CHAPTER 4
RESULTS AND ANALYSIS

4.1 Chapter Overview

This chapter presents overall results from the research, and more specifically, the case study. Results broadly follow the methodological steps introduced in Chapter Three and begin by detailing the organizational performance and quality issues identified at the case study. The results then show the causality of these organizational quality and performance issues via the triad of determinants, which includes work-life balance issues, cultural factors, and general day-to-day performance issues. The chapter then moves to specify critical incidents affecting the software development process at the case study, as based on the CMMI level 2 process. The second part of this results chapter then takes these work performance issues, along with the causality and CMMI process, to show the critical incidents personal mastery model (CPM). The model along with its development and corresponding justification is presented, before considering the effects of the model on the experimental group of employees. This then allows for an effective evaluation of the CPM. Figure 4.1 indicates the key steps followed within this results chapter, which are in alignment with the methodological steps of the research introduced in Chapter Three.

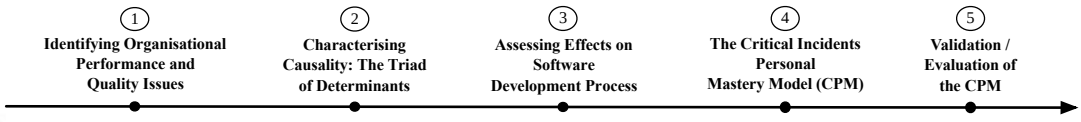

Figure 4.1 The key methodological steps of the research, which are followed in this chapter when presenting the results

4.2 Step One: Identifying Organizational Performance and Quality Issues

As illustrated in Figure 4.2, the first section of the results reflects the first step of the methodology, which aimed to identify the problems facing employees in achieving the desired level of work performance.

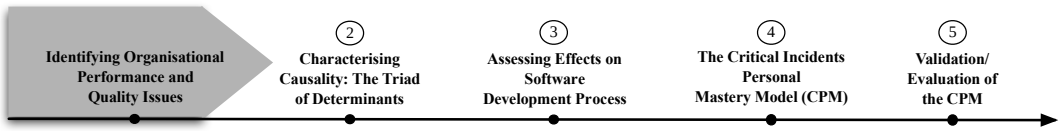

Figure 4.2 The first of five steps in the results, presented in accordance with the methodological steps outlined in Chapter Three

As described in Chapter Three, the organizational problems were identified from interviews with the German expatriate managers, and the German managers from HQ. Problem identification was according to the interview methodology detailed in Chapter Three, section 3.7. Four key problems were identified by managers, and are shown in Table 4.1, and described below in detail with specific examples.

Table 4.1 The four key problems facing German managers when employing Thai employees, along with the effects on work performance

Key Work Problems of Thai Employees in German-Thai Software Development Projects		
Issues	**Definitions**	**Improvements Required**
1. Procrastination	The work is always postponed with no progress.	Managerial capability
2. Unfinished work	The work is unsuccessfully carried out	
3. Work flaws	The finished work required improvements because it does not meet customers' requirements.	Technical capability
4. Ability and attitude toward learning	No enthusiasm toward learning at work. This leads to the inability to balance work and life (e.g. stress/boredom, which in turn leads to low loyalty and early resignation)	Learning capability

As shown in Table 4.1, the key work problems are procrastination, unfinished work, flaws in the work itself, and finally, the ability and attitude toward learning. Naturally, these problems are wide in scale, and are made up of other issues and problems. In terms of procrastination, managers reported that deadlines to finish assignments are always deferred. Managers suggested that a significant problem they encountered when asking about work accomplishment was the frequency of the answer given by employees as "almost done." In relation to procrastination, Thai employees are also commonly unable to finish the final product at all. Finished products were frequently not completed satisfactorily, and often required corrections to meet customer demands. For example, in the interviews, one manager stated:

"...for the software production for the headquarters in Germany, there are three dimensions of excellence: first to produce a quality software product, second the creativity and good ideas of employees who work on the product, and last but not least, is to deliver the product on time. The software projects in particular are very likely to be delayed and so usually it causes a lot of frustration for other parts of the company..."

In terms of the second problem of unfinished work, there were common reports of work never being completed, and workers remaining silent rather than expressing their inability to complete a task, or asking for help when necessary. For example, a manager stated that:

"...basically you'll see when somebody is not delivering on time, when somebody appears to have a problem, but remains very silent...because we want our staff to communicate when they have a problem. So, they should not hide and try to solve it quietly, they should go and ask is there anybody that could help with that, anybody done that before. So, what is suspicious to me is if somebody is always smiling, but very quiet and not delivering on time, working quietly on some problems. He thinks he can solve alone and at the end gives up and just quits the job without any result."

The third key issue from the perspective of management relates to work quality not meeting expectations and containing unacceptable flaws. In the interviews, a manager recounted an example of such an issue:

"...at the beginning, we had a lot of problems, mainly due to lack of specifications and there was also no kind of questioning from the employees since they didn't have the necessary information. As a result, they tried to create the product, but it was not what the customer wanted."

The final issue identified by managers, and perhaps one of the most significant, was the attitude and ability of employees to learn. This is significant as it specifically relates to the development of the CPM, which is the focus of this thesis. The management attitude toward this problem can be summarised as a belief that employees lack vision in their work, have a skewed perspective on work-life balance and a poor ability to learn new information and apply it in their work. One manager summarized this problem, as well as the attitude sought in their employees:

"...working is not only about skills. How to program [software] very much depends on how much employees really care, how eager they are, and how willing they are. It actually depends less on the degree they earn at university. It depends on whether or not they think about the project when they take a shower in the morning, so they have to come out with the first solution for the problem which they are working on while showering ... you cannot be extraordinary when you just work 9 am. to 5 pm. When at the office, if employees spend fifty percent of the time on Facebook and actually you're thinking about your next vacation all the time. So if you don't really care about the project, if you don't really have this urge to be successful. There's no way to have this urge to be successful with your project. You have to be passionate because then your brain focuses on the work and then really good results come to exist."

The German manager's view in the above example indicates that managers believe that the employees' perspective about their work and life (work-life balance)

has significant impacts on the quality of work output. These results link to the triad of determinants investigated in the second stage of the methodology, the results of which are described later in this chapter. It is clear that for knowledge workers, the way in which they think about their work and manage their lives, has a significantly greater impact on a firm's performance than in the more traditional and less knowledge intensive industries. Another example from management corroborates the need for other qualities in knowledge workers, as well as the prerequisite technical skills. A manager reported that:

"…of course, we need employees with good technical skills. But we think the technical skills can always be learnt. We look not for the personal skills now. We want the employee to be clever in his or her ability to learn. We are not looking so much for what the employee can do when he starts with us, but we take a look on how quickly they can learn and if we see that they learn quickly then we know that it's a good indicator of whether or not they are the right employee. Employee loyalty is also important for us because we don't want employees to come to us just to learn, and then leave and work as freelancer when they have gained experience. We want employees to stay in a long term relationship with the company."

Poor ability and attitude to learning ultimately translate into prolonged timescales and low productivity, which affect the company's competitive advantage. The examples given by the German managers in the interviews demonstrate that the probationary employment period is of critical importance to the firm in order to understand employees and ensure they have the ability to learn the right perspective toward work-life balance, and can offer loyalty to the firm.

These four main work and performance issues identified by German managers result in a vicious cycle of low employee satisfaction and work quality at the case study firm. For example, when an assigned project is not accomplished by the due date, the cost of labor increases and company profit is adversely affected. Employees consequently receive complaints from bosses. The resulting attempts to finish the job and associated corrections leads to a strenuous working atmosphere. This psychological pressure can lead to employee resignation, and the subsequent

instability in the workforce is potentially damaging to the firm and its customers. As a result of this, management agree more time and/or funds must be invested in the recruitment and training budget. Results show that without appropriate consideration of recruitment and the probationary employment, the risks that follow include a time-consuming recruitment and training process, and further uncertainty during new employees' probationary period. In turn, this situation results in individual working capabilities that do not support organisational commitments, thus affecting company productivity and individuals' work stress. The identification of these work issues raises the subject of how to nurture employees and improve the quality of their work, especially during the probationary period of employment. The next stage of the results therefore seeks to identify the causes behind the issues employees face, and from the perspective of employees as well as management.

4.3 Step Two: Characterizing and Understanding Causality of Work Performance Issues: The Triad of Determinants

Figure 4.3 illustrates how the results presented in this section fit within the overall structure of results and the methodological steps outlined in Chapter Three.

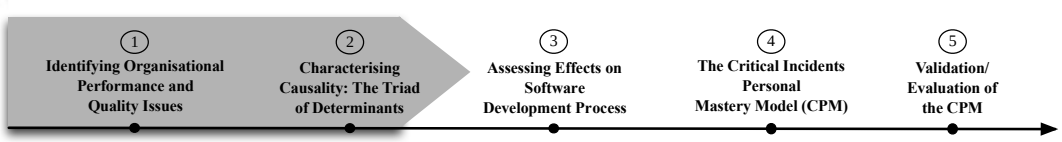

Figure 4.3 The second of five steps in the results, presented in accordance with the methodological steps outlined in Chapter Three

The causes of the problems employees face can be categorized according to three main factors, termed the triad of determinants (Chapter 3, section 3.9). The triad of determinants (illustrated below in Figure 4.4) shows each of the factors are inextricably linked in terms of affecting employees' work performance, particularly during their probationary employment period. The results from the employees' perspective are presented below in sections according to the triad of determinants. Results are based on the interviews with senior software developers, analysis using the theory of Hofstede's cultural dimensions, and finally, fishbone analysis to

structure the general day to day work issues identified by employees (see Chapter 3, section 3.7 for detailed sample group information and methodological information).

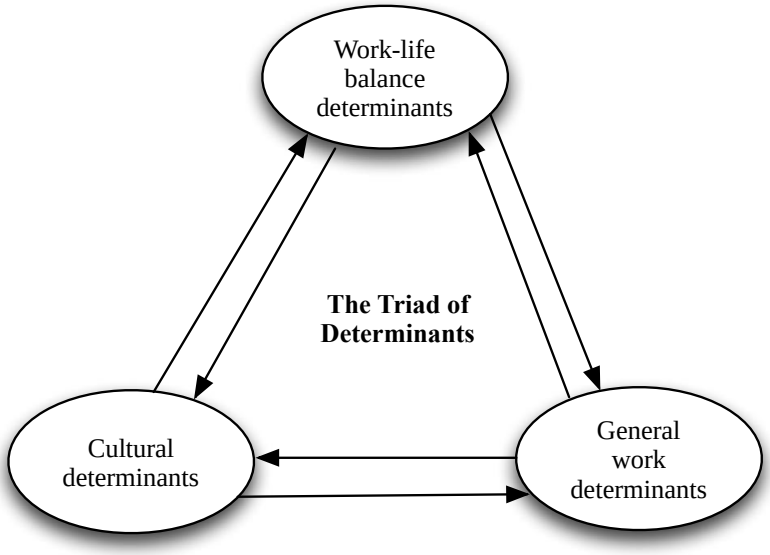

Figure 4.4 The three factors of causality making up the triad of determinants

4.3.1 Work-life Balance Determinants

The literature and theory presented in Chapter Two introduced the importance of effective work-life balance for knowledge workers, particularly expressing the need for understanding, and ensuring an effective work-life balance in the younger generation of knowledge workers. Chapter Three continued this by showing how work-life balance could be an integrated part of developing the CPM in this research. Finally, the results presented in the first section of this chapter have shown by example from German managers how they view work-life balance, and how an effective work-life balance can have significant impacts on the performance of young knowledge workers.

In this section, work-life balance definitions and perceptions from the point of view of the Thai software developers' are discussed. These results then provide the necessary input into the development of the CPM. Employees' perspectives on work-life balance are grouped and presented according to these attitudes and perspectives.

Three distinct employee attitudes to work-life balance were discovered. These are shown in Table 4.2. In the results, T stands for each Thai software developer from the first to the tenth respondent. The three categories of work-life balance attitudes found were as follows:

- a work-life balance attitude focusing on both inside and outside the workplace
- a work-life balance attitude focusing on an organizational setting only
- a work-life balance attitude focusing on issues outside the workplace

Pertinent quotes demonstrating work-life balance opinions were derived from responses in the questionnaires. These quotes along with the three categories of work-life balance are shown in Table 4.2.

Table 4.2 The three distinct attitudes to work-life balance as captured by the employee questionnaires, and the meaning of these attitudes exemplified via sample quotations

Group 1: Work- life balance including both workplace and private life settings	
T2	"to spend life happily and work happily; not too much concentration either life or work"
T3	"have enough time for a private life; have enough time to accomplish work; have happiness in life and work; work on assignments that fit my favourite, talent, responsibility, wages; begin a day with a thought about what can I carry out; not to live a life without goals."
T6	"balance lies between daily life and a job that is enjoyable with good earnings."
T7	"to allot enough time for work and rest; sometimes to put energy into work is necessary"
T8	"to have time for family and provide good results at work"
T9	"work fully and rest fully"
Group 2: Organizational work- life balance only	
T4	"to have a work balance that contains no working pressure; relaxation is required during the job because duties and responsibilities can become overloaded and quite difficult to deal with"
T10	"to allot time correctly; should not take life into work"
T11	"to work in a good place, to have a position that fits myself; to get along well with colleagues and bosses"
Group 3: Work-life balance in private life setting only	
T1	"have freedom to enjoy life, work less and earn a reasonable income, have free time to rest, to stay with family and friends"
T5	"work that does not intrude into a private life"

Thai software developers in the first group demonstrate that work-life balance for them contains two spheres: the workplace and private life. The second group expressed that work-life balance for them focuses on the organization only, whereas the third thought that work-life balance is focused only on their private life. Figure 4.5 illustrates the three main attitudes and perceptions toward work-life balance. In scenario A, the concept of work and life are in a balanced state of equilibrium. In scenario B, life dominates and the equilibrium is tipped out of balance causing knowledge workers' productivity to fall. Scenario C indicates that for some employees, work dominates and tips the work-life balance out of equilibrium. Achieving the work-life balance equilibrium shown in scenario A is particularly difficult during employees' probationary period when they are in a new environment and do not know what is expected of them. The common result is that in the probationary period knowledge workers experience a work-life inbalance represented by either scenario B or C.

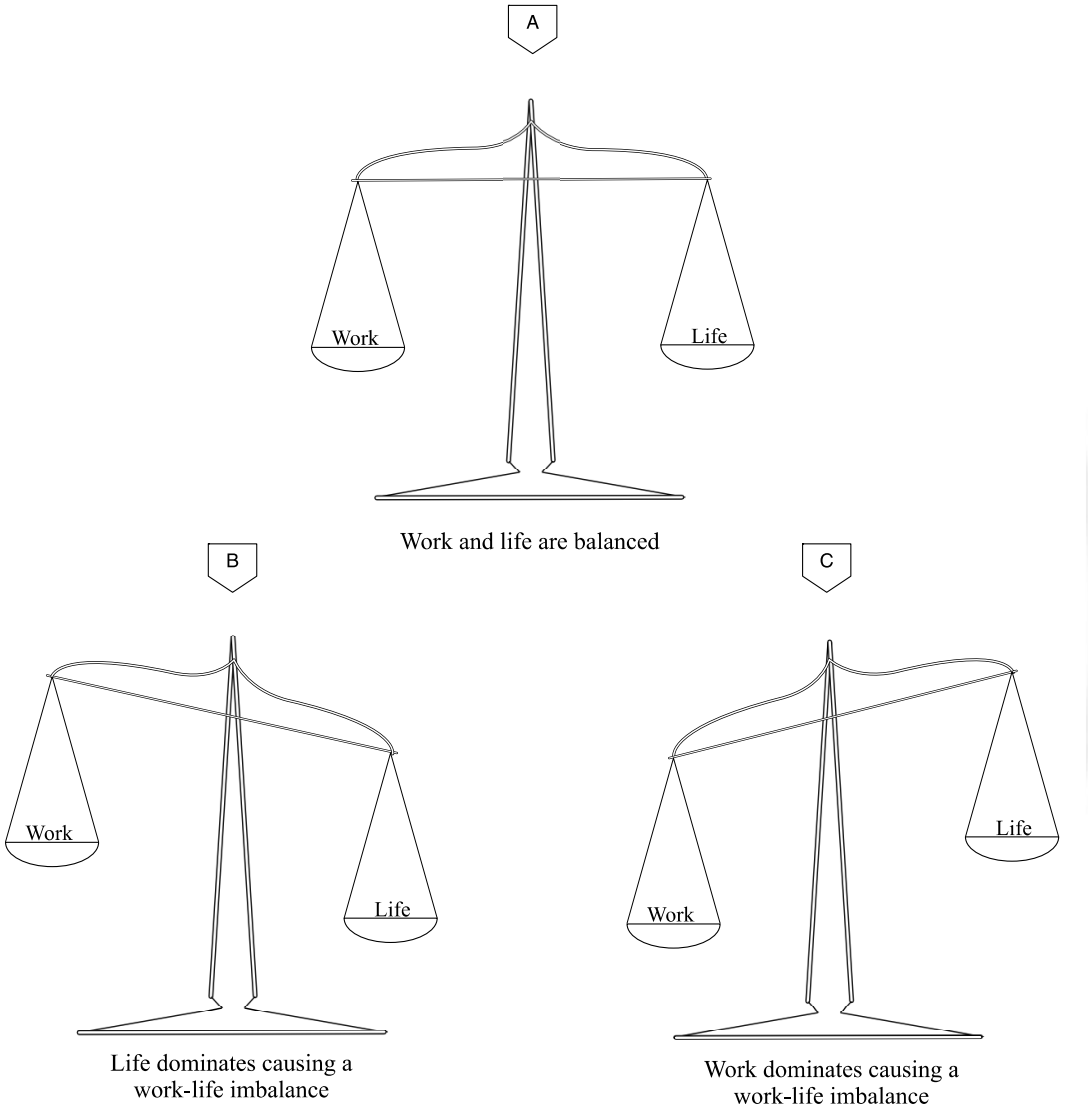

Figure 4.5 The three scenarios and perspectives towards work-life balance at the case study firm

Based on the three different groups and their perspectives regarding the meaning of work-life balance, the ten Thai employees made various decisions to leave or remain with the company. Thus the attitude toward work-life balance, and how the firm manages this, has implications for employee loyalty. Work-life balance is thus a critical aspect to consider during the probationary period, as understanding and achieving an appropriate work-life balance early in a knowledge worker's career will ensure the most productive work, and will also encourage loyalty to those firms who understand and recognize the importance of work-life balance. The loyalty of the

software developers based on their attitudes toward work-life balance are outlined below and shown in Table 4.3 in terms of their decisions to stay or leave the company based on issues of work-life balance.

- **The decision to stay**

The Thai software developers made decisions whether to continue working with the company because of factors of work-life balance within the organization.

- **The decision to leave**

The decision-making process to leave is influenced by work-life balance within the organization as well as the work-life balance outside the workplace.

- **Hesitating when making the decision to leave or to stay**

Decision-making to leave or stay can be influenced by issues of work-life balance being skewed too far toward life or too far toward work. Thus showing a need for work-life-balance considering both organisational factors and life outside the workplace to achieve true work-life balance equilibrium.

The three dimensions and attitudes toward work-life balance all affect the decision making process when software developers decide whether to leave or remain with the company. According to the questionnaire results shown in Tables 4.2 and 4.3, the comments from respondents show that their decisions to leave or stay are affected mainly by organizational work-life balance factors such as administration, fair treatment, employee recognition, the provision of challenging assignments in order to gain work experience, assignment engagement, teamwork, the relationship with superiors, and the working environment. This was distinct from the attitudes toward work-life balance related to life outside the working environment. Work-life balance factors inside the working environment often signify personal demands, for example, to earn more money or to start one's own company.

Table 4.3 Decisions on whether to stay or leave the company as captured in the employee questionnaire results and the associated relevant quotations

Decision to stay because of work life balance within the organization factor	
T11	"I work happily because the job I engaged with is alright."
Decision to leave because of an organizational work life balance	
T1	"I want to work with a company that has a systematic administration, a fair treatment, and a regard for the importance of employees. Alternatively, I want to establish my own business; to become a self- employed"
T4	"sometimes when I don't have an assignment to do or when I feel bored, I want to work in another field that I am able to work and learn so that I can increase my experience and gain new knowledge from work."
Decision to leave due to balancing work -life outside the workplace	
T9	"I want to have an increased salary or to become self- employed"
Decisions to leave or stay due to the organizational work-life balance	
T2	Leave: "I cannot stand the unfair treatment anymore" Stay: "I love my job and I like it more everyday"
T3	Leave: "I have worked for a long time. Sometimes I feel that the work is repetitive; not varied. I want to experience with types of assignments. Stay: "there is excellent teamwork; I get along well with bosses who have a good leadership – not egotistic. Foreign bosses are friendly and sympathetic. It makes me feel confident in this positive atmosphere and environment much more than when I work with a Thai company. Moreover, I have a close and nice relationship with all my Thai friends."
Decision to leave or stay due to work-life balance outside the workplace	
T10	Leave: "salary is not enough for my personal expenses" Stay: "I like this company"

The evidence shows that for Thai software developers, work-life balance has various alternative meanings. The German management can therefore adopt employees' work-life balance perceptions and reflections to improve strategies related to the management of their knowledge workers. When the employees decide that they want to continue working with the company, and thus demonstrate loyalty, this

indicates that either their organizational work-life balance, or the work-life balance in their private sphere supports employees' work and life happiness. A foreign manager can therefore feel assured in terms of retaining these knowledge workers.

The group who indicated uncertainty about leaving or staying indicates that there might be issues with work-life balance, which need to be identified and addressed. However, these problems may be serious enough to warrant immediate resignation of the employee. If the problems are recognized and solved in time, employees may be willing to continue working with the company due to a positive relationship between the workers and the company.

Foreign managers should be especially concerned about the 'at risk' group who intend to leave. The root cause of the problems should be seriously investigated and addressed to retain knowledge workers. This is squarely the domain of the development of the CPM in this thesis, and the identification of these work-life balance attitudes within the triad of determinants allows for a comprehensive understanding about what is causing employees to perform poorly, or what other factors might be affecting their work-life balance.

Considering the definitions of work-life balance given by group 1 and group 2 (see Table 4.2), the reflections of the respondents indicate that working creates a sense of self-worth. This is evident from the perspective of Thai culture, where having a profession provides meaningful and honorable pride. To work and be an expert in a particular job helps to define that person. Such individuals are well known in their profession and will be greeted by an appropriate designation as opposed to their real names. Examples would be "*Khun mor"* (literally 'Mr/Ms doctor') or "*Khun kru"* (literally 'Mr/Ms teacher'). The professionals discussed in this study, are known as "*Nakpattana-software*" ('software developer'). In this regard, Komin (1991) asserts that Thais consider social recognition as one of the main motives for achievement in their lives. It is also interesting to note that in a developed country like Germany, people are generally not referred to by the profession they work in, although some German family names represent what one's ancestors did. For example, "*Schmidt*" refers to people who work with iron, a "*Muller*" is a person who grinds grain, "Meier" is a person who collects milk, a "*Schuhmach*er" is a shoemaker, a "*Kaufmann*" is a businessman, and a "*Schneider*" is a tailor. Hence, the perceptions towards work-life

balance reflect how people judge the value of their work, and depend significantly on where they put the weight of balance, on either their work, their private life, or even on both. This also highlights the relationship and importance of cultural factors on work-life balance. Thus, an understanding of the cultural determinants was critical to understand why certain aspects of work-life balance existed, and how they affected performance of the Thai employees working under German management.

4.3.2 Cultural Determinants

Understanding cultural determinants was critical to ascertain the factors affecting knowledge workers in their probationary period, and beyond. It was important to consider how the cultural relationship between Thai employees and German management affected work performance. As noted earlier, the cultural determinants are also linked to aspects and perceptions of work-life balance. This illustrates the connection between cultural and work-life balance factors in the triad of determinants affecting work performance.

As outlined in Chapters Two and Three, culture is considered as the shared and collective learning of a group, which influences their response in different circumstances. These ideas are embedded into organisational culture (Pinto, 2010). When people from distinctive backgrounds work together, they share a set of assumptions, beliefs, values and norms, which represent the main composition of their work surroundings (Newstrom and Davis, 2002). In the case study, approaching work issues through the lens of differing German and Thai work styles shows that culture has significant impacts on work performance, often resulting in cross cultural discontinuities, as shown in Figure 4.6.

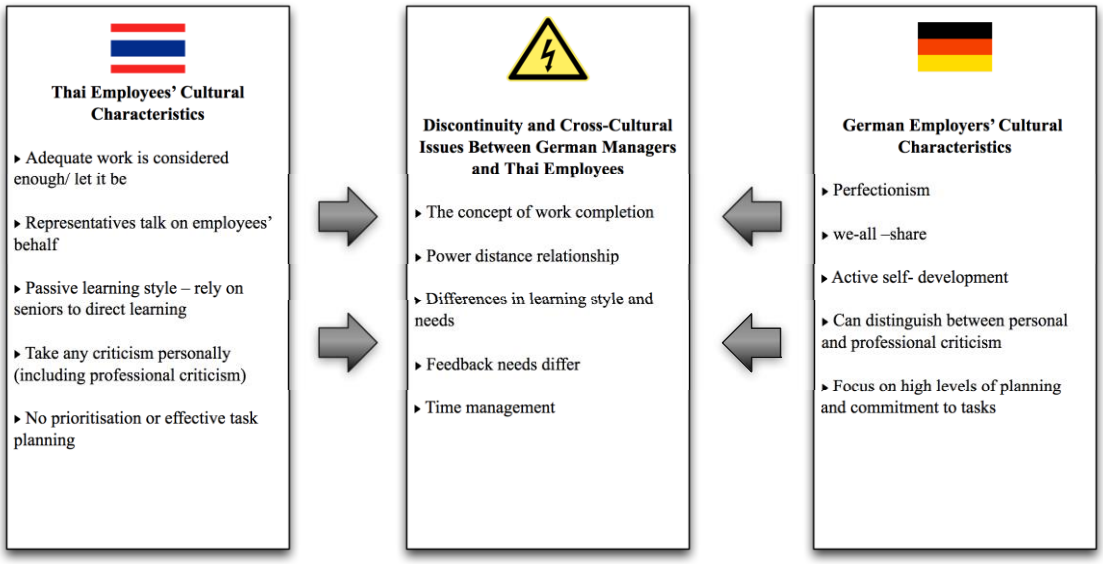

Figure 4.6 Particular cross-cultural aspects between German managers and Thai employees at the case study firm, and the resulting c ultural discontinuities

The cultural discontinuities identified in Figure 4.6 are now discussed in more detail based on the responses from the Thai employees and German managers at the case study firm. The issues are then contextualized based on Hofstede's (1984) cultural dimensions theory and other theoretical aspects of culture.

4.3.2.1 Issue 1: The Concept of Work Completion

When the Thai software developers sent completed versions of their software products to be tested by the German software team at headquarters, the German team discovered that the products were not fully functional, and not at the expected level of completion. The software products had significant aspects missing, or were simply incomplete. This highlights that the concept of product accomplishment is different between Thai and Germans. One German software developer at the German headquarters elucidated this by stating:

"I think the mindset for what is done by a developer is different from what a customer expects. I think for a developer, sometimes what seems to have been done is where I have changed a line of code and committed to the changes. Then if somebody

checks it and it's not working, then this is a problem. So I think this is really a difference in definition of what is done and complete. So they are changing and fixing the problems I have discovered, but they are not checking if it is working properly. Maybe we will have to train and teach them about our definition of what being complete means."

As a result, before sending the software product to HQ, the Thai software developers must ensure that the product reaches the standard of what customers want and what they consider complete. This is also to achieve effective quality assurance. One German team member expanded on this issue by noting:

"We have talked about this, but we need to make sure we all have the same definition of what being done means and the same definition of what quality is. Maybe here in Berlin we have a different expectation about the quality of what is expected in Chiang Mai. Maybe in Chiang Mai they have their own definition of what quality is. We need to make sure we have the same understanding of what quality is and what being done means. If we have the same understanding then we can all move in the same direction and not in different directions."

Another German team member hypothesized ways to overcome the different cultural definitions of work completion by recommending that Thai team members utilize checklists to ensure quality and completion before sending the completed product to test in Germany. The team member suggested that:

"Maybe it would help to give them more structure. To have one person, for example, that employees can talk to if there is a problem or if they don't understand. Maybe also to have a defined workflow. For example, if there is a software bug this must be solved…and before you give it to us you have to install it on the telephone [system] - a real installation, and double check it, because that is what we are doing and we are finding they are not working. So we really need a standard where if the work is marked as done, it must be really checked and completed. Not just on your

computer, but the application must be exported onto the real device. So we could use a checklist."

4.3.2.2 Issue 2: Power Distance Relationship

The second cultural discontinuity occurs due to differences in communication styles and expectations between the Thai developers and German managers. For example, when meeting and discussing work issues, either in the office in Thailand, or via teleconferencing, it is evident that most Thai software developers feel reluctant to share knowledge. They often nominate only one or two representatives of the Thai team members to speak on their behalf and the rest of them listen and nod their head to show agreement. In contrast, Germans in the firm are keen on sharing and discussing various issues. Part of the communication problem relates to a language barrier leading to lack of confidence, and part of the problem is based on the cultural dynamics of communication between Germans and Thais. One German team member responded to questions about communication as follows:

"Well I always communicate with A or B and C their English is really good, but there is a problem with the people who don't speak English as much. For example X, who is new in the team…I have not spoken to him much, but he seems a little afraid to speak English. If we have group meetings or videoconferences, A, B or C are usually talking and the problem lies with the people who cannot speak English very well. They are not talking, and this means they are not communicating. So you only have one or two people who are communicating with us and these people have to communicate for the others. So we will have fewer problems if people can speak more English or German."

4.3.2.3 Issue 3: Differences in Learning Style and Needs

German bosses encourage Thai employees to use creative thinking when accomplishing work tasks. However, this is not always successful, especially when dealing with junior workers. Thai employees like to follow commands rather than thinking about how to finish work on their own. As a result, Thai employees can learn

more about work when their superiors pay attention to what they are doing, and provide guidelines. A senior Thai developer confirmed this:

"Learning is somehow involved with cultural issues. Thais work mostly in silence and keep quiet despite difficulties. They try to sort out the solution, but with an empty head. However, when I sit and advise them closely, they seem to work with more confidence and even more quickly when I show them working steps such as 1,2,3,4,5."

4.3.2.4 Issue 4: Feedback Needs Differ

When giving feedback, Germans are straightforward in expressing their concerns and comments. If they find that Thai workers miss some points in their work, they openly discuss it and expect changes to be completed. Germans consider this form of feedback to be separate to the individual, and not personal, but related to the quality of work. Nevertheless, Thai employees involve their emotions and personal feelings during feedback. Most of them feel that the German bosses dislike them and become afraid of their next meeting. Instead of trying to improve their work, Thai employees try to avoid contact. This causes frustration, degradation of their confidence, and early resignation of Thai employees under German management.

4.3.2.5 Issue 5: Time Management

Time management is significant because the subsidiary in Chiang Mai has to deliver the software product to the in-house customers (the German headquarters) on time. It causes difficulties when Thai software developers cannot finish the final version of the software product. The cultural differences in terms of managing time relate strongly to planning and time management. The old adage of "fail to plan, plan to fail" is illustrated by Thais who do not plan their work, and consequently spend significantly longer on the task than Germans who utilize their work time to plan effectively before starting a task.

Theoretical perspectives in the literature also corroborate the observations of differences between German and Thai culture at the case study firm. In using Hofstede's cultural dimensions theory, the differences between Germans and Thais can be considered in five dimensions, and a score given to show quantitatively just how different the two cultures are in these dimensions. Table 4.4 shows Hofstede's cultural dimensions for Germans and Thais and calculates the differences between each of the five dimensions.

Table 4.4 Differences in the German and Thai national cultures (Adapted from Hofstede, 1984)

Cultural Dimensions	Germans	Thais	Differences
1. Power distance	35	64	+29
2. Individualism	67	20	+47
3. Masculinity	66	34	+32
4. Uncertainty avoidance	65	64	+1
5. Long-term orientation	31	56	+25

As Table 4.4 shows, the greatest difference is between aspects of individualism (difference of 47). Individualism refers to the emphasis placed by society on encouraging individualism or conformity. Cultures with high individualism place importance on individual achievement and initiative. In contrast, cultures with low levels of individualism emphasize group loyalty and dependence on groups, or organizations. This theoretical perspective on the apparent difference of individualism between Germans and Thais therefore ascribes meaning to some of the observations in the cultural discontinuities between Thais and Germans. For example, the large difference between individualism is exemplified in the example of Thai developers communicating in groups, versus the preferred German approach of all individuals communicating equally.

According to Hofstede's cultural dimensions, there is also a large difference between Germans and Thais in terms of masculinity (difference of 32). Masculinity relates to the level of importance society places on either achievement, or nurture. Cultures with a high level of masculinity expect ambition, achievement and the acquisition of wealth. Those cultures with lower levels of masculinity emphasize nurturing for growth, and a high quality of life. This relates to the responses given by German managers, who suggest that Thai employees consider work of an adequate standard to be complete, and favour quality of life over work, whereas the German managers and developers strive for perfection and achievement.

Table 4.4 also indicates that power distance exhibits a large difference between German and Thai cultures (difference of 29). Power distance relates to the expectation of equality within an organization. More specifically, the extent to which less powerful members of organizations expect inequality. Thais have a power distance number of 64, which is relatively high, and thus they expect power to be distributed unevenly, and a high level of inequality in organizations. In contrast, Germans have a relatively low power distance number of 35, and expect all to be treated equally. This supports the various observations from Thai employees and German managers about the differences in their needs and expectations.

Hofstede's cultural dimension of uncertainty avoidance showed very little difference between Germans and Thais. Uncertainty avoidance signifies the degree to which individuals tolerate ambiguity or uncertainty in situations. In this respect, both Germany and Thailand exhibit a similar dislike of uncertainty, and have relatively high uncertainty avoidance in Hofstede's index. However, the differences in other cultural dimensions, and the responses from Germans and Thais in the results, suggest that the uncertainty avoidance between Thais and Germans relates to different aspects of their work. For example, the questionnaires show that Thais do not like uncertainty in their instructions, or in the chain of command in the organization. In contrast, Germans do not like uncertainty or ambiguity in terms of whether employees have understood a task, or whether a task is fully complete.

Long-term orientation (LTO) is another cultural dimension with a significant difference between Germans and Thais (difference of 25). LTO relates to the difference in thinking between different cultures. LTO (signified by a lower LTO

number) is characterized by persistence, ordering relationships by status, and an ability to adapt. Conversely, a culture with a short-term orientation is more likely to respect tradition, focus on quick results, and not save for the future. In the context of a German-Thai working environment this has significant implications for the recruitment, orientation and training of knowledge workers.

The results from the questionnaires as well as Hofstede's cultural dimensions theory show that there are significant differences between four of the five key cultural dimensions. The final aspect of understanding cultural factors within the overall triad of determinants affecting work performance at the case study is to relate cultural aspects to the effects they have on work performance. Table 4.5 thus summarizes the key characteristics of Germans and Thais from the literature and relates this to effects on work performance at the case study firm.

Table 4.5 Summary of German versus Thai cultural characteristics and the effects on work performance as observed in the case study and collected from literature

Typical Cultural Behaviour (From literature and case study results)		Resulting Cross-Cultural Discontinuity	Effects on Work Performance of Thai Employees (Case Study)
Germans	**Thais**		
• Strict (case study; Steers et al., 2010)	Flexible cool-hearted (Jai Yen), considerate (Kreng-Jai) (case study; Komin, 1991)	1. Power distance relationship. 2. Feedback needs differ	Slow decision-making in work processes.
• Disciplined (case study)	Not well-organized (case study)	1. The concept of work completion	Work tasks are not prioritized.
• Punctual (case study; Steers et al., 2010)	Perform tasks at a pace they feel comfortable (case study), Slow work pace, timeless (case study; Sriussa daporn, 2006)	1. Time management 2. The concept of work completion	Delays in delivering required products.
• Direct expression (case study; Hofstede, 1984)	Indirect expression, avoid confrontation, no disputes (case study; Komin, 1991)	1.Power distance relationship	Problems remain unsolved or require time-consuming processes.

Table 4.5 Summary of German versus Thai cultural characteristics and the effects on work performance as observed in the case study and collected from literature (Continued)

Typical Cultural Behaviour (From literature and case study results)		Resulting Cross-Cultural Discontinuity	Effects on Work Performance of Thai Employees (Case Study)
Germans	**Thais**		
• Freedom provided for critical thinking and decision-making (case study)	Follow commands (case study; Kumbanaruk, 1987, Tansuvan, 1993) obedient (case study; Sriussadaporn, 2006: 337)	1. Differences in learning style and needs 2.Feedback needs differ	No creativity to fill in work tasks. Follow orders but work without clear understanding.
• Serious (case study)	Not serious, fun-working orientation (case study; Komin, 1990)	1.Time management 2. The concept of work completion	Work tasks are not undertaken with full competence.
• Prefer flat organisational hierarchy showing equality (case study); low power distance (case study; Hofstede, 1984)	Used to strict organisational hierarchy (case study), - High power distance (case study; Hofstede, 1984)	1. Feedback needs differ 2. Power distance relationship	Employees lose trust and respect for managers. Managers lose credibility as leaders.

Following analysis of the cultural issues affecting work performance within the triad of determinants, the next part of the analysis assessed the factors affecting work performance on a day-to-day basis. These factors are one piece of the overarching triad of determinants causing work performance issues, and are analyzed primarily via the fishbone analysis technique.

4.3.3 General Work Performance Determinants

As described in Chapter Three, fishbone analysis was used to assess general issues affecting Thai employees' work performance. The fishbone analysis was based on a focus group with the sample group of senior Thai software developers in order to identify the main causes of work quality. Work-life balance and culture have already been analysed and discussed, which are two very specific aspects affecting work quality. The fishbone analysis allows for a more holistic analysis of the general issues affecting work performance. It is, however, worth reiterating that the factors in the triad of determinants are inextricably linked, and thus some of the general issues identified in the fishbone analysis are also related to aspects of work-life balance and cultural discontinuities. The discourse so far regarding issues of culture and work-life balance is analyzed from a more structural standpoint via the use of fishbone analysis.

The fishbone analysis identified five main causes of work quality issues: management, method, people, environment/work setting, and tools used in the company. These are illustrated in the in the fishbone diagram in Figure 4.7, and described in turn in the sections below.

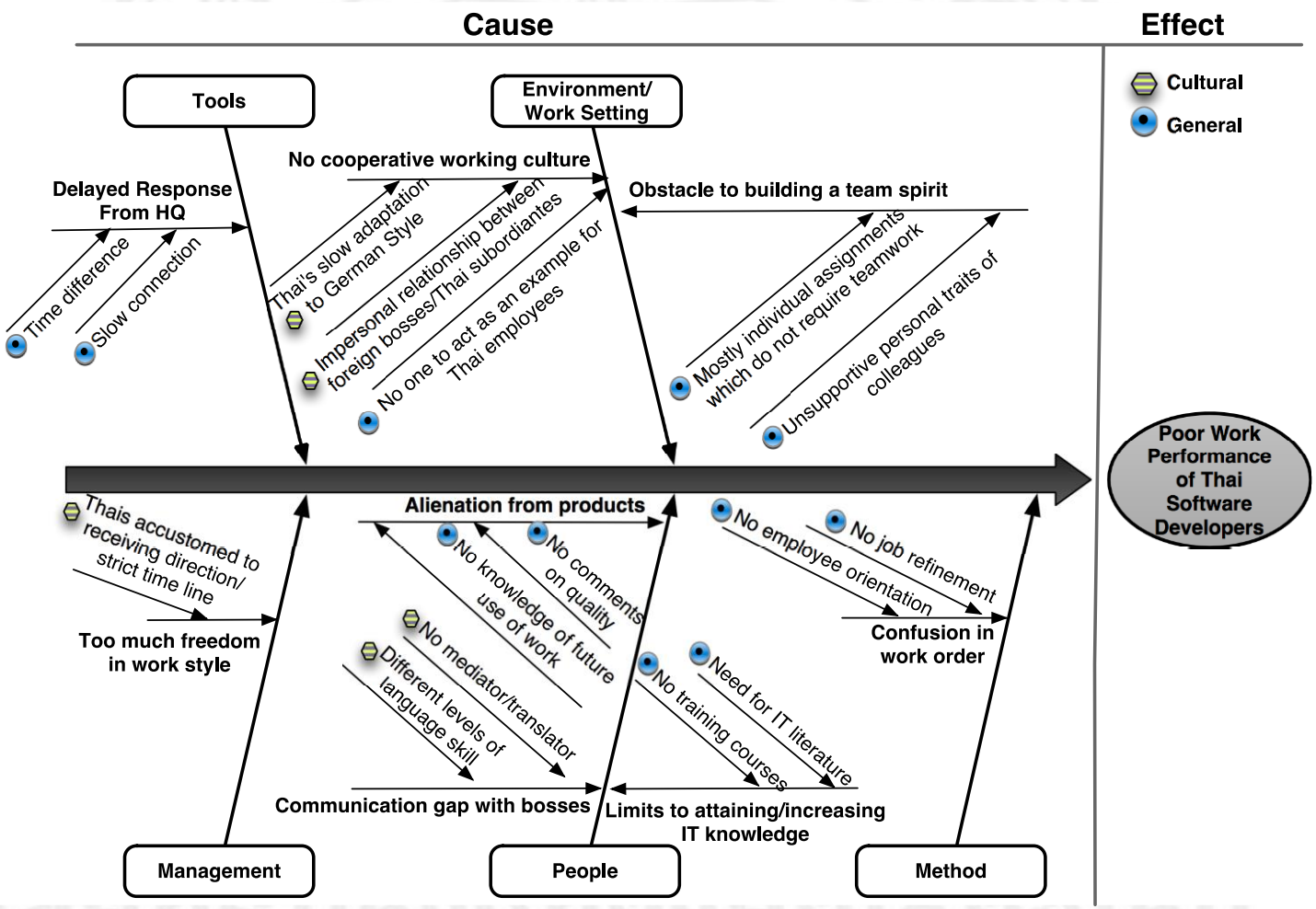

Figure 4.7 Fishbone diagram showing the general determinants of performance issues at the case study firm

- **Management**

In terms of general management, the main causes of work performance relate back to the differences between German and Thai organisational culture (see Table 4.4). Thai employees are accustomed to receiving direction and fixed timescales, whereas in the German workplace, employees can work creatively and freely according to their own schedules. Thais therefore frequently have to adapt their working style to complete a job, rather than waiting for guidance. They must also manage their own time schedule to meet deadlines. Thais belong to a national culture which prides itself on '*jai-yen'* ('cool-heart'), which means working with an easygoing attitude, however this can lead to work procrastination. The proposed CPM in this research helps to reduce issues associated with different styles of management by developing employees' personal mastery during their probationary period, which should enable them to move away from the need to be constantly led, and provide them with a personal vision which they can follow using their own initiative.

- **People**

With regard to people, there are three key causes of work issues: a communication gap, limits to increasing employees' own knowledge, and alienation from products. First, a communication gap arises due to the impersonal relationships between foreign (German) managers and Thai employees. Since the German headquarters and Thai subsidiary work in different locations, they communicate primarily through telecommunications, which can aggravate the issues of communication. In addition, Thai employees have different levels of English language skill, and the ability to understand and respond in English can affect work performance. This arises due to the lack of effective coordination between Thai employees and foreign managers when misunderstandings occur. Second, the learning approach of Thai employees can cause difficulties, particularly when there is insufficient learning media within the organisation to increase professional knowledge. (i.e. not enough IT training books, or provision of effective training courses). Third, the employees' pride or sensitivity is affected by product alienation. For example, one Thai software developer suggested that there is no inspiration to put effort into the next assignment when no comments are received regarding the quality

of the previous job, or no information is provided about the future use of the product they are creating. This leads to assumptions by the Thai software developers that assigned work is not taken seriously.

- **Environment/work setting**

Thai software developers comment that it would be quicker and more effective if their work assignments were undertaken in pairs, where two or more individuals work together to brainstorm solutions to problems. Furthermore, the time difference between headquarters in Germany and the local subsidiary in Chiang Mai is six hours, which often causes a delay in communication between employees and customers, and adds to the impersonal relationship between foreign bosses and Thai employees.

- **Tools**

Technology can be problematic for employees when there is slow Internet connectivity and poor quality telecommunications. Another obstacle shown in the fishbone diagram is the lack of a system to follow up on the feedback provided by German managers, whereby employees can report work progress and understand how to improve it.

- **Method**

Work order confusion affects employees' understanding of assignments. This occurs when senior managers do not refine a job order prior to distribution of the work tasks. The non-uniformity of work orders results in employee uncertainty about what to do, and how to do it. The causality derived from the fishbone analysis provides only a generalized overview of work issues and reveals causes from two main stakeholders: managers, and employees.

The results thus far relate to the triad of determinants. Together, these results feed the development of the CPM, but before the CPM is created and applied, the CMMI framework was used to understand exactly how the triad of determinants manifested in terms of specific impacts on the process of software development.

The next step in the research therefore uses the CMMI framework to identify 13 critical incidents related to seven process areas of CMMI level 2.

4.4 Step Three: Assessing Effects on the Software Development Process (CMMI)

This section of the thesis presents results from the third of five key methodological steps, as illustrated in Figure 4.8.

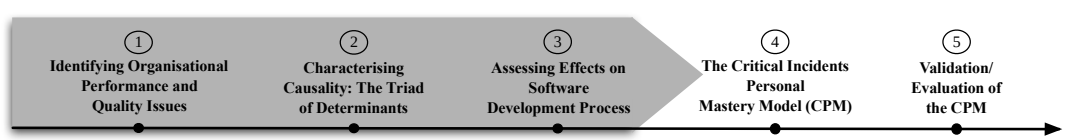

Figure 4.8 The third of five steps in the results, presented in accordance with the methodological steps outlined in Chapter Three

The 13 critical incidents occurring in the workplace at the case study firm (as determined from the analysis so far, and in relation to CMMI level 2), are shown in Table 4.6. The critical incidents are presented, along with the specific process areas they relate to, and the main objectives of successfully meeting the requirements of these CMMI process areas.

Table 4.6 The 13 critical incidents, the related CMMI process area, and the objectives/reasoning behind the elimination of these critical incidents

Critical incidents	CMMI Level 2	
	Process Areas	**Objectives**
1.Slow work preparation process	Project planning (PP)	1. To have a good estimate of cost, schedule and risks of a project so that financial risks for company is mitigated 2. To reduce overlapping projects or phases where no projects take place
2. Unable to adapt to diversity & organizational culture	Requirements management (RM)	1. To understand the customers' needs and desires regarding the product 2. To review assesses requirement whether it is completed 3. To identify ideal qualification of IT employees 4. To distinguish team structures' performance
3. Poor technical performance		
4. Unable to develop & influence others		
5. Poor time management	Project planning (PP)	1. To have a good estimate of cost, schedule and risks of a project so that financial risks for company is mitigated 2. To reduce overlapping projects or phases where no projects take place

Table 4.6 The 13 critical incidents, the related CMMI process area, and the objectives/reasoning behind the elimination of these critical incidents (Continued)

Critical incidents	CMMI Level 2	
	Process Areas	**Objectives**
6. Unable to prioritise product backlogs	Measurement and analysis (MA)	1. To define project milestones 2. To review all milestones and analyze deviation 3. To learn from the past experience in the previous projects to be the foundation of the future ones
7. Poor initiative & expression in English communication	Project planning (PP)	1. To have a good estimate of cost, schedule and risks of a project so that financial risks for company is mitigated 2. To reduce overlapping projects or phases where no projects take place
8. Unable to identify current reality and forthcomings	Project monitoring and control (PMC)	1. To share the same information on the status of the project to suppliers and customers 2. To mitigate risks of project failure or budget overdrawing

Table 4.6 The 13 critical incidents, the related CMMI process area, and the objectives/reasoning behind the elimination of these critical incidents (Continued)

Critical incidents	CMMI Level 2	
	Process Areas	**Objectives**
9. No customer involvement	Process and product quality management (PPQM)	1. To stimulate an awareness towards process and quality guidelines of all software developers 2. To identify and discuss breach of these guidelines to newcomers 3. To provide reasons how employees can improve their mistakes
10. No creation of versioning plan	Configuration management (CM)	1. To collect information regarding performance, usability and functional attributes required by users and store in product management system 2. To identify planning of versions
11. No capability of change management		
12. Failed product deployment	Supplier agreement management (SAM)	1. To create a mutual agreement between the supplier (the affiliating company in Chiang Mai, Thailand and internal customers (the headquarter in Berlin, Germany)
13. Low level of feedback utilization		

Once these critical incidents had been identified, managers were asked to prioritize the incidents so they could be focused on in the development of the CPM, and when evaluating the effectiveness of the CPM after it had been implemented and tested. As well as a prioritization of the CMMI critical incidents, managers were asked about the frequency of occurrence to ascertain how often these critical incidents affected work processes at the firm. The prioritized critical incidents and their frequency are shown in Figure 4.6 and then described in the corresponding sections.

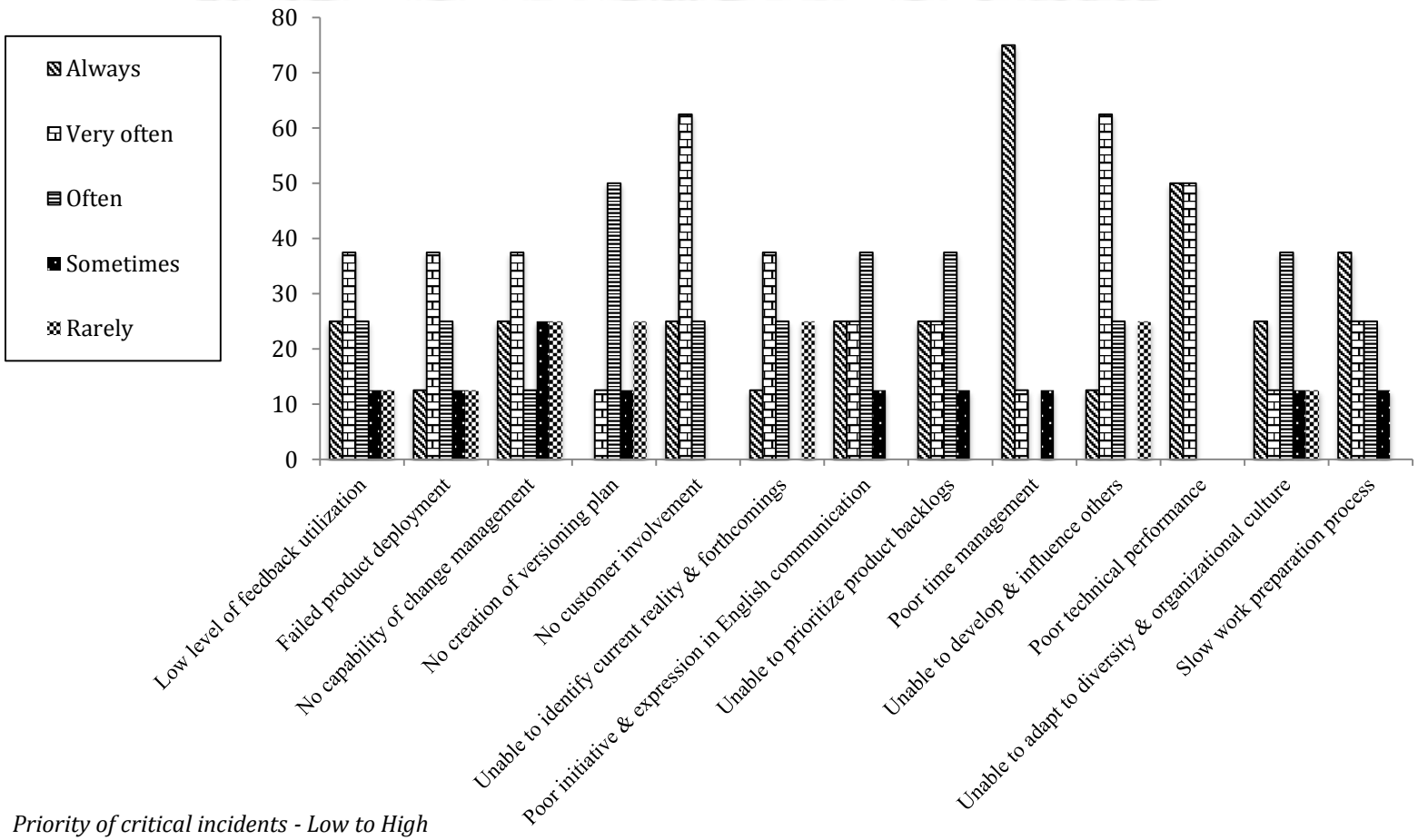

Figure 4.9 The 13 critical incidents prioritized from low to high, along with the frequency of their occurrence based on management questionnaires

4.4.1: Critical Incident 1: Low Level of Feedback Utilization

Definition: Understanding the feedback given and correcting the work according to the requirements

Keywords: Understanding feedback, work correction

The subsidiary of the host company is located in Chiang Mai, Thailand and is the supplier that develops and delivers products to headquarters in Berlin, Germany. Despite some experience in developing and delivering software to headquarters, the past experience is not always taken into account when working on new projects. This includes feedback from customers, how well the timescales are estimated (e.g. estimated burn-down chart). When Thai employees cannot catch up with the comments given by management and headquarters, they cannot integrate the ideas into the project correctly or efficiently. As a result, the outputs for customers cannot be determined.

4.4.2 Critical Incident 2: Failed Product Deployment

Definition: The usage of the product after it has been delivered

Keyword: Product usage ability

After the product requirements have been accomplished, and the finished product has been delivered to the test team at headquarters, further difficulties arise. These relate to difficulties faced by German colleagues who are unable to successfully test new products due to the different environments of deployment. For instance, there may be an unmatched setup server. The time zone difference between Germany and Thailand also causes delays to responses when discussing problems.

4.4.3: Critical Incident 3: No Capability of Change Management

Definition: The ability to cope with a sudden change in requirements

Keyword: readiness for change requirements, setting new job requirements

In software development programs, customers frequently and unexpectedly communicate change requests. The possible changes during the course of the program result in extra work on top of the previous job/requirements. Although the software developers usually understand the most suitable solution to the change request, they do not consider the impact of the change to the source code, or the overall software

design. Due to changing job requirements, employees have a role to reduce ambiguity by working closely in teams to track changes and the status of those changes. For example, everyone in the team should be aware of who is fixing the product, and who is testing the product. It should be noted that implementing change requires employees who can handle multiple, changing priorities, simultaneously.

4.4.4 Critical Incident 4: No Creation of a Versioning Plan

Definition: To identify versions of technology to create a mutual understanding between the developers and testers, and to distinguish between the new and old versions of completed work

Keyword: Version identification

Software configuration management relates to the duty of tracking and controlling versions and changes within the task of developing software. Each particular software artifact is articulated by a version (e.g. files, requirements, bugs, source code). When versioning plans are not created, the Thai employees cannot design the company's products effectively, as they are unable to adhere to coding and relevant standards. In addition deficiencies in versioning plans preclude the testing of product releases and unit tests as part of quality assurance procedures. Errors during compiling source code come from all software developers. Developers must be careful not to let the corrected code be overwritten by other developers, and must identify who has corrected the files, and which parts have been renewed. Comparing code between old and new versions must be undertaken carefully, or there is a risk that users are unable to identify which version is affected by bugs when they submit version reports. More importantly, employees are unable to understand the reasons why codes and algorithms must be changed. In addition, if there is no effective versioning, employees cannot build binaries of old software releases. For example, the version 2.0 of a piece of software might need to be pushed back to version 1.0 in order to create another product. However, when code is developed by simply overwriting old code with newer versions, it becomes time consuming to understand and revert the written code to its original state. On some occasions, the latest version of code correction is also lost. This highlights the need for effective version plans from developers. Currently, the software developers do not use a standard coding protocol in their teams (e.g. file separation and symbol usage to recognize the latest version of saved files).

4.4.5: Critical Incident 5: No Customer Involvement

Definition: Keeping in touch with customers to fulfill their demands/needs

Keyword: Customer interest

Typically, the products to be designed at the firm are determined during the early stages of product planning and development. However, product quality will not satisfy customers or meet their needs when they are not directly involved as part of the continuous feedback provided to the team (e.g. design tweaks and improvements). Scenarios can also emerge where programmers and customers have different opinions and understandings about a feature when the requirements are not sent to customers to review, and employees do not fully understand customers' demands.

4.4.6: Critical Incident 6: Unable to Identify Current Reality and Forthcomings

Definition: The ability to realize the current situation obstructing working processes and foresee the risks that may cause delays to work.

Keywords: realize the present problem, foresee future risks

In order to monitor work progress, it is helpful when employees know what is currently happening, and can predict what will happen in the near future by writing a weekly report. At present, German Management are usually unable to follow up on work activities because Thai employees do not produce well-documented deliverables. The missing content is the information signifying risks, and time spent on a task versus the estimated time to complete the task. Employees who do not realize their present situation and consider future scenarios, cannot identify risks in a timely way, and therefore cannot manage or mitigate risks with team leaders. This shows Thai employees lack a grasp of their current reality and future scenarios.

4.4.7: Critical Incident 7: Poor Initiative and Expression in English Communication

Definition: An ability to express understandable and accurate English in both written and spoken form when communicating between Thai employees and the German management in daily life at work

Keywords: work, communication

The interaction between team members is the lifeblood of the organization and working in a multinational team can be severely constricted if there are obstacles to communication. At the case study, there is a need to establish cooperative conversation and interaction between German management and Thai subordinates (or the Thai employees and foreign co-workers), using English as the language of communication. The problem is not in terms of achieving perfect proficiency in English at the level of a native speaker (e.g. perfect accent, intonation and correct grammar), but the ability to communicate in understandable English messages. Thus employees' English must be at a level considered good enough for communication in the workplace. It appears that the ineffective Thai employees at the case study work in silence, and are not alert and ready to discuss issues about new techniques, or do not inform team leaders about risks and problems with their work. In addition, employees are not able to express and generate creative ideas in English. They think, but are often unable to express themselves. In other words, they are not initiators of communication. This is the reason why they are frequently unable to explain and breakdown functional specifications and requirements to other software developers.

4.4.8: Critical Incident 8: Unable to Prioritize Product Backlogs

Definition: Setting priorities of product backlogs in order to understand which parts of a project need to be completed first

Keywords: sprint backlog, product backlog

To measure the progress of assignments, the Scrum method within agile software development is applied at the case study firm. Jobs are distributed according to the expertise of each employee. After each employee finishes their tasks, all the sprint backlogs are gathered and tested to accomplish completion of one product. A sprint backlog is a list that the development team must address on its next work sprint (Sutherland, 2005). At the firm, it was found that each sprint is completed at a different time. Project components that contain sophisticated modules will require more time than the simple cases. Software developers who complete their parts are expected to help the rest of the team to push and finish the rest of the sprint backlog. In reality, each employee has a different style of writing code, and it is therefore difficult for other software developers (employees) to pick up and follow

development of this code to correct the work of others. Furthermore, in project planning meetings, the sprint requirements are not clarified or clearly prioritized, so employees do not always know their tasks precisely. For example, employees do not list test cases before writing code, and test items are not adopted as part of the backlog requirements. As a result, the product backlog and the realities of coding for the product do not match, and employees therefore cannot finish work according to the product backlog plan.

4.4.9: Critical Incident 9: Poor Time Management

Definition: The amount of time spent on a task exceeds the estimation

Keyword: goal setting

To accomplish organizational commitment from customers depends on the punctuality of work delivered to the customers. Establishing a timeline is important to assist employees in recognizing the importance of individual goal setting. Employees are often unable to deliver accurate work to meet deadlines because they do not inform management of the need for time buffers or extra requirements to complete the task. For example, an additional period might be required to study the technical themes of the task, or to follow up on feedback from the team leaders, or solve problems related to pair-work and collaboration. Employees are also unable to write a complete roadmap identifying when to finish the job. Correctly estimating the time a job takes is strongly linked to project risks, and effective time management is therefore crucial.

4.4.10: Critical Incident 10: Unable to Develop and Influence Others

Definition: Having an employee who performs the job well, and can be used as a role model for others in the team

Keywords: willingness to help, inspiring others

In the organization, employees perform their competencies differently. Some employees have high performance whereas others have a lower ability. Despite the existence of a team of excellent performers, who have been selected from a large pool of applicants, junior workers do not show much improvement. Senior employees do not successfully teach others to work well because they feel that the new junior

employees do not have the same background knowledge. They also feel it interrupts their present job responsibilities. When seniors give up their coaching responsibilities, junior employees are left alone without sufficient guidance (e.g. how to effectively setup and finish the project). Junior employees develop slowly when they do not have anybody as a role model to inspire them. When they feel inferior and regard themselves as being a burden to others, it weakens their personal mastery.

4.4.11: Critical Incident 11: Poor Technical Performance

Definition: Possession of the necessary qualifications and skills required in software development, and IT positions that support the team to develop products that meet the demands of customers

Keywords: knowledge application, knowledge accumulation, work achievement

Knowledge is important to accomplish the job, but due to the different levels of learning capability, each employee requires different support and time when searching and acquiring knowledge. The self-development process of employees takes significant time in order to research and find the right methods of work to accomplish the job. Some employees cannot improve their abilities in a short time to acquire specific skills for technologies used in the project. As a result, they often have insufficient knowledge of application architecture and development methodologies, which then causes delays in completing the job. IT workers are specialists in the techniques applied in their job responsibilities. Without the appropriate background knowledge, they cannot perform well. Each person has particular strengths that can support other team members until a project is completed.

There is also a type of psychological contract between an employee and employer that states the employees will help the organization to attain the goal. Their concern for orders, quality, accuracy and self-recognition based on personal achievement are created by individuals' technical performance. As work is also part of their personal fulfillment, most employees expect that they will be recognized for their good deeds. However, employees frequently feel alienated from their products when they get no comments on the quality of the completed job, and do not hear about the potential future of their work. After employees impart significant energy and effort into a work task, their inspiration and enthusiasm for work is curtailed, as

their work effort is not recognized. Similarly, when the completed work is not up to the required standard, employees also require comments with explanations and recommendations. The technical performance for IT/software positions in the company can be generalized as employees who must have at least the basic prerequisite knowledge to perform well in their duties. The requirements for the various roles are summarized below.

Java/J2EE Programmer

Knowledge and skills in:

- Java in general
- J2EE technologies (including Servlets etc.)
- J2EE application servers
- SOAP and REST Web services
- SWT
- Google Web Toolkit (GWT)
- Solid experiences in design of relational database schemas
- Working knowledge of and corresponding experience with SQL

PHP Programmer

Knowledge and skills in:

- Sound knowledge of fundamental web design technologies, including XHTML, DHTML, CSS.
- Excellent grasp of client-side web programming, especially JavaScript.
- Sound understanding and command of techniques used for rich-application development, including AJAX.
- High proficiency in server-side scripting language (PHP)
- Solid database administration experience desirable, with experience on MySQL
- A good eye for aesthetics and usability of web interfaces.

Flash Designer

Knowledge and skills in:

- Adobe Photoshop, Illustrator
- Flash (including Actionscript)

Mobile Application Developer

Knowledge and skills in:

- Knowledge of, and solid experience in developing mobile applications
- Solid OO (object oriented) programming skills

4.4.12: Critical Incident 12: Unable to Adapt to Diversity and Organizational Culture

Definition: realization of a multinational environment in the workplace, and the resulting adjustment to the working style, including getting along well with superiors and colleagues

Keywords: realize the German national cultural characteristics, realize Thai national cultural characteristics, and comprehend the German-Thai organizational culture

Culture affects human behavior in a variety of significant ways. As noted in the previous section regarding cultural determinants of work performance (section 4.3.2), Thai employees display national cultural characteristics of being indirect in expression, cool-hearted and easygoing, while in contrast, Germans are stereotyped via their culture as being strict, straightforward and disciplined. While the aspects and characteristics of national culture are often a positive reflection of a particular culture, when brought together with aspects from another culture, the cultural differences can lead to a cross-cultural discontinuity, which can result in negative impacts upon the working environment and the work itself. German management usually provides freedom in terms of working styles, and an environment conducive to expressing ideas. For example, at the case study firm, employees don't have to wear a uniform. The German style does not place high importance on how employees look. Instead the way employees perform is considered most important, and reflects the German organizational culture. However, the freedom the German culture provides in terms of working, thinking and creativity does not necessarily fit the Thai culture, and

therefore does not always provide the most effective working environment. Thai workers are accustomed to receiving direction and strict timescales for deliverables, and are not used to making independent decisions. This suggests that providing too much freedom without measurable control is both ineffective and time consuming, as it prolongs the work process and the completion of assignments. Thai employees have a natural preference to work relatively slowly due to their easygoing style, and they aim to avoid confrontation or disputes. This causes issues at the case study when discussing work and participating in feedback. German managers are direct in their expression about work results, while Thai employees frequently see feedback as a humiliating or insulting occasion. Thai employees often feel disappointed and discouraged when they receive the German style of straightforward feedback. In addition, Thai employees have been taught to observe the tradition of respecting their elders. As a result, the flat hierarchy and organizational culture within the German company is not necessarily practical or effective for the Thai employees. Thai employees' behavior results in a lack of knowledge sharing and idea generation. Thai employees are not confident enough to share opinions that directly contradict managers' ideas, even though the employees' ideas could have significant benefits to projects and work processes. This directly relates to the power distance relationship noted earlier in the cultural determinants section of this chapter.

4.4.13: Critical Incident 13: Slow Work Preparation Process

Definition: The time span that the team leaders and IT employees take to prepare the work process, including job specification and distribution.

Keywords: response to supervision, inquiry to perplexity

At the start of a work assignment, the work process is clarified in preparation for job distribution. However, employees are frequently not ready for the projects. They do not correctly understand what the management has requested in order to satisfy the customers. This means that employees do not fully comprehend the purpose of the software products. To understand the nature of the business, knowledge workers must have a clear picture of the customer's needs and the entrepreneurial nature of running a business. When the employees' understanding of work is not complete in their minds, they cannot create concepts and design small

software developments or parts of larger development projects. This critical incident repeats itself, especially when more than one foreign superior gives work orders to Thai employees. Non-conformity in terms of bosses' commands leads to confusing job descriptions. Furthermore, the delayed response from headquarters to the local subordinates obstructs chances to provide immediate feedback to employees' doubts over work tasks. Unanswered questions then leave Thai employees with frustration, little idea about what to do next, and difficulty with involving themselves in the job. The process of work assignments then operates slowly, because employees leave any ambiguous issues unattended to. When the ambiguity is not clearly explained, the work preparation process is prolonged. Hence, the most frequent outcome is that work is not finished as planned, or the employees deliver inappropriate and unexpected results.

The 13 critical incidents based on the CMMI level 2 process were then related to the three key determinants affecting work performance at the case study firm. Once the determinants of performance and the specific effects on the software development process had been understood, the CPM could be effectively designed and implemented. Table 4.7 shows how the 13 critical incidents relate to the aspects in the triad of determinants, and the potential solution in the CPM. This table is significant, as it brings together the causes of work performance issues at the case study, with specific software development factors from CMMI and then shows how they can be addressed via the CPM.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
1. Slow work preparation process	**General Work Determinants** 1. Thai employees are not ready to prepare and promote projects. 2. Thai employees do not have a clear picture of customer needs and the entrepreneurial concept of a company. 3. Thai employees leave ambiguous issues unattended to when there is inconsistency in bosses' commands. **Cultural Work Determinants** 1. Thais tend to work in silence and avoid expressing opinions arguments, and ideas. 2. Germans expect too much of Thai employees' creativity, while Thais are used to following commands	**Personal Vision (prevention phase)** • CMMI critical incidents stimulate critical thinking about how to plan work before undertaking tasks **Creative Tension (Solution phase)** • Defective working behaviors regarding work preparation processes are reported to Thai employees. Force-field analysis is used between employers' driving force and Thai employees' current state to help employees better prepare for work. **Connectedness (Personal Mastery)** • Thai employees thoroughly understand their tasks and the relationship with customer orders. • Thai employees are able to work effectively during the work preparation process.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
2. Unable to adapt to diversity & organizational culture	**Cultural Determinants** 1. Thai employees are accustomed to receiving directions and strict timeline. 2. Thai employees work slowly due to their easy-going work style. 3. Thai employees avoid confrontation and disputes when work discussion is needed. **Work-life determinant** 1. Thai employees make decision to resign early	**Personal Vision (Prevention Phase)** • CMMI Critical incident stimulate critical thinking about how to adapt themselves and work in German-Thai context. **Creative tension (Solution Phase)** • Thai and German cultural differences are displayed. • German employers set the organizational rules to fit the work and life style of Thai employees which enforce driving force in force-field analysis. Likewise, Thai employees realize their own weakness through force-field feedback and then use critical thinking to improve current state of work concerning diversity and organizational culture.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
		Connectedness (Personal Mastery) • Thai employees successfully mingle to German working environment • Thai employees happily working in the German-Thai workplace
3. Poor technical performance	**General work determinants** 1. Thai employees have insufficient knowledge of application architecture and development methodology. 2. Thai employees cannot extend abilities and supply specific skills to match technologies used in the project within a short time. 3. Thai employees feel alienated from their products.	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking by explaining what technical performance Thai employees needs for performing the job. **Creative Tension (Solution Phase)** • Plan to change via force field analysis including working behaviors observation, German employer's driving force to assist Thai employees' working behavior change, and employees' restraining force. Both driving force from German employers and Thai employees restraining force

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
	Cultural work determinants 1. Thais are passive learners. They need supervision. 2. Germans do not express emotionally work orientation.	foster creative tension to happen for improving Thai employees working performance **Connectedness (Personal Mastery)** Thai employees develop essential technical performance and produce the software product without errors
4. Unable to develop & influence others	**General work determinants** 1. Thai employees in the project do not have the same background knowledge. 2. Thai employees learn slowly when they feel they are inferior and regard themselves as the burden of others.	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking about how to the value of oneself by being able to develop and influence others. **Creative Tension (Solution Phase)** • force-field analysis is proposed to present the driving force and restraining force to create the creative tension for employees to improve their working performance up to the standard that they can be a role model for others.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
		Connectedness (Personal Mastery) • Thai employees develop their working performance that colleagues can take him or her as a role model.
5. Poor time management	**General work determinants** 1. Thai employees do not inform of delays. 2. Thai employees cannot write a complete roadmap identifying when to finish the job. **Cultural determinants** 1. Thais tend to work in silent 2. Thais have easy-going and not serious style of working **Work-life determinants** 1. Thai employees encounter work stress when they have to rush to finish the deadline	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking about time management. **Creative Tension (Solution Phase)** • Restraining force considered by Thai employees and driving force proposed by German employers shows why Thai employees cannot control time management. Solutions thought of by Thai employees; are taken as creative tension. **Connectedness (Personal Mastery)** • Thai employees can manage time to work to meet the deadlines.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	Related Aspects in the Triad of Determinants	Potential Solution in the Critical Incident Personal Mastery Model
6. Unable to prioritize product backlogs	**General work determinants** 1. Thai employees do not clarify and prioritize tasks so that employees know their tasks precisely.	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking about how to solve the problem with prioritizing product backlogs. **Creative Tension (Solution Phase)** • Force field analysis is designed to foster creative tension. Thai employees learn to think about solution about how to give priority by considering two comparative retraining force caused by themselves and German employers' initiatives to assist Thais to be better in prioritizing the tasks **Connectedness (Personal Mastery)** • Thai employees are capable of prioritizing product backlogs that help them to finish work one by one in the lists. •

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
7. Poor initiative & expression in English communication	**General work determinants** 1. Thai employees work in silence. They are not conversation initiators to explain and breakdown functional specifications and requirements until being asked.	**Personal Vision (Prevention phase)** • Thai employees are encouraged to use critical thinking to solve future problem they may face concerning communication at work based on this CMMI critical incident. **Creative Tension (Solution Phase)** • Creative tension occurs when restraining force and driving force are compared. Thai employees will realize the differences of their current state and what the company wish them to be good at initiative and expressive English communication at work. **Connectedness (Personal Mastery)** • Thai employees have a competency to initiate the English communication and present their idea at work well either with oral or written expression.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
8. Unable to identify current reality & potential problems	Cultural and general work determinants	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking of Thai employees to realize about the importance of understanding the current problems that occur during the job and the future risks that they may face in the near future. **Creative Tension (Solution Phase)** • The different items of restraining force proposed by Thai employees and driving force initiated by German employers helps foster creative tension in terms of understanding the present work situation and foresee risks that are going to happen. **Connectedness (Personal Mastery)** • Thai employees are able to identify current and future work problems.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
9. No customer involvement	**General work determinant** 1. Customers are not directly taken as a part of the team and continuously provide feedback.	**Personal Vision (Prevention phase)** • CMMI critical incident encourages Thai employees to have critical thinking towards taking customers into a focus of work. **Creative Tension (Solution Phase)** • Creative tension is useful for Thai employees to turn out problems they are facing to be an opportunity for better working behavior change by comparing restraining force and driving force towards customer involvement. **Connectedness (Personal Mastery)** • Thai employees put more of their attention towards what customers need. Caring for what customers want help Thai employees produce the right final product.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
10. No creation of versioning plan	**General work determinant** 1. Thai employees let the corrected code be overwritten by others. 2. Thai employees do not identify who had corrected those files and which parts has been renewed. 3. Thai employees cannot recognize when comparing code with the reminder of old code.	**Personal Vision (Prevention phase)** • CMMI critical incidents provide an insight to what happen during the process of configuration management. It tells story about the impact of working without versioning plan. Employees are stimulated to prepare for solutions if it happens to them using critical thinking. **Creative Tension (Solution Phase)** • To differentiate between restraining forces and driving forces of lacking versioning plan helps foster creative tension of Thai employees to change working behaviors. **Connectedness (Personal Mastery)** Thai employees are careful to create versioning plan before doing work assignments.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
11. No capability of change management	**General work determinants** 1. When receiving request for changes, Thai employees do not think about the impact of change on the source code or report the issues to customers. 2. Thai employees have a role ambiguity to deploy teamwork to track change status. **Work-Life determinants** 1. Thai employees have additional stress when work has to be refined to fit what customers want.	**Personal Vision (Prevention phase)** • CMMI critical incident stimulates critical thinking of Thai employees in the issue involving change management. **Creative Tension (Solution Phase)** • To change defective working behavior of Thai employees when they are unable to deal with work change. Force-field analysis is used to point out restraining force from Thai employees side and driving force or what can German employer can do to support the change. To realize the different picture of restraining and driving force create creative tension among Thai employees. **Connectedness (Personal Mastery)** • Thai employees deal with change management without stress.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
12. Failed product deployment	**General work determinants** 1. Thai employees have difficulty testing the product when they need to cooperate with German colleagues because of unmatched set up server, the time difference to discuss about problems	**Personal Vision (Prevention phase)** • CMMI critical incident help Thai employees to use critical thinking to think about how to solve problem in case that product deployment is failed. **Creative Tension (Solution Phase)** • Creative tension is fostered through force-field analysis which include Thai employees' restraining force and employers' driving force in the topic of what bring about failed product deployment and what can help resolute the problem. **Connectedness (Personal Mastery)** • Thai employees have capability to successfully deploy the software products.

Table 4.7 The 13 critical incidents along with how they relate to the triad of determinants at the case study firm, and the potential solution in the design of the CPM (Continued)

CMMI critical incidents	CMMI critical incidents	CMMI critical incidents
13. Low level of feedback utilization	**General work determinant** 1. Thai employees cannot catch up with comments and put ideas into project correctly	**Personal Vision (Prevention phase)** • CMMI critical incident helps Thai employees to have critical thinking about how to improve the level of feedback utilization. **Creative Tension (Solution Phase)** • Creative tension is useful to change the defective behavior of Thai employees by letting them see the differences between the restraining force and the driving force which push them to improve their weaknesses. **Connectedness (Personal Mastery)** • Thai employees understand the feedback given by German employer to improve the quality of products before deliver to customers

4.5 Step Four: Design, Build and Implementation of the Critical Incidents Personal Mastery Model (CPM)

This section presents the results of the design, build and implementation of the CPM, which according to Figure 4.10, relates to the fourth methodological step in the research.

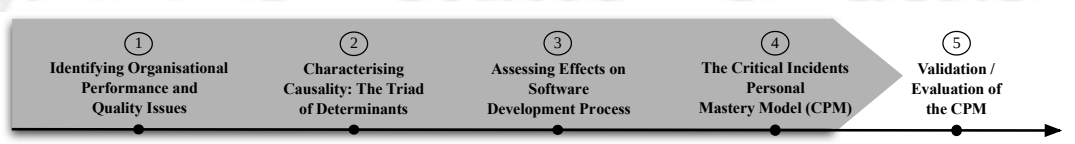

Figure 4.10 The fourth of five steps in the results, presented in accordance with the methodological steps outlined in Chapter Three

After identifying the work performance issues at the case study, characterizing causality via the triad of determinants, and then specifying how the software development process is affected via the CMMI critical incidents, the CPM was designed to solve the work performance issues by addressing the determinants of causality and the critical incidents. The CPM is shown in Figure 4.11 and discussed in more detail below.

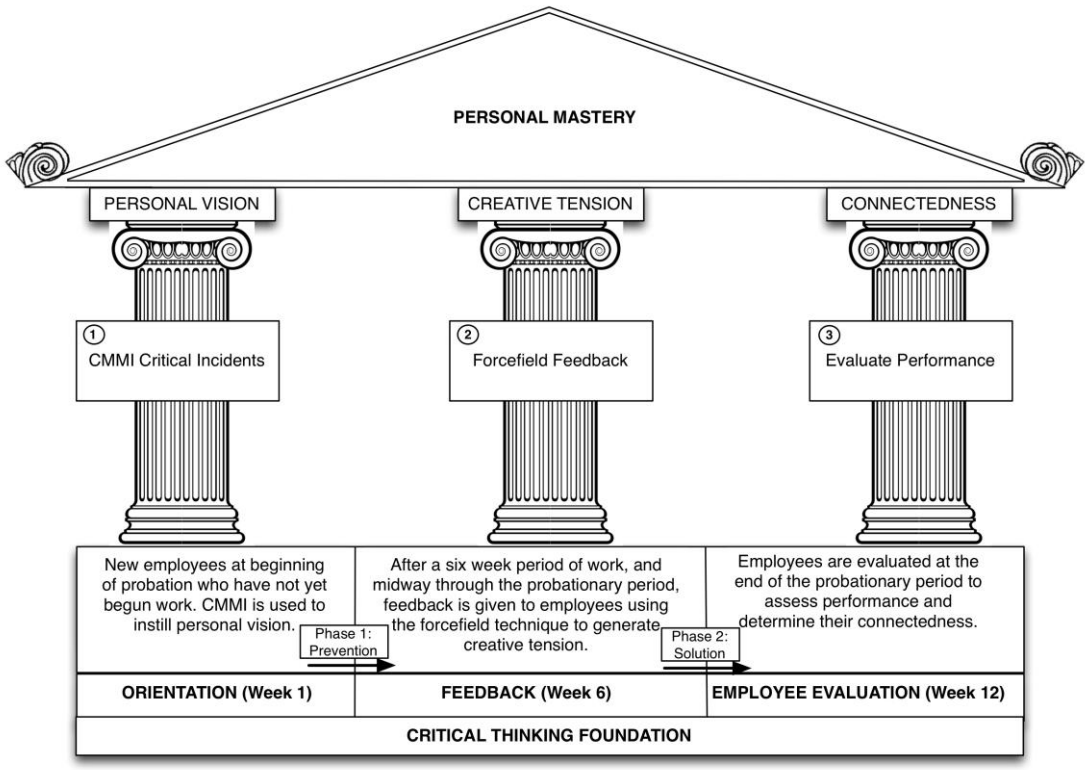

Figure 4.11 The critical incidents personal mastery model (CPM)

4.6 The Critical Incidents Personal Mastery Model (CPM)

Figure 4.11 indicates the conceptual overview of the CPM. At the foundation of the CPM is critical thinking. Critical thinking is an important component of being a knowledge worker, and underpins all aspects of effective knowledge work. Above this critical thinking foundation, the CPM follows the three-month timescale of the probationary work period. Figure 4.12 shows this timescale in more detail.

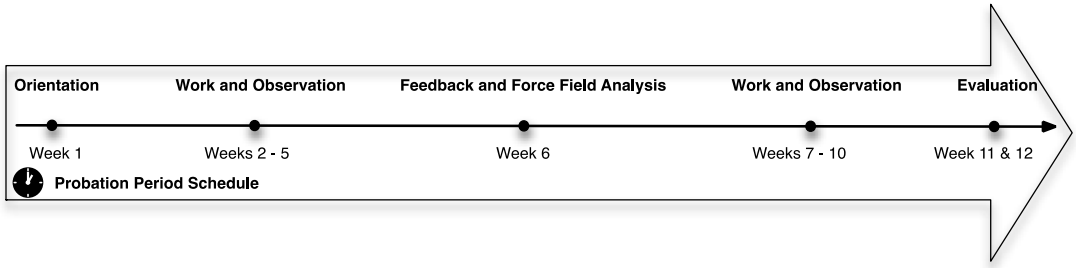

Figure 4.12 The three month probationary timescale in which the CPM was implemented (for larger and more detailed versions of timescales, see Figures 3.13 and 3.14, in Chapter Three)

The CPM is built on three main pillars during the three-month probationary period. Each of these pillars has a different, but specific purpose in the model, as follows:

- **Pillar 1: CMMI Critical Incidents**

During the first stage in the model, employees are at the beginning of their probationary period and have not yet begun work. The 13 CMMI critical incidents identified from the senior employees are used at this stage to teach new employees and create a personal vision to avoid these critical incidents. In relation to achieving personal mastery, the critical incidents allow employees to construct a personal vision. This personal vision represents one pillar supporting achievement of personal mastery by the newly recruited knowledge workers.

- **Pillar 2: Force Field Feedback**

Midway through the probationary employment period, employees are provided with feedback. The model demonstrates that this feedback is based on force

field analysis. The force field analysis is based on their performance so far in the probationary period, and relates to the CMMI process areas. The force field analysis, when combined with the personal vision in pillar 1 allows new employees to generate creative tension, represented by the second pillar in the model, which supports the achievement of personal mastery.

- **Pillar 3: Evaluate performance and Achieve Connectedness**

The third and final pillar in the CPM model is an evaluation of employee performance. This final pillar of the model illustrates whether employees have achieved connectedness, which is the final component of the personal mastery.

Each of the pillars in the model (CPM) supports achievement of true personal mastery, which will in turn set an appropriate tone for the rest of the knowledge workers' career. Each pillar represents a specific time period in the probationary employment period, and is supported throughout by a foundation of critical thinking. Having presented the model, the results now assess its effectiveness in terms of each of the three pillars before the chapter moves on to an overall evaluation of the model's effectiveness.

The results of the model are now discussed in relation to each of the three pillars in the CPM.

4.7 Pillar One Results: Creating a Personal Vision

The three newly recruited employees are all recent university graduates with no experience of full time knowledge work. Therefore the use of the previous critical incidents allowed for the creation of an effective personal vision to ensure the employees did not make the mistakes identified by the senior Thai developers. The employees' personal vision was created in two steps. Firstly, this was done by creating elements of a personal vision to assist them in their transition from university life to a professional career. The newly recruited employees were asked the following five questions:

1. What did you want to be when you were young?

2. What was your career plan before graduation?

3. What/who influenced you to be interested in IT?

4. When did you become seriously interested in the IT field?

5. Why did you choose to work in a foreign/international company?

The results of these questions allowed the newly recruited employees to clarify their personal vision in terms of the transition from university to a work environment. The results show that the three newly recruited employees' motivation to work in software development are as follows:

1. **Family influence** – the family provided some level of influence or agree with the choice of the employees to work in software development.
   1.1 Mr. P. "My brother bought me scientific books regularly and I liked to read them so I started to like everything about technology."
   1.2 Mr. A "My brother was studying computer science, Chiang Mai University. I took my brother as an example. After my brother graduated and started his career, he was so enthusiastic to write more and more difficult code. He always experienced new and exciting things. He also got an increased salary. He began at 20,000 Baht, but now he earns 50,000 Baht a month. That was why I liked computers and worked as a software developer."
   1.3 Mr. B "I was interested in IT more and more because I had a computer at home and my mom sent me to take a computer class. It was about how to create websites, and cartoon characters."
2. **Favorite leisure activity** – the newly recruited developers enjoy software development and had previously been interested in development during their leisure time.
   2.1 Mr. P. "When I was young, I liked electronic gadgets. I often took it apart and investigated what was inside. When I had a self-made computer bought from the shop, I liked to take it apart, look inside and try to create the program to control the computer."

2.2 Mr. A “I liked to play computer games”

2.3 Mr. B “I liked to read about IT updates.”

3. **University background** – the three employees all studied subjects related to software development at university.

3.1. Mr. P “When I was in high school, my teacher taught me to create simple websites. It was not so complicated. It was enjoyable to write code and see its results.”

3.2. Mr. A “When I was at university, I was a representative to attend a computer competition about the fundamental knowledge about computer hardware.”

3.3. Mr. B “I was studying software engineering at College of Arts, Media and Technology, Chiang Mai University. The courses I learned were about being a programmer or a developer. This also included documented program and program design; for example.”

4. **Future career trend** – the three freshly recruited knowledge workers all agreed that software development is a growing employment trend and it is rewarding to work in a multinational company rather than in the Thai companies, which will serve them well in the future. This corroborates the trends in the growing global knowledge economy and Thailand’s interest in developing its IT industry (see Chapter Two for more details).

4.1. Mr. P “Working in a Thai company was serious and bureaucratic. Unlike working in a foreign company, it provided more freedom and they judged people on the work quality.”

4.2. Mr. A “I chose to study software engineering because it was the latest trend and I thought I could get a job easily.”

4.3 Mr. B “In my opinion, working in a multinational company was a lot better. I thought like this because I heard from friends who were trainees at Thai companies that it was terrible there. Thai companies didn’t have a good system. When the existing workers could not finish their work in time, they asked trainees to assist them with their work until midnight. Some of my friends, even worse, just accessed the internet because they had no work to do. Unfortunately, they gained nothing. When I worked

here, I was tired because I had a large quantity of work everyday, but I felt myself lucky to learn something new. I was taking part in real projects."

5. **Job satisfaction** – the three employees reported that they believe software development will give them job satisfaction, mainly due to the four previous reasons stated above.

   5.1 Mr. P said that "My favorite jobs are to work with i-phone or MAC. I liked to work in a multinational company. The foreign company was not strict about how people dress. The company policy was flexible hours. Importantly, they judged employees on the quality of work which was positive for me because I didn't graduate with high grades."

   5.2 Mr. A said that "I graduated from Mae Fah Luang University where I studied in English. Thus I wish to adopt my English skills to practice. If I worked in Thai companies, I would have no chance to train in the English language. Moreover, I got to do what I really liked which was to write applications for android mobile phones."

   5.3 Mr. B said that "I write programs a lot at work much more than when I was studying at university."

The employees were then questioned about their preferences and attitudes to working in an international software development firm. The results are that the employees see the international working environment as a significant career opportunity. They were also attracted by the organizational structure, suggesting the difference in culture was something attracting the employees when they take up initial employment. This again indicates the importance of the CPM in addressing cultural issues. If employees are attracted to the international culture, but then cannot fit into this work environment, it is likely to cause both the individuals and the organization significant inconvenience.

Once the employees had been questioned about their reasons for working in software development and within an international work environment, they were asked to reflect and review these answers and decisions to encourage development of a personal vision. This personal vision was then developed further, and more specifically oriented toward the organization through the application of a reflection

and review of the previous critical incidents, which were captured and taught to the new employees during their orientation. The critical incident reflect and review was adapted from Gibb (1988) and the process is shown in Figure 4.13

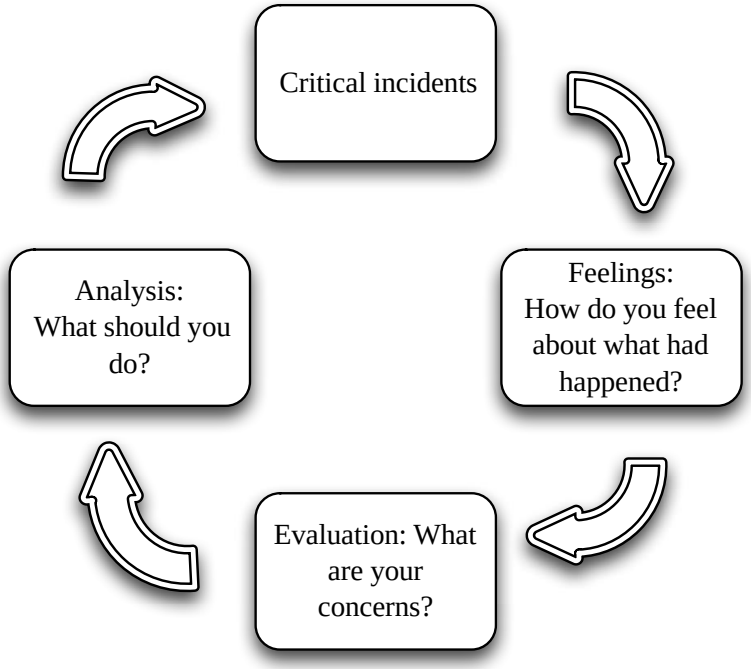

Figure 4.13 The process of critical incident reflect and review

As shown in Figure 4.13, the process used the previously identified critical incidents and asked the newly recruited employees what they thought about these issues. They were asked about their concerns and what they should do if they encountered such issues. This process of reflection and review, in combination with the previous questioning about career choice and influences, encouraged employees to create their own personal vision while working at the case study during their probationary period. The employees then worked for a period of six weeks, while being observed.

4.8 Pillar Two Results: Force field analysis and Creative Tension

Following six weeks of work, the probationary employees were provided with feedback on their work performance. This feedback was related to the 13 critical incidents. The feedback was structured according to the process of force field analysis (see Chapter Three) to generate creative tension in the employees. The results of the

force field analysis and resulting tension are shown below in Tables 4.8 – 4.10 for the three employees. The average tension is calculated by dividing the total tension from the two forces (driving and restraining forces). The forces in the driving and restraining columns, and average tension, can be interpreted according to the following levels, which are also expanded upon in Table 4.11:

- **Level 1** – negligible effects on work performance
- **Level 2** – small effects on work performance
- **Level 3** – medium effects on work performance
- **Level 4** – strong effects on work performance
- **Level 5** – powerful effects on work performance

Table 4.8 Force field analysis and resulting tension for case study 1 (Mr. P)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Time management	+ **5** stay at work focus	+ **4** loss of work concentration	**4.5** (+9/2)
	+ **5** flexible working hours	+ **4** unproductive working hours	**4.5** (+9/2)
	+ **5** Google search technique/ reading materials	+ **4** speed of learning	**4.5** (+9/2)
Report current reality and forthcomings	+ **4** customers feedback	+ **1** distorted information during work report/ requirement creep/ requirement change	**2.5** (+5/2)
	+ **3** senior mentoring	+**1** system misconception	**2** (+4/2)

Table 4.8 Force field analysis and resulting tension for case study 1 (Mr. P) (Continued)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Technical performance	+ **3** working atmosphere	+ **2** unsuccessful self-learning	**2.5** (+5/2)
	+ **3** new technology introduction	+**2** new version of development tools/technology compatibility	**2.5** (+5/2)
Customer involvement	+ **4** customer information	+ **1** indirect way to communicate with customers	**2.5** (+5/2)
Developing and influencing others	+ **4** Scrum meetings	+ **2** lack of interpersonal skills	**3** (+6/2)
	+ **4** employees' work board	+ **2** work display	**3** (+6/2)

Table 4.9 Force field analysis and resulting tension for case study 2 (Mr. A)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Time management	+ **5** Stay at work focus	+ **4** work obstacles e.g. bug/error	**4.5** (+9/2)
	+ **5** Flexible working hours	+ **3** additional work assignment	**4** (+8/2)
	+ **5** Google search	+ **5** long time to understand the usage of new technology required	**5** (+10/2)
Report current reality and forthcomings	+ **4** customers' feedback	+ **3** customers do not understand the work restrictions that arise	**3.5** (+7/2)
	+ **3** senior mentoring	+ **3** unable to foresee the following outcome	**3** (+6/2)
Technical performance	+ **5** working atmosphere	+ **4** insufficient learning medias	**4.5** (+9/2)
	+ **3** new technology introduction	+ **5** complication of new technology used	**4** (+8/2)
Customer involvement	+ **4** customer information	+ **5** customer background e.g. unclear or insufficient customer requirement /customers lacks of technical knowledge	**4.5** (+9/2)

Table 4.9 Force field analysis and resulting tension for case study 2 (Mr. A) (Continued)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Developing and influencing others	+ **4** scrum meetings	+ **4** bravery to express ideas e.g. shortage of experience, personal characteristics	**4** (+8/2)
	+ **4** employees' work board	+ **3** means to show the work	**3.5** (+7/2)

Table 4.10 Force field analysis and resulting tension for case study 3 (Mr. B)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Time management	+ **5** stay at work focus	+ **4** work obstacles e.g. bug/error	**4.5** (+9/2)
	+ **5** flexible working hours	+ **3** additional work assignment	**4** (+8/2)
	+ **5** Google search	+ **5** long time to understand the usage of new technology required	**5** (+10/2)
Report current reality and forthcomings	+ **4** customers feedback	+ **3** customers do not understand the work restrictions that arise	**3.5** (+7/2)
	+ **3** senior mentoring	+ **3** unable to foresee the following outcome	**3** (+6)

Table 4.10 Force field analysis and resulting tension for case study 3 (Mr. B) (Continued)

CMMI process	Creativity (driving force)	Current reality (restraining force)	Average Tension
Technical performance	+ **5** working atmosphere	+ **4** insufficient learning medias	**4.5** (+9/2)
	+ **3** new technology introduction	+ **5** complication of new technology used	**4** (+8)
Customer involvement	+ **4** customer information	+ **5** customer background e.g. unclear or insufficient customer requirement /customers lacks of technical knowledge	**4.5** (+9/2)
Developing and influencing others	+ **4** scrum meetings	+ **4** bravery to express ideas e.g. shortage of experience, personal characteristics	**4** (+8/2)
	+ **4** employees' work board	+ **3** means to show the work	**3.5** (+7/2)

The driving forces, restraining forces, and average tension can be interpreted via a critical thinking framework, which provides a series of levels regarding the competence of individuals in terms of their critical thinking. These levels are shown in Table 4.11. The levels have been adapted from the literature and transposed into real critical thinking levels as seen at the case study and observed in working behaviours. An additional level was created based on the working behaviours shown at the case study during implementation of the CPM.

Table 4.11 Critical Thinking Levels from Working Behaviors and Observation during implementation of the CPM

Critical Thinking Levels (Adapted from Fisher and Scriven, 1997)	Critical Thinking Levels Observed from Working Behaviors
Level 1: Reactive processing level Identifies key ambiguity and missing elements	***Level 1: Passive*** Employees pay no attention to critical incidents that may obstruct their work, ignore the problem, and do not seek assistance
Level 2: Proactive or investigatory Involves interrogating, examining or finding further sources in order to obtain further key information or clarification	***Level 2: Perceive*** Employees realize that critical incidents represent problems that may occur during the job
Level 3: Reflective/ analytical level Meta cognition: identification of good sources and information-gathering procedures	**Level 3:** ***Reactive*** Employees know which critical incidents may or may not cause a problem when they perform the job.
Level 4: Interpretative level Mastery and use of powerful vocabulary of informal logic, drawing conclusion about complex claims	**Level 4:** ***Proactive*** Employees understand problems thoroughly and think about problem prevention
No fifth level	**Level 5:** ***Innovative*** Employees consider each critical incident carefully, analysing and thinking about solutions to prevent problems or repeating the same mistakes

Based on the problem individuals are facing at work, they can have one of the five critical thinking levels from Table 4.11. Levels 1 and 2 suggest that an individual has no critical thinking, and the first stage of critical thinking therefore arises at level 3, which is a reactive level of critical thinking, where individuals are aware of critical

incidents that cause work performance issues. The more complex the work problem, the higher the potential for individuals to feel passive and insecure, and once an individual is able to find a solution to work problems without repeating past mistakes, they have reached the 'innovative' level. If knowledge workers can achieve this innovative level they have achieved what is termed connectedness. Achieving connectedness is the final aim of the CPM. If employees are able to generate creative tension through the force field analysis and then instill their own personal vision, they are likely to achieve connectedness which is the sense of belonging to the organization.

4.9 Pillar Three Results: Connectedness

After the force field analysis and generation of creative tension, the employees were able to continue working for a further six weeks, until the end of their probationary period. At this stage, based on the creation of a personal vision during the probation orientation and the generation of creative tension from the force field analysis, the employees were able to achieve connectedness, and all three pillars of personal mastery. The achievement of connectedness was measured via proxy, through an overall evaluation of the newly recruited employees and the CPM is achieved in Step 5. In terms of connectedness, the newly recruited employees were assessed via three factors: their relation to work-life in the organisation, their relation to the German-Thai culture and finally, their relation to work engagement. Figure 4.14 indicates how the newly recruited software developers achieved connectedness. These three issues were classified based on the results to the research questions of this study. The aims were identified in Chapter 1 and the discussion and conclusion based on the results were described in Chapter 5. After the CPM and probationary period, the newly recruited knowledge workers are no longer trainees, but mingle and connect with each other and the organisation.

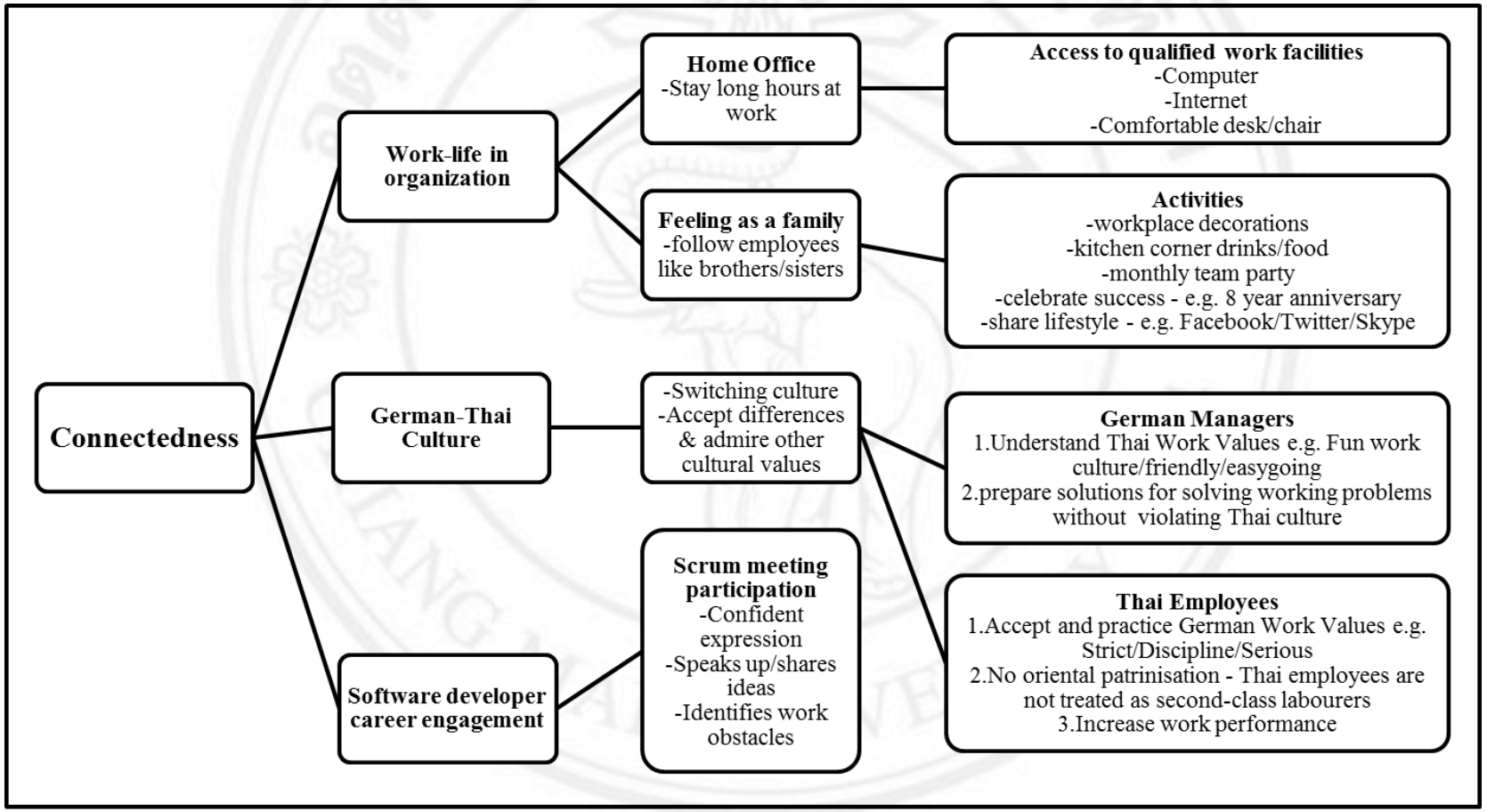

Figure 4.14 Achieving connectedness at the case study: mingling with each other and the firm to become connected rather than remaining as trainees

4.9.1 The Employees Relation to Work-Life in the Organization

Based on the company regulations, Thai employees spend at least 7 hours working as software developers. They usually come to the office at 9 am.; have a one-hour lunch break at 12pm. After that they begin to work again at 1.00 pm and leave for home at 6.00pm or sometimes they stay longer than that. All the new recruited employees agreed that the company make them feel at home. Mr. P said that he didn't mind staying in the office longer than usual working hours. He could access the internet to quickly search for IT updates articles to read. Mr. B liked the working desk and chairs that were comfortable to sit on while working. He said that software developers need to sit for many hours working on the computers. Comfortable office chairs helped reduce back and leg pain when he had to sit and work for a long time. Likewise Mr. A., addressed the fact that the big screen computer made him happy to write long code. He could see things clearly and a good quality computer screen was friendly to his eyesight.

Furthermore, the three new employees felt that they are a part of the company like a member of the family. Each of them gave some examples of activities that brought them into a feeling of being part of a family. Mr. B said that the working atmosphere was pleasant with palm trees and orchid decorations. The big umbrella in the rooms made the room feel like they are at the beach. Mr. A made a compliment on the company kitchen service that offered fruit for employees as well as a relaxing hour in a company massage room. He insisted that the company really cared for the employees' well beings. Mr. P said that he liked the monthly parties and felt happy to participate in the show to celebrate the eight year anniversary. When he saw colleagues smile and laugh at the group's performance, he felt that he shared friends' happiness and he was accepted by colleagues. Furthermore, everyone points out that they have good relationships with other colleagues. They share and talk about daily life via Facebook, Twitter and Skype messages. This signifies that life at work strengthens their friendships and they become closer to each other and they get to know each other more.

4.9.2 The Employees Relation to the German-Thai Culture

The first day of work orientation, the three employees expressed worries about working in a different culture. Mr. P asserted that “on the first day I had so many thoughts in my mind; what was the work going to be like, how could I spend my working life in this company. I was asked to select the assignments I would like to accomplish. I was not sure which one to choose: coding i-phone or android. I conducted my final project about the i-phone, but I also had experience with android too. The problem was that I forgot some parts of the principle. Thus I had to make up my mind to work with i-phone technology.” Mr. A said that “The moment I got an assignment and started working with it, it was difficult for me because it was a really new thing to learn. Even though it was similar to my final project at university, but it was different in a way that at university level I could use tools that existed on the internet. I didn’t have to create an interface or layout. Thus I had to learn to write Android UI completely as well as learning how to log in to the server to get the information from headquarter in Berlin, Germany.” Mr. B” I was assigned to create one program. At first, I did not know how to start so I had to ask the experienced software developers who trained me. I felt insecure and fearful.”

However, after these three case studies were evaluated in week 11-12 which was the experimental period of the CPM (See figure 3.14), they became more experienced and relaxed about work assignments because of learning through the 13 critical incidents presented during the first week of the training orientation as well as the force-field feedback received in week 6 which influenced their positive working behaviours. Mr. P said that he became much more punctual. Mr. A. said that German culture taught him to be organized and disciplined. He prioritized work more often and that influenced him to finish work more quickly than schedule. Mr. B admitted that German culture changed him to be more serious at work. To finish work was not just to finish something, but to create it as perfectly as possible. There would be double checks and test of the coding before sending it off.

There was no problem about the working relationship between Thai employees and German managers. Mr. P said that he was proud of himself working in a multinational company. “I could communicate in English and wrote code according to customers’ orders. I don’t feel as though I was an alien in the eyes of the

westerners. They complimented me on my work and I was happy about it." Similarly, Mr B. said that he was lucky that German managers were not nationalistic. Mr. A. said that the German managers were friendly. "They didn't appear so arrogant or as dead serious as they were stereotyped." I saw German managers smile and joked with us. I thought that he was easygoing to the Thai employees.

The connectedness between Thai employees and German managers could be explained by the orientalism concept addressed by Said (1979). The westerners often viewed the eastern people as backwards and slow to develop themselves. This action clearly showed the west's patronizing ideas towards the group of people who were different from them. The false belief occurred due to the cultural misconceptions about the orient in Asia or Middle East. It signified the colonialism and imperialism era of the western world. However, when the time is passing by and the business world has been influenced by the knowledge economy. The globalization brings people closer and their connectedness creates the acculturation phenomenon of people even if they are from the different cultures. They are more tolerate and flexible to other cultures. For examples, the study of Petison and Johri (2008) demonstrated how expatriates managers adjusted and understood with respect to capabilities and development needs of local Thai employees. Thus four types of expatriates' roles were categorized: a commander, a conductor, a coach and a connector. Likewise in this research, the German managers in the case study realize about the national characteristic of Thai employees. Understanding the differences helps the German managers seek ways to compromise instead of giving a strong admonition when working problems occur. For example, the German managers avoid scolding and giving a bad warning to Thai employee in front of their colleagues because they know that Thais cannot bear confrontation and losing face. Another example is that, the German managers realize that Thai employees have difficulty to express ideas and report important issues in the meetings, to encourage the Thai employees to speak up. The strategy is to let them prepare the topics in form of writing and they can bring notes with them to the meeting room and speak out loud. This way it works out better because Thai employees know exactly what they want to say.

4.9.3 The Employees Relation to Work Engagement

To improve the work performance is the ultimate goal of personal mastery. The employees are successful at work because they synchronize themselves fully with their duties. Mr B. said that "he was relaxing when he needed to talk with the German managers because the bosses patiently listened to his ideas. "German managers never stopped me from explaining about the work. German bosses tolerated listening and openly discussed ideas of which I didn't mind if the feedback would be negative." Mr. P. admitted that he liked to share ideas in scrum meetings. "In my opinion, reporting about the status of work was important and we needed to speak up to share knowledge." Mr. A. confessed that before he was shy and was not brave enough to say something negative about his work in the meeting, however, he gained more self-confidence when he realized that his friends also presented some ideas, thus he felt safe to identify some of the obstacles in his own assignments.

4.10 Step Five: Validation/Evaluation of the CPM

The final stage of this chapter presents results according to step five of the methodology, which according to Figure 4.15 is the evaluation of the CPM.

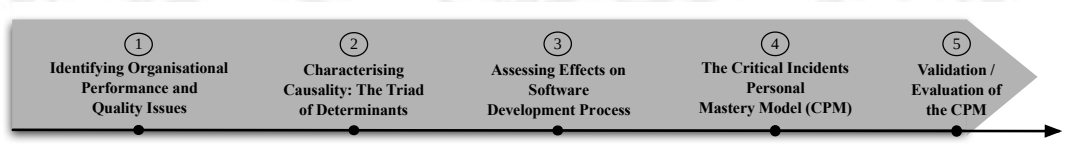

Figure 4.15 The fifth and final step in the results, presented in accordance with the methodological steps outlined in Chapter Three

As described in Chapter Three and shown below in Figure 4.16, the CPM was evaluated from the perspective of three stakeholders: the newly employed software developers, the senior developers and the German management. The results from this evaluation are presented according to each of these stakeholders before summing up the overall evaluation of the CPM. Finally, the CPM is compared with the commonly utilized P-CMM, which is directly related to the CMMI tool. The comparison seeks to understand the advantage of the CPM over more readily available existing tools.

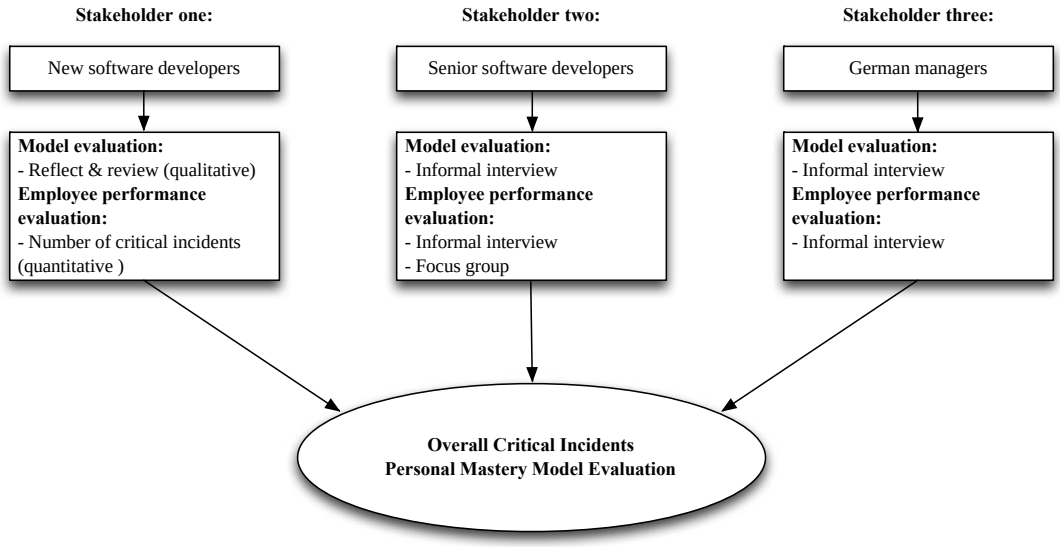

Figure 4.16 The evaluation of the CPM from the perspective of three stakeholders

4.10.1 Newly Recruited Employees

The newly recruited employees reported that the CPM had alleviated stress that they were feeling towards the new job and work environment. The foundation of critical thinking and creation of personal vision gave them something to strive for when working in the probationary period, and a yardstick against which they could measure their own progress and attempt to continually improve. The critical incidents and foundation of critical thinking in the CPM allowed the employees' to enhance their critical thinking power towards work obstacles.

The 13 critical incidents affecting the case study were also reduced to only five, suggesting that the CPM reduced critical incidents by over 50%. In reality, the relatively small sample size of three employees, compared to the ten in the control group suggests that the reduction in critical incidents could be an artifact of statistical sampling. However, the application of the CPM and its specificity in design suggests that the reduction in critical incidents is a real result of the application of the CPM.

4.10.2 Senior Developers

Senior developers reported that the critical incidents, and the performance of newly recruited employees' against these criteria allowed for the creation of a

checklist of the employees' skills. This checklist could then be utilized in making the recruitment, orientation, feedback and evaluation more effective in the future, and would also allow the employees' future needs to be determined in in terms of becoming effective developers. The senior employees also reported that in addition to the specific reduction in critical incidents, there was an improvement in the newly recruited employees' working behaviors. This can be attributed primarily to the generation of creative tension, which enables the new employees to strive for better performance and behavior more in line with company expectations.

4.10.3 German managers

The German management team reported that they had a significantly improved understanding of the causes and effects of work issues in the German-Thai work environment. The management suggested this would help them create an improved German-Thai working culture and would provide the employees with real opportunities and tools to reduce their working problems. The German management also suggested that the creation of a personal vision, and generation of creative tension would enable new software developers to speed up their career path from junior to senior developer.

As well as evaluating the effectiveness of the CPM, each of the three stakeholders provided suggestions to further improve the effectiveness of the CPM. These suggestions are shown in Table 4.12

Table 4.12 The suggestions from the three stakeholders about possible future improvements to the CPM

Newly Recruited Software Developers (experimental group)	Senior Thai Software Developers (control group)	German Managers
1. More explanation about the critical incidents from senior employees so questions can be asked about work problems. 2. Consideration about the prioritization of critical incidents so that the priority might be changed to fit individual employees and circumstances. 3. The use of a knowledge management system to collect critical incidents in the company database so new employees can study and prepare for their career/work at any time.	1. More emphasis should be placed on the cultural differences between Germans and Thais during the probationary period. 2. The collection and assessment of critical incidents should be updated regularly. 3. There should be more focus on the creation of a positive (yes you can) attitude. 4. Newly recruited employees should be reminded of the value of continuous learning and encouraged to practice this.	1. New critical incidents should be investigated and added to the process. 2. There should be a mutual understanding of the meaning of "done" between German and Thai software developers.

Overall, the CPM evaluation showed the following:

- The number of critical incidents made by the newly recruited employees fell from 13, to 5, most likely due to the CPM.

- The creation of personal vision and generation of creative tension allowed newly recruited knowledge workers to adopt working attitudes and behaviors in line with the expectations of the case study firm.

- German management suggested that the CPM would allow new employees to progress more quickly from junior to senior developers, which fits with the personal needs and ambitions of these new employees.

- The CPM developed awareness from all stakeholders about the difference in German and Thai cultures, the potential issues and the possible solutions to these issues.

- The CPM encouraged critical thinking throughout the duration of the probationary period, and beyond.

- Work-life balance issues were identified and prevented in the often difficult probationary period due to the personal mastery aspects of the framework, which allowed employees to understand their role, their potential future career and how they fit within the organization. The expectations of their working behavior were made clear by the CPM.

4.11 The People Capability Maturity Model (P-CMM) Versus the CPM

A critical question to ask of the proposed CPM model is whether it provides any improvement or advantages over more readily available and existing tools and models for the management of knowledge workers in the software industry. Chapter Two (Section 2.11.2) has already introduced the concept of the People Capability Maturity Model, which originates directly from the Capability Maturity Integration

Model (CMMI) (Curtis et al., 2010). The CMMI was used to derive the critical incidents at the case study, but the P-CMM was not selected as a model to address the issues faced by the case study firm. This section thus considers the P-CMM and compares it with the CPM developed in this thesis to illustrate the similarities and differences between the two tools and why there was a need to develop the CPM rather than piggyback on the existing P-CMM tool.

According to Curtis et al. (2010), the P-CMM is a well-tested set of practices for the management of human capital. The P-CMM comprises five levels, with level one being the initial implementation of P-CMM, and level five representing a fully committed organization practicing continuous improvement. Gujral et al. (2012) illustrate that for the software development industry, people, process and technology are critical issues, and that the focus has previously been on process and technology, with a pronounced neglect of people. Figure 4.17 shows the need for a balanced approach to people, process and technology in order to achieve organizational stability. Critique of the original CMMI model related to its inherent focus on process and technology, and the subsequent lack of consideration of human capital. Feedback from organizations suggested that in order to improve process and technology in line with the CMMI model, substantial changes were required to the way in which the organization's human capital was managed. The P-CMM is thus moulded from CMMI, following the same pattern, and allowing software organizations to improve their human capital as well as their processes and technology.

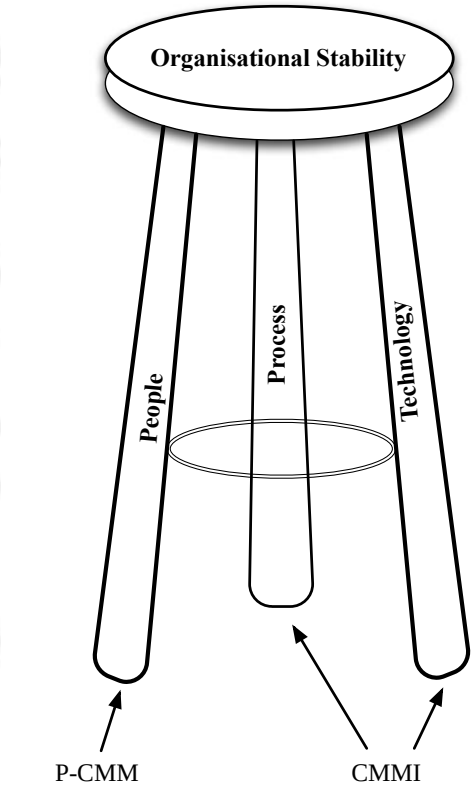

Figure 4.17 The three components required to achieve organizational stability and the relationship between P-CMM and CMMI

The P-CMM is often described as a roadmap (e.g. Wademan et al., 2007; Srinivasa and Ganesan, 2002), which organizations follow carefully, and in a staged approach in order to achieve best practice in the management of their people. The five levels of P-CMM and the associated details of each level are shown in Figure 4.18

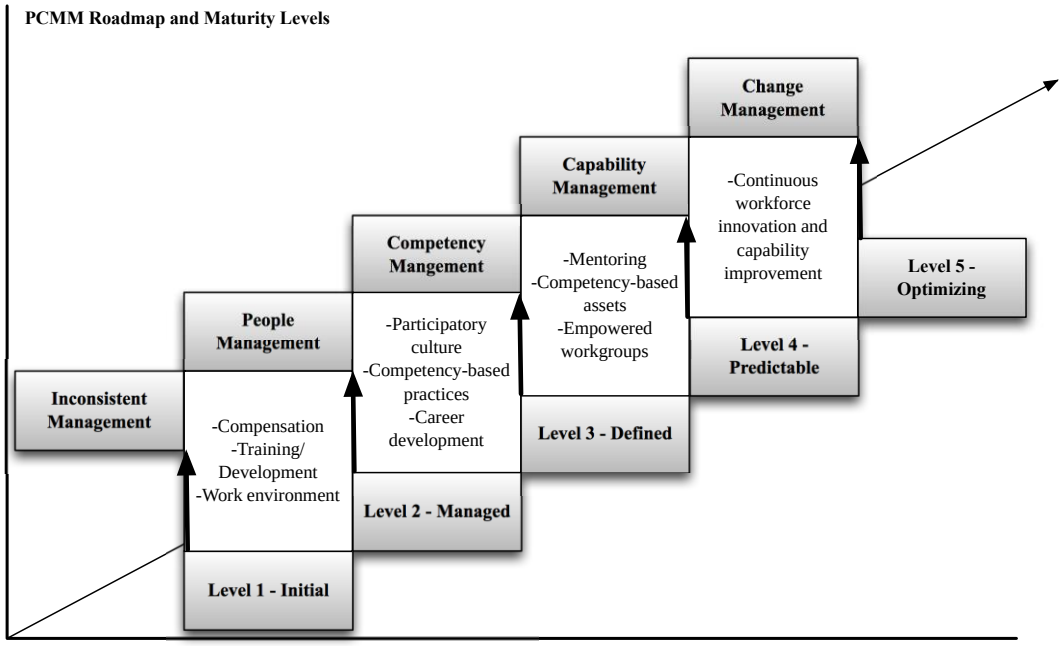

Figure 4.18 The five levels of the P-CMM and the associated organizational status of each level

A variety of organizations have adopted P-CMM since it was introduced to balance the process and technology focus of CMMI. Despite these high levels of adoption, the P-CMM has a number of issues which can impede the speed of adoption, or affect its success.

Firstly, the P-CMM, like the CMMI, was developed in conjunction with the US defence industry, and the majority of the development funding for both the P-CMM and CMMI came directly from the US Department of Defense (DoD) (Rout et al., 2001). While the development of the CMMI and P-CMM is not exclusive to the US DoD, the background and development of the models within the defense industry mean that there are subtle nuances and aspects of the CMMI and P-CMM, which do not necessarily fit with other organizations. For example, Staples et al. (2007) researched and indicated reasons why organizations do not adopt CMMI, and stated that small organizations find aspects of CMMI (and P-CMM) do not fit the needs of a small organization, and are too costly. This directly reflects the roots of the CMMI and P-CMM projects, which have been developed with large organizations in mind.

As noted previously, the original development of the CMM and CMMI did not take into account the effects of people, and instead revered processes and technology. As a result, the P-CMM is essentially an add-on to the existing CMMI framework, rather than being fully integrated within CMMI from the beginning. Proponents of organizational balance shown in Figure 4.9 suggest that people, process and technology should be considered holistically, rather than in silos.

Some argue that the strengths of CMMI and P-CMM lie in the relatively straightforward and staged approach to organizational change (e.g. Heinz, 2004), but this lack of specificity can also make it difficult for organizations to implement the CMMI or P-CMM. CMMI was designed from the ground up with a focus on organizational strategy, rather than day-to-day practice and is therefore a framework for improvement, rather than a tool for specific problems. Effective CMMI and P-CMM must be coupled with other specific tools and models to allow an organization to improve. In this vein, some argue that P-CMM has vague empirical support (e.g. Bach, 1994), and becomes a theoretical rather than practical consideration of organizational activities. This can lead to CMMI becoming a focus on certification rather than on real results. CMMI and P-CMM have frequently been described as being part of a quagmire of standards, which hinder real organizational effectiveness (e.g. Paulk, 2004).

In considering how the CPM proposed in this thesis differs from the P-CMM, Table 4.12 lists the key tenets of the CPM in relation to the people, process and technology aspects of the organization and then provides a comparison and juxtaposition of these aspects to the P-CMM framework.

Table 4.13 A comparison of the CPM proposed in this thesis versus the key tenets of the P-CMM

Aspects	Critical Incident Personal Mastery Model (CPM)	A Framework for Human Capital Management P-CMM
People	• Specific focus on individuals at a particular stage of their development needs • Personal mastery as a key theory to develop people in the organization • The Fifth Discipline and personal mastery advise flexibility • Welcomes and encourages individual and personal contributions to the organization • Built to address cultural issues associated within a multinational operating abroad	• Focus on general organizational strategy with regard to people • Awareness of the need for development of people, but with no suggestion of specific tools • P-CMM advises predictability • Distrustful of personal contributions and argues from an organizational point of view • No specific mechanism to deal with differing cultural aspects affecting the workforce
Process	• Built around a specific timescale (3 months) • Specific tools, activities and implementation plan provided • Process designed based on particular organizational issues with people	• Development process divided into maturity levels with no set timescale

Table 4.13 A comparison of the CPM proposed in this thesis versus the key tenets of the P-CMM (Continued)

Aspects	Critical Incident Personal Mastery Model (CPM)	A Framework for Human Capital Management P-CMM
	• Does not rely on experienced practitioners for implementation	• General guidance given, but with no specification of tools of how to implement • Generic process which does not provide bespoke solution to issues • Quick reference to assist experienced practitioners The development process is divided into levels which require long preparation to achieve goals
Technology	• Views people as the key enablers of technological innovation within the firm • Philosophy of the CPM is to improve people, with a view to enable technology • Desire to promote real technological innovation via the development of people	• Often viewed as a constraint to real technological innovation • Philosophy is sound in terms of advancing people and technology, but practical implementation for software engineering is problematic • Often described as a substitute for genuine change (e.g. Bach, 1994)

One of the key points shown in Table 4.13 relates to the consideration of culture in a multinational software firm. This is a key area where the CPM provides significant advantage over the P-CMM. The CPM has been designed based on the real causes and effects of issues in a multinational work environment. While the CPM has been compared to the P-CMM in terms of the advantages it offers, the CPM could exist in synergy with the CPM. For example, while the CPM provides a specific and focused model for newly recruited software developers in Thailand, the P-CMM provides a more general organizational roadmap. The CPM contributes to various maturity levels in the CPM and straddles the roadmap in several key areas. Table 4.14 illustrates the maturity levels of the P-CMM to show where the CPM makes a contribution, and how it can be coupled with the P-CMM should this be necessary, or desired.

Table 4.14 The five P-CMM maturity levels and areas where the CPM makes a potential contribution

P-CMM Maturity Level and Focus	Potential CPM Contribution
Level 1 – Initial **People Management**	• Provides a training/development program
Level 2 – Managed **Competency Management**	• Builds a participatory culture from the initial employment of knowledge workers • Based on key competencies/critical incidents from CMMI
Level 3 – Defined **Capability Management**	• Aims to empower new knowledge workers • A system of mentoring based on previous competency based issues
Level 4 – Predictable **Change Management**	• Provides a method to manage organizational capability
Level 5 – Optimizing **Continuous Improvement**	• Personal mastery seeks to continually improve knowledge workers' performance

The CPM developed in this research can thus act as a standalone model, or can be coupled with the P-CMM to develop knowledge workers in the organization. While there are a number of weaknesses associated with the P-CMM, along with CMMI, it is still one of the most popular ways to effectively manage people, process and technology in a software development environment (Curtis et al., 2009). This section has therefore provided a critique of P-CMM to show how the model developed in this research differs, as well as illustrating how it can be effectively coupled with P-CMM to provide a more specific and effective way to manage knowledge workers in the organization. The research did not investigate the adoption of P-CMM, and as reported by Staples et al. (2007), small firms often find the application of P-CMM too costly, not specific and with no clear benefits. In this respect, the CPM in this this research provides a cost-effective, specific alternative, with clear benefits and a bespoke consideration of culture, which plays a significant role in mediating people within a multinational organization operating abroad.

4.12 Chapter Summary

This chapter represents the principal research chapter in the thesis, and has presented and discussed the research results. The chapter structure has broadly followed the steps set out in the methodology (Chapter Three). The first part of the chapter has shown the work performance and quality issues at the case study firm from the point of view of managers and employees. The causality of these issues was then shown via the triad of determinants, including cultural, work-life balance and general issues. The 13 critical incidents affecting the software developers at the case study firm were then presented according to CMMI level 2, and related back to the triad of determinants. The second part of this chapter then presented the CPM and showed how it was implemented, including the effects from each of the three pillars within the CPM (CMMI critical incidents, force field feedback, performance evaluation). Finally, the chapter moved to an evaluation of the CPM, including the perspective of German managers, senior software developers (control group) and the newly recruited software developers (experiment group). Discussion comparing and contrasting the CPM versus the more readily available P-CMM provided an evaluation from a wider and software specific contextual viewpoint. The final chapter of the thesis now brings the results to a close by summarising the thesis findings and relating them back to their wider context.