UNDERSTANDING THAI CULTURE AND ITS IMPACT ON REQUIREMENTS ENGINEERING PROCESS MANAGEMENT DURING INFORMATION SYSTEMS DEVELOPMENT[*]

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ABSTRACT

This paper explores the impact of Thai culture on managing the decision making process in requirements engineering and contribution a better understand of its influence on the management of requirements engineering process. The paper illustrates the interaction of technology and culture and shows that rather than technology changing culture, culture can change the way technology is used. Thai culture is naturally inherent in Thai daily life and Thais bring that into their work practices. The concepts of power and uncertainty in Thai culture contribute toward hierarchical forms of communication and decision making process in Thailand, especially during requirements engineering, where information systems requirements need to be established for further development. The research shows that the decision making process in Thailand tends to take a much longer time, as every stage during requirements engineering needs to be reported to management for final decisions. The tall structure of Thai organisations also contributes to a bureaucratic, elongated decision-making process during information systems development. Understanding the influence of Thai culture on requirements engineering and information systems development will assist multinational information systems consulting organisations to select, adapt, better manage, or change requirements engineering process and information systems developments methodologies to work best with Thai organisations.

INTRODUCTION

Cultural differences between countries affect individual personality and behavior and organizational culture (Hofstede 1984, 1991; Karpatschof, 1984; Thanasankit, 1999). Each country has its own ways of expressing feelings, showing emotions, solving problems, and constructing its society. Hales (1995: 105) states that:

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> *... 'culture' approaches to computing technologies are rather high profile.*

In a world with fewer and fewer barriers to communication, information transfer and development of information systems between countries, developers should look at information systems as they are influenced by national culture.

The methodologies of information systems development are invented in the West and are considered as universal rules, but the application of these rules is not. Developers should apply these rules according to a particular country when developing successful information systems and search the appropriateness of the methodologies and adapt them to suit the local culture (Korpela et al., 1998). Palvia and Hunter (1996), suggest that promoting one methodology and single technique for development of information systems within a multinational organization is not necessarily a good idea, because of cultural differences between headquarters and branches in other countries. Furthermore, the use of different methods and different uses of the same methods in countries can be caused by cultural differences (Palvia and Hunter, 1996); Korpela et al. (1998) suggests that African countries need their own ISDM[1] (Information Systems Development Methodology). They argue that the ISDM that has been taught in industrialized countries may not be appropriate for use in developing countries without adjustment. Therefore, it can be argued that localised ISD practices and methodologies are needed for better development of information systems (Avgerou, 1996; Liebenau, 1992).

Organizational, social and political issues in a country are important and influence the development of information systems (Waema, 1996; Walsham, 1992). Korpela et al. (1998: 276) suggest that:

> *The nuts and bolts of information systems are likely to be the same in industrialized and developing countries, but the uses and preconditions differ. In other words, the Software Engineering methods of technological implementation are likely to be the same in different countries, but the ISD methods and methodologies need to be adjusted from country to country to take the infrastructure, organizational, social and political differences into account.*

The methodologies and methods employed during information systems development are tested within western countries where differences of culture between countries are low (Hofstede, 1991). Hunter and Beck (1996) suggest that variation of research findings in different countries may result from differences in culture and values of the societies. Therefore, it is important to understand the local culture for better selection and adaptation of requirements engineering processes to suit to operation in Thailand.

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[1] ISD methodology means to use "a systematic way of conducting ISD by using a set of procedures and methods which are based on a shared more or less explicit philosophy or approach" (Avison and Fitzgerald 1995: 10–12, 418–429).

This paper reviews a series of decision making processes used in requirements gathering in Thai software houses to gain an understanding of what happens and why that is the case. The research aims to gain a more complete understanding of why the decision-making processes, which are described, emerge the way they do. The paper reveals the impact of Thai culture on those processes and describes the effects that result. This is important for information systems management as it defines impacts on effectiveness and efficiency.

REQUIREMENTS ENGINEERING—THE PROCESS

Requirements Engineering (RE) emerged from software engineering (Loucopoulos and Karakostas, 1995; Thayer and Dorfman, 1990; Zave, 1995) and covers all the activities of discovering, documenting, and maintaining a set of requirements for building a computer-based information system (Sommerville and Sawyer, 1997). RE is concerned with analysing, and documentation of requirements, which include needs analysis, requirements analysis, and requirements specification (Thayer and Dorfman, 1990). The requirements specification, therefore, is the end product of RE (Sommerville and Sawyer, 1997; Thayer and Dorfman, 1990). It is an important tool in information systems development in organisations. The use of a specification document can be significant in decision making for strategic outcomes. For the purpose of this research, RE is defined as: "the systematic process of developing requirements through an interactive co-operative process of analysing the problem, documenting the resulting observations in a variety of representations formats, and checking the accuracy of the understanding gained" (Loucopoulos and Karakostas, 1995: 13).

Contemporary software methods do not suggest or propose a formal framework for RE. Most of them "focus on the deliverables of the process rather than the process itself" (Loucopoulos and Karakostas, 1995: 19–20). Therefore, it is important to have a framework for understanding, evaluating, and comparing different RE frameworks (Loucopoulos and Karakostas, 1995). There are three fundamental concerns, which are identified by Loucopoulos and Karakostas (1995: 20) for the development of an RE framework. These are:

- The concern of understanding a problem ('what the problem is').
- The concern of formally describing a problem.
- The concern of attaining an agreement on the nature of the problem.

This Loucopoulos and Karakostas (1995) framework was selected for this research project as a benchmark in the current debate over approaches to RE. They note that: "as a discipline requirements engineering is still evolving with a diversity of approaches being proposed and a lively debate going on. Therefore, it is neither possible nor appropriate to be prescriptive about the approach that one might adopt in developing a requirements specification" (Loucopoulos and Karakostas, 1995: I).
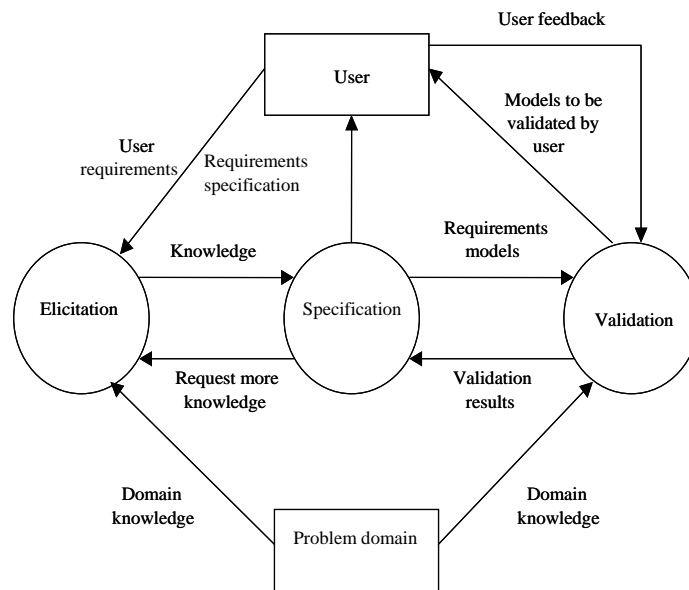
Figure 1. The requirements Engineering process (Loucopoulos and Karakostas, 1995)

The model suggests that the requirements engineering process is a never ending process of elicitation, specification, and validation (Loucopoulos and Karakostas, 1995; McDermid, 1994 in Jirotka and Goguen, 1994) starting from the requirements elicitation phase, which is all the activities involved in discovering the requirements of the system. Requirements elicitation continues through out the requirements engineering life cycle as analysts continually get requirements from users at all times, and also when they have also to seek more information from users to better understand the system.

The second phase of requirements engineering, specification enable analysts to document knowledge or requirements gathered in the first step. This forms the basis for a contract between the client and the analysts. The more analysts study the system under design and work on requirements, the more knowledge or system requirements they need to gather to better understanding the system.

The product of this process is the development of a formal requirements specification document, which needs to be validated by the client. Users will give feedback about the requirements specification documents and evaluate their acceptability. Domain knowledge of the problem in the existing system is also checked and corrected. If it is not what the client wants, the analyst need to reiterate the process.

However, this theoretical framework is essentially western in formulation. It is an accepted framework, and structured process. What framed this research was a search to

see if the same formality and structure is reflected in the RE processes in Thailand, specifically with reference to the way decisions are made.

DECISION MAKING PROCESS IN THAILAND

Decision-making processes in Thailand are influenced mostly by two common elements in Thai culture, power and uncertainty (Thanasankit, 1999).

The Concept of Power in Thai Culture

Hofstede used IBM employees, who worked in similar positions, in different countries to investigate the power relationships, focusing on employee fear, superior autocratic or paternalistic management style and preferred working environment. The result was the development of a power distance index (PDI)[2], indicating the dependence relationships in a particular country. The PDI score for Thailand indicates that Thai society has high power distance, which can be interpreted that Thais accept wide differences in power in their organisations (Komin, 1990) and subordinates will not influence their superior's ideas or decisions (Holmes & Tangtongtavy, 1995). In Thai society, a person's power normally comes with his/her title, rank and status (Komin, 1990). He notes that Thais:

> *play down inequalities as much as possible. Superiors still have authority, but employees are not fearful or in awe of the boss. Countries of low power distance scores are Denmark, Israel and Austria* (Komin, 1990: 216).

High power distance creates tall organizational structures in most Thai organisations. The high power-oriented culture tends to create respect for the leader as the father figure of the organization (Trompenaars, 1993) e.g. the current King of Thailand is respected and is accepted as the father figure for the country. Rohitratana (1998: 190) suggests that:

> *Due to paternalism and dependence, the concept of a 'flat structure' is an organization, which entails speedy decisions cannot effectively take place. The reason is that only those at the top can possibly make decisions; that is their obligation, to operate as 'fathers'. Thais perceive the role of 'leader' as a controller rather than a colleague. This may be called the 'superior-inferior' concept that is dominant in Thailand.*

Therefore, without superior's directions and guidance, effectiveness may be reduced within the organizations. McKenna (1995 in Rohitratana, 1998: 190) suggests the superior's role "are almost like those in a family. That is respect and obligation. This is how things get done".

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[2] Hofstede method for calculating power distance index describes in Hofstede (1991: 24–25).

Face saving or the criticism avoidance value also plays a very important role in Thai culture as part of the way power is practiced. Thais try to avoid conflict and criticism at all times because of the face saving value. Komin (1990: 135) suggests that:

> *The "face" is identical with "ego" and is very sensitive. Since the Thai give tremendous emphasis on "face" and "ego", preserving one another's "ego" is the basic rule of all Thai interactions both on the continuum of familiarity-unfamiliarity, and the continuum of superior-inferior, with difference only in degree.*

Therefore, whenever there is a problem to be solved, Thais would find softer approaches or tone down the negative messages used, avoiding confrontation in public such as during meetings. Thais try to avoid making a person "lose face" at all cost. Losing face also means that a person is being insulted by the other party. This leads to criticism avoidance. Komin (1990: 135) suggests that Thais "are very 'ego' oriented, to the extent that it is very difficult for the Thai to dissociate one's ideas and opinions from the 'ego' self". This is why a person who presents the ideas and gets criticism for the ideas will take the criticisms personally and not as criticism of the ideas themselves. Criticism creates insulting situations (Mulder, 1978).

An 'idea' in Thailand means knowledge gained from one's experience. In situations, where criticism or questioning of a Pu Yai (superior, elder, authority-power figure) occurs, the interpretation is one of an insult. In the Requirements Engineering process there is a great deal of questioning by systems analysts of clients. In the Thai context such questioning must not engage or create criticism of senior staff. Questioning the way a Pu Yai works means insulting their knowledge and experience. Such behavior is avoided in Thai organizational processes. Significant withdrawal by clients would occur if the situation arose resulting in ineffective and incomplete gathering of information or requirements.

> *Thai children are not, on the whole, taught to think independently or develop individual characteristics which will distinguish one individual from another. They are not taught to bring up contrasting views or challenge another's thoughts, particularly if that person is a teacher or someone in a senior position.* (Fieg, 1989: 33).

Power in the Thai context is constructed not by influence or personality, rhetoric or education, rather it is created by position and the status associated with position and rank. Superior/inferior relationships are clearly defined by acceptance and implicit recognition of rank and status. Thai culture accepts that power relations are implicitly constructed in all organisations and at levels of Thai society by appointment to a position, title or status.

The Concept of Uncertainty in Thai Culture

Hofstede (1991: 113) defines uncertainty avoidance as "the extent to which the members of a culture feel threatened by uncertain or unknown situations". Countries that have high

uncertainty avoidance tend to avoid or dislike uncertain situations. This uncertainty is not just for individuals but it can be shared within the community or across society as a whole. The UAI (Uncertainty Avoidance Index) score for Australia is 51 and for Thailand is 64, indicating a higher degree of congruence than for the other culture elements. But one can observe that the Thais have a higher tendency to dislike uncertainty ore unpredictable situations.

In Thailand, subordinates tend not to get involved in decision-making processes, thus avoiding confrontation with their superiors or even with other employees at the same level. Involvement in decision-making processes may engage subordinates with unwanted responsibilities (Rohitratana, 1998). Thai culture does not encourage subordinates to dare to make mistakes, nor to take initiatives. Thais avoid taking on more responsibility and void taking risks, because risk means bringing in more uncertainty and increasing their responsibilities. Thai culture encourages only a few people at the top of Thai organisations to make decisions and take risks (Holmes and Tangtongtavy, 1995: 84).

Decision-making is made by high-level management. Their subordinates believe that since the superiors are qualified for the top positions, they possess certain knowledge, wisdom or experience, which goes beyond their subordinates (Holmes and Tangtongtavy, 1995). It is fair to state that the decision-making system in Thailand is an "upward" delegation (Thanasankit, 1999). "The result, of course, is a buildup of a myriad of major and minor decisions on the top person's desk" (Holmes and Tangtongtavy, 1995: 63).

Thai decision-making is commonly not undertaken in a team approach as in western countries or in Japan. From a recent survey in Thailand, it was found that superiors in Thai organisations accept that they have to make decision in an "authoritarian: way (Holmes and Tangtongtavy, 1995: 63). However, there is a fine line between an "authoritarian superior" and a "dictatorial manager". A dictatorial manager makes decisions without consulting anyone, but an "authoritarian manger" should nevertheless ask for subordinates' opinion and show some interest in their views (Holmes and Tangtongtavy, 1995). However, the authoritarian manager is entitled to make decisions about what he/she thinks is correct (Holmes and Tangtongtavy, 1995). It is his/her job to decide and guide his subordinates, as he/she is their father/mother figure.

Most uncertainty avoidance in Thailand then is associated with avoidance of decision-making. Decisions made might bring unwanted tasks and responsibilities, which subordinates do not want to take. Likewise, unsuccessful implementation of a decision may bring uncertainty for job security and blame to the subordinate. Thus decision-making in Thailand is delegated upwards. Subordinates tend to avoid taking on more responsibilities, thus avoiding mistakes. The frustration that results from working in a Thai context for a westerner (Farang) in avoiding responsibilities and decision-making in Thailand is best expressed below:

> *Basically, I've been the one setting prices in the market place. And I price us very expensively. In a marketing conference the other day, I again got complaints from the reps that our prices are too expensive. Here we go. It's MBO time. Western concept. I said to my sales manager and the sales reps, "I'll tell you what. You people can determine the price. You can sell it at whatever you want in the market. No problem. Just make sure we meet this forecast. And I'm not going to have any say and I'll let you change the prices over the year which means you're going to have to meet on a frequent basis, get our competitive price in position, and then change the prices accordingly. But what comes with that is, you and your sales team are completely accountable for the results. We have these objectives and if we don't meet these objectives, then you'll have to talk about it and take corrective action. Now, until that point, I was basically the one accountable for our sales performance because I was the one setting the prices. Yesterday, my sales manager Mali comes to see me. I say, "Mali, you haven't changed the prices at all. All I've been hearing for the past years in that we're too expensive. I expected a great drop in price, you know, to meet the forecast. "She replies, "Well, I think the sales team is a little reluctant. We would rather have you set the price." And I say, "I think what you're saying is that you'd rather have me accountable."* (Holmes and Tangtongtavy, 1995: 82).

Some Chinese proverbs aptly describe the avoiding of uncertainty in the Thai workplace. One is "one less responsibility is better than one more" and the other is "unnecessary efforts bring unnecessary problems" (in Chu 1995: 234). These two proverbs sum up uncertainty avoidance in the Thai workplace quite well.

RESEARCH METHODOLOGY

The discussion in this paper emerged from an ethnographic study of eight systems analysts in Thai Software Houses. Eight Thai systems analysts were interviewed in Bangkok during 1998 and 1999 (Table 1 shows the 8 Thai systems analysts' background). The interviewees were selected based on their responsibilities in gathering requirements from clients, who engaged in interviewing users, and who were observing users' activities, and gathering documents to construct requirements specification for development of information systems. The principal methods for collecting data were by in-depth interviews with Thai system analysts. The questions were open-ended and system analysts had freedom to describe their experiences and problems beyond their questions' boundaries.

Each interview was set after a request was made to the system analyst's superior for permission. Each interview was recorded on tape in Thai, transcribed into Thai and then translated into English. The translations did not correspond word for word. However, the researcher had to understand Thai language perfectly to be able to pass meaning from Thai language into English language without missing any important details. In addition the researcher used another Thai person to transcribe and translate the interviews to gain a

TABLE 1
THE 8 THAIS SYSTEM ANALYSTS BACKGROUND

	Education	Type of Project	Type of Clients	Experience in IS
SA 1	Bachelor of Computer Science (Thailand)	Large and medium IS development and implementation	Private clients Government	2 years
SA 2	Bachelor of Economics (Thailand) and Master of Information Systems (USA)	Large and complex IS development and implementation	Mainly government	15 years
SA 3	Bachelor of Science (Statistic) (Thailand)	Large and medium IS development and implementation	Mainly government	5 years
SA 4	Bachelor of Accounting (Thailand) and Masters of Computer Science (USA)	Large Re-engineering and IS development and implementation	Private clients Government	13 years
SA 5	Bachelor of Information Technology (Thailand)	Large and medium IS development and implementation	Private clients Government	5 years
SA 6	Bachelor Business Computing (Thailand)	Large and medium IS development and implementation	Government Educational institutions	4 years
SA 7	Bachelor of Medical Science (Thailand) and Master of Information Systems (Thailand)	Large and complex IS development and implementation	Private clients Government	5 years
SA 8	Bachelor of Computing (Thailand) and Master of Information Systems (Thailand)	Large and medium IS development and implementation	Private clients Government	10 years

high level of correspondence about meaning of the text in English. Reporting the details of each case in Thai would be more accurate. However, where meaning is necessary, appropriate English words have been used.

The approach taken was essentially ethnographic. Ethnographic research takes the researcher close to the 'reality' of people's lives (Becker and Geer, 1960). It allows the researcher to develop theory from observation and practice (Hammersley and Atkinson, 1983), and to test theory (Ball, 1981). Ethnography, as both the stimulant and evaluant of theory, requires contextualisation. Essentially this means that through participant-observation data, the researcher is attempting to generate data from the perspective of the individuals being studied (Wagner, 1990). The ethnographic research done for this paper reflects the constructions and observations of many people involved in the Requirements

Engineering process, including ourselves. The research uses vignettes in the style reported in Stake (1985) to illustrate issues which emerged from the detailed evaluation of the texts created from the interviews. Such vignettes are only representational but are highly suggestive of what was clearly apparent in the analysis.

To counteract these perceived deficiencies, Willis (1977), Maseman (1982), Thomas (1983) and Angus (1986) argue for critical ethnography that seeks to describe how the actors in social groups or settings create meanings that generate practice. To Thomas (1983: 485), critical ethnography 'suggests a sensitivity to the issue of the subject-object split or dialectic analysis'. Critical ethnography examines social structures and social interaction as being in a state of 'becoming' and not in a state of 'what is', which traditional ethnography had searched for (Benson, 1977; Simon, 1983; Angus, 1986). For Maseman (1982: 9) "the critical approach is distinguished from interpretivist approaches primarily by their connection to theoretical perspectives which are linked to a general theory of society and a concept of social structure which exists beyond the actors' perception of it". Angus (1988: 74–75) summarizes the nature of a critical approach to ethnography, stating that "a critical ethnography, as opposed to conventional ethnography, insists upon an on-going awareness of the fundamental human agency of social action while simultaneously remaining aware that the subjective consciousness of individuals may conceal underlying structural relationships which are capable of distorting and limiting, or of enhancing and enabling, negotiated systems of meaning".

Critical ethnography, then, challenges the motives behind what is apparent. The political motivation to change or reproduce society will not always be reflected in the rhetoric of requirements statements. Rather the motivation is often hidden, complex or obscure. It is often understood only within the context of cultural practice and ritual. To find out what will and will not work in Requirements Engineering there is a need to examine the subjective feelings and motivation of those involved. There is also a need to find the 'hidden' and subjective components of human social action as they engage, construct and reconstruct requirements throughout the Requirements Engineering process. However, in research of this kind the researcher must also attempt to uncover some of the limitations related to his/her own perceptions and experiences and culture. As Meek (1987: 196) states "fieldwork filters and translates what is observed according to his/her own values, biography and intellectual training and temperament".

THE INFLUENCE OF DECISION MAKING PROCESS ON REQUIREMENTS ENGINEERING IN THAILAND

Thai organizational structures have a decided impact on decision-making processes. Thai organizational structure is perceived to be taller than for similar organisations in North American and the European countries (Hofstede, 1991; Trompenaars, 1993). These differences in organizational structure between Thailand and other western organisations

have come to the notice of western people who have worked in Thailand (Holmes and& Tangtongtavy, 1996).

The 'tall' organizational structures, characteristic of Thai organizations, were claimed by some researchers to result from the implicit concept of the 'superior-inferior' relationship and from the levels of seniority within Thai organisations (McKenna, 1995; Thanasankit, 1999). The eight Thai systems analysts each reported in their stories that the existence of a 'tall' organizational structure within their client companies resulted in the creation of two committees to oversee the development of new or changed information systems.

The first was a development committee, which the systems analysts worked with closely. The development committee was the first point of contact and reference for the systems analysts during systems development. This committee was made up mostly of middle level managers, heads of departments or units and, sometimes, operational level users. It was usually quite large and representative of where the projects had impact in the organization. The development committee assisted with:

- providing the systems analysts with requirements;
- arranging users for systems analysts for elicitation;
- providing the systems analysts with feedback about the requirements specification;
- assisting the system analysts with administrative tasks; and
- providing assistance for the systems analysts when problems arose.

The second committee, the steering committee, had minimum involvement during systems development. It was made up of senior level management and was always small. The steering committee became involved when the development of the information systems had reached a stage where approval was needed to increase costs to include additional features or functions, which were not covered previously. For example, Khun Dao (SA 7) noted that:

> *Khun Dao (SA 7):*   *in any project there was a development committee, which we normally worked with during the development of new systems. However, there was also another committee, called the steering committee, which was the 'top most' (sic) committee. The members of this committee tended to be at the executive level. They only came down to solve serious problems like conflict between the development committee members or to make decisions that could not be made by the development committee members such as approval for additional costs in the development of the systems.*

Involvement also happened when the development committee had become immersed in numerous conflicts about issues, which the members could not agree upon. Khun Thep (SA 6) said:

> *Khun Thep (SA 6):*   *for example at a committee meeting, they presented me with requirements and functions that were impossible for me to develop with current technology. Even though, the decision was reached, I knew that a lot of the members still had doubts with the requirements given, similar to me (sic). I passed the problems upward to their superiors and explained to them why the requirements were unrealistic. It was then left to the President to explain the problems about the requirements to the committee so that they could change their mind without anybody loosing face. So it was a very tricky process.*

These committees mirrored the expected and accepted hierarchical structure of Thai organisations. There was place and rank for everyone working on the systems. Committees and individuals had rank and the nature of human agency within Thai organisations was based on their rank and position within the organization. In requirements engineering, where the process was always outsourced, the link between the client and the consultant was formalized by creating new structures, which were representative of all other structures and which existed in the client organization. Their establishment was implied in any contract. None of the contracts that existed in exemplars described the Thai systems analysts in this study had any mention of committee establishment in them. This notion of rank is informed and constructed within Thai culture. As a result delegation of responsibility moves upwards to points of highest rank, rather than being delegated down to lower ranks.

The long decision-making processes began when the requirements specification or the prototype systems were presented to the development committees for evaluation. This evaluation was done following a presentation from the systems analysts. The feedback provided by the committee members was used by the systems analysts to improve the requirements specification or the prototype systems. This process was repeated until the development committee members were satisfied with the requirements specification or the prototype systems. It reflected the iterative nature of the requirements engineering processes described by each of the eight Thai systems analysts. This process is summarized as a generalized requirements engineering process (Figure 2).

Figure 2 shows that the Thai systems analysts had 2 paths to follow. The first path (direction of the path by broken lines in Figure 2) was progress on to specification and then designing the prototype for validation with their clients. The second path was where the systems analysts elicited requirements from their clients and then progress onto design. Prototyping systems were then built for validation with their clients and used for gathering more elicitation and validation.
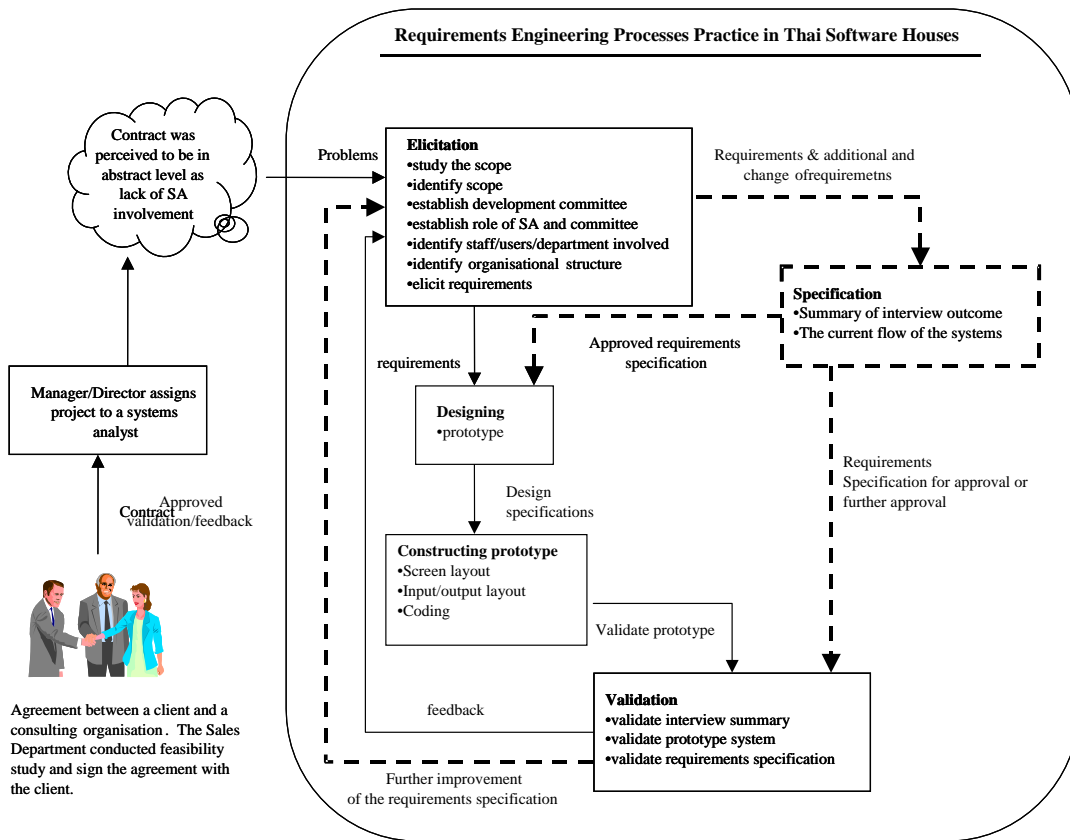
Figure 2. The requirements engineering processes practices by the Thai systems analysts

This difference is important for managing project development in organizations and important for the management of information. The requirements engineering processes employed by the systems analysts in Thailand were different from the requirements engineering documented in the existing literature (Figure 1). Even though, the requirements engineering community has not agreed upon one accepted suggested framework for practicing requirements engineering (Loucopoulos and Karakostas, 1995), one can observe that the requirements engineering processes practiced by the Thai systems analysts were unique. The uniqueness includes:

- the incorporation of the design and construction of prototyping;
- the requirements engineering processes running parallel with the systems development processes; and
- the amount of attention paid toward the requirements specification documents and process was far less.

These iterative processes in making decisions about requirements for projects were a reconstruction of the ways Thais worked and communicated. There was an expectation of new requirements and expectation of constant iterations, as that was 'normal practice' in all Thai contexts where bureaucratic, hierarchical decision-making was an integral part.

After the development committee members were satisfied with the requirements specification or with the prototype systems, they then passed the requirements specification or the prototype systems up to the steering committee for comment and/or final approval. Typically, additional requirements were identified and the iterations began again and continued until both sets of committee members were satisfied. This process resulted from fears within Thai organisations about making mistakes. Thais are not risk takers and they do not want to create any uncertainty. One way to avoid risk and uncertainty was to begin a circuitous, iterative process until all risk and all uncertainty is eliminated.

The approval of the requirements specification or the prototype system then was a lengthy process. In most Thai organisations, where highly developed organizational structures were in place, the Thai systems analysts were presented with long waiting periods to get approval for the requirements specification or the prototype system. This slowed down the systems development processes and hindered the systems analysts ability to move onto the next stage within systems development. Sometimes the systems analysts needed to move onto the next process without approval for the requirements specification or the prototype systems, just to maintain continuity and speed up development and implementation. For example Khun Arun (SA 3) noted that:

> *Khun Arun (SA 3):*   *If the requirements come from just one person, then they have to set up a meeting to check it again to see if anyone else wants anything more or not, or to see if we can change it to a better system.*
>
> *Interviewer:*   *If they are the head of the project, they still do not want to sign off the project? Do they have to go through the committee first?*
>
> *Khun Arun (SA 3):*   *Yes, they have to ask their own committee first, so they can tell us that the requirements are ok (sic) to progress on. You can do that….It is slow.*

The impact of this upward delegation process, which is an implied aspect of these committee structures and the hierarchical nature of Thai organisations, is also supported by Toews and McGregor (1998: 178) in a review on the status of managers in Thai organisations. They state that:

> *The Thai office hierarchy puts you on a higher status than you may have been used to at home (the western countries where the manager comes from). You will be responsible for*

more decision-making than you are accustomed to, as Thai staff will usually not take the initiative. They feel that the taking of initiatives is the domain of the boss because of his or her education and experience.

It can be suggested that there are two reasons for the slowing down of decision-making and communications for approval of the requirements specification and the prototype system in the Thai examples. The first reason is that the Thais tended to avoid making decisions, when they cannot predict the outcomes. Therefore, Thai culture is more likely to avoid making decisions where there are uncertain outcomes (Hofstede, 1991; Thanasankit and Corbitt, 1999b; Trompenaars, 1993). The second reason for the slow decision-making is that Thais decision-making invariably involves an upward delegation process (Holmes and Tangtongtavy, 1996; Thanasankit and Corbitt, 1999a, b). These two elements of Thai culture impact simultaneously, as one element appears to cause the other to happen.

The process of passing decision-making up through organisations confirms an earlier proposition that Thais avoid making decisions if they can, even though they have the full power to make them. The Thai subordinate usually does not feel comfortable with making decisions. As mentioned earlier, decision-making is considered culturally to be their superior's duty. Thais invariably perceive that making wrong decisions may result in the decision-maker losing face. The Thai systems analysts were aware of this. For example they said:

Khun Prasit (SA 5): *They are afraid to make decisions, even though they have the power. If he/she makes the decision, the responsibility is very big (sic) for them. Therefore, they were afraid to make any decision. The taller the organizational structure, the longer the decision making process took. This then led to slowing the project down.*

Khun Julee (SA 2): *It was not our fault. It was within our client's organization. It was as if there were internal problems. ... the Director wanted them to take responsibility, which they did not. They wanted the Director to take responsibility and look after the system, understand the system, and validate the systems specification and design. Therefore, the other staff tended to avoid these responsibilities...*

Interviewee: *Were they afraid that if the validation was not right then they had to take the responsibilities?*

Khun Julee (SA 2): *Yes, they were afraid of that.*

Thais then prefer to pass decision-making upwards as they believe in the knowledge and experience of management. Managers are paid to take responsibility. Toews and McGregor (1998: 180) suggest that:

> *Thai Managers make unilateral decisions and they expect the expatriate managers to do the same. This is a double-edged sword: you are expected to be aware of all problems and also take responsibility for bad results.*

This process is similar to responsibility being passed around a television organisation in Hong Kong, where subordinates did not want to take responsibility and passed that responsibility upwards (Burn et al., 1997). This process of upward delegation as applied within the Thai systems analysts' organisations, also resulted in significant delays in the development processes. Khun Prasit (SA 5) stated that:

> *Khun Prasit (SA 5):   ... if I come out with problems that I could not solve I consulted the project manager (Khun Prasit's superior) or the Managing Director, who I called Ajarn (teacher). Our organization is not a big organization; therefore, I consulted with Ajarn a lot, because after the meeting with Ajarn and the project manager, good solutions emerged. Therefore, it was important to solve all the problems. It was not good for me to progress on without consulting my superiors...*

One of the major tasks of all Thai managers was to make decisions. This was the expectation from their subordinates and within his/her own organization. The process was implicit within Thai culture and in Thai business and social behavior.

Making a decision about approving further requirements gathering or approving the requirements themselves was invariably, if not always, passed to upper managerial levels for decisions to be made. The situation could exist, even though the committee had agreed with the requirements identified. However, the Thai systems analysts reported that the members of the development committee often did not feel comfortable with approving the requirements because by being involved in decision-making process may bring them unwanted responsibility, confirming the conclusions of Rohitratana (1998). Therefore, by adding more requirements, the members could prevent others in the development committee from approving a system that might not meet the organization'

> *Interviewer: Do you know why they did not want to sign the project off?*

> *Khun Krit (SA 4):   Because, they did not know if they had provided all the requirements to use or not, so they were afraid that if they signed off the project and the project became unsuccessful then they did not know what to do next!*

> *Interviewer: The person who signed off the project would then be blamed.*

> *Khun Arun (SA 4):   Exactly.*

The social construction of authority and acceptance of responsibility in requirements engineering in organisations in Thailand reflects the hierarchical nature of society and more especially the construction of responsibility at the top. Since responsibility was always upwards, requirements approval was always delayed and sometimes inhibited.

The interviews with the eight Thai systems analysts demonstrated that Thai culture influenced the process of decision-making during requirements engineering. The high power distance (Hofstede, 1984) between superiors and their subordinates reflected the organizational structure. The high power distance, combined with avoiding making uncertain decisions, demonstrated that the Thais preferred to pass decision upward as they perceived that their superiors had more experience and that decision-making then was one of their responsibilities. The organizational structure also reflected the decision-making processes, which needed to be passed on from the supervisor's level to the development committees. The final decision usually came from the steering committee. As a result the decision-making processes were long.

Because of this elongated decision-making process, it was difficult to set a termination period for the requirements engineering processes in Thailand. Therefore, the timeframe for requirements engineering processes in Thailand depended on each individual systems analyst's ability to use his own intuition and judgement to progress on to the next stage of their systems development methodology. KhunJuliee (SA 2) said:

> *Interviewer: When you talked about not so a big project, how long does it take*
> *to finish the project?*
>
> *Khun Julee (SA 2):   Uh! The contract was for 4–5 months.*
>
> *Interviewer: Have you handed the project to your clients yet?*
>
> *Khun Julee (SA 2):   Actually, it will have to be longer than that.*

The need to conduct requirements engineering in parallel with the systems development processes was a response to Thai expectations of flexibility to maintain close relationships. The two processes needed to run in parallel in the Thai context to allow the systems analysts to progress onto other stages of systems development and/or requirements engineering to overcome time lags in decision-making which seriously affected the set time frames of the various projects. Even though decisions had been made, there was another problem in that it often took a long time to implement those decisions. The hierarchical nature of Thai organisations slowed the process down. Therefore, the Thai systems analysts needed to carry on to the next stage while waiting for direction from the development committee on how the decision was to be implemented or incorporated within the information system. This supports leppert (1996: 72) who states that:

> *Once a decision has been made, it may be difficult to implement. Most Thai people are not willing to be led too far too fast. They might show support for new decisions but quietly ignore their requirements.*

The introduction of prototyping as a part of the requirements engineering activities was aimed to try to get the clients to make decisions during the initial presentation of the prototype systems. The prototype systems were used by the systems analysts to reduce the time taken for decision-making. The expectation of the systems analysts was that immediate response and action by the clients would emerge in the meetings. The hope was that these suggestions would indeed supplement existing requirements and ensure acceptance and improvement of the requirements specifications or the prototype systems. Prototyping allowed the systems analysts to work on other modules of the proposed system while waiting for the approval for the modules that needed to be rectified. This was their practical response to delays in decisions created by Thai bureaucratic practices in organisations.

The long decision-making processes also contributed to the attitude expressed by the Thai systems analysts about the insignificance of the specification process. Since, in the Thai context, the requirements specification documents could not be static, and because the systems analysts could not freeze the requirements, the construction of the requirements specification was an ongoing activity throughout systems development. Khun Julee (SA 2) noted that:

Khun Julee (SA 2):	*I only draw the new design. I draw how the system will work and its operations, which I then design.*
Interviewer:	*So you are not concerned then with constructing a requirements specifications of the current system?*
Khun Julee (SA 2):	*No.*
Interviewer:	*So how do you validate your design with the client? Or how do you do your validation?*
Khun Julee (SA 2):	*We validate only the new design by presenting that new design to my clients... and by explaining to them how the new process will work, when using the prototype system.*

In summary, it has been argued here that the long decision-making process, endemic in Thai organisations, had a significant impact on the requirements engineering processes practiced by the Thai systems analysts. Their processes needed to be flexible to enable them to progress on with systems development whilst waiting for decisions to be made and approved by their clients. The hierarchical nature of Thai society and its impact on the formal relationships within social strata, even within organisations, contributed to the

acceptance of delays in decision-making. The search for certainty and the need by Thais to avoid risk ensured that any decision-making was slow and remained an iterative process until high levels of certainty emerged. To meet these demands of clients, the Thai systems analysts built prototypes as early as they could in the process. However, these delays and the existence and acceptance of uncertainty added to misconceptions within the problem domain for any project.

CONCLUSION

Formal models of decision making in requirements engineering suggest that the process is relatively ordered and commonly well structured although there is accepted in existing research that not all processes are as ordered or rational as they perhaps might be. In this paper we have demonstrated that the iterative nature of the requirements gathering process in the Thai context, appears to be influenced substantially by the nature of 'power' in Thai organisations and by the tendency in Thai workplaces and in project to avoid any uncertainty. Decisions are passed up through organizational structures to top-level management. Lower level managers avoid taking decisions and prefer those higher up take that responsibility. This was further shown to be institutionalized within a hierarchical set of committee structures where decisions were again passed upwards to the top most committee for final validation. This continual avoidance of decision making at lower levels meant that the decision making process was slow and resulted in communications processes that were invariably one way, upwards.

Thai culture does have a significant impact on the way decisions are made, on how long they take and on the nature of the communications systems in operation. The added responsibilities in Thai organisations of superior positions come with added requirements to make all decisions and for those below top level so management to accept them. For management in multinational consulting companies this is very significant. Thanasankit (1999) suggests that when compared to accepted practices, both rational and non-conformist, in Requirements Engineering, the processes discovered in Thai Software Houses was invariably unstructured. Techniques in requirements gathering were similar to those reported in the conventional literature. However, the way they approached each process was different. They were conditioned by Thai Cultural practices. The meanings ascribed to requirements gathering reflected as much about the technologies of Requirements Engineering as they did Thai Culture. Culture drove the use of the technology, rather than the technology changing the culture. However, it must be recognized that the technologies involved in systems development and management have been inculcated into the practice of information management in Thai organisations. What this study was able to demonstrate was that these technologies are absorbed into that culture in a Thai way. As a means of providing support to systems analysts entering the expanding systems development market in Thailand and to meet the needs of effective

requirements engineering practices in Thai Cultural settings it would be important for systems analysts to consider the following strategies:

Understanding Thai work practices, especially the value of face, is very important. Without respect and acknowledgement of Thai cultural practice, western systems developers who correct their superiors' opinions and generate conflict, create situations where the superior can 'lose face' or respect, which can create humiliation and anger. It is important for western systems developers to resolve conflict and engage their clients' opinions outside of meetings and at a personal level. Understanding that the decision-making process in Thai business is very hierarchical, iterative and convoluted is essential. Most middle managers in Thailand prefer not to make any decisions during the requirements gathering process. Vigilant searching up through the hierarchy of Thai business will enable better and more accurate requirements gathering. Time and patience are essential skills in the Thai requirements gathering process.

Understanding that legal contracts for systems development in Thailand are not subject to the same degree of strict interpretation as would be expected in 'western' countries is significant. Western developers should understand that the contract signed between their organization and their client is essentially a framework rather than strict guide for the work to be undertaken. Interpretation needs to be flexible. Decisions about legal contracts are as interactive and convoluted as they are about the requirements gathering process.

These strategies are important in the Thai context. However, they do not preclude other business practices and suggest that all cultures have cultural practices that must be considered. The concepts of 'face' and respect and understanding the important of 'superiority' are especially significant in all South East Asia cultures. In other Chinese-based cultures there are differences in the importance of these concepts and practices to varying degrees. Such suggestions beg the need for more in depth studies of Requirements Engineering and Systems Development in many different cultural settings to enable better adoption of accepted Requirements Engineering processes and ensure that ineffective systems development and failure of systems can be avoided and the risks associated with inefficiency and failure lowered.

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