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facilitated the building of organizational and global experiential knowledge and routine knowledge.

### 7.1.2.4 Summary

The three levels of the SECI spiral in the organizational knowledge building process are presented in Figure 7.4.

**Figure 7.4 Three Levels of the SECI Spiral in the Organizational Knowledge Building Process**



This diagram demonstrates that organizational knowledge asset building starts at the individual level of the SECI spiral, and moves up to the group level through the group knowledge intermediaries (i.e., group leaders and technical leaders), and then to the organizational level through the organization knowledge intermediaries. Individual TSEs transfer, share and build individual and group knowledge with other individual group members at the individual level of the SECI spiral. At the group

level, with group leader/technical leader assistance, group TSEs transfer, share and build group and organization knowledge within the group level of the SECI spiral. At the organizational level, with the assistance of the organization's knowledge intermediary, organization members transfer, share and build organization and global knowledge in the organization level of the SECI spiral.

In the three levels of the SECI spiral, the group knowledge intermediary and the organization knowledge intermediary play the important roles of gatekeeper and boundary-spanner in exploring external knowledge, and introducing new knowledge into the group and the organization. The leadership of the knowledge intermediary is integral to the success of the knowledge transfer and knowledge building. The group and organizational knowledge intermediaries represent group members or organization members in exchanging knowledge with other groups or with other organization's knowledge intermediaries. They have a great influence on group members' or organization members' knowledge transfer and building. Antonakis and Atwater (2002) suggest that followers' self-concepts are affected and implicated by their charismatic leader, especially, when the leader represents the followers' self-concepts and social identity. In this study, group members' or organization members' self-concepts were affected by their knowledge intermediaries, at the same time, their knowledge intermediaries represented their self-concepts and social identity.

Table 7.1 summarizes the four types of knowledge assets building at the three levels of the SECI spiral.

**Table 7.1 The Four Types of Knowledge Assets Building at the Three Levels of the SECI Spiral at Alpha**

Level of SECI spiral	Socialization	Externalization	Combination	Internalization
Individual level	Individual and shared experiential knowledge building	Individual conceptual knowledge building	Individual & group systemic knowledge building	Individual and group experiential knowledge and routine knowledge assets building
Group level	Group leader/technical leader's individual and group experiential knowledge assets building	Group conceptual knowledge asset building	Group and organizational systemic knowledge assets building	group and organizational experiential knowledge and routine knowledge assets building
Organization level	Knowledge intermediary's individual and organizational experiential knowledge assets building	Organizational conceptual knowledge asset building	Organizational and global systemic knowledge assets building	Organizational and global experiential knowledge and routine knowledge assets building

To sum up, the process of *socialization* develops individual, group and organization experiential knowledge (intuitive, mental model and technical know-how). The process of *externalization* enables individual tacit knowledge to be expressed in language and makes the transfer of knowledge possible. It develops individual, group and organization conceptual knowledge. The process of *combination* develops rules and procedures to facilitate the repetition of routines. It develops individual, group, organization and global systemic knowledge. The process of *internalization* enables the organizational knowledge to become embodied in the TSEs' behaviour and embedded in organizational routines. It develops individual, group, organization and global experiential and routine knowledge. Overall, these three levels of the SECI spiral enable individual, group and organizational knowledge assets to be built, leveraged, utilized and expanded.

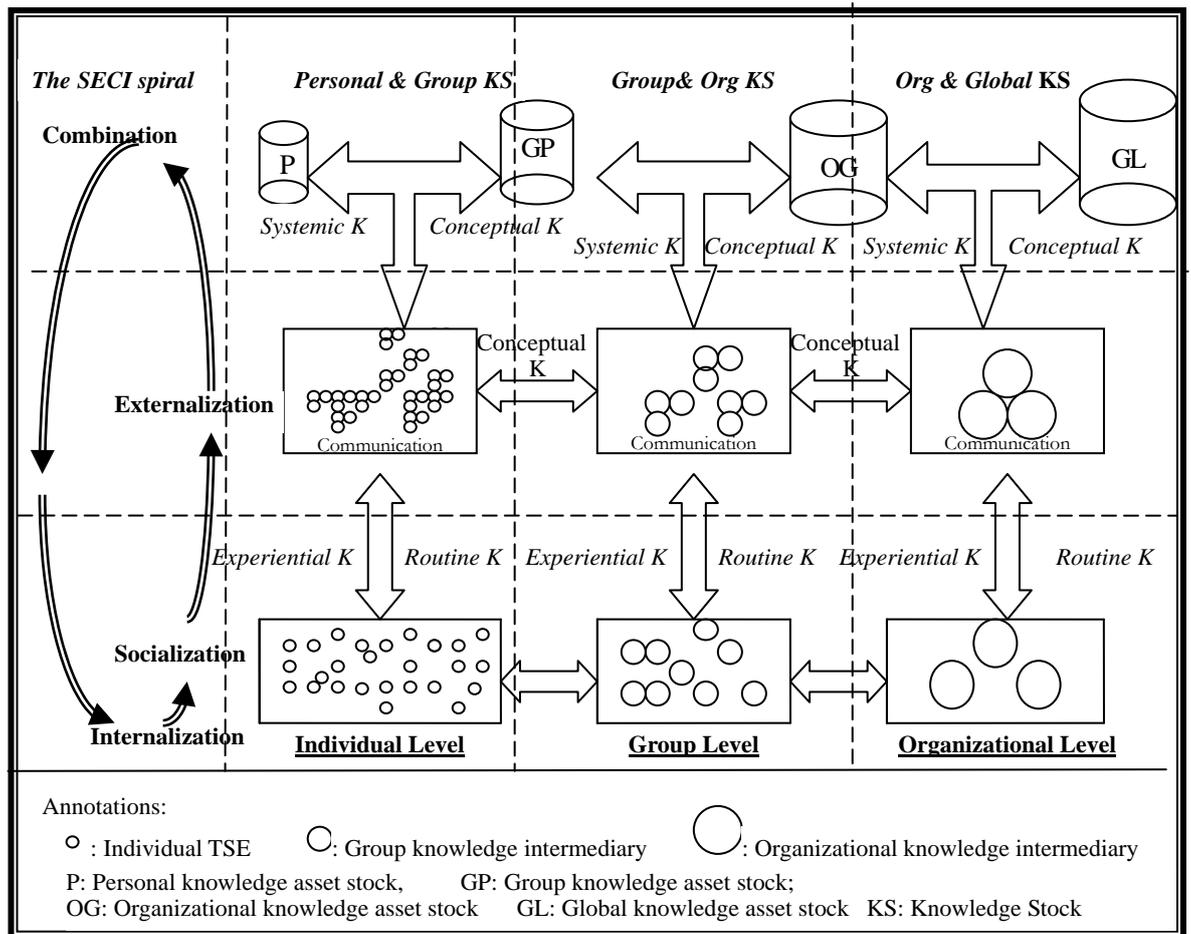
## **7.2 INITIAL ORGANIZATIONAL KNOWLEDGE BUILDING MODEL**

The analysis of data collected at Alpha showed that the organizational knowledge assets were built through three levels of the SECI spiral: the individual level, the group level and the organization level. The three levels of the SECI spiral enable organizational knowledge assets to be continually built, expanded and amplified. The organizational knowledge building started at the individual level, moved up to the group level, and then to the organizational level. At the same time, the organizational level knowledge also moved back to the group level, and then to the individual level.

### **7.2.1 Three Levels of the SECI Spiral Enabling Organizational Knowledge Asset Building**

A summary of the organizational knowledge assets building process in the three levels of the SECI spiral is shown in Figure 7.5.

Figure 7.5 Three levels of SECI loops Enabling Organizational Knowledge Asset Building



The organizational knowledge building is based on the organizational members' knowledge building. At the individual level, the individual members build their individual experiential (practical) knowledge based on their daily work. The daily-based experiential practice and action enables individuals to continually accumulate their tacit knowledge (i.e., mental models and technical know-how). In the *socialization* process, the individuals work with other colleagues (including onshore and offshore colleagues). They interact and communicate with each other through conversation and dialogue. The individual's experiential knowledge is converted into conceptual knowledge through the process of translating the individual's experiential knowledge into readily understandable forms such as words, concepts and visuals. Then individual support engineers can share and transfer each other's knowledge. The conversation and dialogue help to develop individual member's understanding and also help to develop a shared understanding. In the *combination* process, an

individual TSE collects the shared knowledge and combines it with his/her personal knowledge and stores it in his/her personal knowledge stock, thus builds an individual systemic knowledge asset. The individual TSEs' knowledge is collected and edited by group leaders and group technical leaders, and combined and integrated into group knowledge stock to build the group's systemic knowledge. The group's systemic knowledge will be distributed to the group. In the *internalization* process, group members try to embody the shared knowledge through practice in their daily work. The group routine knowledge would be built when the different individual members' actions were based on a set of shared mental models or technical know-how.

At the group level, the group leader or technical leader as a group knowledge intermediary plays an important role in the flow in and out of knowledge between groups. Group leaders and the technical leaders interact with the group members in their daily work. They capture the group members' experiential knowledge and expand their individual experiential knowledge. Apart from working with their group members, they also socialize with other group knowledge intermediaries through social activities or group knowledge intermediary meetings. During the communication with other group knowledge intermediaries, they share their group knowledge with other groups through converting some parts of their experiential knowledge and group routine knowledge into group conceptual knowledge via translation and expression. Also they bring other groups' conceptual knowledge back to their group. The group's knowledge stock will be distributed by the group knowledge intermediary in their group and shared with their group members. The new knowledge will be assimilated by the group's individual TSEs through practice in their daily work. Gradually, the new tacit knowledge will be embodied in the group TSEs' actions and practices, and will be repeatedly used in their routine work. The organizational routine knowledge would be built when the organizational members' actions are based on a set of shared mental models or technical know-how.

At the organizational level, the organization's knowledge intermediary plays a similar role to the group knowledge intermediary in facilitating the flow in and out of the knowledge from their organization. The organization's knowledge intermediary captures the organization members' experiential knowledge and expands their experiential knowledge through their daily contact with the organization's members. They also interact with other organization knowledge intermediaries through global senior technician meetings. They convert some part of their experiential knowledge and their organization's routine knowledge into explicit knowledge (conceptual knowledge), and share this knowledge with other branches knowledge intermediaries through dialogues or discussions. At the same time, they absorb and assimilate other branches' proved 'best practice', and bring this back to their organization. The new conceptual knowledge will be updated into the China-based organizational knowledge stock and shared with the organization's members through the organizational knowledge intermediary. The other branches' "best practice" will be distributed in the organization by the organization's knowledge intermediaries through on-job-training. It would be assimilated by individual support engineers through practice in their daily work. Gradually, the new tacit knowledge would be embodied in the organizational TSE's actions and practices. The global organization routine knowledge would be built when the global organizational members' actions are based on a set of shared mental models or technical know-how.

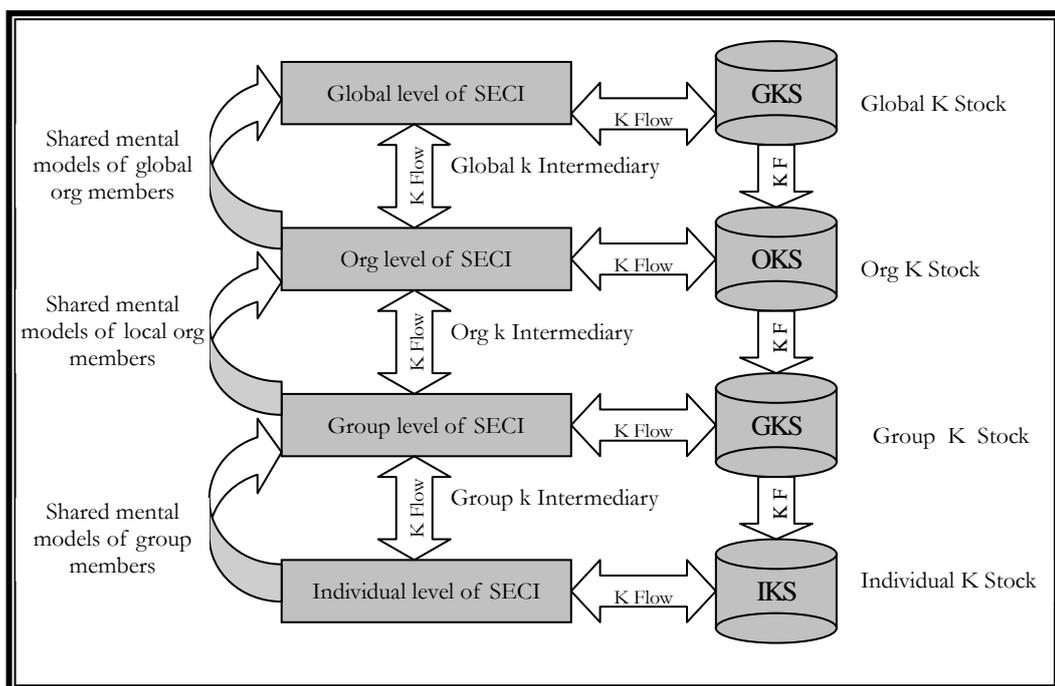
## **7.2.2 The Initial Model of Organizational Knowledge**

### **Building**

The analysis of field data collected at Alpha showed that three levels of SECI spiral facilitate the knowledge flow in and out of individuals, groups and the organization. The flow of knowledge into the organization facilitated the development of shared mental models. The shared mental models of organization members linked individual knowledge building to group knowledge building, and then linked this to organizational knowledge building. It was also evident that the knowledge

intermediary played a critical role in the transfer and sharing of group, organization and global knowledge, and facilitating knowledge flow in and out of group, organization and global levels. In addition, the knowledge assets generated in the three levels of the SECI spiral are collected and leveraged by individual and knowledge intermediaries and then stored in the individual, group, organization and global knowledge asset stock. A model of organizational knowledge assets building is presented in Figure 7.6.

**Figure 7.6 The Initial Model of Organizational Knowledge Building at Alpha**



In the model, the four levels of the SECI spiral (i.e., individual level SECI, group level SECI and organization level SECI) connect to each other through shared mental models and knowledge flow. The global level of SECI is not included in this study. Knowledge flow occurs in the knowledge transferring and sharing in the *socialization* and *externalization* processes through different levels of interaction and communication. The interaction and communication develop shared values, attitudes and interpretative schemes among the TSEs at the group level, the organization level and the global level, which enable TSEs to apply the same meaning schemes, meaning perspectives and mutual understanding of new knowledge and technologies within the computer technical support field. Bathelt, Malmberg, & Maskell (2004)

and Wenger (1998) have suggested that the interaction and communication through day-to-day work, based on the same expertise and a common set of technological knowledge and similar experiences supports the development of shared knowledge and competencies, similar technological paradigms, and shared language and attitudes. The shared mental models of organizational members enable individual knowledge building to be linked to group knowledge building, and then to organizational knowledge building. The shared knowledge and mental models enable individuals, groups and organizations to continuously combine and re-combine similar and non-similar resources to produce new knowledge and innovations (Bathelt, Malmberg, & Maskell, 2004).

This model shows that the knowledge flows in and out of individuals, groups and the organization through three levels of knowledge intermediaries (i.e., group knowledge intermediaries, organizational knowledge intermediaries, and global knowledge intermediaries). In the organizational knowledge building process, new ideas and knowledge flow from the individual to the group through the individual's *socialization and externalization processes*. The new knowledge flows from the group to the organization through the group knowledge intermediary's *socialization and externalization processes*. It flows from the organization to the global intermediary through the organization's knowledge intermediary's *socialization and externalization processes*. The flow of knowledge is an important source for further knowledge creation (Bathelt, Malmberg, & Maskell, 2004). The inflow knowledge enables the individual, group, and organization to develop new knowledge and ideas. The new knowledge and ideas will flow back from the organization to the groups and to the individuals.

This model also points out that the new knowledge created in the three levels of SECI spiral is collected and edited by the group knowledge intermediary, the organizational knowledge intermediary, and the global knowledge intermediary through the *combination* process. The systemic knowledge is built in the *combination*

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process and stored in personal, group, organizational and global knowledge asset stocks. Eventually, the knowledge in these stocks will be accessed by individuals, groups, and the organization. They will apply them in their daily work and embody or embed them in their routines through the *internalization* processes.

## **7.3 COMPARING ORGANIZATIONAL KNOWLEDGE BUILDING AT ALPHA AND AT BETA**

The Alpha case study developed a basic model of organizational knowledge asset building at the offshore TSC. The Beta onsite case study was done after Alpha (the main case) had been studied. This case was employed to verify the model generated in the Alpha case study and to generalize a research model which suited both cases.

An analysis of the field data showed that Beta had the same three levels of the SECI spiral of the organizational knowledge building as Alpha. The three levels of the SECI spiral started at individual level, and moved up to the group level, and then to the organizational level. However, because of the different organizational structure, there were some differences in the three levels of the SECI spiral in the knowledge assets building process at Beta compared to Alpha's. At Alpha, the TSEs were grouped according to the support region and support product. Each group supported the same region and the same product. At Beta, the TSEs were divided only based on the support region. Each group member supported the same regional customers, but supported different products. In a working group, only two or three TSEs supported the same product. For this kind of organizational structure, only general technical knowledge and business process knowledge can be shared within the working group. TSEs cannot acquire enough specialized product knowledge and specialized technical knowledge from their group members. This was the main reason why individual TSEs preferred to acquire knowledge, and share knowledge

with other group's TSEs without a group knowledge intermediary's help. This was the main difference between organizational knowledge asset building at Alpha and at Beta.

### **7.3.1 Individual Level of the SECI Spiral**

At the individual level of the SECI spiral, it was found that Beta's TSEs adopted a similar SECI spiral to those at Alpha. Many knowledge assets were built in the SECI spiral including individual experiential knowledge, individual conceptual knowledge, individual and group systemic knowledge, and individual and group experiential knowledge and routine knowledge assets. However, it was found that the TSEs at Beta not only socialized with other TSEs within the working group, but also socialized with other TSEs across groups. The TSEs at Beta shared and captured knowledge from the TSE in a different group who supported the same product as them. This is different to the situation at Alpha, where individual TSEs only socialized and communicated with other individual TSEs within the same working group. Thus, TSEs at Beta built and shared more extensive experiential knowledge and conceptual knowledge than those at Alpha did.

### **7.3.2 Group Level of the SECI Spiral**

At the group level of the SECI spiral, TSEs at Beta not only belonged to a physical group, but also to a virtual knowledge group. In the physical group, they had a group or group leader as a knowledge intermediary to acquire, capture and share knowledge. This was similar to Alpha's group level in the SECI spiral, in which many kinds of knowledge assets building took place, including group leader/technical leader' individual experiential knowledge and group experiential knowledge; group conceptual knowledge, group and organizational systemic knowledge; group and organizational experiential knowledge and routine knowledge assets. However, Alpha did not have a virtual knowledge group because the TSEs at Alpha could share their specialized product knowledge and technical knowledge within the physical group. The TSEs at Beta who were based in different regional support groups but

supported the same products liked to work together and share their specialized product and technical knowledge with each other. For example, they had some email groups, TSEs who were supporting the same product would be in the same email group. So if a TSE had a problem and wanted to ask a virtual group TSE, he/she could send an email, make a call, have a face-to-face discussion on Instant Messenger with the virtual group members. If a TSE wanted to share his/her “best solution” with whole group, they could send an email to all group members. This virtual group was voluntary. The knowledge flow among the virtual group really depended on the initiative of group members and the relationship between group members. This finding is in line with Pauleen’s (2003) and Pauleen and Yoong’s (2001b) study of virtual groups, which states that, the development of personal relationships between virtual group members is an important factor in effective knowledge sharing and knowledge exchange.

The individual TSE voluntarily shared and transferred their knowledge across groups through *socialization* and *externalization* processes. Therefore, the TSE’s initiative, willingness, and social networks played a very important role in transferring, sharing and building knowledge within the virtual group. However, there was not the building of group routine knowledge or group systemic knowledge in the virtual group SECI spiral because no knowledge intermediary was in charge of the flow of knowledge in or out of the group; there was only the building of individual experiential and conceptual knowledge. It was found that the virtual group level of the SECI spiral was similar to the individual level of the SECI spiral.

### **7.3.3 Organizational Level of the SECI Spiral**

At the organizational level SECI spiral at Beta, there was not only an organization knowledge intermediary to acquire, capture, transfer and share main organizational knowledge, but also individuals voluntarily transferred, shared and built knowledge among the organizations or between organizations, which was volunteer and based on personal willingness. The organization’s knowledge intermediary took

responsibility for acquiring, capturing, sharing and building knowledge among the organization. This was similar to Alpha's organizational level of the SECI spiral. Many types of knowledge assets building took place, including the knowledge intermediary's individual experiential knowledge and organizational experiential knowledge, organizational conceptual knowledge, organizational and global systemic knowledge, organizational and global experiential knowledge and routine knowledge assets building. For the individual TSE, the willingness to share, transfer and build knowledge was based on the personal relationship between the two parties in the knowledge sharing. In other words, if one party is willing to transfer and share knowledge with another party even they do not have any official responsibility for doing this, they will put effort into the knowledge sharing and transferring.

In addition, it was found that all the TSEs at Beta were encouraged to upload their solutions to the organizational knowledge repository. Each ordinary TSE could upload their knowledge to the global knowledge repository, but senior knowledge intermediaries (global knowledge intermediary) took responsibility for filtering the knowledge, deleting the inadequate knowledge, and giving feedback, suggestions or comments to the TSE who submitted the knowledge. The process was different at Alpha. At Alpha, there was an organizational knowledge intermediary who was in charge of capturing and uploading knowledge for the organization's knowledge repository.

**Table 7.2 The Four Types of Knowledge Assets Building at the Three Levels of the SECI Spiral at Beta**

Level of SECI spiral		Socialization	Externalization	Combination	Internalization
Individual level		Individual and shared experiential knowledge building	Individual conceptual knowledge building	Individual & group systemic knowledge building	Individual and group experiential knowledge and routine knowledge assets building
Group level	<i>Physical group</i>	Group leader/technical leader's individual and group experiential knowledge assets building	Group conceptual knowledge asset building	Group and organizational systemic knowledge assets building	Group and organizational experiential knowledge and routine knowledge assets building
	<i>Virtual group</i>	N/A	Individual conceptual knowledge	Individual systemic knowledge	Individual experiential knowledge
Organization level	<i>Across organization's official contacts</i>	Knowledge intermediary's individual and organizational experiential knowledge assets building	Organizational conceptual knowledge asset building	Organizational and global systemic knowledge assets building	Organizational and global experiential knowledge and routine knowledge assets building
	<i>Across organization's individual contacts</i>	N/A	Individual conceptual knowledge	Individual systemic knowledge	Individual experiential knowledge

The four types of knowledge assets building at the three levels of the SECI spiral at Beta are summarized in Table 7.2. The majority of process for building the knowledge assets at Beta is similar to those at Alpha. However, at Beta the individual TSEs had more initiative and volunteered to share, transfer, and build knowledge with other groups and other branches' TSEs than the Alpha individual TSE did. The initiative enabled the Beta's individual TSE to build extensive experiential and conceptual knowledge, the organizational structure at Beta made difficult in building group and organizational routine knowledge.

## **7.4 COMPARING KNOWLEDGE BUILDING AT ALPHA AND AT GAMMA**

The Alpha case study developed an initial model of organizational knowledge asset building at the offshore TSC. The Beta onsite case study confirmed most parts of the model. The Gamma onsite case study was carried out after Alpha and Beta case studies.

An analysis of the field data showed that Gamma had the same three levels of the SECI spiral of knowledge building as Alpha. However, there were some small differences between Alpha and Gamma at the group level and at the organizational level of the SECI spiral. This is because Gamma has only three small English support groups to support similar products (i.e., similar software with different functions) at the China-based TSC. Each group had less than 10 TSEs. At Alpha, there were eight English support groups which support the similar products (e.g., desktop, laptop, server, printer, projector, digital camera, etc.). Each group had more than 10 TSEs. The following section will compare the three levels of the SECI spiral at Alpha and at Gamma.

### **7.4.1 Individual Level of the SECI Spiral**

At the individual level of the SECI spiral, the TSEs at Gamma had a similar SECI spiral knowledge building process to the TSEs at Alpha. Many types of knowledge assets building took place: the individual experiential knowledge building, individual conceptual knowledge building, individual and group systemic knowledge building, and individual and group experiential knowledge building and routine knowledge assets.

### **7.4.2 Group Level of the SECI Spiral**

At Gamma, the group level of the SECI spiral was different from both Alpha and

Beta group levels because Gamma did not have a knowledge intermediary for the three groups, as already noted only three small English support groups support similar products at Gamma. Due to small size of the groups, each TSE knew each other very well; they were physically close and had similar duties. Therefore, a knowledge intermediary was not necessary, as they shared and transferred knowledge directly. At the group level of SECI spiral at Gamma, some types of knowledge building took place, including individual experiential knowledge building, individual conceptual knowledge building, individual and group systemic knowledge building, and individual and group experiential knowledge building and routine knowledge assets. This is similar to the knowledge building at the individual level of SECI spiral at Alpha.

### **7.4.3 Organizational Level of the SECI Spiral**

At the organizational level of SECI spiral, it was found that Gamma had a similar pattern to Beta. It not only had an organization knowledge intermediary taking responsibility for acquiring, transferring, sharing and building knowledge but also had the individual TSEs voluntarily transferring, sharing and building knowledge amongst organizations or between organizations. This willingness is based on the personal relationship between individual TSEs. Thus, at Gamma, the organization's knowledge intermediary facilitated the individual experiential knowledge and organizational experiential knowledge building, organizational conceptual knowledge building, organizational and global systemic knowledge building, organizational and global experiential knowledge building and routine knowledge assets building.

**Table 7.3 The Four Types of Knowledge Assets Building at the Three Levels of the SECI Spiral at Gamma**

Level of SECI spiral		Socialization	Externalization	Combination	Internalization
Individual level	<i>Within group contacts</i>	Individual and shared experiential knowledge building	Individual conceptual knowledge building	Individual & group systemic knowledge building	Individual and group experiential knowledge and group routine knowledge assets building
Group level	<i>Across group individual contacts</i>	Individual and shared experiential knowledge building	Individual conceptual knowledge building	Individual & group systemic knowledge building	Individual and group experiential knowledge and group routine knowledge assets building
Organization level	<i>Across organization official contacts</i>	Knowledge intermediary's individual and organizational experiential knowledge assets building	Organizational conceptual knowledge asset building	Organizational and global systemic knowledge assets building	Organizational and global experiential knowledge and routine knowledge assets building
	<i>Across organization individual contacts</i>	N/A	Individual conceptual knowledge	Individual systemic knowledge	Individual experiential knowledge

The four types of knowledge assets building at the three levels of the SECI spiral at Gamma are presented in Table 7.3. The majority of the knowledge assets building processes at Gamma are similar to those at Alpha. However, at Gamma, there is no group knowledge intermediary taking responsibility for assisting the group level of knowledge transfer, sharing and building. Instead, the knowledge transfer and building at the group level of SECI spiral is similar to the individual level of the SECI spiral.

## 7.5 SUMMARY OF RESEARCH FINDINGS IN THE THREE CASE STUDIES

The analysis of the field data at the three TSCs showed that three levels of SECI (i.e., individual, group and organization) facilitated the building of the four types of

knowledge assets (i.e., experiential knowledge, conceptual knowledge asset, systemic knowledge asset and routine knowledge assets). The main difference in the organizational knowledge building process in the three case studies was in the group level knowledge building process due to the different organizational structures at each site. At Beta, an individual TSE belonged to two groups: a physical group and a virtual group, because TSEs in the same group supported different products. In a virtual group, there was no group knowledge intermediary, and the knowledge building and transferring were based on individual social networks and relationships. Gamma's small group structure meant that there was no group intermediary playing a role of exchanging knowledge between groups. The knowledge building and transferring also was based on individual personal relationship.

This section presents a summary of research findings at the three case studies. It begins by presenting the four types of knowledge assets building at the three levels of SECI and closes by discussing the interactions amongst the knowledge intermediary, knowledge stock and knowledge flows in the organizational knowledge building process.

### **7.5.1 The Four Types of Knowledge Assets Building at the Three Levels of the SECI Spiral**

According to the research findings of the organizational knowledge building process, the four types of knowledge assets are built through three levels of the SECI spiral.

At the individual level of the SECI spiral, the three cases had a similar pattern of the four types of knowledge asset building: the experiential knowledge asset was built through the *socialization* process in all three cases; the conceptual knowledge asset was built through the *externalization* process; the systemic knowledge asset was built through the *combination* process, and the routine knowledge asset was built through the *internalization* process.

At the group level of the SECI spiral, Beta has added on the virtual group scenario (see Table 7.2). Virtual group members' knowledge sharing, transferring was based on individual willingness, and there was no group knowledge intermediary to take responsibility for knowledge flow in or out of the group. Since group concept knowledge, group systemic knowledge, and group experiential knowledge was not built in the virtual group, the group knowledge building tended to focus on individual level knowledge building. Therefore, there was little difference between the virtual group level of the SECI spiral and the individual level of the SECI spiral, so those two levels of the SECI spiral have been grouped together. At Gamma, because of the small group structure and physical proximity, TSEs know each other very well, and no group knowledge intermediary takes responsibility for sharing, transferring and distributing knowledge in the group (see Table 7.3). Therefore, such an organization may not need a group knowledge intermediary. Walton and Hackman (1986) state that groups themselves are influenced by organizational structure and type of management styles. The group can be treated as "extended individuals". At Gamma, as there was little difference between the group level of the SECI spiral and the individual level of the SECI spiral, so those two levels of the SECI spiral have been grouped together.

At the organization level, the TSEs at Beta and Gamma have some personal contacts and communication across the organization (see Table 7.2 and Table 7.3). There is no organizational experiential knowledge asset building, no organizational conceptual knowledge and systemic knowledge and organizational routine knowledge building, the contacts and communication are based on the individual level SECI, the *across organizations individual contacts* was group into the individual level of the SECI spiral.

A summary four types of knowledge assets building at the three levels of SECI in the three cases is presented in Table 7.4.

**Table 7.4 The Four Types of Knowledge Assets Building at the Three Levels of the SECI Spiral at the Three TSCs**

<b>Level of SECI spiral</b>	<b>Socialization</b>	<b>Externalization</b>	<b>Combination</b>	<b>Internalization</b>
Individual level	Individual and shared experiential knowledge building	Individual conceptual knowledge building	Individual & group systemic knowledge building	Individual and group experiential knowledge and routine knowledge assets building
Group level	Group knowledge intermediary's individual and group experiential knowledge assets building	Group conceptual knowledge asset building	Group and organizational systemic knowledge assets building	group and organizational experiential knowledge and routine knowledge assets building
Organization level	Organizational knowledge intermediary's individual and organizational experiential knowledge assets building	Organizational conceptual knowledge asset building	Organizational and global systemic knowledge assets building	Organizational and global experiential knowledge and routine knowledge assets building

## **7.5.2 The Interactions amongst Knowledge Intermediary, Knowledge Stock and Knowledge Flow**

In the organizational knowledge building process, the three levels of knowledge intermediaries (i.e., group knowledge intermediary, organizational knowledge intermediary, and global knowledge intermediary) and four levels of knowledge stocks (personal knowledge stock, group knowledge stock, organizational knowledge stock and global knowledge stock), and knowledge flows played a critical role in the organizational knowledge assets building process.

### **7.5.2.1 Knowledge Intermediaries**

A knowledge intermediary is a person in an organization who has an appropriate network position to connect knowledge seekers with knowledge sources across many

extensive divisions (Behboudi & Hart, 2008). The knowledge intermediary is in charge of researching, collecting, reshaping and storing knowledge in the knowledge stock and transferring knowledge from knowledge sources to knowledge seekers in a way that adds business value. In this study, knowledge intermediaries were in charge of exchanging knowledge across groups and organizations. They played the role of gatekeeper and boundary-spanner in facilitating external knowledge into groups or the organization through effective communication and interaction in their social networks. These were three kinds of knowledge intermediaries in the organization knowledge transfer and building process: a group knowledge intermediary (i.e., group leader/technical leader), an organization knowledge intermediary (i.e., organizational knowledge worker), and a global knowledge intermediary (i.e., GCC knowledge worker).

A group leader or a group technical leader might take on a group knowledge intermediary role when he/she facilitates the knowledge flow in or flow out of groups. For example, he/she collects knowledge from group members, compiles it into group conceptual knowledge, and shares it with other groups' leaders/technical leaders through social activities. At the same time, he/she collects other groups' "best practices" and combines these into the group knowledge repository, and distributes this knowledge repository within the group and the organization. Therefore, the group leader and the technical leader play a critical role in facilitating the knowledge flow in and out of the group, especially, in a large company with many groups.

However, Gamma did not have a group knowledge intermediary because the organization only had three small groups with a few group members. The group members knew each other very well. It was not difficult for group members to share and acquire knowledge from other group members. However, in a large company such as Alpha, with many groups, and each group having many group members, some group members may have difficulty in acquiring knowledge from other group members. New employees, in particular have limited social networks, so even through

they are eager to acquire knowledge from other TSEs, they do not have the necessary contacts to do so. Therefore, a group knowledge intermediary is indispensable for a large company with many groups.

Organizational knowledge intermediaries are in charge of assisting knowledge transfer and building and facilitating knowledge flow in and out of the organization. They socialize with other branches' senior technicians or knowledge intermediaries, and leverage other organization's "best practice" into their organization. They convert members' experiential knowledge into organizational conceptual knowledge and share it with other branches' senior technicians through the *externalization* process in the global senior technician meeting. Also they share organizational routine knowledge in the *socialization* process with senior technician or knowledge intermediaries from other branches in social activity. They aggregate large volumes of individual knowledge from the front line TSEs and then scan, summarize, analyze and interpret it, make connections across a variety of topic spaces, then bring the knowledge back to the front line TSEs and share it with them. Also they take responsibility for exchanging knowledge with offshore, onshore TSC and other branches. In other words, they upload the local organizational knowledge to the GCC, and at the same time, bring back global knowledge to the local TSEs and share this knowledge with them. Therefore, organizational knowledge intermediaries play a critical role in facilitating the knowledge flow in and out of the organization.

Global knowledge intermediaries (GCC knowledge workers) are in charge of leveraging knowledge among the TSC branches. They work with the branch's senior technicians or knowledge intermediaries, and leverage the "best practice" among the branches. They aggregate large volumes of organizational knowledge from all branches and then scan and summarize, analyze and interpret, and integrate it into the global knowledge stock. Therefore, global knowledge intermediaries play a critical role in facilitating the knowledge flow in and out of the TSC branches.

Overall, the knowledge intermediary plays a critical role in the integration of learning across the group and organization levels. The knowledge intermediary enables and enhances this integration by providing a foundation of shared understandings of needs and purposes at different levels of the organization. Also, the knowledge intermediary is important in institutionalizing learning by integrating new and existing knowledge into the organization's policies and practices. Because of the knowledge intermediary's central role in organizational learning and their ability to span boundaries across levels, little knowledge building could take place in an organization without his/her exchanging knowledge, and combining knowledge.

### **7.5.2.2 Knowledge Stock**

The knowledge stock includes the knowledge repositories which store explicit codified knowledge, and tacit inarticulate knowledge stored in the people's memories (such as individual, group members, and organization members). The knowledge repository facilitates knowledge dissemination, transformation, storage, and retrieval. It is likely to enhance the ease of the transmission of knowledge and enhance knowledge flows between groups and organizations (Schulz, 2001). It facilitates knowledge flows and helps to transform personal knowledge into group-level knowledge, and transform group knowledge into organization-level knowledge. In contrast, a person's memory cannot be transferred; it only can be shared in the *socialization and externalization* processes. This study identifies four levels of knowledge stocks involved in the knowledge transfer and building processes: personal knowledge stock, group knowledge stock, organizational knowledge stock, and global knowledge stock.

Personal knowledge stock contains a small volume of knowledge. It is developed by the individual TSE for personal use, and administered by the individual TSE. The personal knowledge stock includes an individual knowledge repository and the individual's memory. The knowledge repository is stored on the individual TSE's computer. It includes the individual TSE's personal systemic knowledge, conceptual

knowledge, and the knowledge collected from other TSEs through email sharing, sharing meeting or organization calibration meetings, and some valuable knowledge extracted from the local organizational knowledge stock, the global knowledge stock, and training material. The knowledge is frequently used by the individual TSE to solve general problems on the phone. The individual's memory stores the individual's received knowledge, shared group routine knowledge, and personal experiential knowledge.

The group knowledge stock is bigger than the personal knowledge stock. It consists of the group knowledge repository and the memory of group members. The group knowledge repository is collected, edited and developed by the group leader and group technical leader for his/her group TSEs' use. It is administrated by the group leader or group technical leader. This knowledge stock contains the group's conceptual and systemic knowledge collected from the individual group members' conceptual knowledge, and the knowledge derived from the organizational knowledge stock and the global knowledge stock, and training materials. Group knowledge stock has a narrow search range and therefore TSEs can find their target knowledge more easily. The shared group members' experiential knowledge and routine knowledge, such as the knowledge acquired and applied in the group member's daily work, are stored in the memory of each group member.

The organizational knowledge stock is bigger than the group knowledge stock. It consists of the organization's knowledge repository and the memory of the organization's members. The knowledge repository is collected, edited and developed by the organization's knowledge intermediary for local TSEs use. The organizational knowledge repository is administrated by the organization's knowledge intermediary and the group's knowledge intermediary. It stores the China-based TSE's systemic knowledge, conceptual knowledge, and the knowledge collected from other sources. The organizational knowledge intermediaries are responsible for uploading all solutions for general issues that occur at the China-based TSC to the China-based

organizational knowledge stock. They collect the solutions shared with colleagues through email, sharing meetings or calibration meetings. Also they extract some knowledge from the global knowledge stock, from e-learning or web based training material, which is useful and helpful for China-based TSEs to solve customers' problems. They extract that knowledge and store it in the China-based organizational knowledge repository where it can be easily accessed by the front line TSEs. The shared organization members' experiential knowledge and routine knowledge are embedded in the organization members' memory.

The global knowledge stock is the biggest organizational knowledge stock. It consists of global knowledge repository and the memory of global members. It is developed by the global knowledge intermediary and contains the most important global 'best practice' systemic knowledge. It is administrated by the global knowledge centered support engineers. Since the global knowledge repository is worldwide and the biggest knowledge repository, it is more difficult and more time-consuming to target useful information in this knowledge repository. The shared global members' experiential knowledge and routine knowledge are embedded in the global members' memory.

In summary, the four levels of knowledge repositories speed up the knowledge retrieval process. The difference among four levels of knowledge repositories is how quickly the TSE can locate and retrieve the knowledge when he/she requires the knowledge. The personal knowledge repository is the smallest and the fastest to access for the individual TSE, but individual TSE still have to edit and categorize the knowledge so as to expand and upgrade the personal knowledge repository. The personal knowledge repository stores files and solutions that he/she regularly uses. Since not all solutions are in their repository, TSE need to access the group knowledge repository. The group knowledge repository is slower to access as it is larger than personal knowledge repository, but it is faster to access and smaller than the organizational knowledge repository. The China-based organizational knowledge

repository stores knowledge/solution used less frequently than the knowledge stored in the group knowledge. The global knowledge repository is the biggest and the slowest to access for the TSE to find target knowledge. Therefore, when TSEs want to search or retrieve a solution, they usually check the personal knowledge repository first and then the group knowledge repository, and if necessary, they will move on to the organizational knowledge repository, and then the global knowledge repository. The four levels of knowledge stocks help individual TSEs locate knowledge quickly and speed up their problem-solving processes.

### **7.5.2.3 Knowledge Flows**

Knowledge flow is a process of knowledge passing between individuals, groups and organizations. It has three significant attributes: direction, content, and carrier (Zhuge, 2002). Direction determines the sender and the receiver. The content is information and knowledge acquired in the knowledge sharing, transferring and building processes in the three levels of the SECI spiral, such as conceptual knowledge, experiential knowledge, systemic knowledge and routine knowledge. These four types of knowledge are mainly carried by knowledge intermediaries who pass the knowledge from individuals, groups, and organizations into individual, group, organization and global knowledge stocks.

Figure 7.7 The Relationships amongst Knowledge Intermediary, Flow and Stock

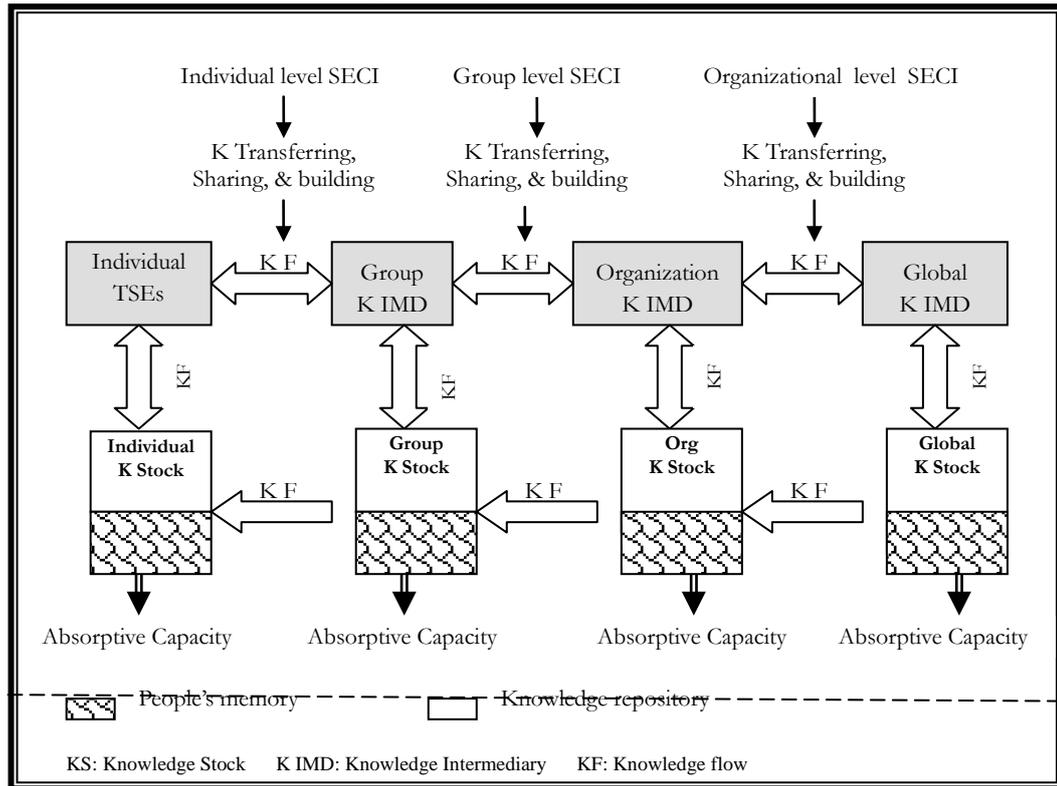


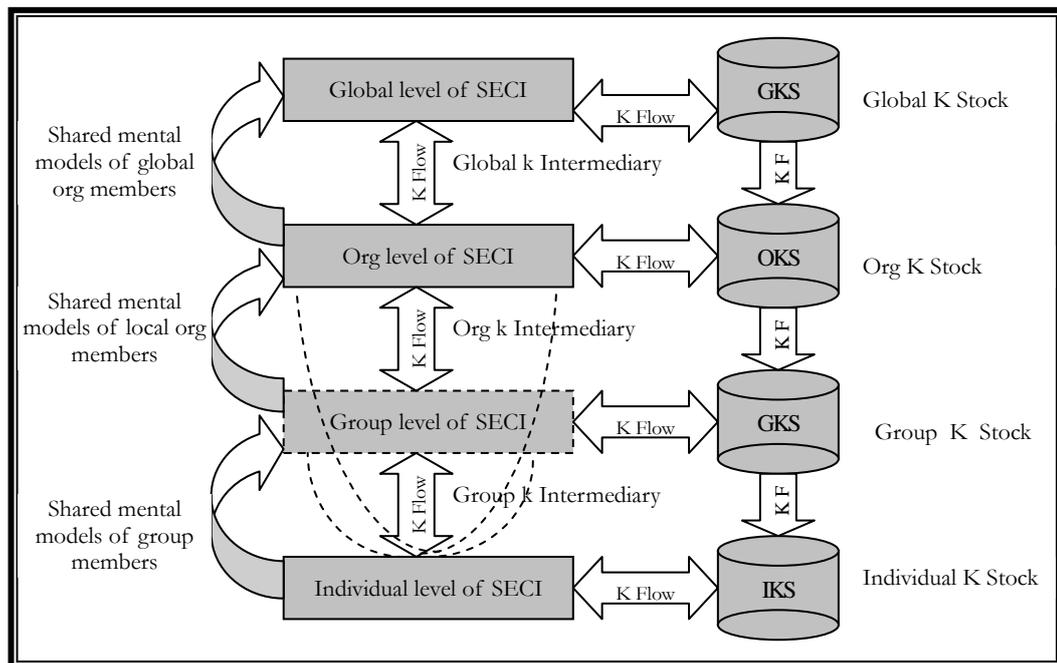
Figure 7.7 illustrates the interactions amongst the knowledge intermediaries, the knowledge stock and the knowledge flow. This diagram shows that the three levels of the SECI spiral facilitate knowledge sharing, transferring and building, which enables four types of knowledge assets building in the SECI spiral: conceptual knowledge, experiential knowledge, systemic knowledge and routine knowledge. These four types of knowledge are mainly carried by three types of knowledge intermediaries who pass the knowledge across individuals, groups, and organizations. At the individual level, when the new tacit knowledge (such as experiential knowledge and routine knowledge) flows into the individual, the group and the organization, it will be assimilated and internalized by individuals and stored in their memory. How much knowledge can be assimilated from the knowledge flow depends on the individual's absorptive capacity. At the group level, the new knowledge will be assimilated and internalized by groups and stored in the group member's memory. The group member's absorptive capacity also determines how much knowledge can be assimilated by the group. At the organization level, the knowledge will be assimilated and internalized by the organization and stored in the

organization's memory. The amount of knowledge that can be assimilated also depends on the organization's absorptive capacity. When the new explicit knowledge (such as conceptual knowledge and systemic knowledge) flows into the individual, the group and the organization, it will be selected by individual, group, organizational, and global knowledge intermediaries, and integrated into the individual, the group, the organization and the global knowledge repository. The increasing amount of individual, group, organizational and global knowledge stock will improve the individual, group, organizational, and global absorptive capacity respectively, which will facilitate the process of assimilation and internalization when new knowledge flows in.

## **7.6 MODIFIED ORGANIZATIONAL KNOWLEDGE BUILDING MODEL**

Through the comparison of Alpha, Beta and Gamma, it was found that even though there were a few differences in the organizational knowledge building process amongst these three cases, the interactions amongst knowledge stock, flow, and intermediary were same, and the three levels of the SECI spiral were similar. The modified organizational knowledge building model is presented in Figure 7.8.

**Figure 7.8 A Modified Model of Organizational Knowledge Building in the Three Cases**



In the modified model, the four levels of the SECI spiral (i.e., individual level SECI, group level of SECI, organization level of SECI and global level of SECI) are connected to each other through knowledge flow and shared mental models. The global level of SECI is not included in this study. The three levels of knowledge intermediaries facilitate knowledge sharing, transferring and building, and this enables the four types of knowledge assets building in the SECI spiral: conceptual knowledge, experiential knowledge, systemic knowledge and routine knowledge. The knowledge flow occurs at the different levels of TSEs' interaction and communication in the knowledge transferring and sharing processes within the three levels of the SECI spiral. The four types of knowledge are carried by knowledge intermediaries who pass the knowledge from individuals, groups, and organizations into individual, group, organization and global knowledge stocks through knowledge flow. In this process, three levels of knowledge intermediaries facilitate knowledge flow in and out of individuals, groups, and organizations.

Readers will note that there are two curved dashed lines in the modified model. One of the curved lines connects the group level of SECI to the individual level of SECI. Another one connects the organizational level of the SECI spiral to the individual

level of the SECI spiral. This modification is based on the research findings from the virtual group of the SECI spiral at Beta and individual contacts across organizations at Beta and at Gamma at the organization level of the SECI spiral. Two curved lines show that the group level of the SECI spiral and the organization level of the SECI spiral occur in the *across groups individual contacts* and *across organizations individual contacts* at Beta and Gamma are all based on the individual level of the SECI spiral. Since the contacts and communication are based on individual willingness to share and transfer knowledge, there was no group or organizational experiential, conceptual, systemic and routine knowledge assets building. The virtual group level of the SECI spiral and individual contacts across organizations individual tended to focus on the individual level of knowledge transfer and building. Therefore, the modified model has one dashed line connecting the group level of the SECI spiral to the individual level of the SECI spiral, and another dashed line connecting the organizational level of the SECI spiral to the individual level of the SECI spiral. The dashed line accounts for those TSEs in a different group or a different organization sharing, transferring and building knowledge at the individual level of the SECI spiral.

The modified model also indicates that group level of the SECI spiral is not compulsory when the organizational knowledge building takes place in a small organization, which has a few small groups with a close relationship structure. For example, at Gamma, the organization has a few small groups with close relationship, and TSEs know each other very well. There is no group knowledge intermediary taking responsibility for sharing, exchanging and distributing knowledge in the group. Therefore, the modified model has a dashed line around the group level of the SECI spiral box to show that the group level of SECI is not compulsory.

## **7.7 FACTORS AFFECTING ORGANIZATIONAL KNOWLEDGE BUILDING**

The analysis of the field data collected at the three cases identified four categories of factors affecting organizational knowledge assets building. These were support and commitment of top management, collaboration and communication, organizational knowledge creation and sharing culture, and information and technology infrastructure.

### **7.7.1 Support and Commitment of Top Management**

Organizational knowledge building cannot be successful without the support and commitment of top management. In this study, two main kinds of top management support have a positive effect on the organizational knowledge--continuous training and incentive systems.

#### *Continuous Training*

The analysis of the field data showed that continuous training could help to leverage knowledge around the organization and facilitate the building of shared mental models. For example, the top management team spent a great deal of money inviting US senior technicians to go to China and provide onsite training for TSEs. This training program enabled the onshore TSC's 'best practice' to be transferred to the offshore TSC, and enabled onshore and offshore TSEs to share their knowledge and daily-based-practice. Also, the on-job-training and mentor-to-mentee training provided by the organization helped individual TSEs to build up and exchange their personal knowledge. The time, money and efforts made by top management team contributed to the expansion of individual TSE's personal knowledge, group knowledge, and organizational knowledge.

### *Incentives Systems*

The top management team considered that knowledge sharing and knowledge transferring among the individual TSEs, and among groups and organizations played a critical role in the building of organizational knowledge assets. Therefore they motivated employees to share knowledge and create new knowledge through organizational incentive systems. For example, if a TSE shared his/her new knowledge with their colleagues in the group or organization knowledge sharing meeting or on the organizational knowledge repository, the top management team would compliment the TSE in the organizational meeting and encourage the TSEs to learn from him/her. If the shared knowledge was very helpful for more than ten TSEs, the TSE would receive a salary bonus.

## **7.7.2 Collaboration and Communication**

In collaboration and communication, TSEs worked together to solve a difficult issue and had a deep discussion about the issue. They could share experience and knowledge and assist each other in the problem-solving, and collectively reflect on the solution. Collaboration and communication plays a critical role in organizational knowledge building. It can facilitate new experiential and conceptual knowledge creation. Since onshore and offshore TSCs work at geographical distance, collaboration and communication can bridge this gap, and enable organizational knowledge to flow in and out between the onshore and offshore TSCs. The global electronic communities (communities of practice) are great knowledge collaboration and communication channels for TSEs to build a social network, and share and transfer knowledge online. This community can facilitate the development of interpersonal ties between onshore and offshore TSEs, which will enhance the communication and transfer of knowledge between the different branches.

The analysis of the data shows that two main factors, social network and absorptive capacity, affect knowledge transfer and knowledge building processes in the

collaboration and communication between individuals, groups and organizations.

#### *Social Networks*

Social networks play an important role in the knowledge transfer and building processes. At the organizational level of the SECI spiral, the organization depends on its organizational knowledge intermediaries' social networks to facilitate knowledge transfer and building between organizations. At the group level of the SECI spiral, the group depends on its group leader's/technical leader's social networks to facilitate knowledge transfer and building across groups within organization. At the individual level of the SECI spiral, the individual is dependent on his/her personal social network for knowledge transfer and building. All of these three levels of knowledge transfer and building depend on the individual and the knowledge intermediaries' social network in the organization position and their personal external networks. For example, if the organization knowledge intermediary has extensive personal networks with other external organizations, this personal social network could help to expand his/her knowledge which he/she can bring to his/her organization. The knowledge intermediary's social network can make a difference to the group and organizational level knowledge sharing, transferring and building. If a TSE has a broad social network, he/she would have more opportunity to share and transfer knowledge with other TSEs in different groups and different organizations.

#### *Absorptive Capacity*

The analysis of the field data showed that the organizational knowledge asset building depended heavily on the absorptive capacities of the individual and the knowledge intermediaries. For example, at the group level, group knowledge intermediaries share the knowledge of their respective group members with other group knowledge intermediaries in a sharing meeting. Their absorptive capacity would influence the amount of knowledge they could acquire from the external knowledge source, which in turn influences the amount of knowledge his/her group

members could acquire from him or her. If the group knowledge intermediary has a high level of absorptive capacity, his or her prior knowledge would have a greater degree of overlap with the external knowledge, so he/she could acquire, assimilate, transform and exploit the external knowledge easily (Zahra & George, 2002). The amount of knowledge that the intermediary can acquire, assimilate, transform and exploit from the external source would affect the amount of knowledge he/she could share and transfer to his/her group members.

### **7.7.3 Organizational Knowledge Sharing Culture**

An offshore organizational knowledge sharing culture could greatly increase the knowledge flow among individuals, groups and organizations. For example, at Alpha, the China-based TSC had a positive knowledge sharing culture. When a TSE encountered a new and difficult problem and spent much time solving it, so he/she would write down the steps of new solution and email this to his/her group, so that other TSEs would not suffer the same difficulties as he/she had. This knowledge sharing culture has been created since the TSC built. Also the top management team encourages TSEs to share and transfer their knowledge through incentive schemes.

### **7.7.4 Information Technology Infrastructure**

A well developed information technology infrastructure could increase knowledge sharing and distribution around individuals, groups and organizations. In this study, the information technology infrastructure refers to knowledge repositories and communication channel. It plays an important role in transferring and sharing “best practices” (i.e., the successful solutions for general issues that have been solved previously) from the US-based support center to the China-based support center.

#### *Knowledge Repositories*

Organizational knowledge repositories play a critical role in transferring successful explicit knowledge (i.e., the successful solutions for general issues that have been

solved previously) from the US-based support center to the China-based support center. The knowledge repositories used by the TSC in this case are a searchable IT-based repository which stores and indexes the successful solutions, and makes them available to the TSE to assist them in solving their problems. Each solution provides knowledge or information about the subject of problem, a problem symptom description, resolution/solution, service action, and recommended action. The organizational knowledge repositories facilitate the TSE's access to expert problem solutions: no matter what his or her current expertise level is. The process and experience of applying the encoded knowledge in repositories to a real problem sharpens the TSE's problem solving skills and diagnostic logic and helps new employees improve their skills more quickly (El Sawy & Bowles, 1997). A knowledge repository "enables staff to be more learningful in that they build on each other's knowledge and on that of more experienced senior colleagues and smart customers"(El Sawy & Bowles, 1997, p. 474).

However, with growth in the organizational knowledge, the knowledge repositories become larger and larger, and many TSEs complain that it is hard to locate the knowledge in knowledge repository and find quality knowledge in time. The other challenge of knowledge location is that individual TSEs are often not aware of the existence of the knowledge they are looking for. When there is time pressure, the TSEs tend to accept lower quality information that is more accessible (Ahituv, Igbaria, & Sella, 1998). These difficulties greatly restrict the efficiency of knowledge sharing and application in the organization. Therefore, providing rapid access to quality knowledge would be one of the important goals of knowledge management in the organization.

#### *Communication Channel*

IT infrastructure provides a communication channel at the boundary between the onshore and offshore TSCs, between the group and those outside the group through email, instant messages, conference call and on-line classes. These communication

channels are the key to sharing, transferring and creating knowledge with internal and external TSEs, and allow the organization to bridge differences and to integrate new information from the external organization (Buchel, 2007).

In summary, the factors of support and commitment of top management, collaboration and communication, organizational knowledge creation and sharing culture, and information and technology infrastructure all have an effect on the offshore TSC's knowledge transfer and knowledge building.

## **7.8 DISCUSSION**

This study has examined how organization knowledge assets are built at three offshore TSCs, how individual knowledge building links to group and organizational knowledge building, and how knowledge flows in and out of individuals, groups and the organization. The research findings indicate that the organizational knowledge assets are built through three levels of the SECI spiral at the individual level, the group level and the organization level. The organization members' shared mental models help individual knowledge building to link to group knowledge building, and then to organizational knowledge building. The knowledge flow in and out of individual, group and organization is facilitated through three levels of knowledge intermediaries and four levels of knowledge stocks. A model of organizational knowledge assets building process was developed in this study.

There are three areas where this study can contribute to a better understanding of organizational knowledge building.

The first contribution is that this study has uncovered how the organizational knowledge is built and expanded through SECI spiral at the individual level, the group level, and the organizational level. It is difficult to link this finding to previous literature, because little seems to have been previously published on organizational

knowledge building. Even though Nonaka and Takeuchi (1995) identify that the SECI spiral enables organizational knowledge to become externalized and amplified, they do not explicitly address how organizational knowledge is continuously built through the SECI spiral at the individual level, the group level, and the organizational level. This study indicated that three levels of knowledge intermediaries (i.e., group knowledge intermediary, organizational knowledge intermediary, and global knowledge intermediary) facilitate knowledge sharing, transferring and building, which enables knowledge to flow in and out of the individual, the group, and the organization in the three levels of the SECI spiral to build organizational knowledge assets. Glisby and Holden (2003) have argued Nonaka's SECI modes of knowledge conversion are culture-dependent, the model might not be used successful in a western culture business context. However, the evidence from this study showed that SECI models can be effectively applied in an offshore outsourcing business context to help offshore TSCs to achieve expected benefits.

The second contribution is that this study has demonstrated how organizational knowledge assets are built in the three levels of the SECI spiral. Nonaka, Toyama, & Komo (2000) identified four knowledge assets: experiential knowledge asset, conceptual knowledge asset, systemic knowledge asset and routine knowledge asset, but they did not explicitly mention how these four types of knowledge assets were build up. This study extends their finding by showing how the three levels of the SECI spiral facilitate the building of the four types of knowledge assets. The three levels of the *socialization* process facilitate the building up of individual TSEs' experiential knowledge, group leaders/technical leaders' experiential knowledge and organizational knowledge intermediaries' experiential knowledge. The three levels of the *externalization* process facilitate the building of individual conceptual knowledge, group conceptual knowledge asset and organization conceptual knowledge asset. The three levels of the *combination* process enable individual systemic knowledge, group systemic knowledge asset and organization systemic knowledge asset building. The three levels of the *internalization* process facilitate the building up of individual

experiential knowledge and group routine knowledge asset, organization routine knowledge asset and global routine knowledge asset.

The third contribution is that this study has confirmed the importance of mental models in linking individual, group and organizational knowledge building and also has uncovered how shared mental models are built in the organization. Kim (1993) and Crossan, Lane, and White's (1999) study on organizational learning showed that shared mental models play a critical role in linking individual to organizational learning. The organizational learning framework developed by Crossan, Lane, and White (1999) suggests that organizational learning occurs across three levels (i.e., individual, group, and organization). They suggest that the individual learning links to group and organizational learning through shared understandings and shared meanings in the interpreting and integrating processes. This study confirmed their premise that organizational learning is multilevel: individual, group and organization. Kim (1993) shares Crossan, Lane and White's (1999) view by stating that individual level learning can be transferred to the organization level learning through mental models. He suggests that individual mental models collectively contribute to the shared mental models. However, Kim does not explicitly address the details of how individual mental models become organizational mental models.

This study's finding suggests that shared mental models are built in the three levels of SECI spiral. In the three levels of SECI spiral, individuals interact and communicate with each other through *socialization* and *externalization* processes, which support the development of shared values, attitudes and interpretative schemes among TSEs at the individual level, the organization level and the global level. The shared mental models enable TSEs to apply the same meaning schemes, meaning perspectives and mutual understanding of new knowledge and technologies within a technical support field. It has been suggested by Bathelt, Malmberg, & Maskell (2004) and Wenger (1998) that the interaction through day-to-day work, based on the same expertise, a common set of technological knowledge and similar experience,

supports the development of shared knowledge and competencies, similar technological paradigms, and shared language and attitudes.

Also, this study suggests that shared mental models are built in the *combination* and *internalization* processes. For example, the individuals' knowledge and information shared in the *socialization* and *externalization* processes would be collected and combined into group systemic knowledge by the group knowledge intermediary. The group knowledge intermediary would distribute the group's systemic knowledge around the group through on-job-training, a group knowledge sharing meeting or group knowledge repository. The new shared systemic knowledge would be drawn to the attention of TSEs who would be encouraged to learn, try and apply it. They would challenge their old mental models, assimilate and adjust the new shared systemic knowledge through applying the new knowledge in their daily work (*internalization*). The new shared systemic knowledge eventually would be embodied in the TSE's action and practice. The group shared mental models would be built when the group members' actions are based on a set of shared mental models or technical know-how. The group knowledge intermediary and organization knowledge intermediary would facilitate individual knowledge sharing, transferring and building across groups and organizations. These two levels of knowledge intermediaries enable the group mental models to become organizational mental models. Therefore, the study findings indicated that individual mental models became the organization shared mental models through three levels of the SECI spiral with the assistance of two levels of knowledge intermediaries.

## 7.9 CHAPTER SUMMARY

This chapter has presented and discussed the study results of organizational knowledge assets building process at three TSCs. Section 7.1 presented the organizational knowledge assets building at Alpha. According to the researching findings at Alpha, Section 7.2 proposed an initial model of organizational knowledge

building. Section 7.3 compared the organizational knowledge assets building at Alpha and Beta. Section 7.4 compared the organizational knowledge assets building at Alpha and Gamma. Section 7.5 summarized the research findings at the three case studies. Section 7.6 modified the initial model of organizational knowledge assets building. Section 7.7 identified factors affecting organizational knowledge building. Section 7.8 discussed the research findings by linking them back to previous literature.

# **CHAPTER 8 COMPREHENSIVE MODEL: OFFSHORE ORGANIZATION KNOWLEDGE TRANSFER AND BUILDING**

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In this Chapter, section 8.1 will summarize the main research findings in this study. Section 8.2 will synthesize the findings into a diagram. Section 8.3 will develop a comprehensive model of knowledge transfer and building. The chapter will end by discussing the comprehensive model by linking back to previous literature.

## **8.1 SUMMARY OF THE MAIN RESEARCH FINDINGS IN THIS RESEARCH**

In this study, Chapter Two reviewed the knowledge transfer and knowledge building in offshore outsourcing in previous literature. It developed a synthesis framework of knowledge transfer and knowledge building in offshore outsourcing (see Figure 2.10). This framework identified the key elements in offshore knowledge transfer and building in terms of knowledge transfer, knowledge flow, absorptive capacity, learning, building and knowledge asset stock.

Chapter Four discussed the differences and interactions between knowledge transfer and knowledge building. It identified that a transfer of knowledge process is the prerequisite of individual and organizational knowledge building. It was also found that absorptive capacity played a critical role in knowledge transfer and building processes. Absorptive capacity influenced the amount of knowledge acquired and

assimilated in the knowledge transfer process. Knowledge building enables the organization or its individual member to accumulate a stock of knowledge. With an increase in the size of the knowledge stock, there will be a corresponding increase in the organization's or its individual member's absorptive capacity, and the organization or its individual member will be able to acquire and absorb more knowledge, which in turn facilitates further knowledge building and knowledge accumulation.

Chapter Five developed a knowledge transfer type adoption model for the different knowledge levels of knowledge recipients, which identified the relationships amongst the levels of knowledge, the types of knowledge and the knowledge transfer approaches. The model illustrated that knowledge transfer could occur at the different levels (i.e., individual, group and organization levels), and that absorptive capacity played a critical role in the knowledge transfer process. The level of absorptive capacity of the knowledge recipient determined the knowledge transfer type adoption and the amount of knowledge acquired and assimilated.

Chapter Six discussed the individual tacit knowledge building process and developed a basic individual tacit knowledge building model. The model illustrated that the goal of individual tacit knowledge building is to build up individual meaning schemes and meaning perspectives through two continuous knowledge building loops, an explicit learning loop and an implicit learning loop. The explicit learning loop creates a core conceptual knowledge, which will guide the tacit knowledge building. The implicit learning loop enables the TSE to build up his/her tacit knowledge through experiential learning and actions and through applying conceptual knowledge into real world problems.

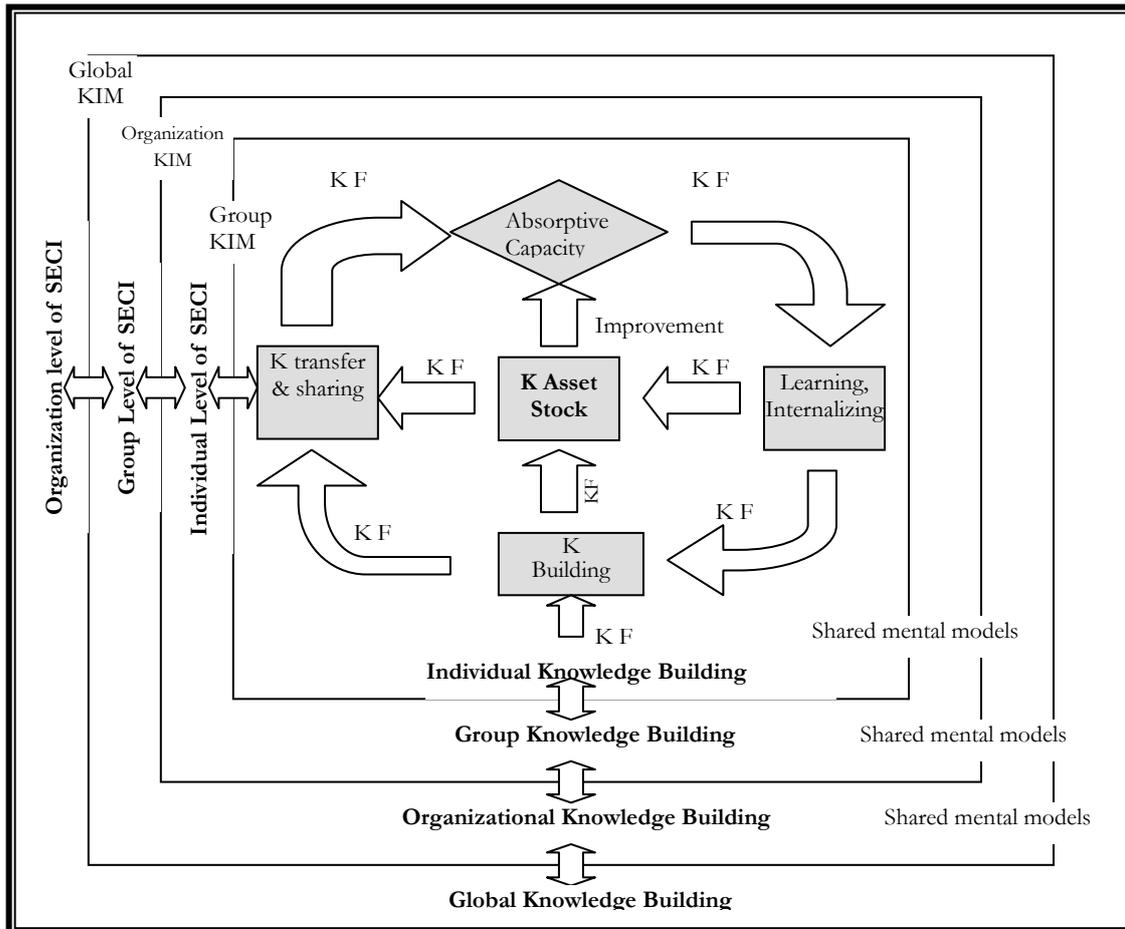
Chapter Seven discussed the organizational knowledge building. It demonstrated that organizational knowledge building is based on three levels of the SECI spiral, which facilitated four types of knowledge assets building. It also showed the interplay amongst knowledge intermediary, flow, and stock, in which knowledge intermediaries

facilitated four types of knowledge assets building at the three levels of the SECI spiral, and knowledge inflow carried the four types of knowledge assets into knowledge stock. The knowledge outflow carried the four types of knowledge assets to other knowledge seekers through knowledge transfer and sharing. Further, it suggested that absorptive capacity played a critical role in the organizational knowledge transfer and building process. The level of absorptive capacity affects the amount of knowledge flow into the individual, the group and the organization.

## **8.2 SYNTHESIS OF THE RESEARCH FINDINGS IN THIS STUDY**

Figure 8.1 combines the findings of five previous chapters into a diagram to show knowledge transfer and building in an offshore organization. This diagram comprises a four-level rectangle box presenting the connection and interplay among knowledge transfer, knowledge flow, absorptive capacity, knowledge building, and knowledge stock at the individual, group and organizational levels in offshore outsourcing. It shows how the knowledge intermediary facilitates the knowledge flow in the three levels of the SECI spiral to transfer and build knowledge, and how the three levels of the SECI spiral shape the shared mental models, affect the absorptive capacity of organizations and accumulate the knowledge stocks of organization in the knowledge transfer and building processes.

Figure 8.1 A Synthesis Diagram of Research Findings



Notes: KIM stands for knowledge intermediary; KF stands for knowledge flow

The left side of the diagram shows that the knowledge flows in and out of individuals, groups, organizations and global with the assistance of group, organization and global knowledge intermediaries in the three levels of the SECI spiral. The knowledge intermediaries play a critical role in this process. They enable and enhance the integration of learning across group and organization levels by providing a foundation of shared understandings of needs and purposes at different levels of the organization. Knowledge flows into individuals through the individual level's interaction and communication in the *socialization* and *externalization* processes, which enable knowledge transfer and sharing to take place. During the knowledge transfer and sharing process, the individual's absorptive capacity determines how much knowledge can be acquired and assimilated. The higher the absorptive capacity the knowledge recipient has, the greater the amount of knowledge that flows into the knowledge recipient in the knowledge transfer process. The external knowledge is

transformed and exploited in the knowledge recipient's daily work and eventually internalized and taken for granted. The knowledge learned from an external source could be background knowledge for building new knowledge. Once the new knowledge is built, it will flow into the TSE's personal knowledge stock. It also could be transferred or shared with another person through the *socialization* and *externalization* processes at the individual level, which enable knowledge to flow out of the individual's knowledge stock.

The knowledge intermediaries also play a critical role in the *combination* process. They aggregate large volumes of individual knowledge from TSEs, scan, summarize, make connections across a variety of topic, and integrate the knowledge into a systemic knowledge asset and then leverage this systemic knowledge across individuals, groups and organizations. The model shows that the systemic knowledge flows in through the *combination* and *internalization* processes at the individual level. The systemic knowledge is distributed or leveraged by the group knowledge intermediary. The new distributed and leveraged knowledge could draw the attention of TSEs who would like to learn it and apply it. The new knowledge could be eventually internalized by the individual and embodied in his/her daily work. This integration of this new knowledge will expand the individual's knowledge stock. The new knowledge could also be transferred and shared with other person. The expanded knowledge stock will improve the individual's absorptive capacity, which in turn would increase the amount of knowledge acquired in the knowledge transfer process.

The bottom of the diagram shows that individual level knowledge building is connected to group level knowledge building, and that the group level knowledge building is connected to organizational knowledge building. These connections demonstrate the interactions and inter-relationships of the knowledge building process amongst the individual level, the group level and the organizational level. The organizational knowledge is built through the organization's members' *socialization*, *externalization*, *combination* and *internalization* processes, but it is independent of any

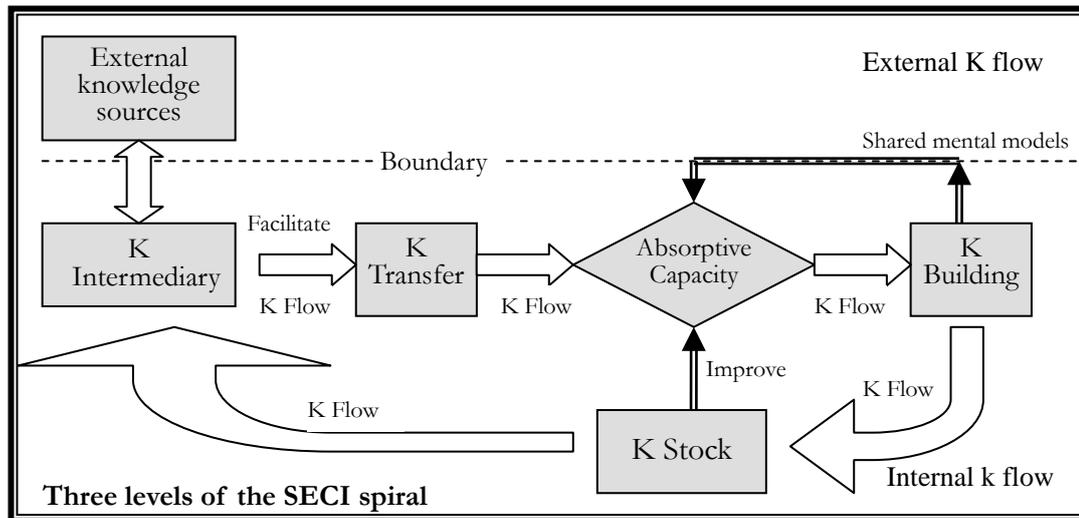
specific member, in the way same as global knowledge and group knowledge is. The individual knowledge building links to group knowledge building through shared mental models within the group. The group knowledge building links to the organization knowledge building through the shared mental models of organization members, and the organization knowledge buildings link to global knowledge building through shared mental models in the global organization. The shared mental models are built through interaction between individuals, groups and organizations in conversation, dialogue, discussion, experience sharing, and observation processes. The shared mental models are also built through learning, trying, and applying the shared knowledge and information, challenging old meaning perspectives, and internalizing and embodying knowledge in daily work practice.

In summary, this diagram presents a complete picture of how knowledge is transferred and built in the offshore organization. It shows that there are seven key elements in the offshore outsourcing knowledge transfer and building: the SECI spiral, knowledge flow, knowledge stock, knowledge intermediary, absorptive capacity, knowledge transfer and knowledge building.

### **8.3 A COMPREHENSIVE MODEL OF OFFSHORE ORGANIZATION KNOWLEDGE TRANSFER AND BUILDING**

The synthesis diagram (see Figure 8.1) identifies seven key elements in the offshore outsourcing knowledge transfer and building, including the SECI spiral, knowledge intermediary, knowledge flow, knowledge stock, absorptive capacity, knowledge transfer and knowledge building. By integrating these elements into knowledge transfer and building process, the author has gained insight into the dynamic interplay of forces which can impede or facilitate knowledge transfer and building in offshore outsourcing. A comprehensive model shows the interplay amongst seven key elements in the offshore outsourcing knowledge transfer and building (see Figure

8.2).

**Figure 8.2 A Comprehensive Model of Offshore Knowledge Transfer and Building**

In this diagram, the knowledge transfer and knowledge building processes occur in all three levels of the SECI spiral. The knowledge intermediaries play the roles of gatekeeper and boundary-spanner in facilitating the flow of external knowledge into the individual, the group and the organization stock through knowledge sharing, transferring and building processes, that enables the four types of knowledge asset building in the SECI spiral: conceptual knowledge, experiential knowledge, systemic knowledge and routine knowledge. Knowledge flow occurs at the different levels of TSEs' interaction and communication within the knowledge transferring and sharing processes in the three levels of the SECI spiral. Knowledge flow carries the four types of knowledge passing through individuals, groups, and organizations and into individual, group, organization and global knowledge stocks. In this process, knowledge intermediaries at the three levels facilitate knowledge flow in and out of the individuals, the groups, and the organizations.

When knowledge flows through individuals, groups and organizations, it will be acquired and assimilated by these recipients in the knowledge transfer process, transformed and exploited in the knowledge learning and building processes, then eventually stored in their memory. The amount of knowledge that can be assimilated

and acquired depends on the knowledge recipient's potential absorptive capacity. The higher the level of the absorptive capacity of the knowledge recipient, the greater the volume of knowledge he/she can absorb. The knowledge acquired from the external source in the knowledge transfer process will be transformed and exploited by the knowledge recipient in his/her daily work, and eventually internalized in his/her knowledge stock. The knowledge acquired from the external source could be background knowledge for building individual, group and organizational knowledge, and this would facilitate the building of shared mental models. The shared mental models could increase the shared prior knowledge, and improve absorptive capacity, both of which enable the organization to acquire and absorb more external knowledge.

The newly built knowledge or acquired knowledge will be stored in a recipient's knowledge stock. An increase in the volume of knowledge stock will improve the knowledge recipient's absorptive capacity, which will in turn influence the volume of knowledge transfer and knowledge building in the future. At the same time, the individual's stock of knowledge will be shared and transferred to other individuals, groups and organizations in the three levels of SECI spiral. In this process, the knowledge flows out of the individual, group or organization.

Knowledge intermediaries play a critical role in facilitating knowledge transfer and knowledge building in the three levels of the SECI spiral. Based on the knowledge intermediaries' social networks in the organization and their external networks, they distribute new external knowledge around the organization. They are gatekeepers and boundary-spanners. With their high level of absorptive capacity, they acquire and assimilate external knowledge, and transfer this knowledge to groups and organizations, which facilitate their group members or organization member's knowledge transfer and building. This study has demonstrated the role of the knowledge intermediary in the knowledge transfer and building processes in offshore outsourcing, and confirms the findings of Easterby-Smith et al.(2008) and Jones's

(2006) studies that gatekeepers and boundary-spanners play an important role in importing new knowledge from the outside.

This model suggests that the three levels of the SECI spiral enable knowledge transfer and knowledge building in offshore TSCs. This finding confirms the importance of the SECI spiral developed by Nonaka and Takeuchi (1995) in the organizational knowledge building process. Also this model extends Nonaka and Takeuchi's SECI theory by explaining how knowledge transfer and building occurs in the three levels of the SECI spiral. Furthermore, it shows how the three levels of knowledge intermediaries facilitate knowledge sharing, transferring and building, and how the four types of knowledge assets building in the three levels of the SECI spiral.

Moreover, this model identifies the interplay amongst knowledge transfer, absorptive capacity and knowledge building. It suggests that knowledge transfer and knowledge building are interrelated through absorptive capacity. The absorptive capacity influences the knowledge recipient's knowledge acquisition and assimilation in the knowledge transfer process. This model confirms Cohen and Levinthal's (1990) theory that an organization's absorptive capacity depends on transfers of knowledge and expertise across and within subunits, and also depends on the individual absorptive capacities being leveraged. This study confirmed their finding that the improvement of organizational absorptive capacity is based on transfers of knowledge and expertise from onshore to offshore TSCs, and is also based on knowledge leverage and learning at the individual level, group level and organizational level. This finding is also consistent with Zahra and George's (2002) model which identified experience, knowledge complementarity and diversity of knowledge sources as influencing an organization's absorptive capacity. However, the model extends both Cohen and Levinthal's (1990) and Zahra and George's (2002) theories by showing how the absorptive capacity influences the knowledge transfer and knowledge building. This study finds that the lower the absorptive capacity of a

recipient, the smaller the amount of knowledge they can acquire in the knowledge transfer process, and that the lower the volume of knowledge transferred, the smaller the amount of knowledge that will be built. The knowledge building process enables the knowledge recipient to accumulate knowledge. With an increase in the amount of knowledge stock, there will be an increase in the absorptive capacity and this will increase an amount of knowledge acquisition and assimilation in the knowledge transfer process, which in turn facilitates further knowledge building and knowledge accumulation. This finding is consistent with the findings of Sun and Anderson's (2010) conceptual study of absorptive capacity which states that the prior knowledge creates absorptive capacity, which enables the organization to learn and deploy new organizational capabilities, which in turn enhances the prior knowledge.

Furthermore, the present model identifies the interplay among knowledge flow, knowledge stock and absorptive capacity. It is difficult to link this finding to previous literature, because little research has been published in this field. Even though Zhuge (2002) identified three attributes of knowledge flow (i.e., direction, content, and carrier), and Dierickx et al. (1989) demonstrated the relationship between knowledge flow and stock, few studies have focused on the interplay among knowledge intermediary, stock and flow. This study confirmed Zhuge' (2002) and Dierickx, et al.'s (1989) findings by identifying that knowledge intermediaries at the three levels facilitate knowledge flow in and out of individual, group, and organization knowledge stocks in the knowledge transferring, sharing and building processes. This study extends Zhuge's (2002) and Dierickx, et al.'s (1989) findings by pointing out that the volume of knowledge flows into knowledge stock depend on the individual, group, or organization's absorptive capacity. The higher the level of absorptive capacity of the individual, the group, or the organization, the greater the volume of knowledge flow into the individual, group, or organization knowledge stock. At the same time, the knowledge stock also influences the absorptive capacity and volume of knowledge flow. An increase in the amount of knowledge stock improves the individual, group, or organization's absorptive capacity, which in turn increases the

volume of knowledge flowing into individual, group, or organization stocks.

## **8.4 CHAPTER SUMMARY**

This chapter summarized the main research findings in this research and synthesized the main findings into a diagram. Based on the main research findings in this study, Section 8.3 generated a comprehensive model of offshore organizational knowledge transfer and building and discussed the comprehensive model by linking back to literature.

## CHAPTER 9 CONCLUSIONS

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In this chapter, Section 9.1 will summarize the research findings which are relevant to answering the three research questions. Section 9.2 will discuss the limitations of the research design. Section 9.3 will suggest six streams of potential future research which have been identified from this research. This thesis closes by identifying the research contributions for both academics and practitioners.

### 9.1 SUMMARY OF RESEARCH FINDINGS

This research has investigated knowledge transfer from the onshore TSC to the offshore TSC, and individual tacit knowledge building and organizational knowledge building at the offshore TSCs. The conclusions presented in this chapter are based on the research findings relating to each of the three research questions proposed in Chapter 1 and sub-questions proposed in Chapter 3.

#### 9.1.1 Findings Relating to Research Question 1

The first research question—**knowledge transfer** question

**How is knowledge transferred from an onshore TSC to an offshore TSC?**

The findings relating to this research question are highlighted in Table 9.1.

**Table 9.1 Summary of Findings Relating to Research Question 1**

Sub-questions in Research Question 1	Summary of Research Findings
<i>What processes are employed in the knowledge transfer from an onshore TSC to an offshore TSC?</i>	<i>Structured knowledge transfer stages:</i> <ul style="list-style-type: none"> <li>◆ Stage One: Initiation</li> <li>◆ Stage Two: Implementation</li> <li>◆ Stage Three: Ramp-up</li> <li>◆ Stage Four: Integration</li> </ul> <i>Unstructured knowledge transfer:</i> <ul style="list-style-type: none"> <li>◆ Unstructured copy</li> <li>◆ Unstructured adaptation</li> <li>◆ Unstructured fusion</li> </ul>
<i>How do knowledge recipients, at different knowledge levels, acquire knowledge from different knowledge providers?</i>	<i>Novice &amp; Advanced beginner:</i> structured transfer stages approach and unstructured copy approach <i>Competency:</i> unstructured adaptation approach <i>Proficiency:</i> unstructured fusion approach
<i>How does cultural difference impact on the knowledge transfer process?</i>	<ul style="list-style-type: none"> <li>◆ The different individualism/collectivism, power distance, and uncertainty avoidance cultural dimensions reduced the likelihood of successful knowledge transfer in a structured knowledge transfer process.</li> </ul>
<i>What are the factors affecting the selection of the knowledge provider and transfer media in the knowledge transfer process, and how do these factors affect the transfer process?</i>	<ul style="list-style-type: none"> <li>◆ <i>Factors affecting selection of knowledge provider and transfer media</i> include personal ties, trust, location distance and cultural difference</li> </ul>

Table 9.1 shows the research findings relating to research question 1. Research question 1 aimed to investigate the knowledge transfer process and to develop a knowledge transfer type adoption model based on the findings of the different knowledge levels of TSEs knowledge transfer processes and analysis of the affecting factors. The following section presents the detailed answers to the sub-questions relating to question one.

### ***Q1.1 What processes are employed in the knowledge transfer from an onshore TSC to an offshore TSC?***

The research findings indicated that there were two groups of knowledge transfer processes being employed to transfer knowledge from an onshore TSC to an offshore TSC: structured and unstructured knowledge transfer processes.

The structured knowledge transfer process consists of four stages: Stage One: initiation, Stage Two: implementation, Stage Three: ramp-up, and Stage Four:

integration. This study confirmed that Szulanski's (1996) four phases of knowledge transfer was a useful guide to structured knowledge transfer processes from the observations made in this research. These structured knowledge transfer processes provided conceptual knowledge for novices, and enabled them to perform the basic functions required by their jobs.

For the unstructured knowledge transfer process, the three types of unstructured knowledge transfer processes developed in the literature review, namely *unstructured copy*, *unstructured adaptation*, and *unstructured fusion* seemed to fit with the data that emerged from the field observations. These three types of unstructured knowledge transfer were adopted by TSEs to acquire existing knowledge or new knowledge from experienced TSEs, to assist them to learn on the job, learn from their colleagues and learn by trial and error. These knowledge transfer processes played a critical role in extending the recipient's explicit and tacit knowledge, which then could be applied to their daily work, allowing them to attain higher levels of support capability.

In addition, drawing on the research findings of the differences among the three cases in the structured knowledge transfer process, this study noted that there were some differences in the structured knowledge transfer processes among the three TSCs. It was found that the transfer process could be adjusted according to the offshore TSC's new employees' adoptive capacity and prior work experience, and the tacitness of the transferred knowledge. This study identified three types of structured knowledge transfer process: *interpersonal oriented transfer*, *semi-interpersonal oriented transfer*, *codified oriented transfer*. *Interpersonal oriented transfer* was suitable for the organization where the transferred knowledge was tacit and the knowledge recipients had a low level of absorptive capacity. *Semi-interpersonal oriented transfer* was suitable for the organization where the transferred knowledge was tacit, but the knowledge recipients had a high level of absorptive capacity. *Codified oriented transfer* was suitable for the organization where the transferred knowledge was more explicit, and

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knowledge recipients had a high level of absorptive capacity.

***Q1.2 How do knowledge recipients, at different knowledge levels, acquire knowledge from knowledge providers?***

The findings from the case study led to the development of a knowledge transfer type model. This model identified the relationships between knowledge recipients and the knowledge transfer type adoption. The novice knowledge recipient acquired knowledge mainly through the *Structured Transfer Stage*; the advanced beginner gained knowledge mostly through *Unstructured Copy*; the competency level knowledge recipient acquired knowledge generally through *Unstructured Adaptation*; and the proficient knowledge recipient gained knowledge largely through *Unstructured Fusion*. The findings identified that the knowledge recipient's absorptive and retentive capacities determined the type of knowledge transfer adopted. The higher the absorptive and retentive capacities of the recipient, the higher the levels of knowledge acquisition (from novice to proficiency), and the higher the levels of knowledge transfer approach adopted. This model also explicated the mutually interdependent relationship between the four types of knowledge and four types of knowledge transfer approaches. Conceptual and systemic knowledge transferred through *Structured Transfer Stages* forms the background necessary to develop systemic and experiential knowledge by adopting the *Unstructured Copy* transfer approach. The systemic knowledge further forms the foundation necessary to develop and interpret experiential knowledge and routine knowledge through *Unstructured Adaptation* and *Unstructured Fusion* knowledge transfer approaches.

***Q1.3 What impact does cultural difference have on the knowledge transfer process?***

The research findings showed that the national culture was the crucial factor affecting the structured knowledge transfer process in the cross-cultural business context. Seven research findings were identified in this study as follows:

*Finding 1: The transfer of knowledge from a knowledge provider in a small power distance culture to a recipient in a large power distance culture in an individualistic learning environment will have a negative impact on explicit knowledge transfer in a structured knowledge transfer process.*

*Finding 2: The transfer of knowledge from a knowledge provider in a large power distance culture to a recipient in a small power distance culture in a collectivistic learning environment will have a positive impact on the likelihood of successful explicit knowledge transfer in a structured knowledge transfer process.*

*Finding 3: A weak relationship between a knowledge provider and a recipient, created by cultural differences, negatively impacts on tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 4: A strong relationship between a knowledge provider and a recipient, created by similarity in culture, positively facilitates tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 5: Where a knowledge provider and a recipient are in different uncertainty avoidance cultural dimensions, there will be a negative impact on the likelihood of successful tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 6: Where a knowledge provider comes from a strongly collectivist-orientated culture, there will be a greater likelihood of successful tacit knowledge transfer in a structured knowledge transfer process.*

*Finding 7: The transfer of knowledge will be more effective if knowledge provider and recipient are located in similar cultural contexts rather than in different cultural contexts.*

The seven research findings provided insight into the cultural issues implicated in the structured knowledge transfer process. The study findings were not only consistent with previous theoretical studies on knowledge transfer in a cross-cultural business context but also went further. There was strong evidence that different

individualism/collectivism, power distance, and uncertainty avoidance cultural dimensions significantly impacted on knowledge transfer in a cross-cultural transfer of organizational knowledge.

***Q1.4 What are the factors affecting the selection of the knowledge provider and transfer media in the knowledge transfer process, and how do these factors affect the transfer process?***

The knowledge recipient had more self-determination in the choice of a knowledge provider in unstructured knowledge transfer than in structured knowledge transfer. This study identified that there were four significant factors affecting the selection of the knowledge provider and transfer media: *personal ties, trust, location distance and cultural difference*.

The research findings identified two types of knowledge provider selection trends: personal-tie oriented selection and competence-based-trust oriented selection. These were based on the severity and urgency of the issues. For general issues, the TSEs tended to adopt personal-tie-oriented selection. The lower the knowledge level of TSEs, the more likely they were to choose the knowledge provider with stronger personal ties. For serious and urgent issues, the TSEs adopted competence-based-trust oriented selection. The higher the knowledge level of TSEs, the more likely they were to choose the knowledge provider with higher competence-based trust.

In addition, this study noted that personal ties played a critical role in the selection of knowledge providers. In some situations, personal ties determined the selection of knowledge provider, and overrode the other factors (i.e., trust, location distance and cultural difference) impacting on the knowledge provider's selection. On the other hand, distance location, trust and cultural difference clearly affected personal relationship building. In terms of distance location, the research findings indicated that the closer the distance between knowledge provider and knowledge recipient,

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the easier it was to build personal relationships. In terms of trust, it was found when people trusted each other, they were more willing to establish a good relationship. In terms of cultural difference, the research findings indicated that the less the cultural difference was between knowledge provider and recipients, the greater the likelihood that they would build a good relationship.

## 9.1.2 Findings Relating to Research Question 2

The second research question focused on the individual knowledge building process and the factors affecting the building process. The question is:

### How do individuals build up tacit knowledge in workplace?

Table 9.2 highlights the findings relating to research question 2.

**Table 9.2 Summary of Findings Relating to Research Question 2**

Sub-questions in Research Question 2	Summary of Research Findings
<i>How can individuals' tacit knowledge be built up and developed?</i>	Individual tacit knowledge building through three types of knowledge building approach: cumulative knowledge building, intensive knowledge building and intentional knowledge building
<i>What processes are employed by an individual to build up his/ her tacit knowledge?</i>	Tacit knowledge was acquired and built through continuous knowledge building loops: explicit learning loop and implicit learning loop. ◆ The explicit learning loop includes knowledge seeding, attention and awareness, interpretation and remembering, communication and internal reflection. ◆ The implicit learning loop includes formation of meaning schemes or scripts, observation, interpersonal communication, internal reflection, active trial and practice, concrete experience, interpersonal communication, internal reflection, calibrating loop, and meaning perspective transformation.
<i>What factors influence the individual knowledge building process?</i>	◆ Organizational environment workload, job complexity, encounters with people, support and feedback ◆ Personal characteristics previous experience and education background, motivation and individual personality

Table 9.2 identifies the research findings relating to research question 2. Research question 2 aimed to investigate the individual tacit knowledge building process and generate a basic individual tacit knowledge building model.

**Q2.1 How can individuals' tacit knowledge be built up and developed?**

In this study, three types of knowledge building approaches: *cumulative knowledge building*, *intensive knowledge building* and *intentional knowledge building* were widely adopted by the different knowledge level TSEs to build and develop their personal tacit knowledge, including.

These research findings indicated that the TSEs at different knowledge levels built up their knowledge through different knowledge building activities and actions. For novices and advanced beginners, the main knowledge building process was cumulative knowledge building. The main knowledge building activities were *job training, being mentored and coached, working alongside others, tackling challenging tasks and roles, and working with customers business partner and colleagues, knowledge sharing meeting, and supports and feedbacks from management team*. The knowledge building actions focused on *knowledge seeding, explicit learning loop, formation of action scripts, observation, trial and practice, concrete experience, personal communication, internal reflection, and meaning perspective transformation*.

Competency level of TSEs adopted the intensive knowledge building approach. The key knowledge building activities were *on-job-training, consultation within and outside the working group, coaching and helping new TSEs, and challenge of the work itself*. The knowledge building actions focused on *knowledge seeding, trial and practice, concrete experience, personal communication internal reflection, and meaning perspective transformation*.

Proficiency level of TSEs favored the intentional building approach to build up their knowledge. The main knowledge building activities were *challenge of the work itself, collaboration within and outside the working group, and coaching and helping junior TSEs*. The knowledge building actions focused on *trial and practice, concrete experience, personal communication, internal reflection, and meaning perspective transformation*.

***Q2.2 What processes are employed by an individual to build up his/her tacit knowledge?***

The research findings identified that the basic tacit knowledge building process started with knowledge seeding and ended with meaning perspective transformation. Tacit knowledge was acquired and built through continuous knowledge building loops: the explicit learning loop and the implicit learning loop. Phase One was knowledge seeding and the explicit learning loop. This phase aimed to create core conceptual knowledge, which would guide the tacit knowledge building. The *Explicit learning loop* included knowledge seeding, attention and awareness, interpretation and remembering, communication and internal reflection. Phase Two was implicit tacit knowledge building. In this phase, the TSE built up his/her tacit knowledge through experiential learning and actions and through applying conceptual knowledge into real world problems. The *Implicit learning loop* included the formation of meaning schemes or scripts, observation, interpersonal communication, internal reflection, active trial and practice, concrete experience, interpersonal communication, internal reflection, calibrating loop, and meaning perspective transformation. These two loops enabled the individual tacit knowledge to enlarge and become more accurate in application. This knowledge building process was an upward loop process, starting at the knowledge seeding, moving to the individual tacit knowledge construction through trial and practice, and then to a new refined meaning perspective.

***Q2.3 What factors influence the individual knowledge building process?***

The research findings showed that two categories of factors affected 'TSEs' tacit knowledge building process. The first category was the organizational environment, including the workload, job complexity, encounters with people, and support and feedback. The second category was the personal characteristics, which determined the TSE's subjective willingness and adoptive capacity to build up knowledge. These characteristics included previous experience and educational background, motivation and individual personality.

### 9.1.3 Findings Relating to Research Question 3

The third research question focused on the organizational knowledge building process and the factors affecting the building process. The question is:

**How does the offshore TSC organization build up its organizational knowledge after the knowledge has been transferred from the onshore TSC?**

Table 9.3 highlights the findings relating to research question 3.

**Table 9.3 Summary of Findings Relating to Research Question 3**

Sub-questions in Research Question 3	Summary of Research Findings
<i>How can an organizational knowledge be built up and developed?</i>	Organizational knowledge building is built through the three levels of the SECI spiral at the individual level, the group level and the organization level. The shared mental models of organizational members enabled individual knowledge building to link to group knowledge building, and then to organizational knowledge building. The three levels of knowledge intermediaries facilitate knowledge flow in and out of individual, group and organization knowledge stocks.
<i>What processes are employed by an offshore TSC to build up its organizational knowledge?</i>	Organizational knowledge is built and expanded through three levels of the SECI spiral, which enable the four types of knowledge assets to be built at the individual level, the group level and the organization level. <ul style="list-style-type: none"> <li>◆ <i>At the individual level:</i> individual and shared experiential knowledge, individual concept knowledge, individual and group systemic knowledge assets and routine knowledge asset were built.</li> <li>◆ <i>At the group level:</i> individual and group experiential knowledge, group concept knowledge asset, group and organization systemic knowledge assets and routine knowledge asset were built.</li> <li>◆ <i>At the organization level:</i> individual and organizational experiential knowledge, organization concept knowledge asset, organization and global systemic knowledge assets and routine knowledge assets were built.</li> </ul>
<i>What are the factors influencing the organizational knowledge building process?</i>	<ul style="list-style-type: none"> <li>◆ Support and commitment of top management (continuous training and learning, and incentive systems),</li> <li>◆ Collaboration and communication (social network and absorptive capacity)</li> <li>◆ Organizational knowledge creation and sharing culture</li> <li>◆ Information and technology infrastructure (knowledge repositories and communication channel)</li> </ul>

Table 9.3 demonstrates the research findings relating to research question 3. Research question 3 aimed to investigate the organizational knowledge building process and the factors affecting the building process to generate an organizational knowledge building model.

***Q3.1 How can organizational knowledge be built up and developed?***

The research findings indicated organizational knowledge was built through three levels of the SECI spiral: the individual level, the group level and the organization level. The three levels of the SECI spiral enabled organizational knowledge to be continually built, expanded and amplified. The organizational knowledge building started at the individual level, and moved up to the group level, and then to the organization level. At the same time, the organization level knowledge also moved back to the group level, and then to the individual level.

It was noted the three levels of SECI spiral were connected with each other through shared mental models. The organization members' shared mental models link individual knowledge building to group knowledge building, and then to organizational knowledge building. The knowledge intermediaries at the three levels play the gatekeeper and boundary-spanner role in facilitating knowledge sharing, transferring and building across groups and organizations, enabled the four types of knowledge assets to be built in the SECI spiral. These four types of knowledge are mainly carried by knowledge intermediaries who pass the knowledge from individuals, groups, and organizations into individual, group, organization and global knowledge stocks.

***Q3.2 What processes are employed by an offshore TSC to build up its organizational knowledge?***

Organizational knowledge is built and expanded through SECI spiral at the three levels of the SECI spiral at the individual level, group level and organization level at the TSCs.

Knowledge building was based on the organization members' knowledge building. At the individual level, the *socialization* process facilitated the building of individual and shared experiential knowledge; the *externalization* process facilitated the building of individual conceptual knowledge; the *combination* process facilitated the building of individual and group systemic knowledge; the *internalization* process facilitated the building of individual and group experiential knowledge and group routine knowledge assets.

At the group level, it was noted that the group leader or technical leader as a group knowledge intermediary played a pivotal role in the flow in and out of knowledge between groups. The group knowledge intermediary facilitated individual and group experiential knowledge expansion through the *socialization* process, group conceptual knowledge building through the *externalization* process, group and organizational systemic knowledge expansion through the *combination* process, and group and organizational experiential knowledge and routine knowledge assets building and expanding through the *internalization* process.

At the organizational level, it was noted the organization knowledge intermediaries played the similar role as group leaders in facilitating the flow of knowledge in and out of their organization. The organizational intermediary enabled individual and organizational experiential knowledge expansion through the *socialization* process, the organizational conceptual knowledge building through the *externalization* process, the organizational and global systemic knowledge expansion through the *combination* process, and organizational and global experiential knowledge and routine knowledge assets building and expansion through the *internalization* process.

***Q3.3 What are the factors influencing the organizational knowledge building process?***

The analysis of the field data identified four categories of factors affecting

organizational knowledge assets building. They were support and commitment of top management, collaboration and communication, organizational knowledge creation and sharing culture, and information and technology infrastructure.

## **9.2 LIMITATIONS OF THIS RESEARCH**

The study has three limitations. These limitations may indicate areas where generalizations may not be possible or potential bias might exist.

Firstly, three offshore TSCs in China were chosen as the case sites for this study and for conducting in depth research. Even though the three study sites were carefully selected, the results obtained from the three case studies might not be generalizable with respect to all offshore TSCs both in China and globally. Replication of this research within different organizations would be required to assess the likely extension of this generalizability.

Secondly, the results and subsequent discussion presented are based on the researcher's interpretation and analysis. Others might interpret the same results differently. Furthermore, all of the interviews were conducted by the author. The likelihood of interviewer bias is significantly increased under such conditions, even though care was taken to minimize this bias. However, because a single researcher conducted all the interviews, the interviews were conducted in a consistent manner. It was also important that the interviewer conducted the data analysis to ensure that the richness that emerges from the interviews such as emotion, facial expression, and tone was taken into consideration.

Thirdly, the author had previously worked at one of the case organizations and thus had an in-depth understanding of the operations and of the individuals involved in the research. This influenced the analysis and the interpretation of the case study. However, "qualitative researchers believe that their own subjective experience can be

a source of knowledge about the phenomenon they are studying” (Auerbach & Silverstein, 2003, p. 27). It was important that the researcher understood the interviewees’ culture, faith, and experiences as this allowed for correct interpretation of interviewees’ thoughts and comments. In addition, this study also conducted the same research at other two offshore TSCs, which would have helped to reduce the possible influence of the author’s opinions of the findings at the previously worked case site.

## **9.3 DIRECTIONS FOR FUTURE RESEARCH**

This section will address the future research that might arise out of this research. Various topics for future research have been identified. They are related to six main areas: knowledge transfer, individual tacit knowledge building, organizational knowledge building, offshore organization knowledge transfer and building, cultural issues in offshore outsourcing company, and factors affecting knowledge transfer and knowledge building. The following subsections suggest a number of future research topics that have emerged from this thesis.

### **9.3.1 Research Relating to Knowledge Transfer**

This research identifies three topics for future research on knowledge transfer.

The first topic is to continuously examine and test the conceptual model of knowledge transfer type adoption. The investigation was conducted in this study as an exploratory study and therefore may be extended by statistical testing of the interrelationships between the experience levels of knowledge recipients and the types of knowledge transfer approaches, and the relationships between the types of knowledge and the types of knowledge transfer approaches, to test and improve the understanding of the knowledge transfer type adoption model. Then, this extended model can be applied to cases in a variety of industries.

The research could be extended by looking at the topic of knowledge transfer from the perspective of the onshore TSE. In this study, as noted in Chapter Five, most of the participants in this study were from the offshore TSC. Further work from the perspective of onshore TSC could provide an alternative understanding and insights into knowledge transfer. Most crucially, there is a need to ascertain how other onshore TSEs and customers understand the performance, skills and knowledge offshore TSEs undertake. Placing these multiple and diverse voices at the centre of future inquiries would contribute a great deal more to investigations of knowledge transfer process.

The third topic concerns the unstructured knowledge transfer area where there is a lack of substantive theories. A more specific topic could be how the unstructured knowledge transfer can be conducted effectively. The results from the unstructured knowledge transfer in this study show that three types of unstructured knowledge transfer approach (*copy, adaptation, and fusion*) played an important role in knowledge transfer process. Further work could look at what factors affect the selection of three types of unstructured knowledge transfer approaches. In addition, the research findings in this study identified four factors affecting the priority selections of knowledge providers and transfer media in unstructured knowledge transfer: personal ties, trust, location distance, and cultural difference. Future research could develop a quantitative research instrument to test to what extent the four factors affect the knowledge providers and transfer media selections in the unstructured knowledge transfer process.

### **9.3.2 Research Relating to Individual Tacit Knowledge**

#### **Building**

With regard to individual tacit knowledge building, there are three topics which could be studied in the future.

The first topic is continuously examining and testing the conceptual model of individual tacit knowledge building. The individual knowledge building research design employed in this study could be adapted for the purposes of conducting such studies. It could be useful to undertake a research with a larger number of participants from a more varied range of professional people such as mechanical engineers, nurses, physicians and accountants. A larger number of cases would allow more comparisons to be made, and would presumably render the findings more generalizable. The quantification of the study's findings could serve as a base line, and further studies could examine the typicality or exceptionality of the experiences of the TSE participants in these three case studies. Findings from further studies would then have particular value in that they could provide more knowledge for professional people about the tacit knowledge building process.

The second topic is to explore the different knowledge levels of professional workers' tacit knowledge building process. As noted, the individual tacit knowledge building model developed in the Chapter Six is a general individual knowledge building model. Since the professional workers at the different knowledge levels (i.e., novice, advanced beginner, competency and proficiency) employ different types of tacit knowledge building approach, future work could focus on the particular experience level of individual knowledge building process. For example, a study could look at a model for the proficiency level's tacit knowledge building.

The third topic concerns the individual tacit knowledge building approach. This study suggests that the different knowledge levels of TSEs adopted the different types of tacit knowledge building approach (i.e. *cumulative knowledge building, intensive knowledge building and intentional knowledge building*) and knowledge building activities to build up their individual tacit knowledge. They tap into each of the knowledge building approaches depending upon the context and content of what is being experienced. The different knowledge building approach adopted determines the

productivity of the knowledge building. Future work examining the different knowledge building approach adopted by the different knowledge levels of support engineers could help explain the variance between those who develop an expertise and those who do not. For example, a comparison of the differences in the knowledge building approach adoption between competency level and proficiency level of support engineers would allow one to find out in what kind of situation the proficient engineers would adopt an intentional knowledge building approach, whereas competency level TSEs would adopt an intensive knowledge building approach. Examining the different knowledge building approach adopted by individuals could provide insights into how the knowledge building approach affects the individuals' productivity in tacit knowledge building.

### **9.3.3 Research Relating to Organizational Knowledge Building**

In terms of organizational knowledge building, three topics have emerged from the research.

The first topic is to examine the importance of the group knowledge intermediary in the organizational knowledge building process. In the findings it was reported that three levels of knowledge intermediaries facilitated knowledge flow in and out of individuals, groups and organization in the three levels of the SECI spiral. The knowledge intermediary played an important role in the organizational knowledge building process. The group knowledge intermediary clearly had an impact on organizational knowledge building. However, one of the case studies (i.e., Gamma) revealed that a group knowledge intermediary was not necessary in organizational knowledge building. Further research is necessary to clarify this point. Also, future research could investigate how the knowledge intermediary affects organizational knowledge building.

The second topic concerns the three levels of the SECI spiral. The organizational knowledge building model developed in this study suggested that organizational knowledge building relied on the three levels of the SECI spiral. Future work could examine how the three levels of the SECI spiral facilitate knowledge transfer, sharing, distribution, and creation which could help to explain the intra-organizational and the inter-organizational knowledge flow among individual, group and organization. A deeper understanding of the three levels of the SECI spiral may provide useful input into that organizational knowledge building.

The third topic is to study knowledge assets building. The organizational knowledge building model developed in this study identifies an efficient process of organizational knowledge assets building at the offshore TSCs. The model presents how the four types of knowledge assets are built and how the knowledge assets are continually renewed. Future research should deepen our understanding of how organizational knowledge assets are built, where substantial theories are absent. Three groups of research questions are identified here. Firstly, how can the organizational knowledge assets be transformed, evolved, and renewed, and then become obsolete? Secondly, how do the existing knowledge assets support new knowledge building and expand the organizational knowledge? Third, how does an organization build new capabilities to adapt to changes in environments?

### **9.3.4 Research Relating to Offshore Organization**

#### **Knowledge Transfer and Building**

In terms of offshore organization knowledge transfer and building, there are two topics which should be studied in the future.

The first topic is to continuously examine the comprehensive model of offshore organization knowledge transfer and building. This study was conducted as an exploratory study, and therefore may be extended by statistical testing of the

inter-relationships among knowledge transfer, knowledge building and absorptive capacity. The present study identified that absorptive capacity influenced the amount of knowledge that a recipient could acquire and assimilate in the knowledge transfer process, and then influenced the amount of knowledge that the recipient could transform and exploit in the knowledge learning and building processes. The knowledge building would accumulate a stock of the recipient's knowledge, which in turn would influence the recipient's absorptive capacity and the knowledge transfer process. Examining the relationships among absorptive capacity, knowledge transfer and knowledge building would deepen understanding of how absorptive capacity affects knowledge transfer and knowledge building in an organization.

The second topic relates to the inter-relationships between absorptive capacity, knowledge flow and knowledge stock. This study found that the volume of knowledge flows into the knowledge stock depends on the individual, group, or organization's absorptive capacity. The higher the level of absorptive capacity, the greater the volume of knowledge flows into the knowledge stock. At the same time, the knowledge stock affects the recipient's absorptive capacity, which in turn affects the volume of knowledge flows into the stock. An increase in amount of knowledge stock would improve the individual, group, or organization's absorptive capacity, which in turn would increase the volume of knowledge flows into the knowledge stock. Future research could focus on developing a quantitative research instrument to test to what extent the absorptive capacity influences the knowledge flow, and to what extent the knowledge stock influences the absorptive capacity in the knowledge transfer and building processes.

### **9.3.5 Investigating Cultural Issues in Cross-Cultural Knowledge Transfer**

The cultural issue in the cross-cultural knowledge transfer is another area worthy of further research. The research findings show that national culture plays an important

role in cross-cultural knowledge transfer. Seven research findings related to cultural issues were identified in this study. It would be desirable to test these findings empirically in additional cultural and organizational contexts. Some of the preliminary work required to perform such a test has already been done. Hofstede (1997) has developed validated measurement scales to assess national cultural dimensions, while Szulanski (1996) has proposed a four-stage structured knowledge transfer model aimed at possible analytical structures for understanding the processes of knowledge transfer. Research based on such a cultural dimension index and these stages of knowledge transfer would help the empirical testing. Such a study would provide insights into the cultural issues implicated in the structured knowledge transfer process when a knowledge provider and a recipient come from different cultural dimensions, as well as offer more general insight into the mechanism of knowledge transfer in the cross-cultural business context.

### **9.3.6 Investigating Factors Affecting Knowledge Transfer and Knowledge Building**

There are many factors impacting on the effectiveness of knowledge transfer and knowledge building processes. Many factors block knowledge transfer between countries, organizations, and groups of knowledge-based practices, and affect the individual knowledge building and organizational knowledge building, but these were not discussed in depth in this study. This could be area worthy of further study. For example, in the findings it was reported that there was some evidence of organizational environment and personal characteristics affecting an individual's tacit knowledge building. The author has already proposed that this could be attributed to the organizational environment in terms of workload, job complexity, encounters with people, support and feedback. Personal characteristics could be prior work experience and education background, motivation and individual personality. Future research could focus on developing a quantitative research instrument to test how these organizational environment factors and personal characteristics factors affect

an individual's tacit knowledge building.

## 9.4 CONTRIBUTIONS AND IMPLICATIONS OF THIS RESEARCH

This research provides five major research contributions for both academics and practitioners, which are:

1. The knowledge transfer type adoption model
2. The individual tacit knowledge building model
3. The organizational knowledge building model
4. The comprehensive model of offshore knowledge transfer and building
5. The effect of cultural issues on knowledge transfer.

They are discussed below.

### 9.4.1 The Knowledge Transfer Type Adoption Model

This model makes two contributions to academic literature on offshore outsourcing organization knowledge transfer.

The first contribution is that four types of knowledge transfer approaches have been identified and discussed in this study: *structured transfer stages*, *unstructured copy*, *unstructured adaptation*, and *unstructured fusion*. It is difficult to link this finding to previous literature, because little seems to have been previously published on knowledge transfer approaches in the cross-cultural business context. Even though Szulansiki (1996) identified four phases of structured knowledge transfer, he did not mention the unstructured knowledge transfer process. Davenport and Prusak (2000) noted unstructured knowledge transfer is important to an organization's success, but they did not explicitly address how the unstructured knowledge transfer takes place. As noted in the literature review there has been little prior in the field of

unstructured knowledge transfer. This study confirmed that Szulanski's knowledge transfer process model is a useful guide for structured knowledge transfer, and it also extended his model and recognised three types of structured knowledge transfer: *interpersonal oriented transfer*, *semi-interpersonal oriented transfer* and *codified oriented transfer*. It suggests that the selection of the three types of structured knowledge transfer is based on the organizational new employees' adoptive capacity, prior work experience, and the tacitness of the transferred knowledge. In addition, this study has demonstrated how unstructured knowledge transfer takes place. Therefore, this study bridges this gap in the literature.

The second contribution is that this study recognizes the relationships amongst the levels of knowledge, the types of knowledge and the knowledge transfer approaches. It is difficult to link this finding to previous literature. Even though Lam (1997) identified four types of knowledge and Dreyfus and Dreyfus (1986) indicated four knowledge levels of people, prior work has not identified the relationship amongst the knowledge levels of knowledge recipients, the types of knowledge and the knowledge transfer approaches. This model fills this gap in the literature. This model suggests that the lower the level of the recipient's absorptive and retentive capacity, the more difficulty the recipient will have in acquiring tacit and complex types of knowledge, and the more formal the structured knowledge transfer approach the recipient will need to adopt. This model contributes to an understanding of the processes of knowledge transfer, and the mechanisms for knowledge transfer in a cross-cultural business context.

This model has important practical implications for either organizations which are trying to transfer organizational knowledge, or organizations which are trying to acquire organizational knowledge in a cross-cultural business context. This model provides a systematic roadmap for practitioners to conduct their globalization agenda. The model outlines the structured knowledge transfer activities and phases required in the offshore knowledge transition process. It will enable organizations to

construct appropriate types of structured knowledge transfer strategies based on their organizational structures and new employees' adoptive capacity and prior work experience, and the tacitness of the knowledge to be transferred. This model also suggests that, for the different knowledge levels of recipients, the knowledge provider should adopt a different knowledge transfer approach to transfer different types of knowledge. The model therefore provides new insights into the knowledge transfer process for knowledge acquisition at different levels in a cross-cultural business context.

### **9.4.2 The Individual Tacit Knowledge Building Model**

This model summarizes the key knowledge building activities and actions for the four experience levels of TSEs, and identifies the basic individual tacit knowledge building process based on the four experience levels of TSEs' knowledge building activities and actions. This model also identified three individual tacit knowledge building approaches: *cumulative knowledge building*, *intensive knowledge building* and *intentional knowledge building*.

This model makes five contributions to the academic literature. The first contribution is that this model expands Bereiter & Scardamalia's (2003) 'knowledge building' concept from the education research context to the experiential research context. The findings contribute to an understanding of the tacit knowledge building processes required when an individual wants to build up his/her tacit knowledge in a workplace effectively.

The second contribution is that this model bridges a gap in the literature on the individual knowledge building process. This model describes the basic tacit knowledge building process, and also shows how to acquire and build up the tacit knowledge in a workplace and how to advance the frontiers of knowledge. This model extends Kolb's four-stage experiential learning model. It confirms the

importance of observation, trial, experience and abstract conceptualization in experiential learning. It also points out that interpersonal communication and internal reflection play a critical role in experiential learning.

The third contribution is that this model points out the importance of received knowledge in the tacit knowledge building process. Sternberg and his colleagues (2000) developed a model of memory structures and knowledge acquisition pathways. They suggested that tacit knowledge is acquired by episodic memory and personal experience. They did not explicitly address the importance of how received knowledge (explicit knowledge) affects the personal experience and episodic memory, and how the received knowledge indirectly influences tacit knowledge (procedural memory) acquisition. They consider that tacit knowledge (procedural memory) can be acquired either through experience alone or initiated by the communication of generalized knowledge based on someone else's experience (Sternberg et al., 2000). This research extends Sternberg and his colleagues' (2000) findings and points out that received knowledge is the foundation of tacit knowledge building. The received knowledge guides TSE's choices of experiences and directs their attention to some aspects of apprehended experience. It was also found that received knowledge (i.e. semantic memory) influences the experience (i.e. episodic memory) to become tacit knowledge (i.e. procedural memory).

The fourth contribution is that this study confirms Mezirow's theory that meaning perspective and mental models (meaning schemes) are continuously transformed through content, process and premise reflections in the knowledge building process. This model also extends Mezirow's theory by showing how tacit knowledge or meaning perspective is acquired and built. It shows that tacit knowledge is acquired and built through continuous knowledge building loops: an explicit learning loop and an implicit learning loop. These two loops facilitate the growth of an individual's tacit knowledge and its accuracy in application.

The fifth contribution is that this study supports Raelin's (1997) model of work-based learning in three TSC organizations, and also demonstrates a systematic sequence of knowledge building processes in the work-based learning context.

This model has important practical implications for both organizational managers and individuals. This model can alert organizational managers to the need to provide appropriate support, feedback and challenge to their organizational members to enable them to build up their tacit knowledge. The model can help individual aspiring support engineers understand the tacit knowledge building process. This understanding could help them to build up their tacit knowledge more effectively and efficiently.

### **9.4.3 The Organizational Knowledge Building Model**

This model suggests that organizational knowledge building involved three levels of SECI spiral: individual level, group level and organization level. The three levels of SECI spiral enable organizational knowledge assets to be continually built, expanded and amplified. The shared mental models of organizational members enable individual knowledge building to link to group knowledge building, and then to organizational knowledge building. The knowledge flows in and out of the individual, the group and the organization through three levels of knowledge intermediaries and four levels of knowledge stocks.

There seem to be three areas where this research can contribute to a better understanding of organizational knowledge building processes.

The first contribution is that this study has revealed how the four types of knowledge assets were built in the three levels of the SECI spiral. Even though Nonaka, Toyama, & Komo (2000) identified four knowledge assets: experiential knowledge asset, conceptual knowledge asset, systemic knowledge asset and routine

knowledge asset, there has been little prior work explicitly addressing how to build up these four types of knowledge assets in an organization. This study identifies that the four types of knowledge assets are built through three levels of the SECI spiral. This finding fills the gap in the literature.

The second contribution is that this study has uncovered that the three levels of the SECI spiral drive the organizational knowledge building at the individual level, the group level, and the organization level. It is difficult to link this finding to previous literature. Nonaka and Takeuchi (1995) identify four modes of knowledge conversion between tacit and explicit knowledge (i.e., *socialization*, *externalization*, *combination* and *internalization*) and the four modes of knowledge conversion enable organizational knowledge to become externalized and amplified. They do not explicitly address how the SECI spiral impels the organizational knowledge building at the individual level, the group level, and the organization level. Easterby-Smith et al. (2000) also point out that Nonaka and Takeuchi emphasize knowledge over action in their knowledge-creation process. This present study has emphasized the role of action and demonstrated how individuals, groups, and the organization acquire, assimilate, transform and exploit knowledge in the knowledge building process. This research extends Nonaka and Takeuchi (1995)'s study and bridges the gap in the literature.

The third contribution is that this study has not only confirmed the importance of mental models in linking individual, group and organizational knowledge building, but also uncovered how the shared mental models of organizational members can be built in the knowledge building process. This study confirms Kim (1993) and Crossan, Lane, and White's (1999) views on organizational learning, which see shared mental models as playing a critical role in linking individual learning to organizational learning. The model extends this literature by pointing out that shared mental models of organizational members were built in the three levels of the SECI spiral.

This model has important practical implications for practitioners (senior managers,

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shop level managers and supervisors, knowledge intermediaries). This model could help practitioners to better understand the organizational knowledge building process. An understanding of the knowledge building process may improve their understanding of how knowledge is built and evolved within organizations. They will have a deeper appreciation of the managerial requirements of building, exploiting and renewing knowledge within the organization. This can help to build the organization's new knowledge capabilities to respond to changes in the external environment. Such an understanding also could help practitioners play an effective role in facilitating the organizational knowledge building.

#### **9.4.4 The Comprehensive Model of Offshore Knowledge Transfer and Building**

This model demonstrates how knowledge is transferred and built in an offshore outsourcing organization. This model identifies seven key elements in the offshore outsourcing organization's knowledge transfer and building: the SECI spiral, knowledge flow, knowledge stock, knowledge intermediary, absorptive capacity, knowledge transfer, knowledge building.

The first contribution is that this model identified that the knowledge intermediary plays a gatekeeper and boundary-spanner role in facilitating knowledge transfer and knowledge building across organizations. It shows how the knowledge intermediary facilitates knowledge sharing, transferring and building in the three levels of the SECI spiral. This finding contributes to understanding how knowledge is distributed around inter-groups or inter-organizations. It confirms the findings of Easterby-Smith et al. (2008) and Jones's (2006) studies that gatekeepers and boundary-spanners play an important role in importing new knowledge from outside.

The second contribution is that this model identified the relationships amongst knowledge flow, knowledge stock and absorptive capacity. Even though Zhuge (2002)

identified three attributes of knowledge flow (i.e., direction, content, and carrier), and Dierickx et al.(1989) demonstrated the relationship between knowledge flow and stock. Few studies have focused on the interaction amongst absorptive capacity, stock and flow. This study confirmed Zhuge (2002) and Dierickx et al.'s (1999) findings. It also pointed out that the volume of knowledge flow into the knowledge stock depends on the individual, group, or organization's absorptive capacity. The higher the level of absorptive capacity the individual, group or organization has, the greater the volume of knowledge that will flow into individual, group, or organization knowledge stock. At the same time, the knowledge stock also influences the absorptive capacity and volume of knowledge flow. An increase in the amount of knowledge stock, individual, group, or would increase the absorptive capacity of the organization, which in turn would increase the volume of knowledge flowing into individual, group, or organization stocks.

The third contribution is that this model identified the interplay amongst knowledge transfer, building and absorptive capacity. This study confirmed Cohen and Levinthal's (1990) theory that an organization's absorptive capacity depends on transfers of knowledge and expertise across and within subunits, and also depends on the individual's absorptive capacities being leveraged. This finding is also consistent with Zahra and George's (2002) model where experience, knowledge complementarity and diversity of knowledge sources influence the organization's absorptive capacity. Further, this model identified the interactions amongst knowledge transfer, knowledge building and absorptive capacity. It is found that absorptive capacity influences the knowledge recipient's knowledge acquisition and assimilation in the knowledge transfer process, and that acquired and assimilated knowledge then influences the knowledge building. The knowledge building will accumulate a stock of knowledge, which increases absorptive capacity and knowledge transfer.

### 9.4.5 The Effect of Cultural Issues on Knowledge Transfer

A knowledge gap exists in understanding how national culture impacts on the knowledge transfer in the cross-cultural business context. Seven research findings in this study provided insight into the cultural issues implicated in the structured knowledge transfer process. Prior research has proposed some conceptual frameworks on the cross-cultural knowledge transfer, for example, Lucas (2006) developed a conceptual model of cross-border knowledge transfer within multinational corporations, but there has been little prior exploratory or experimental work to verify this conceptual model. The study findings were not only consistent with previous theoretical studies such as Bhagat et al. (2002) and Lucas (2006) on knowledge transfer in a cross-cultural business context but also went further. It is suggested that peer-to-peer help, close relationships and proactive learning may help to mitigate cross-cultural knowledge transfer difficulties.

These findings have important practical implications for organizations who need to transfer organizational knowledge, or organizations who are trying to acquire organizational knowledge in a cross-cultural business context. This study suggests that the knowledge providers should find ways of introducing 'foreign' knowledge to recipients, whilst still valuing the local learning culture, knowledge and skills. Second, the recipient should build a good relationship with the providers through joint activities such as group building or social activities which could help recipients establish a good interpersonal relationship with providers and thus have further exchanges of knowledge. Third, encouraging peer-to-peer help and group knowledge sharing would help recipients to share more, and understand each other's knowledge better because they would become proximate in experiences, the knowledge gap would not be as great and the level of absorptive capacity would be similar. Fourth, during the original knowledge transfer process, the author suggests that the knowledge recipients' company should nurture some excellent recipients as knowledge seeds and future knowledge providers. Once the original knowledge

providers have withdrawn, the ‘seeds’ can competently take on the knowledge providers’ positions.

## 9.5 JOURNAL PUBLICATIONS

Based on the first research question (how is knowledge transferred from onshore TSC to offshore TSC?), I submitted an article entitled “*Knowledge transfer process for different knowledge levels of knowledge recipients at an offshore TSC*” to the Journal of Information Technology and People. The article passed the refereeing process, and was published in Volume 23, Issue 1, 2010.

This article investigated the relationships between the levels of knowledge and the type of knowledge transfer approaches, and the relationships between the types of knowledge and the knowledge transfer approaches which were adopted in a study of knowledge transfer from a US-based TSC to an offshore support center in China. The findings indicated that the lower the level of a recipient’s absorptive and retentive capacity, the more difficulty the recipient would have in acquiring tacit and complex types of knowledge, and the more formal the structured knowledge transfer approach the recipient will need to adopt. The results showed that the *structured transfer stages* were used by novices to transfer embrained and encoded knowledge; *unstructured copy* was widely adopted by advanced beginners to transfer encoded and embodied knowledge; *unstructured adaptation* was mainly utilized by those at the competency level to transfer embodied and embedded knowledge, and *unstructured fusion* was preferred by recipients at the proficiency level to transfer embodied and embedded knowledge.

Another article, based on this study and titled “*The impact of national cultures on structured knowledge transfer*”, has passed the peer reviewing process and was published in the Volume 14, No 2, 2010 of Journal of Knowledge Management.

The purpose of this article is to explore the impact of national culture on the structured knowledge transfer from a US based (onshore) TSC to an offshore support center in China. The findings identify that knowledge tacitness, knowledge gaps, cultural and communication difficulties and weak relationships were the critical barriers to successful knowledge transfer in a cross-cultural knowledge transfer context. It was found that there was a reduced likelihood of successful knowledge transfer in a structured knowledge transfer process when a provider and a recipient were located in different individualism/collectivism, power distance, and uncertainty avoidance cultural dimensions. However, peer-to-peer help, close relationships and proactive learning may assist in reducing the difficulties in the knowledge transfer process.

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## Appendix A: Summary of the Key Interviewees

A summary of the key interviewees is shown in Table A.1. Due to the confidentiality concerns, the names of participants have been disguised.

**Table A.1 Summary of key interviewees**

Name	Company	Position	Years of work at the current company	Years of work at the China based TSC	Interview language
P1	Alpha	Offshore transition project manager	3	3	English
M2	Alpha	Operation Manager	3	3	Chinese
CC	Alpha	Culture Coach	2	2	English
QA	Alpha	Quality Auditor	2.5	2.5	English
TR1	Alpha	Process Trainer	2.5	2.5	English
TR2	Alpha	Technical Trainer	2.5	2.5	Chinese
MT1	Alpha	Trainer, Mentor, Desktop Technical Support Engineer	2.5	2.5	Chinese
MT2	Alpha	Mentor, Desktop Technical Support Engineer	2.5	2.5	Chinese
MT3	Alpha	Mentor, Desktop Technical Support Engineer	2.5	2.5	English
MT4	Alpha	Mentor, Laptop Technical Support Engineer	2.5	2.5	Chinese
TL1	Alpha	Tech Leader at notebook team	2.5	2.5	Chinese
TL2	Alpha	Tech Leader at Desktop team	2.5	2.5	English
TL3	Alpha	Group leader at notebook team	2.5	2.5	Chinese
TL4	Alpha	Group leader at Desktop team	2.5	2.5	Chinese
TL5	Alpha	Group leader	2.5	2.5	Chinese
TL6	Alpha	Group leader	2.5	2.5	Chinese
TSEN1	Alpha	Novice, Laptop Technical Support Engineer	0.5	0.5	Chinese
TSEN2	Alpha	Novice, Laptop Technical Support Engineer	0.5	0.5	English
TSEA1	Alpha	Advanced beginner, Desktop Technical Support Engineer	1	1	Chinese
TSEA2	Alpha	Advanced beginner, Laptop Technical Support Engineer	1	1	English
TSEC1	Alpha	Competency, Desktop Technical Support Engineer	2.5	2.5	Chinese
TSEC2	Alpha	Competency, Laptop Technical Support Engineer	2.5	2.5	English
TSEC3	Alpha	Competency, Laptop Technical Support Engineer	2	2	Chinese
TSEP1	Alpha	Proficiency, Tech Leader at Desktop team	2.5	2.5	Chinese
TSEP2	Alpha	Proficiency, Tech Leader at Laptop Technical Support Engineer	2.5	2.5	English

Name	Company	Position	Years of work at the current company	Years of work at the China based TSC	Interview language
TSEP3	Alpha	Proficiency, Mentor, Desktop Technical Support Engineer	2.5	2.5	Chinese
ASV1	Beta	Supervisor at GSD	1	5	Chinese
ATL1	Beta	Group leader at GSD	1	2.5	Chinese
AMT1	Beta	Mentor, GSD Process Engineer	1	2.5	Chinese
ACC	Beta	Culture coach	1	2.5	English
ATR	Beta	Trainer, GSD AISA Tier 2 Technical support engineer,	1	2.5	Chinese
ATSEN1	Beta	Novice, GMS Technical support engineer	0.5	0.5	Chinese
ATSEN2	Beta	Novice, GMS Technical support engineer	0.5	0.5	Chinese
ATSEA1	Beta	Advanced beginner, GSD AISA Tier 1 Technical support engineer,	1	2.5	Chinese
ATSEA2	Beta	Advanced beginner, Technical Support Engineer	1	2.5	Chinese
ATSEC1	Beta	Competency, GSD <b>Process Engineer and trainer</b>	1	2.5	Chinese
ATSEC2	Beta	Competency, GSD Australia Tier 1 Technical support engineer,	1	2.5	English
ATSEC3	Beta	Competency, GMS Technical support engineer	1	2.5	Chinese
ATSEC4	Beta	Competency, GSD AISA Tier 1 Technical support engineer,	1	2.5	Chinese
ATSEC5	Beta	Competency, GSD AISA Tier 1 Technical support engineer,	1	2.5	Chinese
ATSEP1	Beta	Proficiency, GSD Australia Tier 2 Technical support engineer,	1	2.5	Chinese
ATSEP2	Beta	Proficiency, GSD AISA Tier 2 Technical support engineer,	1	2.5	Chinese
OSV	Gamma	Supervisor at internal TSC	1.5	2.5	Chinese
OTSEN1	Gamma	Novice, GCC Global customer care analyst	0.5	2.5	Chinese
OTSEA1	Gamma	Advanced beginner, GCC Global customer care analyst	0.5	2.5	Chinese
OTSEC1	Gamma	Competency, GCC Global customer care analyst	1	2.5	Chinese
OTSEP1	Gamma	Proficiency, Technical support engineer, <b>Mentor</b>	1.5	2.5	Chinese
OTSEP2	Gamma	Proficiency, GCC Customer service analyst, <b>Tech leader</b>	1.5	2.5	Chinese

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## **Appendix B: Semi-structured Interview Questions**

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### **Semi-structured Interview Questions for Offshore Transition Project Manager**

#### **Offshore outsourcing strategy**

1. What are the factors influencing your company's decision on technical support centre location?
2. What are the main reasons that your company wants to set up technical support centre in China?
3. How would you describe the Chinese business environment?

#### **Knowledge transfer**

4. How do you organize knowledge transfer? What are the techniques or strategies used by your company to 'safely' transfer technology to your Chinese partner? Please give me some examples.
5. How is your company's business activities adapted to fit changes in the technical support centre when the support service was transferred to China? Please give me some examples.
6. How does the new technical knowledge generated in China flow back to your company head office or your company subsidiaries?
7. Have you gained some knowledge from your offshore partner, and adjusted your expertise/mindset according to the offshore local conditions?

#### **Cultural difference in knowledge transfer**

8. How do you deal with the culture difference between onshore and offshore technical support centre in knowledge transfer?
9. How would you describe the organizational culture difference in onshore and offshore technical support centre?
10. How do you perceive and monitor the cultural difference which may have potential impact on the knowledge transfer?

#### **Communication and interaction**

11. Do you feel misunderstood when you interact with the Chinese managers? And how do you tackle these problems? (through meetings, private discussion, etc)
12. How is knowledge transferred and distributed in the offshore technical support centre?
13. From your point of view, what are the main factors and instruments that encourage and facilitate the transfer of knowledge between onshore and offshore technical support centers?
14. What are the main difficulties and barriers in transferring knowledge? And how did you overcome them? Please give an example.

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## Semi-structured Interview Questions for Operation Managers, Supervisors, Group leaders

### General questions about company

1. What kind of service does your support centre provide, and who are your customers?
1. Could you tell me how many TSEs there are in your company?
2. When did your company start its offshore technical support service?

### New staff background

3. What criteria do you use to select a new technical support engineer? What kinds of knowledge stock should she/he have (such as education background, experience, personality)?
4. Can you identify from the following who would be a good technical support engineer after a short-term training? Why?
  - People who have overseas studying and working experience
  - People who only have local studying or working experience
  - People from overseas, whose native language is the same as your customers
  - People who have better computer skills than communication skills
  - People who have better communication skills than computer skills

### Knowledge transfer process

5. How is the knowledge transferred from the onshore TSC to your support center? Could you please describe the transfer process?
6. Were any trainers or mentors assigned to your support center to transfer knowledge? If yes, how long did the training last? What kind of knowledge was transferred?
7. What kinds of factors affected the success of the knowledge transfer? What kind of difficulties and challenges did your support center encounter in the knowledge transfer process? How did you overcome the difficulties?

### Individual knowledge building process

8. In your opinion, what kinds of knowledge should a support engineers possess to satisfy customer needs?
9. How does your company help a new support engineer build up his/her knowledge, skill and ability to move from a novice to an expert?

#### Before novice picking up a real call

- i. What kind of training do they have before a novice picks up a real call? Who was the trainer? What are the main topics in the training program? Do you have a training schedule? What was that? Can I have a look?
- ii. During this training process, how did the onshore technical support centre facilitate knowledge transfer from an expert to a novice successfully? Could you give me an example?

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- iii. How do you motivate experienced staff to transfer their knowledge to new staff?
  - iv. What criteria are used to evaluate whether a support engineer is qualified to be a support engineer?
10. After a new staff member is qualified to handle customer's problem independently, how does your department help him/her to develop his/her further supporting knowledge?
  11. How do you build a knowledge sharing atmosphere in your department?
  12. Information technology changes rapidly, how do you help the staff catch up with the new technology?
  13. How does your department retain engineer's tacit knowledge before they leave the company?
  14. Did you encounter any difficulties in facilitating engineers' knowledge building? If yes, what were they? How did you deal with these difficulties?
  15. At the technical support centre, what is the rate of support staff turnover? If the staff turnover is high, do you still believe it is worth spending a lot of time and effort in building a technical engineer's knowledge?

**Organizational knowledge building process**

16. How does your company expand its organizational knowledge?
17. How is new knowledge built and how is it distributed in the company? Could you give me an example?
18. How does knowledge flow in and out of the group and the organization?
19. What kind of difficulties or challenges have you encountered in the organizational knowledge building and expansion?

## Semi-structured Interview Questions for Technical and Business Process Trainers

1. In your opinion, what kinds of knowledge should a support engineers possess to satisfy customer needs?
  2. How do you help novices build these kinds of knowledge or skills?
    - a) **Before novice picking up a real call**
      - i. What kind of training do you provide before a novice picks up a real call? What were the main topics in the training program? Do you have a training schedule? What was that?
      - ii. Following are some interactive learning approaches. Which one did this training program use? Could you provide me with details about how each approach was used in this training program?
        1. reciprocal teaching,
        2. peer collaboration (collaborative learning)
        3. cognitive apprenticeship,
        4. problem-based instruction (case study),
        5. web quests
        6. dynamic assessment
        7. others
      - iii. How long was the training program last? During the training process, did you encounter any difficulties or challenges? If yes, how did you overcome them? Could you give me example?
      - iv. What criteria are used to evaluate whether a novice is ready to become a qualified engineer
    - b) **After the novice qualified to pick up a real call**
      - i. After the novice has qualified to pick up a real call, how did you help them develop their supporting knowledge and advice giving ability?
  3. According to your personal experience, did trainees experience any difficulties or barriers in their knowledge building process? If yes, what were those difficulties? How did you help them to overcome the difficulty?
  4. Did you provide different knowledge transfer mechanisms for trainees from different background? Are there differences in the training for local employees and for overseas employees? Can you give me some example?
  5. Have you ever got any feedback from customers' survey? Has your manager ever asked you to revise training content, or add or delete some training materials? If yes, what were they?
  6. What criteria are used to evaluate whether a support engineer can satisfy customers needs?
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## Semi-structured Interview Questions for Culture Coach

1. Could you please tell me your educational background and work experience?
2. How long have you been working at this company? What are your main duties?
3. In your opinion, which level of social communication skills should a support engineer have, to enable them to satisfy customers as a support engineer
4. How do you help support engineers to build up this level of communication skills?

### **Before novice qualified to pick up a real call**

- 1) What kind of training did you provide before a novice picking up a real call? What were the main topics in the training program? Did you have a training schedule?
- 2) How did you help novice TSEs develop American culture knowledge and social communication skills? Please give me an example.
- 3) How long was the training program last? What kind of difficulties did you encounter in the cultural training program? How did you overcome them?

### **After novice qualified to pick up a real call**

- 1) After novice was qualified to pick up a real call, how did you help them develop their social communication skills?
- 2) Would you tell me about how you use the dynamic assessment approach to help engineers improve their social communication skills with American customers?
5. What were the major difficulties or problems that engineers encounter during the process of improving their social communication skills? How did you help them deal with these difficulties? What actions did you take? Could you give me some examples?
6. Did you employ s different teaching approach for TSEs from different backgrounds? If yes, what was the difference? Could you give me some example?
7. Based on customer survey or call sample analysis, have you ever adjusted or revised training contents, or added or deleted some training materials? If yes, what were they? And why?
8. What criteria did you use to evaluate whether a support engineer had the ability to have an effective social communication with American customers?

## **Semi-structured Interview Questions for Technical Support Engineer**

### **Experience and Background**

1. Could you please tell me your educational background and work experience? How long have you been in China? Before this job, did you do any other job in China? Do you like working in China?
2. How long have you worked here? What are the main duties of this job? What is your everyday role?
3. Have you experienced any cultural difficulties when working at this support center? What were they? Please give me an example.

### **Before novice picking up a real call**

4. In your opinion, what kinds of skills, abilities and knowledge should you have to survive at this support center
5. How did you gain these kinds of knowledge and skills?
6. What did you learn during the first a few months worked at a new position? What efforts did you make to improve your skills and knowledge?
7. How did you learn from your mentor, experienced agents, or high level technician? During the first a few months worked at a new position, did you have any difficulty in understanding a senior technician's solution or customer's questions?
8. What kinds of difficulties or challenges did you come across during the first a few months worked at a new position? How did you deal with the difficulty or challenges? How did your mentor/team lead/tech lead help you to overcome these difficulties and build up your knowledge, or pick up this job?
9. During this period, who was the person who helped you the most to pick up this job, to become a good TSE? Why do you think so?
10. Have you felt any pressure while working here? What kind of pressure? Did you feel time pressure on the phone? Do you remember what average calls handle time you took to solve a customer problem on the phone for the first a few months worked at a new position? Currently, what is the average call handle time you take to solve a customer problem on the phone?

### **After novice qualified to pick up a real call**

11. Have you been involved in any training programs provided by American headquarters? If yes, what have they been?
12. How long does it take you to have enough skills or knowledge to handle most customers' problems? What types of customers are you confident in dealing with, such as strong/non-technical background customer, angry/upset customer? Please give me an example.
13. How did you build up your confidence? Please give me an example.
14. At the beginning of doing this job, how did you find a solution to help customer to solve problem? How do you quickly learn and acquire the solution and apply the solution to a customer's problem? Please give me an example.
15. Could you tell me from what time began to think by yourself to develop a new solution, rather than apply a pre-existing solution in a similar situation?
16. Can you see the differences between you and your Chinese colleagues in the way you handle an American customer's call?

17. How do you catch up with the new job related ICT knowledge?
18. Could you tell me your story about how you built up your technical support knowledge moving from a beginner to a skilled person? To sum up, what kind of skills or knowledge did you learn from this position?

### Knowledge Transfer Channel

19. During you daily work, how do you solve a tough problem from a customer on the phone?

There are three ways of acquiring the technical solutions:

- Acquiring from published sourcing
- Acquiring from personal communication with individual support engineer
- Acquiring from a group of organizational employees (collaborative learning)

- i. When you were working on a tough problem, which approach did you often use? Please rank these three ways of acquiring a solution in priority. Who would you like to ask? (colleagues, senior technician, friends, discussion with people on the forum, etc.) Please give an example.
- ii. Which one is the easiest way to acquire a solution? Please rank these three ways of acquiring a solution in priority.
- iii. Please fill the box provided.

Comparison		In what situation use it	How often	Advantage	Disadvantage	Priority
Knowledge transfer						
Published Sourcing	Internal knowledge repositories Local KMI					
	Internet document					
Dyadic Sourcing	e-mail					
	telephone					
	Face-to-face					
Group Sourcing	e-mail (broadcast)					
	physical meeting					
	electronic discussion groups					