

## **Implications from Decision Science for the Inter-Cultural Trust Development in Information Systems**

*Rong Du<sup>1,2</sup>*

*Cathal M. Brugha<sup>2</sup>*

*Shizhong Ai<sup>1,2</sup>*

- 1. School of Economics and Management, Xidian University, Xian, China*
- 2. Quinn School of Business, University College Dublin, Dublin, Ireland*

### **ABSTRACT**

In this paper we use Nomology, a decision science approach to structuring qualitative decisions, to show that Inter-Cultural Trust Development (ICTD) corresponds to a generic structure based on convincing and committing processes. In the structure we relate some typical Chinese constructs to those in English speaking countries in Western Europe. The key issue in the ICTD is shown to be that of ownership of the process by the decision-maker or organization. Consequently the decisions when to move from one stage of development to the next and by which way to move should be determined 'subjectively' by the decision-maker. Considering the ways of thinking and behaving in China, such as Confucian approach and Wuli-Shili-Renli approach, the comparison the ICTD with other similarly structured systems, suggests that each stage of the ICTD is fitted into the matrix of committing phases and convincing stages. The stages should be best implemented 'objectively' as an adjusting process in which balance should be retained. With the help of our presented ICTD structure, we analyze a case of inter-cultural trust development in information systems. The generic nature of the structure suggests that practitioners could borrow from similar decision processes in other fields, including stages of activities, types of thinking and philosophies in Chinese and Western cultures, to develop inter-cultural trust in information systems.

### **Keywords:**

Decision Science; Organizational Communication; Information Systems; Inter-Cultural Trust; Epistemology

## INTRODUCTION

As electronic commerce business develops rapidly worldwide, inter-cultural trust between business partners is becoming more important for inter-organizational communication. To explore the issues in the context of inter-cultural communication and resulting international business, many researchers have become interested in the area of inter-cultural study and particularly in the dynamics of trust. We will give an introduction to some of their work in the next section.

Information systems are used heavily to facilitate the telecommunications and transactions in global businesses. With very few or even without face to face contacts, people do businesses virtually. In this situation the development of inter-cultural trust faces challenges. Managers involved in inter-cultural business are increasingly relying on information systems when having to make decisions for their inter-cultural trust development (ICTD). Therefore, the issue of ICTD is very critical and is closely related to the development of information systems.

In the field of information systems theory, there are some philosophical assumptions of information systems development (ISD). Iivari *et al.* (1998) have reviewed the fundamental philosophical assumptions of five contrasting information systems development (ISD) approaches. They included the Professional Work Practice (PWP) approach (Andersen *et al.*, 1990) because it exemplified nomothetic and constructive research methods. The PWP approach emerged from empirical analysis of what systems practitioners actually do in practice. It is a descriptive system that relies on field studies and action research. It has been influenced by organizational learning theory and led to the usage of maps for diagnosing problem situations and metaphors for generating visions to help guide practitioners. PWP includes the use of twenty-four principles that are controlled via numerous dualities such as performance versus management, and planning versus evaluation. These dualities are mutually dependent and must be addressed together. Iivari *et al.* (1998, p.171) criticize the PWP approach for its failure to see the importance of methods as “intellectual frameworks with which the experience can be compared and reflected upon”. The absence of an underlying philosophical framework appears to have made it difficult for Iivari *et al.* to review the PWP approach with regard to ontology, epistemology, methodology and ethics. Brugha

(2000) proposed some ideas that corresponded closest to the Professional Work Practice (PWP) approach. He had relied on a method from Critical Realism (Bhaskar 1998) of retroduction, which takes well founded empirical research and good management practice and devises a theory to explain them. The parallels between the PWP approach and the decision structures presented by Brugha (1998a,b,c) suggest the inescapable conclusion that each validates the other. The empirical evidence that led to the PWP approach supports the decision science proposal to introduce dichotomous thinking into the information development life cycle (IDLC). The decision structure proposed there, which provides the intellectual framework missing from PWP, is a powerful three-layered generic structure that combines both objective and subjective problem solving processes. The structure corresponds with the way of thinking in traditional Chinese culture known as Yin and Yang.

Influenced by the development of information systems, the ICTD needs to be studied with the suitable philosophical approach. In this paper we use Nomology, a decision science approach to structuring qualitative decisions, to show that the ICTD can be analyzed by using a generic structure based on the convincing and committing process. In the structure we relate some typical Chinese constructs to those in English speaking countries in Western Europe. The key issue in the ICTD in information systems is shown to be that of ownership of the process by the decision-maker or organization. Consequently the decisions when to move from one stage of development to the next and by which way to move should be determined 'subjectively' by the decision-maker. Considering the ways of thinking and behaving in China, the comparison the ICTD with other similarly structured systems suggests that each stage of the ICTD is fitted into the matrix of committing phases and convincing stages. The stages should be best implemented 'objectively' as an adjusting process in which balance should be retained.

In the remainder of this paper, we make a literature survey of inter-cultural trust first. Then on the basis of the nomological structures in decision science we present the ICTD process. We make a case analysis by using the structures and the ICTD process. Finally, we conclude our work and give some directions for further studies.

## **LITERATURE SURVEY IN INTER-CULTURAL TRUST**

Branzei *et al.* (2003) discussed how partners' national culture influences their trust relationships at the beginning of cross-cultural collaborations. Using an experimental design, they compare trustors, i.e. people who trust, from Canadian culture with trustors from Japanese culture. The findings showed that specific contractual agreements increase both partner's credibility and the level of initial trust for Canadian trustors, but have no effects for Japanese trustors. Informal assurances influence neither credibility nor trust for Canadian trustors. For Japanese trustors, different types of informal assurances contribute to higher credibility or to higher initial trust. The nationality of the trustee influences partner's credibility, but does not change the level of initial trust. Higher credibility contributes to a higher level of initial trust for Canadian trustors. However, there is no association between credibility and trust for Japanese trustors. This research implies that the inter-cultural trust is affected by the individual cultures.

Stahl *et al.* (2003) examined how characteristics of the takeover situation and the acquiring firm's integration decisions and actions influence target firm members' trust in the acquiring firm management in a cross-national sample of German, Canadian and Singaporean employees. The findings revealed that the five factors were significant influences on respondents' trust decisions, among which cultural distance and interaction history contributed the trust. Moreover, the negative effects of a hostile mode of takeover on target firm members' trust are stronger in cross-border acquisitions compared to domestic ones. National cultural orientations moderated the relationship between the characteristics of the takeover situation and the post-acquisition integration process, and respondents' trust decisions. From this study we can see that the trust decisions in inter-cultural business activities are associated with not only the involved cultural orientations but also the interaction history. In other words, the process of trust development may have bearing on the trust decisions.

Mayer and Gavin (2005) investigated the relationships of the in-role performance and organizational citizenship behaviour (OCB) of the employees in an organization with their trust in their plant managers and top management team. The study indicated that trust in these two managerial referents related to employees' ability to focus attention on value-producing activities and that this focus related to OCB. So in multinational companies where the employees and managers usually possess different national cultures

the employee's trust in their managers and top management team should be emphasized.

Then, the following questions arise: What characteristic is featured in the inter-cultural trust development? Are there some structured stages and phases to be used in the trust developing process? How do the people make inter-cultural trust decisions? How should a multinational company build its strategy and policy to fertilize the inter-cultural trust? All these questions should be answered in an integrated way. However, most of the existent researches did not provide a systematic answer to such important questions; rather, they focus on the differences among national cultures. For example, Chen *et al.* (2005) studied the interaction between foreign managers and local employees, trying to help the managers and employees to combine their expertise to effectively take part in the innovations in multinational companies. They investigated in Chinese employees, one hundred and eleven of which described their specific interactions with their foreign manager and then responded to the survey questions. They showed that the diverse cultural values held by Chinese employees and foreign managers make it challenging to develop a productive leader - member relationship. Let us take another example. Chen and Partington (2003) adopted the interpretive research approach, developed for the purpose of understanding the different ways in which people conceive given aspects of their reality, to report an empirical comparison of matched samples of Chinese and Western construction project managers' conceptions of their work. The study highlighted some fundamental differences in conception of the meaning and significance of different forms of relationship in construction project management work in two cultures. It also showed that the cross-cultural transfer of management processes in general is not always successful because there are a number of well-known contrasts between Chinese and Western cultural values that shape management beliefs in important ways.

Some researches on the inter-cultural trust between China and English speaking Western countries related the traditional Chinese cultural values to the Western ones. For instance, Chow *et al.* (1998) investigated the effects of national culture on the truthfulness with which subordinates communicate upwards under alternate pay schemes. U.S. nationals and Chinese nationals in Taiwan were used to represent members of two cultures. Concern with "face", which is underpinned in Chinese culture, is chosen as one

of the dimensions to measure national cultures. The findings showed the importance of national culture and its effect on the organizational communications between subordinates and their superiors in the absence of face to face interaction.

In comparing Chinese culture with Western Cultures, researchers often regard the United States of America as the bench mark of the western countries. For example, Chowa *et al.* (2002) examined the organizational cultures of public accounting firms with data from US affiliated international accounting firms in Taiwan and Taiwanese local firms. They tested some hypotheses about the impact of the national culture of the US firms on their Taiwanese affiliates, and about cultural differences across function and rank. Kelley *et al.* (2006) compared and examined the cultural attitudes in Hong Kong and Taiwan within the context of dissimilar region (the US) for the banking industry during 1985 and 2000. The findings revealed the potentially dynamic nature of national culture, as opposed to a more static approach that is often assumed in management research using a Hofstede framework (Hofstede, 2001). This research suggested that organizational policies and practices should be updated for maximum effectiveness in relation to “cross-verging” (by author to show the converging tendency across different cultures) realities and that culture may not be static. The findings of these studies can only be used to explain the similarities and differences between the US culture and Chinese culture.

In fact, as China goes fast in its market economy and globalizing process, the businesses between China and Europe increase significantly in recent years. As a result, the western countries other than the US, like those in Western Europe, play a more and more important role in the international businesses. Hence, there is a need to develop a more general framework within which one can make decisions for the international businesses in the context of inter-cultural organizational communication. In the following section, we will introduce such a general framework in the perspective of decision science.

### **DECISION SCIENCE STRUCTURES IN NOMOLOGY**

Nomology is the study of the decision-making processes of the mind named by Henry Tappan (1855, pp. 70-85) after the Greek words *nomos* and *logos*, literally the

doctrine of law. Nomology is based on the premise that intelligent beings' choices tend to follow a common set of simple decision rules. Thus if several different fields of human activity have similar categorizations of some type of behaviour, then it is more likely than not that they emerge from the same common decision structure. Hamilton (1877) incorporated into Nomology ground-breaking ideas from Kant (1785, 1790; originally published in German in 1781, 1790), especially about the existence of a feelings level between the knowing and willing levels. Hamilton defined the terms cognition, affect and conation as a triad of mental activities corresponding to knowing, feeling and willing, which operate as levels which he called somatic, psychic and pneumatic.

Recently Brugha (1998a,b,c) has formalized the rules of Nomology and shown that this triad corresponds to three stages or levels of a committing process. Kant also discovered the three stages or levels in a parallel convincing process. Brugha and Bowen (2005) has formalized the rules for this also and shown that its levels start with technical or self-orientated issues, then relates to the context of the problem as indicated by the perceptions of other people, and finally takes account of situations.

Brugha (2001) has showed parallels with similar structures that have emerged from research in fields such as management and psychology, and to synthesize them into a unified framework. He showed that the differences between the committing and convincing dialectics from Kant have parallels with Jung's (1971) introverted and extroverted orientations in psychology. Jung's particular contribution was to show that different levels on these two orientations can be combined into meaningful orienting functions such as intuiting, sensing, thinking and feeling. Thus the committing and convincing processes act as independent dimensions. Parallels with Maslow's (1954) hierarchy of needs confirmed the validity of this pattern and suggested that both his and Jung's systems could be formalized and filled out to the full Kantian two-way dialectical structure of nine aspects. Brugha (2001) did this and showed that the levels of activity (Table 1) and types of thinking (Table 2) arise as each phase of commitment goes through a convincing process. A further extension was to show that the nine activities correspond to stages of a development process that have parallels with the Systems Development Life Cycle (Table 3) (e.g. Whitten and Bentley, 1998).

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The wide variety of systems that fit into this structure should be visualized as facets of a broader reality. Each of the cells in Tables 1 to 3 should be viewed as coherent clusters of activities that are best explained via the corresponding facets. For example, in Table 2, “trusting” could be described as a psychological state, rather than a process, that relates to some situation; it operates on the emotional level of behaviour and is particularly relevant at the acquisition stage of the SDLC. Brugha (1999) has shown that the confluence of thinking types, levels and stages of the development process is also useful for explaining the antecedents of trust in relationship marketing.

Extensive trawls of similar qualitative structures based on established systems or empirical evidence indicated that systems that did not fit into the above dialectical structure appeared to be based on balances between opposites or contrasts. Some of these were connected with culture, such as Hofstede’s cross-cultural study (1980) which reported that cultures tended to differ on four main dimensions of uncertainty avoidance, individualism, power distance and masculinity. Another was the eight Trigrams or archetypes of the I Ching from the Yin-Yang-based system of Ancient China (Secter, 1993, 1998).

Brugha (2004) also had developed a generic structure based on three dichotomies raised the open-ended questions about how to achieve defined development objectives. From analysis of many surveys it became clear that decision-makers were addressing the

problem with the same approach based on asking questions that had dichotomous answers. Combining the answers to these dichotomies led to the formalization of eight principal adjustment activities (Brugha & Bowen, 2005). It was described as an adjustment system because remedying the imbalances in the three dichotomies acted as a mechanism for reducing excessive emphasis on particular approaches to solving problems in organisations.

This structure constitutes a Nomology adjustment system based on three dichotomies raised the question of parallels with the Yin-Yang (either-or) system in oriental culture. It emerged that descriptions of the eight activities in Nomology adjustment system correspond to those of the eight Trigrams or archetypes of the I Ching.

Committing, convincing and adjusting are three dimensions that form an important generic model that occurs naturally. Brugha & Bowen (2005) have described such a combination as occurring in Galliers and Sutherland's revised 'stages of growth' model (Galliers & Sutherland, 1991; Galliers, 1991). The adjusting process is about fine-tuning at a third or lower level. Thus, when an organization wishes commit itself to working on a higher level of use of IS, it must develop through a process of fulfilling the requirements of that level convincingly. Because doing this in a major organization is non-trivial matter each step requires adjusting to the new situation.

As a continuous part of the study, in this paper we use the same decision structure in Nomology to develop the inter-cultural trust development process in information systems, which is presented in the following section.

## **INTER-CULTURAL TRUST DEVELOPMENT IN INFORMATION SYSTEMS**

The inter-cultural trust development (ICTD) is a process for developing trust between two individuals or organizations, who do business with each other while possess different cultural backgrounds. It suits the needs that occur and grow in global economy where heterogeneous business partners take involved in. Nowadays the issue of ICTD becomes more necessary in electronic commerce where people do business virtually by using the information system and the Internet. Global organisations typically have many stakeholders including suppliers and customers, which think and behaviour in different ways for their diversified cultures. The trust development of an organization in their

business partners may be at different stages, which may also be interacting with each other. This fact makes it more valuable to reap the benefits of understanding the ICTD process.

Lee *et al.* (2006) studied tension and trust in international business negotiations, attempting to shed lights on the antecedents and consequences of tension felt during international business negotiations. They found that both Chinese and American executives felt tension during the negotiations, but that this tension had different consequences. For the Chinese executives, greater levels of tension led to lower levels of interpersonal attraction and in turn lower trust for their American counterparts. For the Americans, tension felt did not affect interpersonal attraction, but did have a direct negative effect on trust. In their study, trust was viewed as a psychological state, which is related to some other psychological states, such as tension and interpersonal attraction. Here we put trust in the framework of a developing process and the ICTD in information systems should be viewed as a flexible process influenced by some structured constructs.

As illustrated in Figure 1, the ICTD decision structure should be used as a conduit through which to draw from a wide range of fields, including philosophy, psychology, information systems, culture, management, and other fields.

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For example, commonly found IS processes that have three phases or levels of committing such as Understand the Problem or Opportunity, Develop a Solution, and Implement a Solution (O'Brien, 1993) have parallels with Simon's (1977) Intelligence, Design, and Choice, and consequently with the satisficing concept. The committing phases in ICTD conform to the primary processes in fundamental management theory, which are planning, organizing, leading and controlling (Robbins, 2002). The combined use of the ideas from a variety of fields should be reinforced amongst in ICTD managers.

Brugha (2001) showed that the levels of activities (Table 1), the stages of thinking (Table 2), and the stages of System Development Life Cycle (Table 3) arise as each phase

of commitment goes through a convincing process. Here is a further extension to show that the nine activities correspond to the ICTD stages in information systems.

As illustrated in Table 4, the ICTD stages in information systems are fitted in a matrix featured by committing phases and convincing stages. Like the levels of development (Table 1), stages of thinking (Table 2), and stages of System Development Life Cycle (Table 3), the ICTD stages arise as each phase of commitment goes through a convincing process. The use of colloquial language such as in Tables 1, 2 and 3 could help to enhance decision-makers' sense of ownership of the ICTD process.

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The committing phases include three phases, among which the first two correspond to the cognitive-based trust and the affective-based trust (McAllister, 1995). The third phase should be a higher level of trust, which is named subconscious trust here because it occurs naturally based on the pneumatic values and good implementation of trust-related strategy and policy. The phases in committing process are parallels to the approach in Confucian philosophy of Knowing-Thinking-Acting in China.

The convincing stages include three stages, i.e., technical, contextual, and situational stages, which correspond to the initial period, growing period, and maturing period of the trust in inter-cultural trust development (Du *et al.* 2006). The stages in convincing process are also parallels to the approach in modern philosophy of Nature-Human-Society in China.

The decision structures in the Adjusting-Committing-Convincing system have a parallel with those in the Wuli-Shili-Renli (WSR) approach (Zhu, 2000; Gu and Zhu, 2000).

In reality the overlapping of stages within the whole ICTD process is often forced by the situation, particularly where there is interaction such as between the design of the procedures and the acquisition of soft and hard support. In this point it has been very helpful to explain each stage by reference to nomological structures. The cognitive phase,

for example, emphasizes the somatic, i.e. tangible and measurable aspects that exist in the current relationship; it also focuses on the requirements of the inter-cultural trust. The ICTD activities should be viewed as a generic structure that should be used more flexibly in dealing with specific cases, especially the electronic commerce in information systems.

IS people generally come from a technical background, and so could benefit from having their intuitions and feelings affirmed. However, they need to develop their intuitions and feelings in technical stage to the further stages of recognizing and believing in contextual and situational ones. On the other hand, the committing phases of analysis, design and implementation could extend the understanding of IS people involved in the ICTD projects from the lower level to the high level. Because frequently in an IS context there can be many interacting and overlapping ICTD projects with regard to different partners leading to multiple ICTD process, sometimes in several layers, it is even more important that decision-makers have the maximum control possible over the process. The Inter-Cultural Trust Development Stages in Information Systems (Table 4) could provide decision-makers with a general framework to have the maximum control over the ICTD process.

The combination of eight adjustment activities (Brugha & Bowen, 2005) that are carried out within each of the nine development stages of an ICTD can be viewed as a sort of “Nomological Map” to help decision-makers to locate where the decision process is at any point in time. This framework can help to provide indicators about what decision-makers should do at a particular stage of adjustment or development. Information such as this could help to move an organization onwards by revealing to the members where there are blocks to change in the process or where there is a need for targeted effort. It can also help decision-makers and advisors by indicating the type of behaviour associated with each stage, as it is exhibited and manifested in the feelings of the organisation and its members. It can also point to suggested guidance with regard to such behaviour.

The major implication for inter-cultural trust development practice arising from the discussion of decision structures in Nomology is that each of the development stages should be implemented using the rules of adjustment decision-making. The principal requirement is that there should be balance in the usage of alternative managerial

approaches. This is an “objective” requirement. For instance a manager could cause harm by bringing to the job a particular bias in favour of planning as against putting plans into effect. Having an awareness of such potential imbalances can offset such a bias.

The combination of alternatives on each of the three dichotomies produces the following eight activities: pounce, procedure, price, policy, promotion, productivity, pliability, and practice. These activities can be viewed as coherent “activity tools” that can be used independently or as part of a cycle that is applied within each ICTD stage. They reflect an unfolding process that could go through the whole cycle or just the first few steps. This adjusting process should be a generic problem-solving process that is usable at each stage of the ICTD. Occasionally it can help to carry out a formal review of where one is in the cycle, especially where there appears to be a problem.

The implication for the inter-cultural trust development in information system is that the ICTD in Nomology decision structure is a powerful three-layered generic structure that combines both objective and subjective problem solving processes. Objective processes should be employed within each step of the ICTD and should be implemented using adjustment decision-making to addresses imbalances between dichotomies. Subjective processes should determine the movement between the steps of the ICTD and should be implemented using development decision-making in a holistic manner that draws eclectically from management and psychology. In the next section we use the ICTD structure to analyze a case of inter-cultural trust development in information systems.

### **ANALYSIS OF A CASE**

XXYY (not its real name) is a service company engaged on B-to-C electronic commerce. The company is located in Beijing, China. Both the owner and the manager of the company are Canadian Americans. They envisioned the huge market of the Chinese families willing to get native English language speakers to stay at their homes in order that their children could improve English listening and speaking. On the other side they have seen the growing market of the young university students in developed countries who are learning Chinese language and want to tour in China in summer holidays. So they launched an electronic business called home stayer program to explore both markets.

The company operates mainly through the Internet and a registered web page. On this page there are some introductions to the company and its business, including the detailed information about home stayer program. According to the program, a home stayer, the person who stays in a local family's home, gets free accommodation and free evening meals when he/she visits a place as a tourist (usually a young students coming from foreign countries). In return, he/she must offer some hours' English tutoring each week to help a family member (usually a child) to improve his/her English level. In addition, the company may find some classes in the local city for home stayers to teach English to make money, and some classes where they can learn the Chinese language. The company provides detailed terms and conditions on its web page. It makes money by charging the home stayers (and their families in some situations).

The company attracts potential home stayers through its business introduction on the web and through advertisements in some tourist guidebooks published in the English speaking countries such as the US, UK, and Canada. It also uses a marketing work force to promote its home stayers program in some universities in those English speaking countries. Many young university students registered on the company website as candidate home stayers and provide their personal information, such as age, gender, nationality, living address, identity, hobbies, level of Chinese Mandarin, telephone, email, etc. At the same time, the company promotes its home stayer program on its Chinese web page to attract Chinese families to register as candidate families. Many families registered, offering their household information, such as the city and community where the families are located, number of the rooms, family habits and activities, and the personal information about each family member.

The employees in the company match the candidate home stayers to the candidate families and inform them by emails and phone calls once they get the home stayers and families matched. Also, the XXYY employees send the information of a home stayer to his/her Chinese family and the information of Chinese family to the home stayer, helping them to know with each other before they meet. The XXYY employees get the home stayer's travel schedule through the Internet as soon as the home stayer has it. Then, they contact his/her matched Chinese family and ask the family to collect the home stayer when he/she arrives at the city. After the home stayer meets his/her family, he/she is

required to pay the company fees (250 USD) for the service by bank transfer. In some situations the Chinese family is charged too. In return the home stayers get free places to stay and the families get native English speaking tutors. The company also makes money from its electronic services.

In such an inter-cultural electronic business, information systems are the only bridges between the three parties: the company, the home stayers, and the families. Trust between the company and its customers (home stayers and families) is entirely dependent on information systems because of the absence of face-to-face interaction. Moreover, because this electronic business deals with diversified customers with different cultural backgrounds the issue of *inter-cultural* trust must be considered. The successful development of inter-cultural trust among the three parties involved in the business could have helped to resolve the difficulties of both the home stayers and the families, and also contribute to not only the company's profits but also its good reputation and its future business. Because of the vulnerability to inter-cultural mis-communication of transactions where there is no face-to-face contact, we will focus here on inter-cultural trust development in information systems.

According to our presented ICTD decision structure, the company should follow the ICTD activities in information systems (Table 4) in its home stayer business to develop inter-cultural trust. Unfortunately, the company failed to achieve the ideal result because there are some gaps in its inter-cultural trust development. The story of two university students and their Chinese families is one of some examples.

Ted and May, who are from a university in England, travelled to Xi'an, China. Jessie, a lady with XXYY Company is responsible for their arrangement. She speaks both English and Chinese very well. She seems to be very kind when she speaks in the telephone and to know both Western culture and Chinese culture very well when reply emails. With Jessie's work through the Internet, Ted and May were collected by May's Chinese family when they arrived at Xi'an. Then Jessie informed that Ted's family couldn't accept him for some unexpected reason and she was looking for a new family. Upon Jessie's arrangement, Ted had to go to May's family and share a room with May because there were no other rooms available there. He was dissatisfied with such an arrangement. Two days later, he got Jessie's phone call and went to his new family.

Immediately, Ted and May were each asked to pay 250 USD by bank transfer. Ted and May refused because they were worried about their further situation in the families and their teaching and learning opportunities outside the families, which the company had promised to give. However, one day later, Ted paid since he was happy staying with his new family, a couple of university professors and their only daughter, who have experiences interacting with the English speaking Western foreigners and speak English well. May didn't pay immediately because she was short of cash and had to wait for her mom's post mail. She was not satisfied with the company. She asked Ted to contact the English school and Chinese class that Jessie had arranged for them. To their surprise, the classes had not been arranged at all. They were angry with the company. Several days later, May's family quit from the program because they found they couldn't communicate with May for two reasons: May cannot speak English at all while the family's English is very limited; the family feel cultural shock in the interaction with May. May had to stay at Ted's family and share a room with the family's daughter. Ted and May were completely disappointed by Jessie and her company. Of course, May did not pay her 250 USD to Jessie. She decided to quit from the program too.

Comparing with the ICTD stages in Table 4, we can identify some gaps in XXYY's inter-cultural trust development. As shown in Table 5, XXYY carried out only four of the nine stages in the ICTD activities. It surveyed the feasibility of developing a trust relationship amongst the three parties involved in home stayer business, studied the current state of trust relationship in itself and the customers, selected a feasible solution (communication with customers through emails and phone calls by well educated employees knowing both Chinese culture and Western culture very well) to build inter-cultural trust, and designed some procedures (e.g., sending information to both home stayers and families before get them met) necessary for trust building.

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However, the company ignored five activities in higher level stages and phases: (1) defining the detailed requirements of inter-cultural trust (e.g., the least language level and

cultural level for the families and the home stayers), (2) acquiring soft and hard support from the third parties (e.g., some local institutions or individuals who could provide language and inter-cultural training) and the information systems (e.g., a stable electronic communication platform for special use, including procedures for resolving difficulties as they arise), (3) constructing a detailed strategy and policy to mature the inter-cultural trust, (4) showing and delivering the inter-cultural trust system in its program implementation, and (5) maintaining and improving the established inter-cultural trust between the company and customers.

If the company had followed the ICTD decision structure to develop its inter-cultural trust development process, the families and home stayers wouldn't have quit from the program and the home stayer program would have achieved more successes.

Space limitations prevent us from giving more detail about the need for a balanced implementation of each stage of this committing and convincing structure at a third adjusting level. It is not enough to nominally complete each stage. Evidence of their proper completion comes when all the relevant issues have been taken into account in a balanced way. The enormous imbalances in the customers' expectations and outcomes, and in the company's promises and delivery, shown in the case, are evidence of this failure. They also point to the detailed remedies.

## **CONCLUSIONS**

In this paper we have presented inter-cultural trust development (ICTD) activities in a generic development decision-making structure based on a convincing process embedded within a committing process in the framework of Nomology. Considering some approaches and philosophies in Chinese culture, using comparisons with other systems, we have revealed that each stage of the ICTD process is fitted into the matrix of committing phases and convincing stages. And an adjusting process is embedded within each stage of the ICTD activities. We have illustrated the application of our ICTD structure in a case of inter-cultural trust development in information systems. The case analysis implies that our ICTD structure can be used to analyze and diagnose specific ICTD processes, to identify and find gaps and problems in ICTD processes, and to

explore and provide problem-solving solutions

As the rapid development of global electronic businesses and information systems, it appears that the future of ICTD will be characterised by changing groups of decision-makers, multiple projects, conflicting strategies, and dynamic markets. At any point we should be able to reconsider our commitments to ICTD development projects, check how convinced we are about them, and be able to make appropriate adjustments. In this context we could benefit from having a better understanding of the processes involved and how they inter-relate. Some understandings will be crucial to good ICTD project management. One is that inter-stage progression should be determined 'subjectively' by the decision-maker or organisation, while within each stage there are 'objectively' good and bad ways to proceed. Another is that good ICTD project management and good cross-cultural business management should be seen as intertwined. In the further study, the following questions should be researched into: how is the adjustment process performed in each stage of the ICTD activities? How does an organization adjust both its world and itself?

In spite of these unanswered questions, the generic nature of the ICTD structure has determined its widespread application and its flexibility in empirical use. This study suggests that practitioners could borrow from similar decision processes in other fields, including stages of activities, types of thinking and the philosophies in Chinese and Western cultures, to develop inter-cultural trust in information systems.

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### **REFERENCES**

Andersen, N., Kensing, F., Lundin, J., Mathiassen, L., Munk-Madsen, A., Rasbech, M. & Sorgaard, P. 1990. *Professional Systems Development: Experience, Ideas and*

*Action*. Prentice-Hall: Hemel Hempstead.

Bhaskar, R. 1998. A Realist Theory of Science. In Archer, M., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (Eds.). *Critical Realism: Essential Readings*. London: Routledge.

Branzei, O., & Vertinsky, I. 2003. Initial trust in cross-cultural collaborations: formal and informal assurances in Canada and Japan. *Academy of Management Best Conference Paper, IM*.

Brugha, C. 1998a. The structure of qualitative decision making. *European Journal of Operational Research*, 104 (1): 46-62.

Brugha, C. 1998b. The structure of adjustment decision making, *European Journal of Operational Research*, 104 (1): 63-76.

Brugha, C. 1998c. The structure of development decision making, *European Journal of Operational Research*, 104 (1): 77-92.

Brugha, C. 1999. Trust and Commitment in Relationship Marketing, In *Proceedings of the IMP Conference*, Smurfit Graduate Business School, University College Dublin.

Brugha, C. 2000. An introduction to the priority-pointing procedure. *Journal of Multi-Criteria Decision Analysis*, 9: 227-242.

Brugha, C. 2001. Implications from decision science for the systems development life cycle in information systems. *Information Systems Frontiers*, 3(1):91-105.

Brugha, C. 2004. Structure of multi-criteria decision-making. *Journal of the Operational Research Society*, 55:1156-1168.

Brugha, C., & Bowen, K. 2005. Decision Research Using Cognitive Structures, *Systemic Practice and Action Research*, 18(1): 67-88.

Chen, Y., Tjosvold, D., & Sub, SF. 2005. Goal interdependence for working across cultural boundaries: Chinese employees with foreign managers. *International Journal of Intercultural Relations*, 29:429 - 447.

Chen, P., & Partington, D. 2004. An interpretive comparison of Chinese and Western conceptions of relationships in construction project management work. *International Journal of Project Management*, 22: 397 - 406.

Chow, CW., Hwang, RNC., Liao, W., & Wu, A. 1998. National Culture and

Subordinates' Upward Communication of Private Information. *The International Journal of Accounting*, 33(3): 293-311.

Chow, CW., Harrison, GL., McKinnon, JL., & Wud, A. 2002. The organizational culture of public accounting firms: evidence from Taiwanese local and US affiliated firms. *Accounting, Organizations and Society*, 27: 347 - 360.

Du, R., Hu, N., & Ai, S. 2006. Interpersonal trust: a significant factor in knowledge transfer within the alliances consisting of both foreign and Chinese firms. *Lecture Notes in Decision Science 8, Proceedings of KSS'2006, Knowledge and Systems Sciences: Towards Knowledge Synthesis and Creation*. Edited by Jifa Gu, Yoshiteru Nakamori, Zhongtuo Wang, Xijin Tang. Global-Link Publisher. 367-274

Galliers, R.D. 1991. Strategic information systems planning: myths, reality and guidelines for successful implementation, *European Journal of Information Systems*, 1: 55-64.

Galliers, R.D. & Sutherland, A.R. 1991. Information systems management and strategy formulation: the 'stages of growth' model revisited, *Journal of Information Systems*, 1: 89-114.

Gu, J. & Zhu, Z. 1995. The Wuli Shili Renli approach: An Oriental systems methodology. In Gerald Midgley & Jennifer Wilby (Eds.), *Systems Methodology: Possibilities for Cross-Cultural Learning and Integration*. (pp. 29-38). England: Centre for Systems Studies, University of Hull.

Hamilton, W. 1877. Lectures on Metaphysics, Vols. 1 & 2, 6th Ed., in *Lectures on Metaphysics and Logic*, Edinburgh & London: William Blackwood & Sons.

Hofstede, G. 2001. *Culture's Consequences*, (2nd edn), Sage: Thousand Oaks, CA.

Iivari, J., Hirscheim, R. & Klein, H.K. 1998. A Paradigmatic Analysis Contrasting Information Systems Development Approaches and Methodologies. *Information Systems Research*, 9 (2) 164-193.

Jung, C. 1971. Psychological Types, In *The Collected Works of C. J. Jung* Volume 6, London: Routledge & Kegan Paul.

Kant, I. 1985. *Critique of Pure Reason*. (Translated by Norman Kemp Smith) McMillan, (First published in 1929) (Original in German first published in 1781).

Kant, I. 1987. *Critique of Judgement*. Indianapolis: Hackett Publishing Company.

(Original in German first published in 1790).

Kelley, L., MacNab, B., & Worthley R. 2006. Crossvergence and cultural tendencies: A longitudinal test of the Hong Kong, Taiwan and United States banking sectors. *Journal of International Management*, 12(1): 67– 84.

Lee, K., Yang, G., & Graham, JL. 2006. Tension and trust in international business negotiations: American executives negotiating with Chinese executives. *Journal of International Business Studies*, 37(July 13, 2006; doi:10.1057/palgrave.jibs.): 623–641.

Maslow, A. 1987. *Motivation and Personality*. New York: Harper & Row.

Mayer, RC., & Gavin, MB. 2005. Trust in management and performance: who minds the shop while the employees watch the boss? *Academy of Management Journal*, 48(5): 874–888.

McAllister, DJ. 1995. Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, 38(1):24-59.

O'Brien, J.A. 1993. *Management Information Systems: A Managerial End User Perspective*. Irwin: Second Ed. Homewood, IL.

Robbins, SP., & DeCenzo, D. 2002. *Fundamentals of Management*, Prentice Hall.

Secter, M. 1993. *I Ching Clarified: A Practical Guide*, Japan: Charles E. Tuttle Company, Inc.

Secter, M. 1998. *The Yin-Yang System of Ancient China: The Yijing-Book of Changes as a Pragmatic Metaphor for Change Theory*. David Lam Center for International Communication, Simon Fraser University, Vancouver (Burnaby), British Columbia, Canada.

Simon, H. 1977. *The New Science of Management Decisions*. Rev. Ed. Englewood Cliffs, NJ: Prentice-Hall.

Stahl, GK., Chua, CH., & Pablo, AL. 2003. Trust following acquisitions: a three-country comparative study of employee reactions to takeovers. *Academy of Management Best Conference Paper*.

Tappan, Henry P. 1855. *Elements of Logic; Together with an Introductory View of Philosophy in General and a Preliminary View of the Reason*. New York: D. Appleton and Company (first published 1844: New York and London: Wiley & Putnam).

Whitten, J., & Bentley, L. 1998. *Systems Analysis and Design Methods*. (4th ed.). Homewood, IL, IRWIN / McGraw-Hill.

Zhu, Z. 1998. Cultural imprints in systems methodologies: The WSR case, *Proceedings of the 3rd International Conference on Systems Science and Systems Engineering (ICSSSE)*, Beijing, China.

Zhu, Z. 2000. WSR: A systems approach for information systems development, *Systems Research and Behavioural Sciences*, 17 (2), 183-203.

**Table 1. Levels of Development**

Introverted development (Committing phases)	Extroverted development (convincing stages)		
	Technical (Self)	Contextual (Others)	Situational (business)
Somatic-Needs	Physical	Political	Economic
Psychic-Preferences	Social	Cultural	Emotional
Pneumatic-Values	Artistic	Religious	Mystical

**Table 2. Stages of Thinking**

Introverted development (Committing phases)	Extroverted development (convincing stages)		
	Technical (involving)	Contextual (protecting)	Situational (observing)
Somatic-having	Intuiting	Recognising	Believing
Psychic-doing	Sensing	Learning	Trusting
Pneumatic-being	Experiencing	Understanding	Realising

**Table 3. Stages of System Development Life Cycle**

Committing phases	Convincing stages		
	Technical	Contextual	Situational
Analysis	Survey project scope and feasibility	Study the current system	Define the end-user's requirements
Design	Select a feasible solution from candidate solutions	Design the new system	Acquire computer hardware and software
Implementation	Construct the new system	Deliver the new system	Maintain and improve the system

**Table 4. Inter-Cultural Trust Development Stages in Information Systems**

Committing phases	Convincing stages		
	Technical (Initial period)	Contextual (Growing period)	Situational (Maturing period)
Somatic (Analysis) Cognitive phase	Survey the feasibility of developing the relationship	Study the current state of the relationship in both sides	Define the requirements of inter-cultural trust
Psychic (Design) Affective phase	Select a feasible solution from candidate solutions to build inter-cultural trust	Design the procedures to build inter-cultural trust between two parties	Acquire soft and hard support from the third parties and the information systems
Pneumatic (Implementation) Subconscious phase	Construct the strategy and policy to mature the inter-cultural trust	Show and deliver the inter-cultural trust system	Maintain and improve the established inter-cultural trust

**Table 5. XXYY's Inter-Cultural Trust Development Stages in IS**

Committing phases	Convincing stages		
	Technical (Initial period)	Contextual (Growing period)	Situational (Maturing period)
<b>Somatic (Analysis) Cognitive</b>	Surveyed the feasibility of developing trust relationship among the three parties involved in home stayer business	Studied the current state of trust relationship between itself and the customers	
<b>Psychic (Design) Affective</b>	Selected a feasible solution (communication with customers through emails and phone calls by well educated employees knowing both Chinese culture and Western culture very well) to build inter-cultural trust	Designed some procedures (e.g., sending information to both home stayers and families before get them met) necessary for trust building	
<b>Pneumatic (Implementation) Subconscious phase</b>			

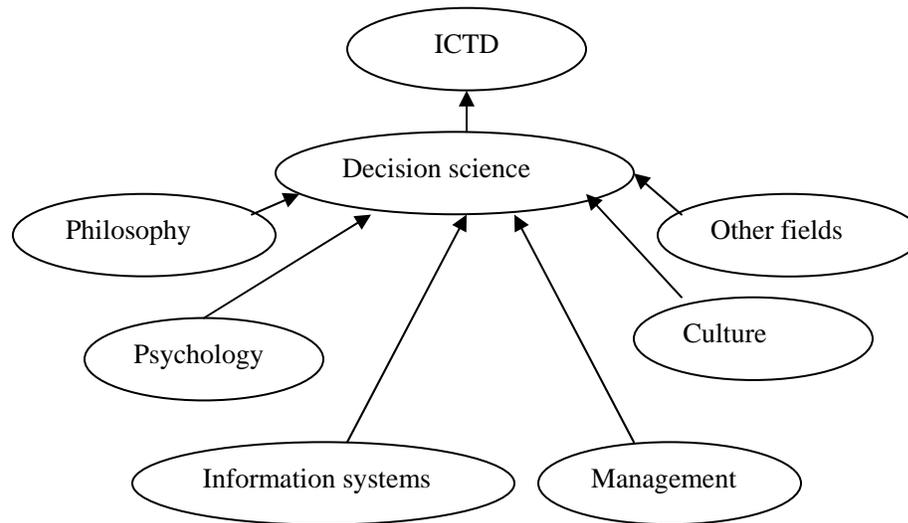


Figure 1. Relationship of ICTD to other fields through decision science