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電子商務碩士在職專班

碩士論文

以關係模式理論探討企業員工知識分享之意願

Exploring the Knowledge Sharing Intention of Business

Employees with Relations Model Theory

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中華民國九十六年六月

## 中文摘要

企業經營目標，為首重獲利、並著眼於永續發展與經營。然而，並非所有企業均具備達到永續經營的競爭條件，根據研究指出：維繫企業其自身競爭優勢的關鍵資產為智慧資本，而知識則是此項對企業日形重要的智慧資本與無形資產的主要促進力量。因此，有關知識管理的議題與相關的企業內部活動方興未艾，但除了實徵研究的進展有限之外，企業推動知識管理的成效似乎也並未彰顯。

本研究以 Fiske 的關係模式理論為基礎，探討職場在不同企業文化下所孕育出不同的人際關係模式（共同分享、權力排序、平等互惠、與市場訂價），是否影響著企業員工知識分享意願，並進一步探究哪一種關係模式最能鼓舞員工之間的知識分享行為。此外，為求更貼近職場的實際狀況，本研究另加入了二個干擾變數：任務互賴性、與合作時間，以釐清關係模式對於員工知識分享的作用影響上，是否同時受到其它企業內在因素的干擾。

本研究使用問卷調查法對於台灣地區的企業員工進行結構化抽樣，以取得其日常工作中與知識分享行為有關的實際資料；並以統計分析對所提出的研究架構進行驗證；數據結果顯示，在理論模式的部份：共同分享以及平等互惠對於員工知識分享的意願，有明顯的正向影響，而市場價格則有略為負面的影響，至於權力排序則沒有顯著的影響力；此外在完整模式的部份，任務互賴性同時對於上述三種關係模式（除權力排序外）影響分享意願的作用上，產生了調節的作用、而合作時間則在共同分享、平等互惠及市場價格對於員工分享意願的影響上產生調節作用。本研究的結果，可讓我們更進一步瞭解員工分享知識的行為，並可作為企業訂定知識管理策略與設計企業內知識分享計劃或活動的參考。

關鍵字：知識分享、知識管理、關係模式理論、任務互賴性、合作時間

Exploring the Knowledge Sharing Intention of Business Employees  
with Relations Model Theory

**ABSTRACT**

With a view to achieve the ultimate goal of a permanent development, operation, and growth, to any business and enterprise, the strategy of knowledge management must be reinforced, and the sooner the better. In despite of those new and high interests shown toward the organization-embedded knowledge, not much concrete finding has been obtained regarding how and why employees are reluctant to share what they know.

In our research, we proposed to base on the Relations Model Theory to explore how different relation models, cultivated and shaped by different corporate cultures, give their influences on the willingness of knowledge sharing from employees. In the mean time, with a view to get closer to the realistic circumstance in the office, we give it a shot to include additional moderating variables, task inter-dependence, as well as time-of-cooperation, into our full research framework, aiming to see if they will disturb the influencing processes between the four principal relations and the willingness of employees to share their knowledge.

The result reflects the distinct impact from communal sharing and equality matching on the willingness of sharing, while a subtle but negative impact of market pricing on the sharing willingness. There is no clear effect of authority ranking. Furthermore, in the analysis of interaction mode including additional moderators, the result has exhibited that task inter-dependence does moderate the relationship between communal sharing / equality matching / market pricing and the notion of sharing, while time-of-cooperation also adjusts the influencing processes between communal sharing, equality matching, market pricing, and willingness of sharing.

This analysis and study grant us some clues regarding how corporate culture would eventually leverage employees' intention in sharing their knowledge, and advise the business organizations how they should correctly formulate the knowledge management strategy and activities to augment the knowledge inter-flows between employees.

**Keywords:** *Knowledge sharing, Knowledge management, Relations Model Theory, Task Inter-dependence, Time of Cooperation*



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## CHAPTER I: INTRODUCTION

### 1.1. RESEARCH BACKGROUND

Retrospecting the world industrial transition over the past centuries, we find it an obvious trend that the industries have evolved from land and labour intensive, to capital and equipment intensive, and now further transmitted to information and knowledge oriented. Simultaneously, the global market has also reformed its shape deeply with the immensely innovated new technology, forcing the business to respond much more quickly to this now volatile market demand driven by shorter product life-cycle with higher quality and lower cost. Without enduringly well-deposited knowledge, it is doubted any business will remain itself competitive and profitable. The critical importance of knowledge and knowledge management therefore has evolved accordingly over the past decade.

Certainly for any business and enterprise today, it justifies regarding knowledge and know-how as one of the most important assets (Hansen et al., 1999), owing that the knowledge itself is also the major enabler to both intellectual capital and intangible asset (Lin, 2003). In light of the following facts, the critical importance of knowledge has been distinguished: ❶ knowledge and information intensified industries demonstrate the fastest growth rate and the most recognized corporate value, ❷ in the United States ever since the seventies the total employment from knowledge intensified industry had exceeded the one from industrial, with a proportion of around 55%, ❸ knowledge-oriented companies, such as Amazon, Yahoo, or Microsoft, all possess higher corporate values than those traditional capital-oriented companies, e.g. GM, Ford, ❹ it has been a trend that highly-developed countries in Europe or the States have



instituted policies to keep domestically the knowledge-intensified industry, while move out the other capital-concentrated or labour-intensified industries.

But what are the exact advantages of implementing knowledge management? The following two reports have given some ideas: ❶ a report from KPMG (2000) conducted to survey four hundred and twenty-three executives in Europe and America illustrates the benefits of knowledge management respectively are: to reinforce the competitiveness (79%), to promote companies (75%), for customer retention (72%), for product innovation (64%), for revenue growth (63%), to increase profit (63%), to enhance the development of employees (57%); ❷ the other report to survey hundred and fifty-eight companies in Europe and America says, the major purposes for knowledge management in turn are: to increase corporation opportunities (41%), to enhance productivity (18%), not for any specific purpose (15%), to transfer knowledge of employees (8%), to lift innovation (7%), to improve the quality of decision-making (7%), to obtain knowledge from customers (4%) (The Conference Board, 2000).

Today, we have noticed that all sorts of corporate activities toward knowledge management are just arising everywhere in the office, and this ad-hoc topic regarding the strategy of effective knowledge management is nowadays very commonplace. Hence it stands to reason that the most businesses have already realized that it is not wise to lag behind this contemporary tendency.

## **1.2. RESEARCH MOTIVATION**

The very distinguished aspect of knowledge sharing exists in the absence of diminishing marginal utility, which is often the case for those well-known physical assets, namely, the more employees share their knowledge, the more synergistic value

will be created. Quinn (1996) also pointed out that through the sharing processes of knowledge, the information and experience obtained by the both sides (giver and receiver) will grow exponentially (as per the formula composed by Arthur Anderson:  $K = (I+P)^S$ , where K for Knowledge, I for Information, + for Technology, P for People, and S for Sharing). Arthur Anderson (1997) had also identified several key processes in the KM activities, which are Knowledge **①**Identify **②**Collect **③**Select **④**Organize **⑤**Apply **⑥**Share and **⑦**Create.

However yet among those seven processes mentioned, knowledge sharing seems to face the most difficulty in its implementation (Ruggles, 1998). In traditional economics, it is studied that people lay more emphasizes on their own power and benefits, so do business employees, who are observed to focus over whether the result will maximize their personal interests or not (Kim and Mauborgue, 1998). As soon as employees start to treat knowledge and information as personalized assets, it is more common to see the reluctance in sharing behavior (Senge, 1997). In fact, Davenport (1997) also suggested that it is unnatural for any person to conduct any sort of knowledge sharing, because people treat owned knowledge as valuable and significant resources of competitiveness. “The knowledge market, like any other, is a system in which participants exchange a scarce unit for present or future value”. On account of all those findings above, it is then vital to compose a KM strategy that will encourage knowledge transfer as we have agreed knowledge sharing is the most important and centric indicator among all these KM activities.

In sum, to figure out what could possibly affect employees’ personal intention to share their knowledge is the very preliminary step of a successful strategy for knowledge management within the organizational settings.

### **1.3. STATEMENT OF RESEARCH PROBLEM**

If we try to conceptualize knowledge sharing process as a physical flow, knowledge should flow from the knowledge possessors to the receivers. From the possessor's point-of-view, this flow is an optional "push" process, whereas it is a "pull" process in the eyes of the receiver. People search for (pull) knowledge because they expect it to help them succeed in their work (Davenport and Prusak, 1998). On the one hand, knowledge possessors might not have the full aspiration to impart the knowledge to the receivers, who may be unilaterally keen to learn, or, on the other hand, when the willingness to share of a knowledge possessor exists but none is observed from the receiver (Hsia-Hou, 2000). In our study, we target to dig into what preceding factors would eventually leverage the willingness of sharing knowledge from employees.

Up to the present, notwithstanding there have been plenty papers and researches probing into the phenomenon of knowledge sharing behavior, the research results remain diversified and even contradictory, being unable to lead to a comprehensive foundation of a specific theory, leaving the exploration of affecting factors discordant.

### **1.4. PURPOSES OF THIS STUDY**

In this paper, we firstly refers to the Relations Model Theory by Fiske in 1991, which uses four principal relation models to interpret the different ways how people interact with each other, as our major theoretical model. These four models are respectively Communal sharing, Authority Ranking, Equality Matching, and Market Pricing. In each model, we tried to induce some factors, more vivid and more measurable, from the previous researches and papers, to help acquire the realistic conditions in the daily

organizational settings. Moreover, referential expertise, know-how, and sorted written materials in the office all belong to the comprehensive scope of “knowledge” and almost scatter across a continuous spectrum from purely tacit to totally explicit, so we propose to combine all the availability into one factor for the practicability of study.

In addition, the moderating effect of the two additional moderating variables, task inter-dependence, and time of cooperation toward the processes where the four relation models functions on the sharing willingness will also be examined, so as to pursue a more comprehensive and comprehended model that would have sketched the organization settings in more real as versatile contingencies have been filled up in the office from day to day.

Here we briefly summarize the questions we target to inquire in this research:

(1) Do different relation models affect employees’ willingness of sharing their knowledge? If yes, which relation model will most encourage the willingness, and which will not.

(2) Will the characteristics of employees’ daily tasks (highly dependent or independent) further moderate how different relation models influence the sharing willingness?

(3) Will the interaction between the relation models and the sharing willingness be further calibrated over time?

## **1.5. OVERVIEW OF CHAPTERS**

In the following chapters: a required portion of literature review will be addressed in Chapter II. In Chapter III, we shall illustrate the established conceptual framework of this paper, as well as all the hypotheses. Also, how we conducted the data collection

and software / tools used for data analysis will be addressed in the same chapter. Chapter IV expounds the overall data analysis and data interpretation, so as to validate our conjectures. Chapter V is comprised of discussions, conclusions, limitations, and suggestions for a future step-further.

## **CHAPTER II: LITERATURE REVIEW**

### **2.1. KNOWLEDGE SHARING**

#### **2.1.1. THE DEFINITION OF KNOWLEDGE**

Versatile researchers use versatile expressions to define knowledge, e.g., Starbuck (1992) defines knowledge as the stock of expertise, Purser and Pasmore (1992) propose knowledge is an unity of facts, models, schemes, ideas, opinions, and intuition used for decision making processes. Nonaka (1994) defines knowledge as a justified true belief. Ruggles (1998) advocates knowledge as a mixture of information, experience, value standard, and norm. Liebowitz and Beckman (1998) thought knowledge is a situation, fact, example, event, rule, conjecture, or model, capable of enhancing the understanding or effects of in a specific field or a subject. Elliott and O'Dell (1999) expound knowledge as information in action.

Specifically, Davenport and Pursak (1998) ever granted a definition of “working knowledge”, which views the knowledge in the organizational settings as a “fluid mix”, including framed experience, value, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. According to those retrospection of knowledge, our study proposes the scope of knowledge should contain documentation, information, technical reports, professionalism, know-where, and know-how, and because most of them they are distributed across the continuous spectrum from purely tacit to totally explicit, we propose not to differentiate the sharing willingness from tacit to explicit under such organizational settings.

### **2.1.2. KNOWLEDGE TRANSFER**

Knowledge sharing, or transfer, means for employees to exchange and discuss knowledge with internal or external groups via all sorts of channels (e.g. vis-à-vis discussion, conference, both informal or formal networks, best practices, and database), aiming to expand the value of knowledge utilization during the inter-change of knowledge, and to create the synthesis. According to Darr and Kurtzberg (2000), Knowledge sharing is a process meant to gain experience from someone else, hence it is also named “knowledge transfer”, which will also reinforce the learning of an organization (Levitt and March, 1998).

Generally speaking, employees are capable to re-adapt and re-construct knowledge (Allen, 1997), and s/he is the only entity who stores tacit and explicit knowledge at the same time, and is able to apply it to a new situation (Berry and Broadbent, 1984 and 1987). Therefore, the personal knowledge within the organization must be shared with those employees who do needed it to perform his tasks efficiently, that is to say, to transfer knowledge at the right time, in the right place, and to the right person.

However, as knowledge is also considered as the source of power and a person’s core-competency, it will be very difficult to command employees contribute selflessly. Consequently, compared to other processes of knowledge management, we propose knowledge sharing is the most challenge to an organization’s knowledge management activities. That is also why we are interested in figuring out what could possibly affect the willingness of a knowledge possessor, and by identifying the preceding factors affecting the willingness, we therefore are able to leverage the improvement of such sharing activities within an organization.

## 2.2. RELATIONS MODEL THEORY

Relations Model Theory was raised by Fiske in 1992, and the underlying assumption is that people are fundamentally sociable due that human, out of an intention to fight against the wild nature and the native environment and struggle for survival, learned to group together and strengthen the force to protect themselves from undesired dangers. Gradually such clustering living style leads human to organize their life socially, instead of individually. Social relations derived consequently. According to Fiske, this sociability fundamentally have four 'faces', i.e. there are four essential styles of human relationships, which determine the way people behave with others: Communal Sharing, Authority Ranking, Equality Matching and Market Pricing.

- *Communal Sharing* (CS) is a relationship in which people feel to belong to a group in which each member is equal and where it is expected and natural to share resources such as knowledge.

- In an *Authority Ranking* (AR) relationship there is no such equal relation. Instead there is another sort of ranking and hierarchy. People who are higher in ranking request to share knowledge, and the lower will follow.

- *Equality Matching* (EM) is based on a balance in giving and taking. The expectation for equality is the motivator for knowledge sharing.

- In a *Market Pricing* (MP) relationship, the contribution of what is given (both in terms of quantity and quality) is evaluated in financial or comparable value. This theory identifies not only factors that motivate interaction, but also certain contexts that select these factors.

The Relations Model Theory by Fiske is 'translated' to the field of knowledge sharing by Boer (2002). In a Communal Sharing setting, knowledge is treated as public belongings to all members of the group and should therefore be shared. Such a



relationship is often found among professionals of the same background. Under Authority Ranking, knowledge sharing is motivated by power differences. Examples of such types of relationships are commonly found in the military units or in many organizations. Under Equality Matching, knowledge is shared because a return is expected or someone else has shared something before, while under Market Pricing knowledge is being shared because one gets compensation for it. This translation by Boer has its good reason, because the sharing activity of knowledge itself is basically one “social phenomenon”, since individual behavior will only be assumed with its social meaning in the context of human relations, which is built between employees so long as sharing takes place. It also implies that such particular relationship being built will then decide in return how knowledge will be shared.

These four dimensions of principal social interaction have been proofed to be well underlain for knowledge transfers: in a CS model, group members interact with each other out for nothing but due to feeling of belonging. Knowledge in a CS relationship is freely shared within the identical group, following the idea “what is mine will be yours”. In an AR relationship, team members are sorted linearly from higher in the hierarchy to the lower, and upon being urged to contribute ideas, know-how, knowledge, members from lower level must react to disclose, regardless being on her/his own will or not. Equality matching is based on a model of even balance and one-for-one correspondence. Within equality matching relationships, employees share what they know out of an expectation to receive similar response in return. Finally, in the relations of market pricing, employees ignore all relevant features and components under consideration to a single tangible value, mostly in the form of monetary compensation, which can enable a cost / benefit analysis from qualitatively and quantitatively diversified factors. In such relations, knowledge will only be shared as soon as a financial reward at an acceptable amount of value has been observed. In

table 2.1. some the major postulations of the relation models theory will be summarized (Boer, et al., 2002).

《Table 2.1.》 Postulations of Relation Models Theory (Derived from Fiske 1992)

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1. People are fundamentally sociable; they generally organize their social life in terms of their relations with other people.
  2. People use just four relational models (communal sharing, authority ranking, equality matching and market pricing) to generate, understand, coordinate and evaluate these social relationships; the four social structures are manifestations of elementary mental models (schemata).
  3. People find each of the models of relationships intrinsically satisfying for its own sake. There is typically an extremely high degree of consensus among interacting actors about what model is, and should be operative.
  4. People believe that they should adhere to the models, and insist that others conform to the four models as well.
  5. Social conflicts often occur when people are perceived to be profoundly violating the elementary relationships.
  6. The residual cases not governed by any of these four models are asocial interactions, in which people use other people purely as a means to some ulterior end, or null interactions, in which people ignore each other's conceptions, goals and standards entirely.
  7. People commonly string the relational models together and nest them hierarchically in various phases of an interaction or in distinct activities of an organization.
  8. Relations and operations that are socially significant in one relational structure may not be meaningful in certain others.
  9. People in different societies commonly use different models and combinations of models in any given domain or context. Cultural implementation rules (rules that stipulate when each model applies and rules that stipulate how to execute each model) are essential for the realization of any model in practice (domain, degree).
  10. The four models do not all work equally well in every domain, and each is dysfunctional for some purposes in some contexts.
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In table 2.2. we also list down several important referential papers which have been conducted to address the correlation or influencing relationship between relations model and knowledge sharing, as they have substantially inspired this exploration:

«Table 2.2.» Researches Conducted with Relations Model Theory and Knowledge Sharing

	Research Finding	Author
1.	Illustrates how relation models theory is able to integrate different existing models of knowledge sharing, and explain contradictory research findings. Also demonstrates that relation models theory is a useful tool for analyzing knowledge sharing in practice	Boer and Berends, 2003
2.	Explores how different social relation models contribute to a better understanding of the dynamics of knowledge sharing within different organizational settings, asserting that the dynamics of knowledge sharing is organized according to a mix of four relational models distinguished by the relation models theory. Also describes how each model have their own implications for understanding and supporting the knowledge sharing process	Boer, Baalen, and Kumar, 2002, 2004
3.	Proposes a methodology that enables to describe and analyze the situatedness of knowledge sharing within and between different organizational settings. Explains the sharing phenomenon according to its emergent object of activity and its mediation of language and technologies, social rules and division of labour. The situated nature of the knowledge sharing process is stressed and a systemic analysis is ensured	Boer, Baalen, and Kumar, 2003
4.	Identifies main incentives which influence knowledge sharing, and illustrate the differences of impacts brought under different situation	Maass, W., Stahl F., Schäfer, MF., 2004
5.	To link basic motivation theories to empirical strategies to stimulate knowledge sharing, and the role of various ypes of incentives, and search for underlying processes that may explain why people share or share not their knowledge	Andriessen, J.H.E., 2006

### 2.3. FACTORS AFFECTING KNOWLEDGE SHARING WILLINGNESS, REPRESENTING EACH RELATION

So far we have discussed about the famous Relations Model Theory and its four principal dimensions. But how employees would exactly perceive their organizational settings is worth a closer examination, as “relations” are somehow abstract perception, which is felt and sensed by employees. In order to get a further step, to deliberate the atmosphere in the office in a more objective way, we propose to firstly explore some possible independent factors which can be used to represent these four relations, and regard them as the realistic proxy on behalf of those four relations, to study whether they influence employees’ willingness of sharing their knowledge or not.

《Table 2.3.》 Relational Models and Existing Models of Knowledge Sharing

<i>Fiske’s Relational Models</i>	<i>Existing Models of Knowledge Sharing</i>
Communal Sharing (CS)	“Communities-of-Practice” (e.g., Wenger 1998) “Gift Giving” (e.g., Hagstrom 1965)
Authority Ranking based on Formal Hierarchy	“Scientific Management” (Taylor 1916)
Authority Ranking based on Expertise	“Credibility Cycles” (Latour & Woolgar 1979)
Equality Matching (EM)	“Social Dilemmas” (Cabrera & Cabrera 2002)
Market Pricing (MP)	“Knowledge Markets” (Davenport and Prusak 1998)

In table 2.3., we firstly illustrate the found corresponding theories to these four relation models, on the relational dimension of knowledge sharing and communication, and continue with another more in-depth probing of variables.

### **2.3.1. FACTORS FOR COMMUNAL SHARING**

People in a Communal Sharing relationship shows an attitude to share their intelligence possession within the team, neither asking anything in return nor with any other unspoken intention. Such voluntary behaviors are out of a generous, being altruistic, warm-hearted, and passionate faith, and demonstrate full trust toward members.

According to result of our exploration, we have identified two key factors that are provided with the same characteristics of “communal sharing”, which are Altruism and Trust (Affect-Based and Cognition-Based).

#### **2.3.1.1. ALTRUISM**

Kurz (1997) proposes a definition of altruism in behavior terms – an act by one person of providing goods and services to another person without any enforceable contract to receive maximal compensation for charity act, Kurz also claims that exists a subtle social mechanism to provide compensations that will ultimately make altruistic behavior individually optimal.

Hsia-Hou (2000) also suggested those who hold the characteristics of sharing tends to give people a hand and are ready to exchange information with others. This turns out positive to the willingness of sharing. Davenport and Prusak (1998) also deemed that some employees may be a nice guy who just wants to help without asking for anything in return, who is simply so passionate about what he knows and is happy to share it anytime. From this point of view, we agree altruism well fits the spirit of Communal sharing.

### **2.3.1.2. TRUST (AFFECT-BASED and COGNITION-BASED)**

Under the atmosphere of Communal Sharing, employees tend to treat the other colleagues as his / her own fellows, and will consider things in their shoes, which means they hold faith in each other. As a result, Nonaka et al (2002) claims that with a view to encourage organization members to share knowledge, affection, caring, trust, and commitment must exist between them, and hence to induce the expected sharing behavior. Ojala (1999) declared if trust is absent in the co-relationship, people might feel hesitated to liberally reveal their knowledge, and sharing turns out to be something illusory. Andrews and Delahaye (2000) also proposed trust as one key factor in the process of knowledge sharing, for without trust, it's not worth sharing. Davenport and Prusak (1998) regarded trust as a vital element in promoting the operation efficiency of knowledge market, expediting the transmission of knowledge.

To explore trust more deeply, we understood that trust can further be differentiated into different types. Lewis and Weigert (1985) suggested trust can be distinguished as “affect-based” trust and “cognition-based” trust. “Affect-based” trust reasons that as long as partners / colleagues care for each others' benefits, recognize a virtue existed in their relationship, and mutually believe that the devotion of caring will lead to a sensible return, trust will grow. Such trust lay emphasize on the intrinsic value of the relationship itself.

“Cognition-based” trust states that “trustors” will judge when to grant their trust to the trustees according to different objects and scenarios, and this judgment is in accordance with any evidence and appropriate reason we hold to trust the trustees, i.e., owing to our understanding about a person's ability, capability, and personalities, we have confidence that her/his performance will be in line with our expectation. As a result, cognition-based trust is a kind of trust on the basis of rationality, embracing

concepts such as capability, responsibility (Butler, 1991, Cook and Wall, 1980).

### **2.3.2. FACTORS FOR AUTHORITY RANKING**

In light of the theory from French and Raven (1959), in a hierarchical organization, there are different levels of perceived power. Often people with higher job position or higher in the bureaucratic hierarchy are perceived to share a stronger power in influencing, decision-making, and leveraging, while people lower in the ranking are believed to be relatively weak. A number of scholars have tried to summarize the key types of powers, e.g. Cavanaugh (1979), Clark (1968), Schopler (1965), etc. Here we refer to French and Raven's assertion, that there are five basic powers: referent power, expert power, legitimate power, coercive power, and reward power.

The major purpose of this study is to evaluate whether the power difference in the native organizational settings will influence employees' willingness in sharing knowledge, which means we aim to seek the primitive impact derived from different power of classes, tentatively ignoring other affecting factors such as the need for being rewarded, the need for being consulted, and the need for being referred. Instead we will be focusing on the legitimacy and coercion from the bureaucratic system itself. For the aspect of authority ranking, we have also identified two key factors that are provided with the same characteristics of "authority ranking", which are Legitimate Power and Coercive Power.

#### **2.3.2.1. LEGITIMATE POWER and COERCIVE POWER**

If we probe the willingness of knowledge sharing from the point of view of power, we realized that when any group member expects their power or position will diminish

during the process of sharing out their knowledge, it will be obvious the willingness gets lowered (Szulanski, 1996, Fraser et al., 2000). Davenport and Prusak (1998) contended that the knowledge owned by any organization member is somehow exclusive in the market of manpower, and it also grant knowledge possessors some monopolized advantages in competition. Therefore, such advantages will not be sold rashly at any price. In the research conducted by Tammy Tang (2000), the negative view in the knowledge sharing activities lies that knowledge possessors treat the ownership of knowledge as an ownership of power. Accordingly, sharing her/his accumulate professionalism over years, work experience, know-how will weaken his/her relative advantages, or harm to the security of job or position. In the article of Dieterly and Schneider (1974), self-perceived power can be further classified into five sorts, referent power, expert power, legitimate power, coercive power, and reward power. Judging from the cited context of argumentation, we propose legitimate power and coercive power well represent the authority ranking model.

### **2.3.3. FACTORS FOR EQUALITY MATCHING**

Members in an EM relationship are egalitarians, who are only willing to contribute for a certain amount equal to what can be expected in return. According to Boer (2002), the expectation for a fair payback in a foreseeable near future is the only reason why people in an EM mode do sharing, so some principal guidelines to follows are for example, being reciprocated, being equal, and are deserved to look forward to. In accordance with the mentioned requirement, for the aspect of equality matching, we have obtained three key factors that are provided with the same characteristics of “equality matching”. They are “reciprocity”, “expected reward”, and “expected association.”



### **2.3.3.1. RECIPROCITY**

With the existence of a mentality expecting reciprocity, when people provide support to others, they look forward to something equally valued in return or rewards. Such impression of mutual benefit will leverage with each other, and finally leads to the evolvement of exchange behaviors within and between groups (Nelson and Coopriider, 1996), and further results in a quite mutually interactive relationship formed by such dependence. Davenport and Prusak (1998) also agreed that knowledge possessors require knowledge demanders to give out equal assistance in return in the future whenever necessary. Under such consensus, the knowledge possessor will be more willing to spend time and efforts in sharing their knowledge. Tammy Tang (2000) ever regarded reciprocity as one of the positive values of Knowledge Sharing, implying if employees valued knowledge sharing more positively, the behavior of sharing will also be observed more frequently. Based on the real situation of interaction, the knowledge possessor will amend his motivation to some degree.

### **2.3.3.2. EXPECTED REWARD**

Both expected rewards and expected associations derived from the implication of Economic Exchange Theory and Social Exchange Theory (Kelly and Thibaut, 1978, Blau, 1967), as knowledge sharing behavior is also a social interaction between people, hence it is appropriate to adopt these 2 theories for interpretation. According to the Economic Exchange Theory, people have given it a thought whether it is beneficial or not, before they really put something into practice, which is to say, when an employee undertakes knowledge sharing, it must be under a circumstance when the remuneration to be obtained is greater to the devoted cost (Kelly and Thibaut, 1978, Constant et al.,

1994). That is also why many scholars lay stress on the incentive program, which is to be incorporated when carrying out a successful organizational knowledge management (O'Reilly et al., 1987; Davenport and Prusak, 1998; Hall, 2001; Bartol and Srivastava, 2002). Besides, incentive system is an objective indicator for performance evaluation, not is only able to give rather much feedback, but to encourage most employees (O'Dell and McAdams, 1987). Subsequently, what expected rewards mean to the employees is they are certain to acquire extrinsic benefits, such as bonus, promotion, and opportunities to pursue for further education, etc.

#### **2.3.3.3. EXPECTED ASSOCIATION**

On the other hand, Social Exchange Theory centers on intrinsic rewards (Blau, 1967), invisible social cost and interest exchange, e.g. respect, reputation, friendship, care, with no definite rules and articles for regulation and management. If a social exchange takes place, it means the opposite has made someone feel obligated, gratified, or trusted to do so, even it is something in the future (Gouldner, 1960; Blau, 1967). Therefore, expected association presumes employees believe via the sharing process of knowledge to whomever needs it will reform their relationship. To sum up, both extrinsic benefits and intrinsic rewards will do good to encourage knowledge sharing.

#### **2.3.4. FACTORS FOR MARKET PRICING**

Under an environment where people only want to share given that a reasonable or considerable compensation has been promised, it is a MP relation. In there, knowledge is treated as a commodity with a certain value, and can be traded. When the perceived compensation is not satisfactory enough, people show less or even no

willingness to share. Also, as suggested by Davenport and Prusak (1998) that knowledge exchange also functions as a market, where people sell knowledge for benefits, implying the cost exist, because knowledge is not a born talent, but is created during an enduring time-frame with relatively respectable efforts. Also, knowledge sharing is a mutual mental process which requires the “seller” to strive to pass on the knowledge to the “buyer”, and the so-called transaction cost also derives. For the aspect of market pricing, we have obtained two key factors that are provided with the same characteristics of “market pricing” – the “tangible reward” and “cost”.

#### **2.3.4.1. TANGIBLE REWARD**

Osterloh, M., and Frey, B., proposed employees are extrinsically motivated if they are able to satisfy their needs indirectly, especially through monetary compensation. Money is a goal which “provides satisfaction independent of the actual activity itself” (Calder and Staw 1975). Extrinsically motivated coordination in firms is achieved by linking employees’ monetary motives to the goals of the firm. The ideal incentive system is strict pay-for-performance.

Although many economists admit the existence of intrinsic motivation, they leave it aside because it is difficult to analyze and control (e.g., Williamson 1985, p. 64). Even if the assumption of opportunism is an “extreme caricature” (Milgrom and Roberts, 1992, p.42), opportunism as a “worst-case scenario” is a contemplation when designing institutional structures (Williamson 1996). Transaction cost theory goes a step farther by assuming that individuals are opportunistic and seek self-interest with guile. Opportunism is a strong form of tangible reward when individuals are not constrained by any rules. In the transactions cost view, the task is to establish institutional settings that mitigate the hazards and costs of opportunistic behavior

(Williamson 1985, 1996).

#### **2.3.4.2. COST**

Under such relation structure of Market pricing, knowledge is treated as a valuable goods and can be traded with a certain amount of rewards, which might not necessary be in physical or materialized forms. But in the transaction process, the knowledge possessor must have obtained some remuneration while the knowledge demander paid some, and the condition is agreed by the both sides.

Williamson (1975) treated transaction cost as “implicit cost excluded from the fundamental cost of procurement, which include the cost of search, negotiating, bargaining, contracting, post-monitoring, as well as violation.” This is an extra point of view compared to the classical economics because the factor of human nature is neglected. Williamson identified this remark, declaring that during the transactions, it is the human issue as well as the dynamics in the transaction environment that cause the market to mal-function, leading to the difficulty in normal transactions, and generating additional cost. And this “human issue” derives itself from the “bounded rationality” and “opportunism”. Bounded rationality takes its place owing to the inherent nature of people’s limitation in processing information and handling communication, particularly when located in an uncertain condition. Constrained by this inability and complexity and uncertainty about the external circumstance, people may not be willing or able to share their knowledge effectively, and that is the reason why roadblocks are incurred.

From the point of opportunism (economics), people’s behaviors are decided by the market mechanism, which focus on the balance between supply and demand. If we try to expound whether people will engage into some kind of behavior from transaction

cost point of view, we could observe that when the transaction cost goes up, people would decrease their tendency to share. This suggests that with a view to maximize the overall efficacy between supply and demand, the transaction cost issue must be addressed in advance (Lin and Wang, 2005). Besides, people spent great time and efforts studying and absorbing their tacit and structural knowledge, and also the experience and know-how are accumulated during an enduring process with many lessons learned and a certain amount of real practices. This can also be conceptualized as another form of cost.

## **2.4. MODERATORS**

Being addressed earlier, organization culture, more a long term setting, formed shall gradually determine which relation model employees adopt under certain circumstances, and as the time and space change, when employees are situated in differently perceived relationships, they shall also demonstrate different levels of willingness about sharing, but even though in the organizational settings, we can hardly conclude employees' willingness of sharing their knowledge is utterly or uniquely influenced by their perceived relationships with other colleagues, but also some additional indirect influencers (Boer and Berends, 2003), or that is to say, the *Contingent Variables*, more short term settings, as the organizational settings vary with different time, space, and environment (Fiedler and Chemers, 1974).

In our study, we postulate there are a few additional factors will eventually moderate the process where different relations model influence the willingness. Here we have identified two factors: Task Inter-Dependence, as well as Time of Cooperation.

#### **2.4.1. TASK INTER-DEPENDENCE**

The construct of task inter-dependence results from the type of group task and the technology used to complete this task which are based on the mutual cooperation from many people (e.g., Shea and Guzzo, 1987; Thompson, 1967). Task inter-dependence has been defined in many different ways (Kiggundu, 1983; Pearce and Gregersen, 1991; Shea and Guzzo, 1987, and more), but the differences in definitions are merely the result of differing viewpoints regarding what causes task inter-dependence and who are task inter-dependent.

Here we propose to define task inter-dependence as the degree to which group members have to exchange information and/or means for the completion of the group task. When the level of task interdependence is high, inevitably the employees will have to cooperate (exchange information and means) for the completion of the goal-setting. When the level is relatively low, on the contrary, colleagues need not to do so. Task inter-dependence can vary from zero to (highly) positive.

#### **2.4.2. TIME OF COOPERATION**

According to Social Capital Theory, cognitive capital refers to those resources that make sharing interpretations and meanings within a group possible. Engaging in a meaningful exchange of knowledge requires at least some level of common understanding between people, such as a shared language and vocabulary (Nahapiet and Ghoshal, 1998). Individuals must also understand the context in which their knowledge is relevant (Orr, 1996). An individual's cognitive capital develops as he or she interacts over time with others sharing the same practice and learns the skills, knowledge, specialized discourse, and norms of the practice. This understanding may

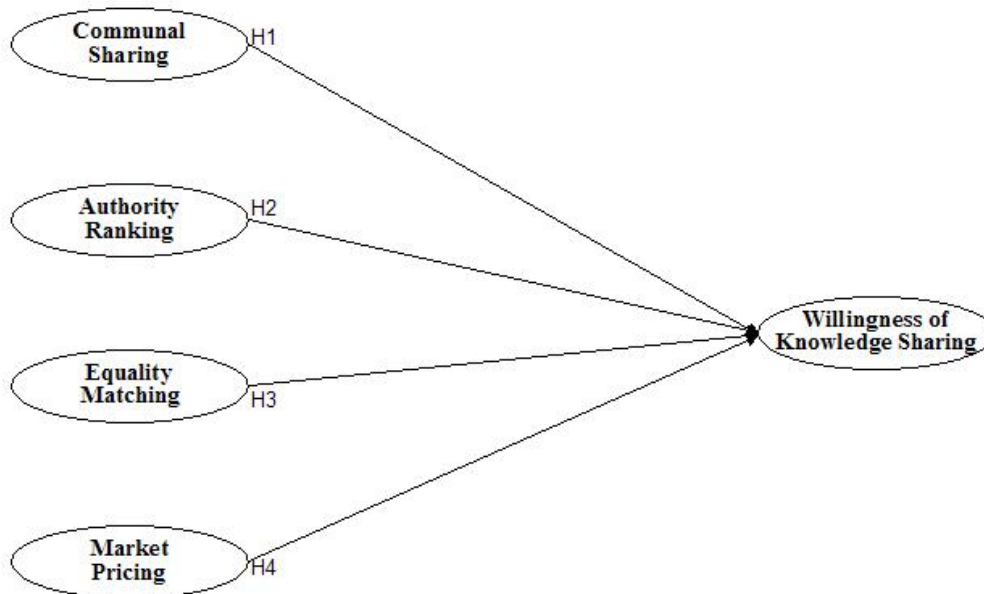
be gained either through hands-on experience or through narratives told over time.

Simultaneously specified by Boer and Berends (2003), “Time plays an important role since the interaction between two people in the past can have an effect on people’s current interaction behavior.” Relations might cease being existed, yet the dominant relation model would have changed over time. Within one organizational setting, different relation model would dominate according to different time scope, and shall issue reversed impacts. In our study, we therefore advocate to understand if this is a mediate variable that would possibly affect the result of knowledge sharing.

### CHAPTER III: RESEARCH METHODOLOGY

In this chapter, we will explain how our research model was constructed, propose the theoretical hypotheses, and illustrate how variables will be measured. Proceedings are the part of our research design, detailing our research subject, the sampling process, as well as data collection. Regarding the measurement of research variables, we will articulate the theoretical definition, referential literature, and tools for data analysis.

#### 3.1. MODEL DEVELOPMENT AND HYPOTHESES



《Figure 3.1.》 Research Framework – Theoretical Model

Earlier in chapter II, we had enunciated the details of the Relations Model Theory, the main body of our research, which is composed of four principal relations: Communal sharing, Authority Ranking, Equality Matching, and Market pricing. From



each principal dimension, we tried to identify a number of concrete and measurable factors, and based on these factors to validate the influence of relations on sharing willingness. As for these identified variables nominated as representatives, they are incorporated into the four major dimensions. Here we illustrate an overview of our theoretical arguments in Figure 3.1. as above:

Based on the main theoretical module, we've postulated the first four hypotheses as follows:

**【H1】** : A communal sharing (CS) relation will influence on employees' willingness of knowledge sharing (KS)

**【H2】** : An authority ranking (AR) relation will influence on employees' willingness of knowledge sharing

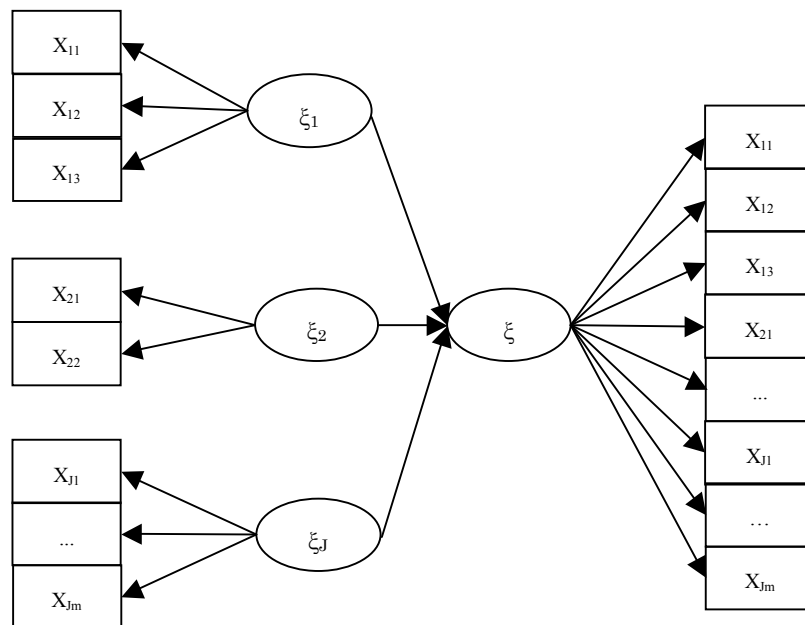
**【H3】** : An equality matching (EM) relation will influence on employees' willingness of knowledge sharing

**【H4】** : A market pricing (MP) relation will influence on employees' willingness of knowledge sharing

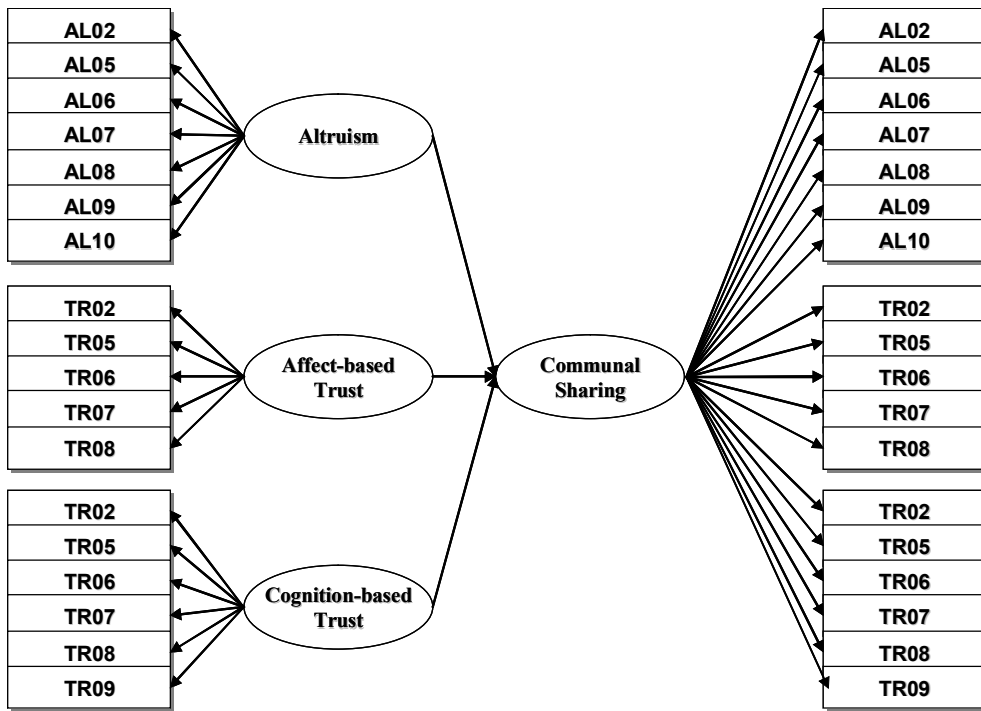
Owing that the current version of Visual PLS somehow does not support bootstrap regression algorithm for a second-order research structure, we are obliged to find another way out to validate our structural mode. Regarding the links between PLS and its related methods, many have been studied on several other practical examples (Guinot et al., 2001, and Pagès and Tenenhaus, 2001). Academically the alternative is considering a situation where  $J$  blocks of variables are observed on the same set of statistical units. In such presentation, it is firstly postulated that each block is fundamentally uni-dimensional and hence can be accommodated by another one Latent Variable, denoted as (LV)  $\xi$ . As for estimating these LVs  $\xi_j$ , Wold (1982) has proposed the hierarchical model defined and explained as follows:

- a new block  $X$  is constructed by merging these  $J$  blocks  $X_1, \dots, X_J$  into a super-ordinate block (each construct)
- the super-ordinate block  $X$  is denoted by one LV  $\xi$  in the model
- a path model connects each exogenous LV  $\xi_j$  to the endogenous LV  $\xi$

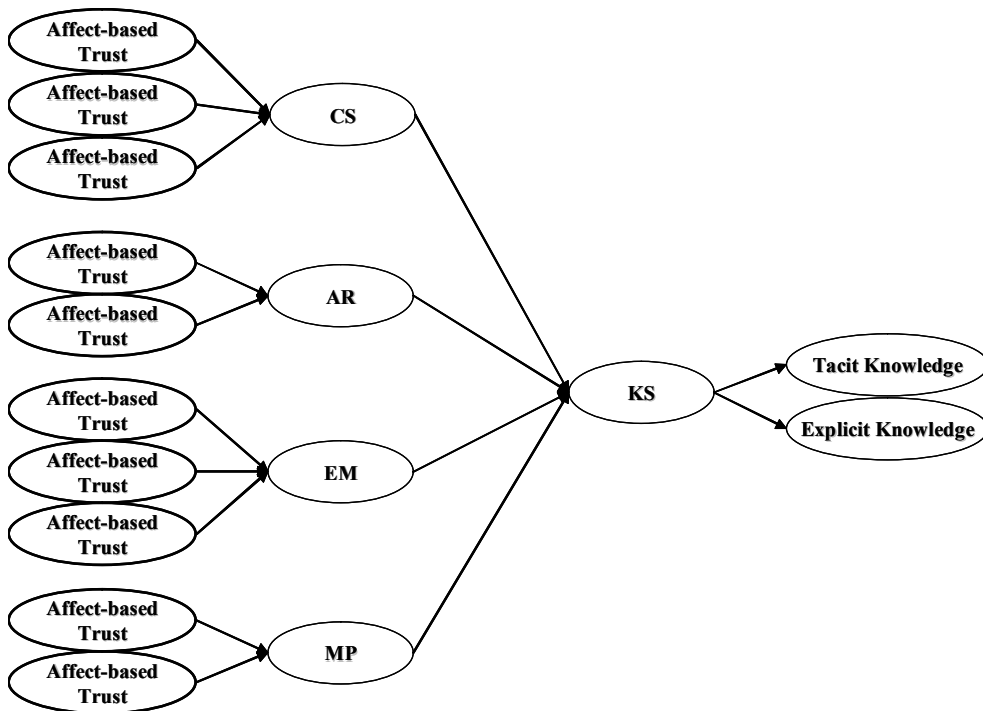
Figure 3.2. gives a diagrammatic notion about how this process proposed by Wold (1982) was constructed, while figure 3.3. illustrates how accordingly our second order research concept of CS was formed based on the process based on the same methodology, and so forth for AR/EM/MP. In figure 3.4. we will demonstrate how the overall research framework of this study was constructed conformably.



«Figure 3.2.» A Hierarchical Model for a PLS Analysis of  $J$  Blocks of Variables

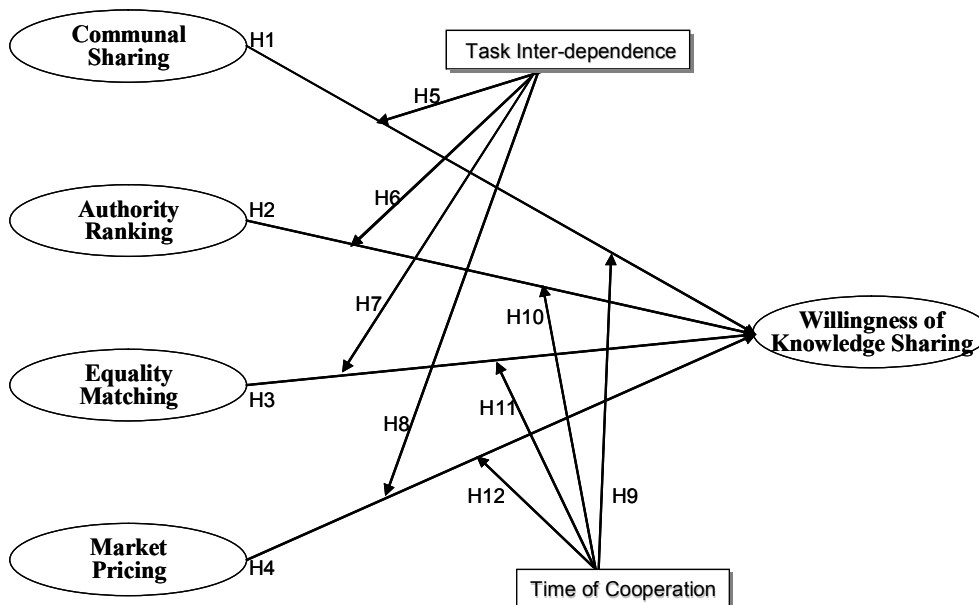


«Figure 3.3.» A Hierarchical Model of Three Blocks of CS Variables



«Figure 3.4.» Research Framework – Second-Order Model

Furthermore, on top of examining these direct impacts brought by different relations to sharing willingness, we further postulate there are several additional that would in the mean time further moderate these above influencing processes, as also named contingent variables, as they would be able to reflect more precisely the real and contingent working environment. According to contingency theory (Fiedler and Chemers, 1974), the organization settings would change under circumstances of different people, different space-time. In search for related literature, two moderating factors were identified, which are: “Task Inter-Dependence” as well as “Time of Cooperation”, considering that the effectiveness of contingency is also influenced by the level of task interdependence (Wageman, 1995), and as the relations might cease to exist, or change of dominant model over time (Boer and Berends, 2003). We have also fit them into our theoretical research model with an eye to, on the one hand enrich a comprehensive research structure, and on the other hand, validate their influencing effects via statistical means. The full model of our theoretical arguments is illustrated in figure 3.5.



《Figure 3.5.》 Research Framework – Full Model

Incorporating the moderating factors into the theoretical research framework, the revised full research model gets extended as illustrated in figure 3.2. and several supplementary hypotheses are derived:

- Incorporating Task Inter-dependence as a moderator:

**【H5】** : Task Inter-dependence will moderate the relationship between CS relation and the willingness of KS

**【H6】** : Task Inter-dependence will moderate the relationship between AR relation and the willingness of KS

**【H7】** : Task Inter-dependence will moderate the relationship between EM relation and the willingness of KS

**【H8】** : Task Inter-dependence will moderate the relationship between MP relation and the willingness of KS

- Incorporating Time of Cooperation as a moderator:

**【H9】** : Time of Cooperation will moderate the relationship between CS relation and the willingness of KS

**【H10】** : Time of Cooperation will moderate the relationship between AR relation and the willingness of KS

**【H11】** : Time of Cooperation will moderate the relationship between EM relation and the willingness of KS

**【H12】** : Time of Cooperation will moderate the relationship between MP relation and the willingness of KS

In table 3.1 (next page). we will outline again the primary referential literature and papers underlain for our conjecture and hypotheses:

《Table 3.1.》 Related Literatures for the Hypotheses

Hypotheses	Factor	Supporting Literature
CS	altruism -> KS	Kopfman and Smith (1996) and Morgan and Miller (2002), Wasko and Faraj (2005); Kankanhalli et al. (2005); C.R. Fu (2005); S.J. Fan et al. (2004); Kolekofski and Heminger (2003); Constant et al. (1994)
	trust -> KS	McAllister (1995); Lewis and Wiegert (1985) J.C. Lin, C.C. Wang (2005), S.J. Fan (2004), Hsia-Hou, H.P. (2000), Nelson and Coopriider 1996
AR	power -> KS	Dieterly and Schneider (1974) Y.C. Tung (2004), Nelson and Coopriider (1996)
EM	reciprocity -> KS	Hu, Y. and Korneliussen T. (1997) Wasko and Faraj (2005), Kankanhalli et al. (2005), S.J. Fan et al (2004), Y.C. Tung (2004); Kolekofski and Heminger (2003), Weiss (1998), Constant et al. (1994)
	expected reward -> KS	Bock and Kim (2002) Bock et al. (2005), Hall (2001)
	expected association -> KS	Bock and Kim (2002ab) Bock et al. (2005), Hall (2001)
MP	tangible reward -> KS	Lee, C., et al (1991) Kluge MA. (2002), Osterloh, M., and Frey, B (2000)
	cost -> KS	Williamson (1975), Kou. D.Y. (2002) Davenport et al. (1998), J.C. Lin, C.C. Wang (2005)
KS		Fishbein and Ajzen (1975)
Task Dependence		Jarvenpaa and Staples (2000, 2001)

\* KS for Knowledge Sharing

### 3.2. THE MEASUREMENT OF VARIABLES

As for the measuring our target subjects' feelings and perception against their working environment, several useful papers and related questionnaires were acquired during the searching. These questionnaires have been referred to in a number of other academic probes and have meanwhile demonstrated their goodness in reliability and validity. This availability gave a very profuse aid in initiating a especially-tailored version of survey form for our research.

### **3.2.1. ALTRUISM**

Kopfman and Smith proclaimed that being altruistic is a non-volatile human characteristic, leading to a pleasure in helping people without asking for a return. For the measurement of employees' degrees of being altruistic, this research adopts the well-formed questions designed by Kopfman and Smith (1996) and Morgan and Miller (2002), such as "I enjoy doing small favors every day for the people I care about", "Overall, I tend to be a cheerful person", and "I enjoy working for the welfare of others". Following the Likert scale, the questionnaire is designed to examine how strongly subjects agree or disagree with statements on a seven-point scale with the following anchors: 1 point very disagree, to 7 point strongly agree.

### **3.2.2. AFFECT-BASED and COGNITION-BASED TRUST**

For the measurement of employees' degrees of granting affect-based trust (perceptually I feel I can trust this person) as well as cognition-based trust (judging from her/his past performance, there is a reason for me to believe her/him), to their colleagues, this paper adopts the questions from McAllister (1995), as the referential literature is also the interpretation toward trust by Lewis and Wiegert (1985). There are totally ten questions, and among them are five for affection, e.g., "If I shared my problems with this person, I know (s)he would respond constructively and caringly", and the other five for cognition, e.g., "Given this person's track record, I see no reason to doubt her/his competence and preparation for the job". This part also follows the seven-point Likert scale (1 point for strongly disagree, while 7 points for strongly agree).

### **3.2.3. LEGITIMATE POWER and COERCIVE POWER**

Measuring employees' perception of power in the working environment, this paper adopts the questions composed by Dieterly and Schneider (1974). The literature on power has been clear in specifying the organizational conditions that may have an effect on how the legitimate and coercive powers are perceived by employees. Probing questions are for example: "The position of managers give them a great deal of authority" and "The decision made at managers' level are of critical importance" for perceived legitimate power, as well as "Managers can punish employees at lower levels" and "Managers' works are checks on lower level employees" for perceived coercive power, following the seven-point Likert scale (1 point for strongly disagree, while 7 points for strongly agree).

### **3.2.4. RECIPROCITY**

How reciprocal we are? This, according to Hu and Kornelissen (1997), can be measured by evaluating how a mutually contingent exchange of benefits are conducted and how a set of sentiments is associated with mutual gratification. Measuring employees' perception regarding the reciprocation with their colleagues, three questions elaborated by also Hu, Y. and Korneliussen T. (1997) are adopted in this study such as "We work actively on developing a collective image within the fields of cooperation", with seven-point Likert scale (1 point for strongly disagree, while 7 points for strongly agree).



### **3.2.5. EXPECTED REWARD, EXPECTED ASSOCIATION**

As proposed by Bock and Kim (2002), some people share knowledge with others with an anticipation to obtain rewards or remuneration, or with a prospection to improve or even enhance the relationship with their associates and partners. For the measurement of business employees' attitudes over their expected reward and expected association when being commanded to share what they have in mind, this study utilizes the proposal from Bock and Kim (2002), and Hall (2001). Questions are designed to appraise whether respondents agree on this supposition. The seven-point Likert scale is applied as so (1 point for strongly disagree, while 7 points for strongly agree).

### **3.2.6. TANGIBLE REWARD**

According to Lee, et al., (1991), tangible rewards contained items representing the probability that goal success will lead to job security, pay raises, and promotion, etc. Such rewards must be reimbursed in a relatively tangible or specific form, instead of implicit or intangible. For the evaluation of employees' motivation by tangible reward when tempted to behave like this, an existing questionnaire raised by Lee is assumed, except there is one caption which literally highly resembles an earlier question for expected reward. With an eye not to cause unnecessary interference, we've proffered to eliminate it, and we pay special attention to this elimination until later on the Cronbach's alpha value still shows a well-constructed result. Questions are exploited to evaluate if it is agreed that tangible rewards will inspire the intention to share. This evaluating follows seven-point Likert scale as well (1 point for strongly disagree, while 7 points for strongly agree).

### **3.2.7. COST**

Among what really hinders people from sharing in terms of the cost concern, according to Williamson (1975), there is a key factor, the opportunism, bringing about the deep concern regarding the cost spent to acquire knowledge for her or himself, as well as the cost spent in conducting knowledge transferring. With a view to understand employees' real concern in spending time and efforts in sharing as undesired extraneous cost, either in terms of money, time, efforts, or other obscure values, the questions derived from Williamson (1985) are referred, e.g. "I think it really costs me much time to share important knowledge with my colleagues". Likert scale is applied (1 point for strongly disagree, while 7 points for strongly agree).

### **3.2.8. WILLINGNESS OF KNOWLEDGE SHARING**

The only dependent variable in this research is to judge employees' willingness of sharing their knowledge. Fishbein and Ajzen (1975) identified that the intention of behavior means the subjective probability for a person to perform this specific behavior, i.e., how much would (s)he like to do it. One matured question-set is available for conducting the corresponding measurement, which has been proposed by Fishbein and Ajzen (1975), enquiring the repliers whether s(he) would intend / try / or plan to share knowledge. The seven-point Likert scale (1 point for strongly disagree, while 7 points for strongly agree) is consulted.

### 3.2.9. TASK INTER-DEPENDENCE

As for the estimation regarding employees' job-nature, the task inter-dependence, a handy and quality questionnaire has been raised by Jarvenpaa and Staples (2000, 2001), Staples and Jarvenpaa (2002), following still the Likert seven-point scale (1 point for strongly disagree, while 7 points for strongly agree). The operational definition is about the degree how one's task mutually depends on her/his associates, for example, "My work often involves sharing information wit other departments."

### 3.2.10. TIME OF COOPERATION

As for the other moderating variable, Time of Cooperation, the referential data comes from the questions about the interviewees' personal information, "for how long have you joined the current company?" Due to the limitation of the support from statistics tool, we merely divide the samples into two groups: the first group contains those whose seniority is less than one year, while the second group is comprised of people who have joined her/his company for more than one year.

In table 3.2. we try to summarize all the operational definitions and the referential sources of our research variables:

《Table 3.2.》 Operational definitions and referential sources of research variables

Altruism	A non-volatile human characteristic, leading to a pleasure in helping people without asking for a return	Kopfman and Smith (1996)
Affect-based Trust	Trust built over the sentimental connection	Lewis and Weigert (1985)
Cognition-based Trust	Trust built over acknowledgement and appropriate reasons for trust	Lewis and Weigert (1985)
Legitimate Power	An official position and power authorized by the organization	French and Raven (1959); Dieterly and Schneider (1974)
Coercive Power	Also an authorized power to manipulate or punish	French and Raven

	those who do not obey	(1959); Dieterly and Schneider (1974)
Reciprocity	A mutually contingent exchange of benefits and a set of sentiments associated with mutual gratification.	Hu and Korneliusen (1996)
Expected Reward	Believe to obtain reward via knowledge sharing behavior	Bock & Kim (2002)
Expected Association	Believe to improve or enhance the relationship with associates via knowledge sharing behavior	Bock & Kim (2002)
Tangible Reward	Believe that goal success will lead to job security, pay raises, and promotion	Lee, Bobko, Earley, and Locke (1991)
Cost	Time and efforts spent during knowledge acquiring, and occurred during knowledge transfer	Williamson (1985)
Willingness of Sharing Knowledge	The subjective probability for a person to conduct knowledge sharing behavior	Ajzen (2002)
Task Inter-dependence	The level of dependence between the task of oneself and the tasks of other associates.	Jarvenpaa and Staples (2001)

### 3.3. PRE-TESTING

After the proposed questionnaire was completed in its design, it was in the first place reviewed and fine-tuned by the dissertation committee members of our lab (comprised of the chief advisory professor, mentoring assistant professor, as well as three PhD candidates). Later on the pre-testing was directly conducted in the practical organization to ensure that the syntax generated no confusion to on-job employees. We internally identified fifteen colleagues with master degrees or above and invited for their support to try filling out our survey forms. These fifteen supporting colleagues are from NXP Semiconductor Inc., as I am, and are mainly specialists or consultants in their professional fields such as business coordination, logistics, human resource, production management, and customer services. During the pre-testing, if there was any wording or sentence semantically unclear, they were pointed out and feedback to us. While all feedbacks were collected, we went through all the questionnaires again, granted all needed modifications, particularly these questions with vague description and remain confusing. A revised and recompiled form was sent to check again with the specific respondent for review, and asked about if the re-writing sounds much

clearer to them. This procedure was repeated for a few times, until a consensus was met from each respondent, so as to continue with the formal survey.

### **3.4. DATA COLLECTION**

This research primarily aims at realizing how different relations would affect the willingness of sharing knowledge of business employees in their daily jobs. Therefore, regarding our data collection, we will send out the survey forms / questionnaires to those who are currently working in any public-owned or private business organization, excluding sohos and people who work for the government, schools, or the armies.

As our target research subject is employees, whose quantity is too huge so as that sampling process for representatives is mandatory. From the 2007 published telephony directory of Taiwan Industry and Commerce (in alphabetic order), most of the companies are distinctly clustered in North / Central / South Taiwan, and accordingly, cluster sampling into three is well-suited to start with. Among each cluster, systematic sampling approach is adopted to retrieve our survey target. (Here the ratio for sampling interval is two thousand versus one, since our expected sample size is around four hundred companies, and the approximate cluster sizes are four hundred thousand in Taipei, and around two hundred thousand in Central / South Taiwan). Firstly we managed to contact the concerned bureaucracy of these selected companies, expressing our sincere purpose for academic research, and seek their agreement for us to send the questionnaires. Most of them responded warmly, while the rest still courteously turned down our request anyhow, thus we must continue sampling more until all required quantities were met. The next step was five copies of survey forms were sent to each selected company, with the most sincere tone and a very clear

purpose expressed in the opening statement, together with a desired deadline. Totally two thousand copies of questionnaires were issued in the form of both traditional mails and electronic mails, and the total responses are three hundred and eighteen before the date was due.

### **3.5. DATA ANALYSIS**

After we completed all the data collection, data cleaning was deployed, aiming at trying to get rid of unwitting feedbacks so our data analysis will not be unnecessarily disturbed. Reckless responses with significantly illogic answers were merely dumped. Every piece of feedback was treated as an independent record (row) in the MS-Excel to be the raw data for statistical analysis. For a few records containing blank responses, we use the averaged number of the rest to replace them. Some of the questions described in a negative expression were also converted as positive by reversing their score (in the seven-point scale) when being entered into MS-Excel. We then were on our marks to carry on with the preliminary and advanced data analysis.

#### **3.1.5. STATISTICS TOOL**

In this research, we mainly rely on the Visual Partial Least Square (PLS) for statistical measurement, analysis, and validating the structural model. Visual PLS, which is free downloadable from the URL address, <http://fs.mis.kuas.edu.tw/~fred/vpls/>, and elaborated by Fu, J.R., employs a component-based approach for estimation, and it places minimal restrictions on sample size and residual distribution. PLS, according to Chin et al (2003), is perfectly suited for testing complicated relationships by

avoiding inadmissible solutions and factor indeterminacy, and its capability in exploring complex relationships has been proven in many other studies (Fornell and Bookstein, 1982; Fornell, Lorange, and Roos, 1990). As also stated by Wold (1985), "PLS comes to the fore in larger models, when the importance shifts from individual variables and parameters to packages of variables and aggregated parameters", who continued to state later, "In large, complex models with latent variables PLS is virtually without competition".

These two distinguished characteristics make it our choice as it covers our sampling scenario and restriction. Other applied statistics methodology would have included descriptive statistics, factor analysis, reliability analysis, validity analysis, correlation analysis, and regression analysis.

### **3.5.2. DESCRIPTIVE STATISTICS**

There are totally seventy-three questions in our questionnaire, being categorized into ten independent variables, two moderators, and one dependent variable, as well as the part for understanding the demographics. These ten independent variables are further incorporated into four super-ordinate principal constructs (CS/AR/EM/MP) in the form of second-order. We measured the major effects between the four constructs against the willingness, and conceptualize these variables into these four constructs as factors. Therefore the descriptive statistics, such as maximum, minimum, means, standard deviations and variance, of these single questions will not be presented as not giving out an effective overview.

Sample Demographics gives a clear idea and an overview of all qualified respondents. At length we received in-time responses from three hundred and eighteen respondents, while sixteen of them are either seriously fragment or clearly

irrational in responding logic. These sixteen records have been scrapped, and the total sample size for statistical inference is three hundred and two. In Chapter 4.1, we will illustrate the sample demographics of all qualified respondents.

### **3.5.3. ANALYSIS FOR MEASUREMENT MODEL**

#### **3.5.3.1. FACTOR ANALYSIS**

Following a two-step procedure recommended by Anderson and Gerbing (1988), we firstly estimated our research model prior to incorporating the structural restrictions. Confirmatory factor analysis (CFA) using Visual PLS was performed against all variables to filter out disqualified indicators with a factor loading less than point five. All those qualified indicators were then modeled into their destined variables with an averaged value from all related scores, as the current version of Visual PLS still does not support the second-order bootstrapping manipulation, and alternative is also not available from SPSS. Each of these variables is incorporated as reflective indicators into its principal construct of relation.

#### **3.5.3.2. RELIABILITY ANALYSIS**

After factor analysis, with an order to check the reliability and validity of our designed questionnaire, we must proceed with reliability test. A good level of reliability and validity are main characteristics to a good survey. As long as the reliability raises its portion, the rate for measured deviation is reduced, and this survey is more trust-worthy.

The common test methodology in Likert Scale is Cronbach's  $\alpha$ , whose value is



between zero and one. When the value is close to one, it means the high reliability of this test, but on the contrary, when the value moves toward zero, it is advised to re-design the questionnaire.

### **3.5.3.3. VALIDITY ANALYSIS**

The (construct) reliability has been assessed with Cronbach's alpha. As for the convergent validity, it should also be assured especially when multiple indicators are used to validate one single construct. This convergent validity can be examined by a composite reliability of constructs, as well as AVE (Average Variance Extracted). To obtain the composite reliability of constructs, the sum of loadings should be squared and then divided by the combination of the sum of squared loading and the sum of the error terms. AVE value will reflect the variance captured by indicators. If the AVE is less than 0.5, it means that the variance captured by the construct is less than the measurement error and the validity of a single indicator and construct can be questioned. Visual PLS also supports to hint the calculated composite reliability value and AVE value.

### **3.5.4. ANALYSIS FOR STRUCTURE MODEL**

#### **3.5.4.1. REGRESSION ANALYSIS – Using Partial Least Square**

Linear regression is a statistical procedure for model selection where there are a number of potential explanatory variables. In each stage of the procedure, the variable space is searched for the candidate variable that yields the greatest increase in some measure of goodness of fit such as the R-square. The procedure determines whether

the measurement is maximized, or if the available improvement falls below some critical value. In this study, regression analysis is employed to examine how and to what degree each relation models affect the effectiveness of knowledge sharing, with a view to validate our structure model. In the analysis of Regression, Visual PLS Bootstrap with size re-sampling to five-hundred is applied.

Concerning the second-order structure of our research framework, as stated in the beginning of this chapter, PLS well suits for testing complicated relationships by avoiding inadmissible solutions and factor indeterminacy (Chin et al., 2003), and a proven methodology to support statistical inference using second-order construct is ready, this yet juvenile software is already acceptable to be adopted.

## **CHAPTER IV: DATA ANALYSIS AND RESULTS**

### **4.1. SAMPLE DEMOGRAPHICS / CHARACTERISTICS**

The total responses to our issued survey forms are three hundred and eighteen. After data cleaning, we've decided to eliminate sixteen of them for being either relatively incomplete or somehow significantly irrational as indicated earlier. The remained sample quantity for the following statistical inference is three hundred and two.

Comprehensively reading the sample of our study, among the responses fifty-two percent is female as the majority. More than eighty percent are of meridian ages (from twenty to forty years old), and more than thirty-seven percent of them have joined their current companies for more than five years. About the level of education, the majority of respondents own a degree of bachelor, while around eighteen percent are masters. A significant concentration in the category of industry they engage in is manufacturing industry, which is in line with the characteristics of Taiwan's structure of industry. Twenty-three percent are from technology department, and distinctly work for a large department of more than twenty people. Besides, a noticeable feature of this sample lies in that more than seventy-percent of respondents work for large-scale companies (with more than five hundred employees). At length, we are glad to find that the bulk of interviewees are basic level employees.

Here we summarize the detailed sample demographics from our collected results in a table 4.1.:

《Table 4.1.》 Sample Demographics (N = 302)

		N	%
Gender	Female	157	52%
	Male	145	48%
Age	20-29	105	35%
	30-39	146	48%
	40-49	48	16%
	>= 50	3	1%
Time of Cooperation (year)	<= 0.5	11	3.6%
	0.5-1	39	12.9%
	1-3	85	28.1%
	3-5	55	18.2%
	>= 5	112	37.1%
Level of Education	High school	27	8.3%
	Junior College	40	13.2%
	University	183	60.6%
	Graduate School	43	17.9%
Industry	Manufacturing	157	52%
	Financing	11	3.6%
	Transporting	2	0.7%
	Information Tech.	37	12.3%
	Service	55	18.2%
	Channel	6	2%
	Medical	2	0.7%
	Government	9	3%
	Others	23	7.3%
Department Function	HR	10	3.3%
	Sales	52	17.2%
	Technology	70	23.2%
	Information Tech.	32	10.6%
	Administration	17	5.6%
	Service	30	9.9%
	Finance	13	4.3%
	Procurement	5	1.7%
	Production Mgm't	13	4.3%
	Marketing	3	1%
	RandD	22	7.3%
	Logistics	3	1%

	Others	32	10.6%
Department Size (no. of person)	<= 5	35	11.6%
	6-10	61	20.2%
	11-15	50	16.6%
	16-20	25	8.3%
	>20	131	43.4%
Company Size (no. of person)	<=50	26	8.6%
	50-100	14	4.6%
	101-200	26	8.6%
	200-500	23	7.6%
	>500	213	70.5%
Job Position	High Level Mgr	3	1%
	Mid Level Mgr	21	7%
	1 <sup>st</sup> line Mgr	39	12.9%
	Employee	235	77.8%
	Others	4	1.3%

## 4.2. ANALYSIS FOR MEASUREMENT MODEL

### 4.2.1. FACTOR ANALYSIS

In this study, Visual PLS will be relied on to execute the preliminary factor analysis against those collected data. From each factors (CS / AR / EM / MP), we measure the factor loading per their representative variables in first-order construct, and continue with factor analysis and extraction. Because it is suggested to trim those indicators with loading less than an absolute value of 0.5, (Ron, 2006) and then form the variable with these qualified factors. As a result, those unqualified indicators (with a loading of less than 0.5) are eliminated, and we repeat again the factor analysis, until all the disqualified factors are trimmed. Result is illustrated in Table 4.3.

Herewith we summarize how the super-ordinate constructs are formulated using second-order (Oppen et al, 2005) with the variables and their indicators in Table 4.2:

《Table 4.2.》 Using Second-order to Form the Super-ordinate Constructs

Indicator (Question)		Factor (Variable)		Construct (2 <sup>nd</sup> Order Variable)
AL02				
AL05				
AL06				
AL07	⇒	Altruism		
AL08				
AL09				
AL10				
TR01				
TR02				
TR03	⇒	Affect-based Trust	⇒	Communal Sharing
TR04				
TR05				
TR06				
TR07				
TR08				
TR09	⇒	Cognition-based trust		
TR10				
TR11				
PW03				
PW04				
PW05	⇒	Legitimate Power		
PW06				
PW07			⇒	Authority Ranking
PW08				
PW09				
PW11	⇒	Coercive Power		
PW12				
RE01				
RE02	⇒	Reciprocity		
RE03				
ER02				
ER03	⇒	Expected Reward	⇒	Equality Matching
EA01				
EA02				
EA03	⇒	Expected Association		
EA04				
EA05				
TA01				
TA02				
TA03	⇒	Tangible Reward		
TA04				
CO01			⇒	Market pricing
CO02				
CO03	⇒	Cost		
CO05				

《Table 4.3.》 Factor Analysis using Visual Partial Least Square

	Variable	Question No.	Factor Loading	Total Variance Explained
Communal sharing				
Altruism	AL02	2	0.569	48.747%
	AL05	5	0.687	
	AL06	6	0.804	
	AL07	7	0.726	
	AL08	8	0.767	
	AL09	9	0.663	
	AL10	10	0.595	
Affect-based Trust	TR01	11	0.754	59.239%
	TR02	12	0.780	
	TR03	13	0.712	
	TR04	14	0.765	
	TR05	15	0.825	
Cognition-based Trust	TR06	16	0.746	52.125%
	TR07	17	0.748	
	TR08	18	0.676	
	TR09	19	0.811	
	TR10	20	0.789	
	TR11	21	0.512	
Total Variance Explained of Communal sharing: 54.961%				
Authority Ranking				
Legitimate Power	PW03	32	0.670	48.858%
	PW04	33	0.678	
	PW05	34	0.593	
	PW06	35	0.766	
	PW07	36	0.729	
Coercive Power	PW08	37	0.734	52.505%
	PW09	38	0.688	
	PW11	40	0.695	
	PW12	41	0.742	
Total Variance Explained of Authority Ranking: 52.766%				
Equality Matching				
Reciprocity	RE01	43	0.874	72.139%
	RE02	44	0.883	
	RE03	45	0.789	
Expected Reward	ER02	47	0.610	88.546%
	ER03	48	0.975	
	EA01	49	0.845	
Expected Association	EA02	50	0.835	77.944%
	EA03	51	0.898	
	EA04	52	0.927	
	EA05	53	0.904	
Total Variance Explained of Equality Matching: 79.175%				
	Variable	Question No.	Factor Loading	Total Variance Explained
Market pricing				
Tangible Reward	TA01	54	0.889	79.364%
	TA02	55	0.914	
	TA03	56	0.911	
	TA04	57	0.844	
Cost	CO01	58	0.788	65.952%
	CO02	59	0.872	
	CO03	60	0.869	
	CO05	62	0.690	
Total Variance Explained of Market pricing: 72.804%				

#### 4.2.2. RELIABILITY & VALIDITY ANALYSIS

After trimming these disqualified indicators and repeating the factor analysis, new loading values are reflected for each of these remaining indicators. Meanwhile we also reckon the amount of total explained variance, which indicates the percentage that the extracted factors are able to explain for overall variance of all factors. In the table, it is demonstrated that almost all the Cronbach's  $\alpha$  values fall between 0.698 ~ 0.928, which is in line with the threshold ( $\alpha$  should be  $\geq 0.7$ ) proposed by Nunnally (1978), though there is one exceptional  $\alpha$  value of coercive power (0.698) that is slightly less than our expectation but anyway so close to the required minimum level. Therefore we recommend this acceptance. Based on the reliability analysis result, it is in consequence sensible for us to judge our questionnaire set possesses an acceptable level of reliability.

Reliability was assessed using internal consistency scores, calculated by the composite reliability scores. Internal consistencies of all variables are considered acceptable because almost all of them exceed 0.80. Convergent validity is shown when the PLS indicators when the square root of each factor's average variance extracted (AVE) is larger than its correlations with other factors (Chin, 1998). The composite reliability, AVE, and Cronbach's alpha values (table 4.4.) together indicate a good internal consistency. The discriminate validity was assessed using the latent variable correlations matrix (table 4.5.), where the square roots of the values of the average variance extracted calculated for each of the constructs along the diagonal is reported. Overall, our measurement model exhibited sufficient convergent and discriminate validity.



《Table 4.4.》 Reliabilities and Variance Extracted

Variables	Composite Reliability	AVE*	Cronbach's alpha
Altruism	0.867	0.572	0.809
Affect-based Trust	0.878	0.590	0.826
Cognition-based Trust	0.864	0.519	0.805
Legitimate Power	0.818	0.560	0.729
Coercive Power	0.807	0.511	0.698
Reciprocity	0.886	0.721	0.793
Expected Reward	0.785	0.658	0.870
Expected Association	0.946	0.778	0.926
Tangible Reward	0.939	0.793	0.913
Cost	0.883	0.655	0.825

\* AVE: Average Variance Extract

《Table 4.5.》 Average Variance Extracted and Correlation Matrix

	AVE	A	B	C	D	E	F	G	H	I	J
A	0.572										
B	0.590	0.068									
C	0.519	0.049	-0.166								
D	0.560	0.036	-0.121	-0.157							
E	0.511	0.017	-0.098	-0.172	0.309						
F	0.721	0.091	-0.305	-0.242	0.22	-0.338					
G	0.658	0.05	-0.074	-0.151	0.288	-0.312	-0.338				
H	0.778	0.048	-0.205	-0.014	0.195	-0.133	-0.221	-0.061			
I	0.793	0.06	-0.173	-0.115	0.22	-0.263	-0.397	-0.69	0.106		
J	0.655	0.018	0.145	0.117	0.047	-0.034	0.123	-0.042	-0.04	-0.045	

A: Altruism      B: Affect-based Trust      C: Cognition-based Trust

D: Legitimate Power      E: Coercive Power      F: Reciprocity      G: Expected Reward

H: Expected Association      I: Tangible Reward      J: Cost

Notes: 1. Square root of AVE (average variance extracted) is on the diagonal  
 2. AVE: average variance extracted

### **4.3. ANALYSIS FOR STRUCTURE MODEL**

#### **4.3.1. REGRESSION ANALYSIS - Using Partial Least Square**

Owing to this particular second-order structure with two additional moderators, the first step for us is to validate the relationship of the basic model: if and how the four relations will influence the willingness of sharing knowledge. Only when the first level conjectures are concurred with statistical figures can we move on to the next step, which is to see if this proven influencing relationship will be further disturbed by these moderating variables.

#### **4.3.2. REGRESSION ANALYSIS FOR BASIC RESEARCH MODEL**

##### **- Using Partial Least Square**

For the reason that we've obtained convincing results from the testing of reliability and validity in the previous sections, we shall move on with the testing for our proposed hypotheses. In this section, Visual PLS helps firstly validate the direct relationship between these four relations model versus the knowledge sharing willingness.

Table 4.6 provides the overview of the first level Regression Analysis. Both CS model and EM model positively correlate with KS Willingness, while AR and MP models negatively correlate with KS Willingness. Meanwhile, it shows CS and EM are accompanied with significant level of confidence, but the negative effect for MP to influence KS Willingness is relatively small ( $p < 0.1$ ). No clear evidence is obtained to support the conjecture regarding AR model will impact KS willingness. Eventually, the overall explanatory strength for Relations Model Theory to influence employees'

willingness of sharing knowledge is estimated at around twenty-three percent.

《Table 4.6.》 Summary of Regression Analysis – Basic Model

Construct	Beta	t-value	R <sup>2</sup>
CS	0.319	5.119 ***	
AR	-0.008	-0.196	0.230
EM	0.205	3.040 **	
MP	-0.075	-1.352 †	

† [p<0.1] [\* p<0.05] [\*\* p<0.01] [\*\*\* p<0.001]

According to the regression results shown in the above matrix, hypotheses **【H1】** and **【H3】** are both supported with a significant t-value at 99% and 99.9% level of confidence respectively, while **【H4】** is backed up at only 90% level of confidence. Hypothesis **【H2】** does not acquire an encouraging result and hence cannot stand its conjecture. Notice that both model AR and MP function in a more negative aspect, meaning to some degree they would have impaired employees' willingness regarding to share their knowledge.

### 4.3.3. REGRESSION ANALYSIS FOR MODERATING VARIABLES

#### - Using Partial Least Square

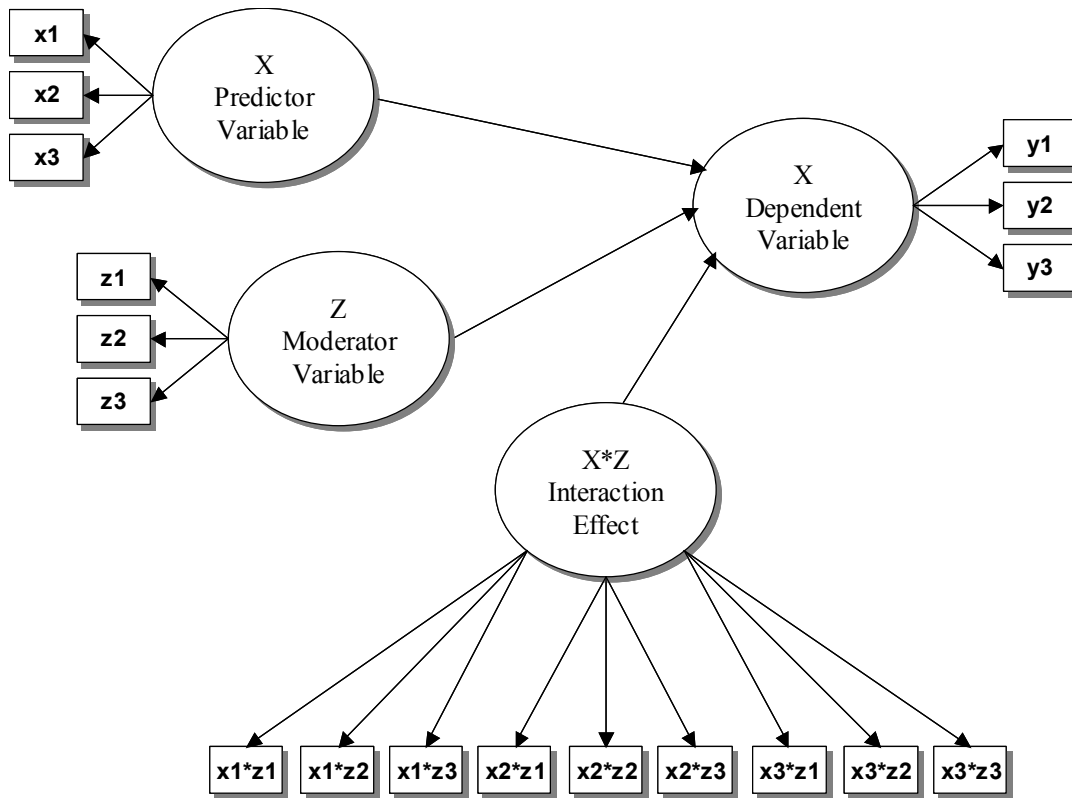
The specific part of our research model is the introduction of additional two moderating factors on top of the essential theory. In the earlier section, sound statistical supports concerning the impact brought from CS / EM / MP models to the willingness of KS have been revealed, thus the foundation for continuing to examine the moderating effect is ready in order. Somehow AR model, according to the bootstrap calculation, does not get concrete evidence for its impact on the knowledge

sharing willingness, i.e., in this relations model, being AR does not significantly influence employees' willingness, and consequently there is no ground for us to continue further with the testing for its moderating effect. As a result, the hypothesis 6 and hypothesis 10 is not applicable.

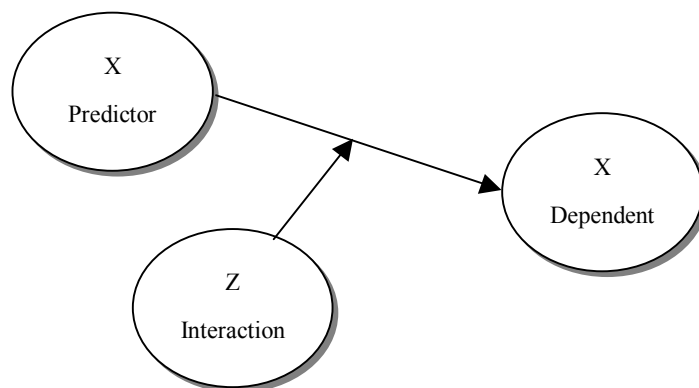
Predictor, moderator, and dependent variables in this PLS approach are viewed as latent variables (constructs), being abstract and cannot be measured directly, so instead, multiple indicators for these latent variables must be obtained. Furthermore, it is possible to gather measures in alternative ways, e.g., a direct question in the survey form. But for this analytic technique, each indicator is modeled as being influenced by both the underlying latent variable, (i.e. reflective indicators) and error. Product indicators<sup>1</sup> reflecting the latent interaction variables are then created by multiplying the indicators from the predictor and the moderator variables (see Figure 4.1.). This analytical model is consistent with the theoretical model shown in Figure 4.2. Each set of indicators reflecting their underlying construct or latent variable are then entered to Visual PLS for estimation resulting in a more precise assessment of the underlying latent variables and their corresponding relationships.

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<sup>1</sup> a product-indicator approach, proposed by Kenny and Judd (1984), measuring latent constructs by cross-multiplying to form interaction terms used to estimate the underlying latent interaction construct within proper algorithm.



«Figure 4.1.» Model with Three Indicators per Main Construct and  
 Nine Product Indicators for the Interaction Construct



«Figure 4.2.» Comparable Theoretical Model for Analytic Model of Figure 4.1.

《Table 4.7.》 Regression Analysis of Moderator: Task Inter-dependence

Construct	R <sup>2</sup> (Main Effect Model)	R <sup>2</sup> (Interaction Model)	Beta (Interaction Model)	t-value	f <sup>2</sup>
Moderator 1: Task Inter-Dependence					
CS	0.191	0.237	0.1	1.649 *	0.057
EM	0.135	0.198	-0.184	-1.803 *	0.073
MP	0.054	0.123	-0.185	-1.443 †	0.073

† [p<0.1] [\* p<0.05] [\*\* p<0.01] [\*\*\* p<0.001]

Where  $f^2 = [R^2(\text{interaction model}) - R^2(\text{main effect model})] / [1 - R^2(\text{main effect model})]$   
 Interaction effect sizes are small if 0.02, medium if 0.15, and large if 0.35, (Cohen 1988; Chin, et al, 2003)

As illustrated in table 4.7., t-value of CS in the interaction mode is 1.609, which suggests *Task Inter-dependence* improves the influences issued from CS model to KS. But it weakens the relationships between EM / MP models and KS as the t-values are negative. In sum, hypotheses **【H9】** **【H10】** stands at 95% level of confidence, while **【H11】** stands at 90% level of confidence. However, as also clearly indicated that the interaction effect sizes ( $f^2$ ) are small if  $\leq 0.02$ , medium if around 0.15, and large if  $\geq 0.35$  (Cohen 1988; Chin, et al, 2003), which means even if Task Inter-Dependence does moderate the interaction between CS/EM/MP and KS, the effect remains subtle, or not enormous.

*Time of Cooperation* in this study also reveals only slightly indistinct moderating effects toward the relationships of CS/EM/MP and KS, since as stated earlier under a constrained circumstance of statistics tooling, we divide the samples into two groups by the seniority of one year, and managed to understand if this seniority (time of cooperation) will moderate employees' intention of sharing in different relation models. Hypotheses **【H9】** and **【H11】** stand at only 90% level of confidence, while **【H12】** stand at 99% level of confidence, summarized in table 4.8.

《Table 4.8.》 Regression Analysis of Moderator: Time of Cooperation

Construct	Group I (less than one year, n=50)		Group II (one year or above, n=252)		t-value
	Path	Std. Error	Path	Std. Error	t-value
<b>Moderator 2: Time of Cooperation</b>					
CS	-0.119	0.1193	0.053	0.0463	-1.487†
EM	-0.283	0.1938	-0.058	0.0574	-1.57†
MP	0.279	0.1821	-0.11	0.0608	2.461**

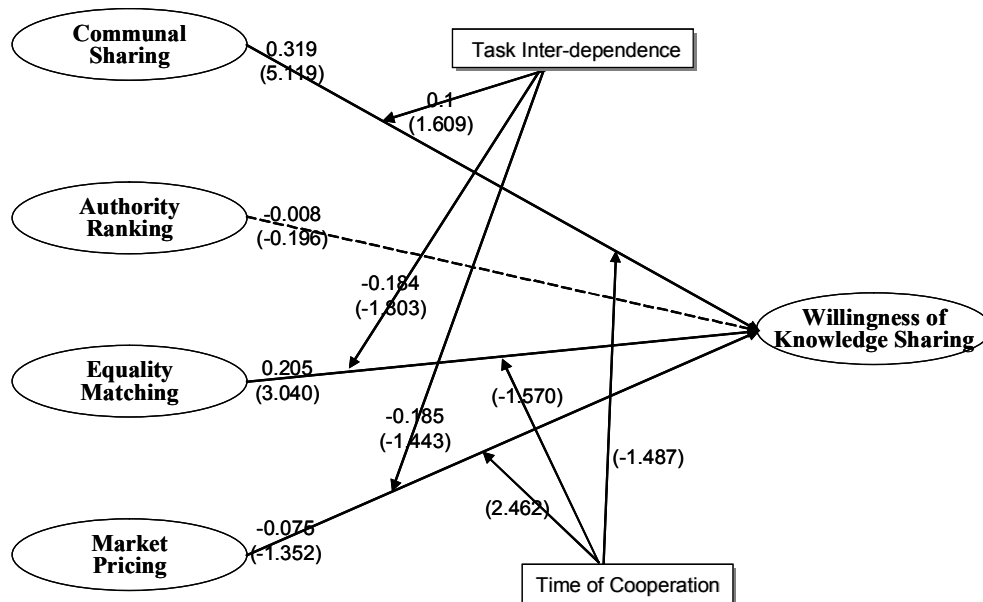
† [p<0.1] [\* p<0.05] [\*\* p<0.01] [\*\*\* p<0.001]

referential formula:

$$\frac{Path_{sample\_1} - Path_{sample\_2}}{\left[ \sqrt{\frac{(m-1)}{(m+n-2)} * S.E.^2_{sample1} + \frac{(n-1)}{(m+n-2)} * S.E.^2_{sample2}} \right]} * \left[ \sqrt{\frac{1}{m} + \frac{1}{n}} \right]$$

PLS Regression Formula for Multi-Group comparison Chin et al., (2002)

Here we summarize the overall hypotheses testing in the research framework as figure 4.3. and table 4.9.



† [p<0.1] [\* p<0.05] [\*\* p<0.01] [\*\*\* p<0.001]

- . negative figures are marked in red
- . dotted lines are used to remark those relationships with no significant interaction

《Figure 4.3.》 Summarized Hypotheses Testing of Full Research Framework

《Table 4.9.》 Summary of Hypotheses Testing

Hypotheses	Description	Results
<b>Theoretical Model</b>		
<b>【H1】</b>	A communal sharing (CS) relation will influence on employees' willingness of knowledge sharing (KS)	<b>Supported</b>
<b>【H2】</b>	An authority ranking (AR) relation will influence on employees' willingness of knowledge sharing	Not supported
<b>【H3】</b>	An equality matching (EM) relation will influence on employees' willingness of knowledge sharing	<b>Supported</b>
<b>【H4】</b>	A market pricing relation (MP) will influence on employees' willingness of knowledge sharing	<b>Supported</b>
<b>Full Relation</b>		
<b>【H5】</b>	Task Inter-dependence will moderate the relationship between CS relation and the willingness of KS	<b>Supported</b>
<b>【H6】</b>	Task Inter-dependence will moderate the relationship between AR relation and the willingness of KS	Not applicable
<b>【H7】</b>	Task Inter-dependence will moderate the relationship between EM relation and the willingness of KS	<b>Supported</b>
<b>【H8】</b>	Task Inter-dependence will moderate the relationship between MP relation and the willingness of KS	<b>Supported</b>
<b>【H9】</b>	Time of Cooperation will moderate the relationship between CS relation and the willingness of KS	<b>Supported</b>
<b>【H10】</b>	Time of Cooperation will moderate the relationship between AR relation and the willingness of KS	Not applicable
<b>【H11】</b>	Time of Cooperation will moderate the relationship between EM relation and the willingness of KS	<b>Supported</b>
<b>【H12】</b>	Time of Cooperation will moderate the relationship between MP relation and the willingness of KS	<b>Supported</b>



## **CHAPTER V: RESEARCH DISCUSSION AND CONCLUSION**

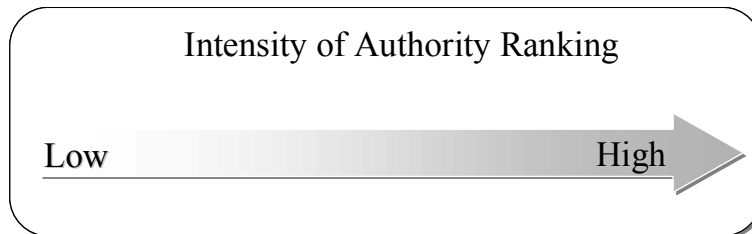
In this chapter, we will evaluate the overall data analysis, retrospect the literature again, discuss what has been found and what could have been missed during the re-searching procedures, and interpret the results. According to the findings, the limitation and future suggestions are to be provided in the third section. Eventually as this study subjects are the employees in the business organization, some remarks over the implication to the practitioners will also be illustrated.

### **5.1. DISCUSSIONS**

#### **5.1.1. THEORETICAL MODEL – RELATIONS MODEL THEORY**

In accordance with the analysis result, overall the different relation models does generate different levels of impacts to employees' willingness of knowledge sharing. This is in line with the view interpreted by Boer (2002), that Fiske's (1991) general model of human relationships provides the underlying assumption about how people interact with each other. Nevertheless the exception lies that the statistics result of authority ranking shows no prominent influence toward the willingness. A reasonable explanation for this phenomenon is the characteristic of the degree of "authority ranking". Based on the argument of Boer, in an environment of AR relationship, people higher in the rank might as well to command the lower to share knowledge, but somehow on the contrary, if an organization contains no specifically distinct characteristic of AR, in another word, this organization is prone to be de-centralized and looks more "flat" in her hierarchy (Chatman and Jehn, 1994; Haslam, 2004) (see

figure 5.1), and is reasonably categorized as an organic, network organization. Employees of a low-AR group will tend to autonomously communicate, negotiate, and share within the team (Turhan and Wetherbe, 1996).



《figure 5.1.》 The Propensity of Organization's AR characteristics


Boer, et al, (2002); (Chatman and Jehn, 1994)

MP model functions in relatively a negative manner in the heterogeneous organizational setting. Since the research scenario here is for business employees, who most often get compensated at a certain amount of agreed salary per a regular base, e.g. bi-weekly or monthly according to the official offer, and with a clearly defined role and responsibility, hence it is very scarce that any employee will be extra-ordinarily rewarded owing to her/his sharing behavior. Furthermore, the measurable variables representing MP model are tangible reward as well as cost.

Applied with the same logic, companies will not grant additional tangible reward to employees for her/his specific sharing activities at the ordinary occasions. Meanwhile, employees who tend to regard sharing as needed cost will not demonstrate high aspiration in knowledge sharing, or it will violate the very basic assumption of economics.

Besides, as also pointed by Boer (2002) that office environment is a heterogeneous setting, where there might be one dominant model particularly at organizational level, but between department and department, between different project teams, and between

employee and employee, there are way far un-intelligible interactions existed. Employees often situate themselves in different relations at different occasions and conditions, but only when they feel a sense of CS/EM model exist will they get motivated to share. Based on the inferred result from the statistical data, we conclude that employees shows higher intention in sharing when they are in a more CS/EM oriented relationship.

		Organizational Level			
		CS	AR	EM	MP
Interaction Level	CS				
	AR				
	EM				
	MP				

« figure 5.2. » Combining Relational Models At Organization and Interaction Level

Boer, et al, (2002)

### 5.1.2. FULL MODEL – HOW TASK INTER-DEPENDENCE MODERATES

The higher level of task inter-dependence, the more inevitable employees have to seek proactive and active interaction with her/his colleagues within the same task frame, with an eye to complete the group task by means of intensive cooperation (Vijfeijken, et al, 2002). Grounded on the inference by Wageman and Gordan (2005), a group of highly task inter-dependence will be more inclined to a spontaneous sharing behavior owing to a long term habitual mutual aid and by degrees, a sense of community is therefore formed, and that is exactly the core spirit of CS model. The regression analysis of our study supports this inference, when the level or degree of task

inter-dependence is higher / more intensive, the more evident it will reinforce the relationship between CS model and KS.

On the contrary, the level of task inter-dependence will somehow depress the interactions between EM model and MP model. Teams working under an EM model, according to Boer et al., (2002) are de facto loose-structured, where colleagues are not intimate with each other and there has evolved itself a consensus over only egalitarian in such a contingency. Under such circumstances, highly inter-dependent task should preferably not be assigned to the team otherwise it might have confronted some counter-action from group members, and even worse break down the existing grouping. This phenomenon will somehow be improved if a cohesive group is formed by degrees (Yoo and Alavi, 2001). This connotation also applies to groups of MP model, where group members are oriented towards prices, wages, commissions, rents, etc., and are not consorted with the desired principle of highly “inter-dependent” of task functions.

### **5.1.3. FULL MODEL - HOW TIME OF COOPERATION MODERATES**

Normally people would have expected that as time evolves, relationship between team members will seem to be more intimate, further contributing to the quality of interaction as well as a more amicable atmosphere for sharing knowledge. Nevertheless, a contingent phenomenon is detected by scholars majoring in organization behaviors, that people’s faith, value concept, frame of interpretation, will be influenced by her/his team members, partly out of a pressure for teaming and group identification, and partly out of a unconscious assimilation during the frequent interaction in daily jobs. Gradually, a cognitive equilibrium will evolve itself within the cohesive group (Merali, 2001), and employees could have been radically familiar with each other. Contradicted to people’s natural expectation, sharing activities will

be less and less out of the presence of inertia. Theoretically this episode is described as a Cognitive Congruence.

As indicated earlier that teams working under an EM model are loose-structured (Boer et al., 2002). As mutual trust is not present, members in an EM relation are indeed concerned about the quantitative amount of “imbalance”, and accordingly, they only seek equality and “balanced” exchanges or taking turns (Fiske, 1992). Time of Cooperation does no good to such relationship as Forge (1972) has observed that “To be equal and stay equal is an extremely onerous task requiring continual vigilance and efforts” all the time. Besides, employees come from different background and their mind-sets are versatile, and the thinking-logic and subjective perception might differ very much. When an employee has strived with his best to complete one task, the amount of endeavors may not be equally recognized by the other. Once one side in an EM relation accidentally perceives an in-equivalence in paid efforts, the prompt response would be to draw back what (s)he has been contributing, and a horrible balance gets destroyed.

Concerning the moderating effect on MP model toward KS, statistical results shows a positive influence, as it seems would have reinforced the interaction between MP and KS. This could be well explained by the psychological theory, classical conditioned learning theory by Pavlov (1963), asserting that conditioned stimulus will provoke conditioned response. In a MP relation, the tangible reward and repulsion of cost (time and efforts) are the conditioned stimulus, while the sharing behavior is the conditioned response. Once the unvoiced consensus has taken its root, it will root more deeply as time evolves. In the long run, without the presence of a desired proportion of reward, it will be even more hardly to demand a sharing behavior on employees.

## 5.2. THEORETICAL CONTRIBUTIONS

This paper continues the exploration of Fiske's Relations Model Theory in search for different interaction models in a socialized society, but with a step further to evaluate how its four principal dimensions would influence knowledge possessors' willingness to share out what they know in a more overview, since they would have co-existed at the same time under the same organizational setting. We could have concluded that the behaviors observed from employees are not a "fixed" mode, but would vary according to different situations. From the at hand responses of collected samples in this country, we realize that employees are significantly motivated when being situated in either a CS or EM relationship, but relatively not in an utilitarian environment of MP. The current inference cannot conclude if the sharing is a benefit of an AR relation. To sum up, we expand this theory from a linear understanding onward to a dimension concept a step further.

Organization culture is an abstract subject though several researchers have done much effort to distinguish and categorize it, so are the relations perceived by people. One person in a relationship may interpret how (s)he has perceived this relation, but the translation from someone else within absolutely the same relationship may obviously heterogeneous and diverse. That counts for the reason why we propose to launch our exploration with the support from several more measurable variables, such as altruism, trust, power, reciprocity, expectation, reward, and cost. Those variables have all been retrospectively in a bunch of papers and fully-tested, qualified questionnaires have been innovated so as to accurately weight the interviewees' sensuality as well as feelings, and would eventually lead to construct the four principal relations more closely.

### **5.3. IMPLICATION FOR PRACTITIONERS**

As clearly indicated in our discussion, different models of relations will clearly leverage how employees perceive and react to their behaviors in knowledge sharing, therefore to form the right atmosphere in the organization settings and to elaborate a correct context in encouraging and motivating employees for positive interaction is mandatory and critical. High level of management in business companies should pay constant attention to the organization culture as it is the derivation of these different relation models, and the once-shaped model is not static but instead dynamic, which in a sense transforms as time moves on. Only when employees are able to autonomously act per a desired model by the company would it lead to a positive attitude in sharing what they know, and consequently prosper the faithful interaction in the organization settings and ultimately result in a successful knowledge management fulfillment.

Over and above, business organization is not a purely simplified environment that could get rid of additional intrinsic interferences. As portrayed in our discussion, at least it has been ascertained that employees' recognized ownership of knowledge, inter-dependency of assigned tasks, and the dynamic variation changed over time would all indirectly moderate the current interaction from CS/EM/MP to KS, and certainly there will be more irritators. For the purpose of an effective management, the top management board and the human resource authority must extraordinarily leave an eye on these unconscious moderating factors. After all, to share or not to share, that is the question.

#### **5.4. LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDY**

Retrospecting our study a certain number of research limitations are noticed. First of all, during the initial stage whereas abundant literature reviews have been conducted in order to find out some more measurable variables to represent each relational dimension, and these variables have formerly all been fully studied, examined, and deliberated in versatile research themes, being proved in this study to be able to meaningfully delegate for its super-ordinate constructs. Notwithstanding that there are doubtlessly excess variables that can be put into the same category and strengthen a comprehensive coverage in its representation for the four principal relations of RMT. Restricted by time, space, and resource, only these ten independent variables get exercised in this research. This leaves the successors a room for continuity, to look for more possible factors and further fortify the amount of explanation.

Second, earlier researches conducted with a second-order framework as well as how to leverage via contingency moderators remain just relatively emerging yet insufficient and thus the available referential methodologies seem to us neither adequate nor abundant. Given in an allowed condition, advanced mathematical and statistical exploration should be endured to scrutinize the subtle connection or mutual interference between those independent variables and their super-ordinate constructs. That would not only scientifically heighten the convincingness of the study, but also augment the theoretical infrastructure for future studies to count on.

Finally, we divided the samples into two groups per their seniorities (less than one year and above), but the sample sizes are relatively asymmetric: the group of less than one year includes only 50 persons, while the other group of equal or above are 252 persons. Such splitting did allow us to utilize the existing understanding of statistics tool to validate the moderating effect of time of cooperation as dichotomy, but does not



illustrate the possible gradual and linear levels of impacts from different points on time scale, i.e., as the seniority of employees gains, this tendency of being reluctant is also remained linearly correlated.

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## APPENDIX A: QUESTIONNAIRE FOR SURVEY

<b>Communal sharing</b>
<b>Altruism</b>
整體而言，在工作上我是一個愉快的人
整體而言，在工作上我並不是一個熱心的人
整體而言，當有同事傷害到我時，我會記恨很久
整體而言，在工作上我是一位容易感動且富有同情心的人
整體而言，在工作上我是一位誠實可信任的人
整體而言，如果我有能力幫助別的同事，我會盡可能去做
整體而言，在日常工作中，我常喜歡幫我身邊的同事一點小忙
整體而言，幫助同事是我日常工作中很重要的一部份
整體而言，在工作上我喜歡為其他同事謀福利
在工作上，我認為『施比受更有福』
<b>Affect-Based Trust</b>
在公司內，我與同事間可以自由自在地分享彼此的想法與感受
在公司裡面，同事與同事之間可以自由自在地談論工作上所遭遇的困難、彼此也願意傾聽
遇有任何一位同事因職務上的異動，因而無法繼續再與大家共事時，同事們多少會感覺到難過
我與同事討論問題時，彼此都會給予建設性的建議
我與同事間，除了工作的互動之外，彼此也有許多情感交流
<b>Cognition-Based Trust</b>
我相信我的同事們是以專業與全力以赴的態度來面對工作
我不會懷疑同事的工作能力
一般而言，我的工作夥伴們不致於因他們的個人疏失而連累我的工作
即使不是很親近的朋友，大部份的同事還是視彼此為值得信賴與尊重的同事
其它與我同事有業務上往來的人員，也都信賴我的同事
越是了解我同事的背景，我會越關心他的表現
<b>Authority Ranking</b>
<b>Legitimate Power</b>
公司所賦予主管階層的授權，相當充份
有些主管的職位，對公司而言並不怎麼重要
公司裡的任何一位主管，其所作的決策都具有相當的重要性
公司的任何一位主管，均須謹慎地審核各式各樣的申請
在公司裡，部屬並不太尊重主管
大部份的主管，均可以持續地作出正確的決策
員工會願意尋求主管的指導
<b>Coercive Power</b>
主管可以對部屬作出該有的懲處
如果員工被主管發現有過失，該員工將會被處以適當的處罰
訓斥偷懶的員工，並不是主管的職責範圍
主管對於部屬的考績表現，有絕對的影響力
檢驗部屬的工作成果是屬於主管的職責範圍內
若主管戮力以赴，就可以減少或避免員工出錯
<b>Equality Matching</b>
<b>Reciprocity</b>
在合作的範疇裡，相關的同事們會積極地建立團隊形象
團隊的成就，首先會被視為是所有合作夥伴們共同努力的結果
就我的經驗而言，團隊的收穫，總能夠公平地分配到所有共同努力的同事身上
<b>Expected Reward</b>
當同事提供知識給公司中有需要的同儕時，公司會給予他實質的獎金
當同事提供知識給有需要的同儕時，公司會調升他的職務
當同事提供知識給有需要的同儕時，公司會給予他更好的考績

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### Expected Association

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提供我的知識給有需要的同儕，將加強我與同事之間的關係

我相信，提供我的知識給公司中有需要的人，將使我與不熟識的公司成員有進一步的瞭解

我相信，提供我的知識給公司中有需要的人，將使我擴展我的人脈與交際範圍

我相信，提供我的知識給公司中有需要的人，將使我在未來和公司中有能力的同事能合作愉快

我相信，提供我的知識給公司中有需要的人，將使我和公司中有共同利益的同事建立更良好的關係

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### Market pricing

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#### Tangible Reward

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公司對於分享提供優秀知識的員工，會有適當的獎勵制度

如果我貢獻有價值的知識，我認為公司會提高我的工作保障

如果貢獻有價值的知識，公司調高我薪水的機會也會相對增加

如果我分享優秀的知識、並達成公司所預期的目標，我有更好的機會可以獲得升遷

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#### Cost

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我認為分享重要的知識給其它同事，會花費我很長的時間

我認為我沒有多餘的時間來教導其它同事我的知識

我認為教導其它同事知識，是一件很辛苦的事情

我目前所擁有的知識，曾花費我許多的時間與心力去取得

我認為分享知識給其它同事，所須付出的勞力與心力成本很高

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### Moderators

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#### Task Inter-dependence

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我的工作經常需要其它同事的協助才能完成

我的工作經常需要與其它同事交換分享一些資訊／知識

我的工作經常會使用到其它同事的資訊／知識

我的工作成果需要依賴其它同事的努力來配合

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#### Time of Cooperation

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請問您開始加入目前的工作團隊／部門至目前為止，前後約有\_\_\_\_\_的時間？

半年以下

半年到一年

1-3 年

3-5 年

5 年以上

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### Willingness of Knowledge Sharing

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#### Willingness of Sharing Tacit Knowledge

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我會願意與同事分享工作相關的內隱知識

我會試著與同事分享工作相關的內隱知識

我會想要與同事分享工作相關的內隱知識

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#### Willingness of Sharing Explicit Knowledge

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我會願意與同事分享工作相關的外顯知識

我會試著與同事分享工作相關的外顯知識

我會想要與同事分享工作相關的外顯知識

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Sample Demographics

性別： 女性 男性

年齡：\_\_\_\_\_歲

請問您開始加入目前的工作團隊／部門至目前為止，前後約有\_\_\_\_\_的時間？

半年以下 半年到一年 1-3 年 3-5 年 5 年以上

請問您的最高學歷是？

國中以下 高中(職) 專科 大學 研究所以上

請問貴公司所屬的產業別是？

製造業 金融業 公共事業 運輸業 資訊業 服務業 零售業 其它

請問您目前在公司中所任職的部門是屬於：

人資部門 業務部門 技術部門 資訊部門 行政部門 服務部門 財務部門  
採購部門 生管部門 行銷部門 研發部門 物流部門 其它

請問您目前所屬部門的現有人數約為：

5 人以下 6-10 11-15 16-20 21 人以上

請問貴公司的總員工人數約為：

50 人以下 51-100 101-200 200-500 500 人以上

請問您在公司的職級是屬於？

高階主管 中階主管 基層主管 一般員工 其它



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Subject:  
Author: Esprit  
Keywords:  
Comments:  
Creation Date: 2007-07-16 PM 10:21  
Change Number: 17  
Last Saved On: 2007-07-16 PM 10:46  
Last Saved By: calvin lu  
Total Editing Time: 18 Minutes  
Last Printed On: 2007-07-16 PM 11:13  
As of Last Complete Printing  
Number of Pages: 88  
Number of Words: 18,735 (approx.)  
Number of Characters: 106,792 (approx.)