CHAPTER 2
LITERATURE REVIEW

2.1 Chapter Overview

This chapter presents a review of the literature, including key concepts and theories related to the research. The literature is presented in a logical order from general to more specific concepts relating to the research problem. The chapter begins with an outline of the burgeoning knowledge economy, and considers the varied definitions and debates contributing to the meaning and management of global knowledge industries. The chapter then moves on to specifically consider the software development industry as a key part of the knowledge economy. Thailand's growing software development industry is sketched via relevant literature, before concentrating on FDI as a key driver of growth in Thailand's software industry. The key factors affecting FDI then form the basis of the second half of the literature review. These factors are specifically related to the research problem and refer to managing employees in an international environment. The traditional human resources (HR) approach to managing staff is highlighted, before describing the relative merits of knowledge management (KM) to organize and administer the recruitment of knowledge workers. This approach naturally moves the discussion into arenas of research that include managing and changing human behavior, including personal mastery and critical thinking. Finally, aspects of the literature are connected and drawn together to illustrate the research problem and demonstrate the most appropriate way to address it, which then forms the domain of Chapter Three.

2.2 The Global Knowledge Economy

The concept of the knowledge economy was originally introduced by Drucker (1966), who was in turn heavily influenced by Machlup (1962). According to Powell and Snellman (2004), since the 1960s, there has been a growing debate over the definition, but continuing agreement that the leading edge of the economy is primarily influenced by innovation, technology, and knowledge production and dissemination.

Powell and Snellman (2004) go on to outline the three key research strands relating to the knowledge economy, which can be summarized as follows:

1. The traditional definitions of the knowledge economy, with science, engineering, and technology at the forefront of economic growth and knowledge production, as well as the perspective that theoretical knowledge is the key driver of innovation and knowledge growth (Powell and Snellman, 2004).

2. A second key definition and understanding of the knowledge economy centers on whether there are particular industries or types of activity which are considered particularly knowledge intensive, and how these relate to growth in the knowledge economy (Brinkley, 2008).

3. The third aspect of research and debate around the knowledge economy adopts the stance that what separates the knowledge economy and those industries involved in knowledge activities is how the organization operates in terms of continuous learning and innovation (OECD, 2005).

In reality, the knowledge economy cannot be constrained to one narrow definition or perspective, and thus straddles all the definitions outlined above. Despite Brinkley's (2006) assessment that there is a weakness and pervasive lack of definition in the literature, a particularly useful clarification of the knowledge economy is that it is simply the production and consumption of knowledge activities (Kay, 2012). This definition is broad and relatively straightforward, and therefore a useful addendum to this definition is that the knowledge economy encompasses innovation, signified by rapid technological change and associated obsolescence. One of the key tenets of the knowledge economy throughout the literature is the process and pace of change (e.g. Leslie and Rantisi, 2012). The penetration of the knowledge economy has not been constrained only to more developed economies; developing countries are also realizing the importance of knowledge as a driver of growth.

2.2.1 Knowledge as a Driver of Economic Growth

While debate centres on how to study and define the knowledge economy, there is agreement in the literature as to the way in which knowledge drives economic growth (e.g. Chen and Dahlman, 2005, Raspe and Van Oort, 2006; Contractor and Lorange, 2002). As such, governments are increasingly pursing strategies related to growing the knowledge economy. These strategies have resulted in globally shifting policies aimed at expanding the knowledge economy. Figure 2.1 illustrates a snapshot of worldwide policies and strategies related to the growing knowledge economy.

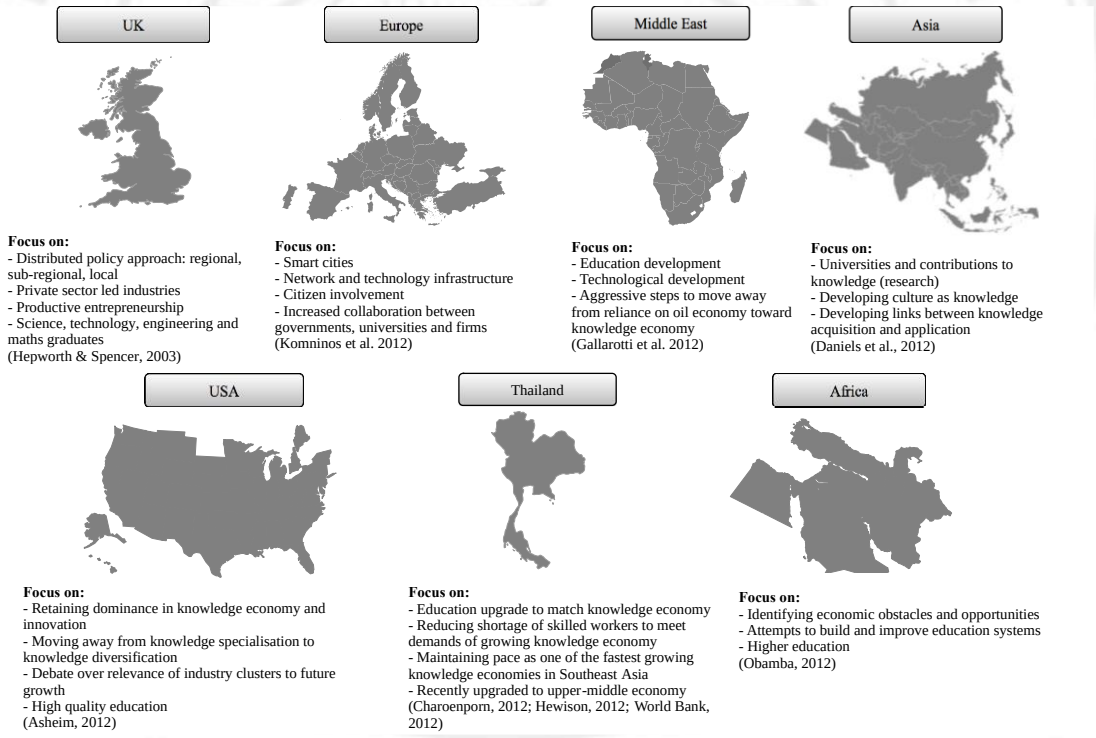

Figure 2.1 The global state of the knowledge economy based on current strategy and policies in various countries and regions

As shown in Figure 2.1, there is global interest from nations wising to compete and lead in the knowledge economy, but there is no one-size-fits-all approach, with spatially distinct features evident in different geographic regions. For example, the Middle East is keen to shift its reliance on oil and build a sustainable knowledge-based economy (Aubert and Reiffers, 2003). In the US, the originally dominant

knowledge economy, there are debates about whether industry specialization and clustering, or diversification represent the most effective way to continue developing and leading in the knowledge-based industries. The UK is placing focus on regional and sub-regional knowledge development, while Europe considers technological advantage and smart cities essential to success in the knowledge economy. Meanwhile, the image of China as the world's manufacturer is being replaced with increasingly innovative strategies and expanding investment in education (Aubert and Dahlman, 2001). In Southeast Asia, Thailand is shifting away from its agrarian focus and placing emphasis on the knowledge economy, with the recent upgrading of Thailand's World Bank categorization to an upper-middle economy being the result of sustained effort at developing its knowledge-based industries (World Bank, 2008).

While the definition of the knowledge economy varies, and there is continued debate in the literature about the best way to nurture the knowledge economy, there is agreement about what industries are considered knowledge-based and how they contribute to the knowledge economy.

2.2.2 Knowledge Industries: Knowledge as a Product vs. Knowledge as a Tool

While nominally similar, there is a subtle but important distinction between the terms knowledge economy and knowledge-based economy. The fundamental difference is that in the knowledge economy, knowledge is considered a product or service and in a knowledge-based economy, knowledge is regarded as a tool. This distinction also spills over to the related terms of knowledge industries and knowledge-based industries. Again, this distinction centres on whether knowledge is considered as a product or a tool. Those industries where knowledge is considered as a product are generally termed knowledge industries, while knowledge-based industries is a term reserved for companies using knowledge as a tool rather than a product. The knowledge industries are more accurately described in the literature using the term 'creative industries'. For example, Howkins (2007, p.8) describes the creative industries as, "*transactions of creative products that have an economic good or service that results from creativity and has economic value*". According to Howkins (2007), there are 15 broad categories describing the creative industries. These are as follows:

- Advertising
- Architecture
- Art
- Crafts
- Design
- Fashion
- Film
- Music
- Performing Arts
- Publishing
- Software
- Toys and Games
- Television
- Radio
- Video Games

Businesses operating in the above categories can be described as knowledge industries, where knowledge is considered as a product. It is worth noting that software (the focus of the case study in this thesis) is considered as one of these creative industries involved heavily in the creation and production of knowledge.

As well as the knowledge industries involved in creating knowledge as a good or service, there are also knowledge-based industries, where knowledge is not necessarily a product. Instead, knowledge is utilized as a tool to change the way an industry or business operates. The knowledge-based industries are thus much broader in scope than the knowledge industries (creative industries) where knowledge is regarded strictly as a good or service. The knowledge-based economy and the related knowledge-based industries focus on knowledge management and knowledge engineering as approaches to create competitive advantage in their businesses (Quinn, 1992). There are a plethora of examples in the literature, which reflect the focus on creating competitive advantage through knowledge engineering or knowledge management approaches (e.g. Bal *et al.*, 2011; Foss *et al.*, 2012; Sandhawalia, 2011).

One of the key aspects of either the creative industries, or the knowledge-based industries where knowledge is leveraged as a tool, is that they both rely on knowledge workers in order to create their competitive advantage. The development of a knowledge economy and the resulting reliance on knowledge workers has therefore become a key aspect of the majority of those global economies who seek growth, and in turn there have been a variety of approaches to designing strategies which build competitive advantage in an ever connected global economy.

Thailand has been actively pursuing development of a knowledge economy, as illustrated by the Tenth Economic and Social Development Plan 2007 – 2011 (National Economic and Social Development Board, 2007). Figure 2.2, corroborates the growth of knowledge activities in Thailand's economy, showing a definite increase in the knowledge economy index (KEI) between 1995 and 2002.

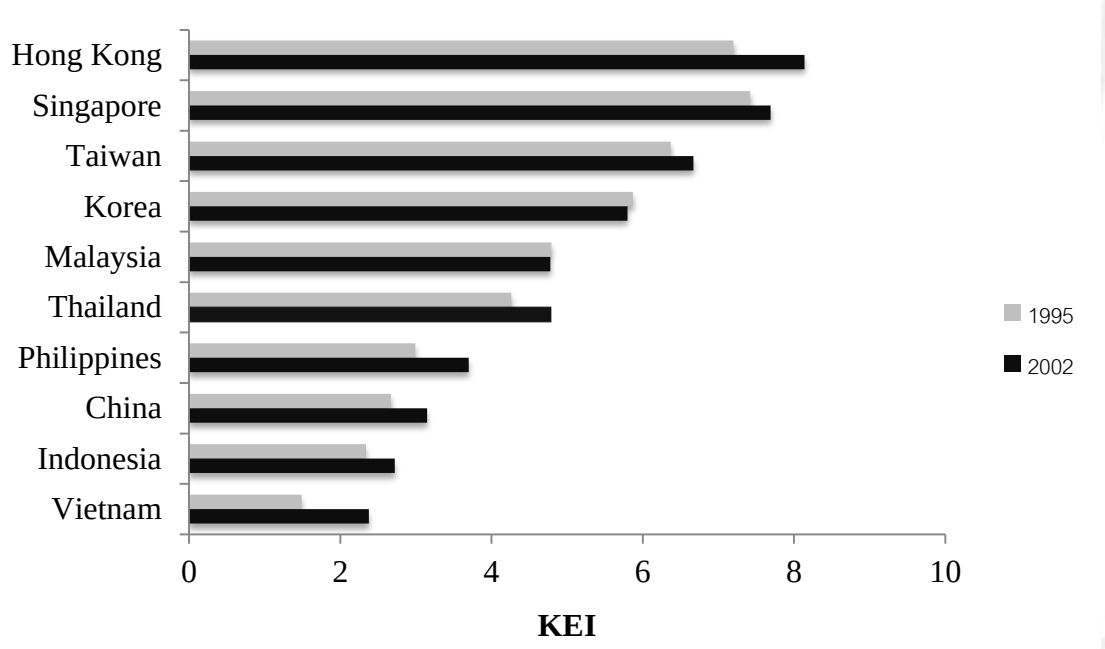

Figure 2.2 Thailand's knowledge economy index (KEI) from both 1995 and 2002 compared to other Asian nations. (Data source: The World Bank).

Figure 2.2 also indicates that Thailand has a greater KEI than China, the Philippines, Indonesia and Vietnam, representing a significant opportunity for growth. In terms of drivers of Thailand's growth, one of the dominant factors in Thailand's growing knowledge economy is IT, and more specifically, the software industry.

2.3 Thailand's Software Industry: Chiang Mai and Bangkok

According to Malaivongs (2008) Thailand's software industry has grown in parallel to global growth in the IT sector, and particularly in response to requirements to customize early versions of software designed for English speaking nations, so they were appropriate for the Thai market. Today, the software industry is worth over 300 billion baht in revenue per year (BOI, 2012), and the market value of Thai software products has seen rapid increases each year (Thai Financial Post, 2012). Concurrent with the growth in ICT, Thailand has experienced significant growth in its software development industry, and sees it as an important area of future growth (MICT, 2011). There are more than 100,000 IT professionals in Thailand, reflected by over 1000 software companies, of which the majority are SMEs (Software Park Thailand, 2011). While the domestic software market accounts for some of this growth, there are significant opportunities for foreign investment. For example, Gartner (2010) ranks Thailand as one of the top 30 off shoring destinations. There are a number of factors affecting the growth of the software industry, which can be categorized into one of seven areas for ease of discussion. These are listed below and described in detail in sections 2.3.1 – 2.3.7. The specific locations of the software industry in Thailand are then presented with a critical overview of the software industry in Bangkok and Chiang Mai.

Factors affecting growth and sustainability of the software industry:

1. Government strategy and policies
2. Availability of intellectual capital including skilled labour (knowledge workers)
3. Infrastructure (particularly the technological infrastructure)
4. Industry clusters
5. Wages
6. Work-life balance
7. Networking, marketing and overall investment image of a particular area/location

2.3.1 Government Strategy and Policies

Government strategy and policies are critical to the success of most economic activity (Krugman, 1986; Porter, 1980), but particularly to the growth and success of the software industry. This is due to some of the unique aspects of the software industry including its reliance on innovation, knowledge workers and the general leading edge nature of the software industry (Mowery, 1995; Heeks, 1996). Schware (1992) argues that policy and strategy are critical to build an effective software industry, and suggests that companies without effective government strategy may be unable to catch up with those nations who have already begun to build a successful software sector. In Thailand, government policy and strategy toward the software industry is strong, and according to the Thai BOI (2012), software is seen as a critical component of Thailand's wider drive toward a creative economy. One of Thailand's key policies is the Smart Thailand 2020 framework (MICT, 2012), which relies on a foundation of ICT (including the software industry), to drive a stronger economy, social equality, and environmentally friendly nation. To effectively nurture Thailand's software industry, the government has setup a variety of organisations. These allow strategy and policy to be transformed into actionable and practical steps conducive to growing the software industry. The key organisations are as follows:

- **Ministry of Information and Communication Technology (MICT)** – This was setup in 2002 as an umbrella organisation to manage and develop industries related to ICT, including software (MICT, 2012). MICT also publish strategy and policy documents related to Thailand's general ICT development as well as the related industries.

- **Software Industry Promotion Agency (SIPA)** – This organisation was established in 2003 to plan and develop Thailand's software industry policy (SIPA, 2013). The organisation also coordinates and involves itself with research, technology transfer, and the appropriate rules and regulations required for an effective software industry. SIPA is one of the most important organisations in terms of developing and designing policy related to the software industry.

- **Thailand Board of Investment (BOI)** – The BOI is a government organisation with the remit to promote investment in Thailand. While the BOI promotes investment in a variety of sectors, software is promoted as a key business opportunity for investors (BOI, 2012), and the BOI works closely with other organisations (e.g. SIPA, MICT) to ensure investment opportunities in the software industry are appropriately nurtured. The BOI is therefore critical in terms of attracting offshore investment in the software industry.

- **The Association of Thai Software Industry (ATSI)** – ATSI is Thailand's professional ICT association, with members from across the ICT industry. According to the ATSI (2013), they represent over 80% of Thailand's ICT industries. The ATSI has leverage in contributing and developing Thailand's national ICT policies.

- **The National Electronics and Computer Technology Center (NECTEC)** – This is an organization under the control of the Ministry of Science and Technology, and was established in 1986. NECTEC supports and develops electronics and computer technology (NECTEC, 2012). The organization also links research and industry and seeks to develop industrial clusters.

- **The Thai Animation and Computer Graphics Association (TACGA)** – TACGA formed in 2006, mainly as a consequence of discussions within SIPA (TACGA, 2012). TACGA is supported by several related government bodies and aims at building Thailand as a digital content center within the wider ASEAN region.

- **Thailand Software Process Improvement Network (Thailand SPIN)** - The growth of Thailand's software industry led to the establishment of Thailand SPIN in 1999. Thailand SPIN promotes software process improvement and software quality, acting as a forum to discuss quality methods, best practice and general support of technology transitions (Thailand SPIN, 2012).

These organisations highlight the importance the Thai government places upon the software industry. Together the organisations are a reflection of government strategy, while also informing and contributing to it. The importance of the software industry to the Thai government was demonstrated recently when SIPA announced a budget of 220 million THB to promote the software sector in 2013 (The Nation, 2012). While policy and strategy are critical to the success of the software industry, there must also be a suitable supply of skilled labor in order to fully develop the software industry.

2.3.2 Availability of Intellectual Capital (Knowledge Workers)

Thailand's labour force is undergoing a period of transformation (Glassman, 2004), particularly towards knowledge-based and service work. Parallel to this transformation has been an overall growth in the work force. This is illustrated in Figure 2.3, which shows growth in the Thai workforce from the 1980s to 2011.

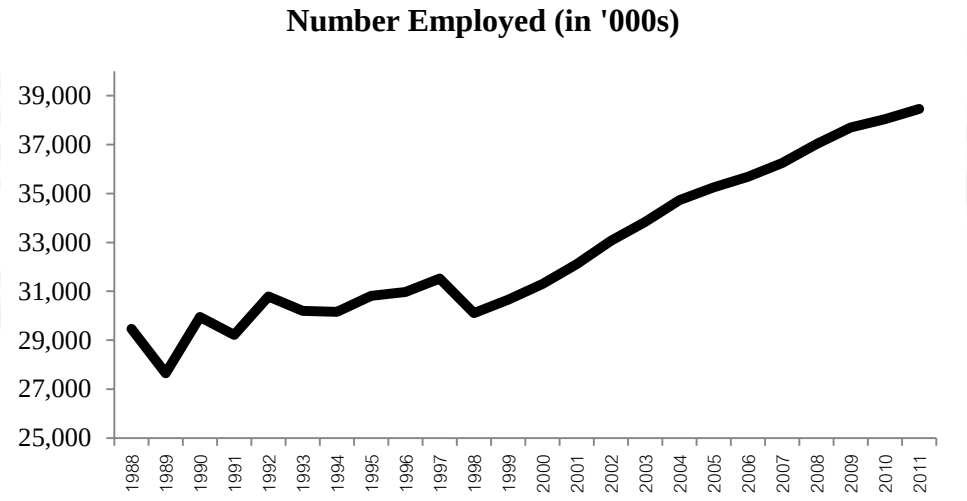

Figure 2.3 The growth of the Thai labour force in millions from 1988 – 2011 (Data Source: Asian Development Bank, 2013)

The growth in the workforce has also seen the percentage employed in ICT (and software) increase. Table 2.1 indicates that ICT-based employees grew by over 100,000 in seven years, and as also grew as a percentage of the total workforce.

Table 2.1 Number employed in ICT industries and proportion employed in ICT as a percentage of the total workforce (Data Source: National Statistical Office of Thailand, 2009)

Proportion	2002	2003	2004	2005	2006	2007	2008	2009
ICT-based employees	303,068	320,048	339,615	348,081	359,328	365,253	403,842	416,862
Proportion of ICT-based employees per total employed	0.92	0.95	0.98	0.99	1.01	1.01	1.09	1.11

As part of government strategy and policy, the availability of skilled software professionals has steadily increased. NECTEC (2012) state that one its key aims is to increase ICT human capital and general IT literacy among the population, particularly by removing the 'digital divide'. In line with this, there has been a concerted effort from Thai higher education to increase ICT-related human capital. For example, Table 2.2 indicates the rapidly increasing number of students graduating in software animation and gaming courses.

Table 2.2 The number of students graduating in the software based subjects of animation and gaming from 2007-2010

Year of Graduation	Number of students graduating in animation	Number of students graduating in gaming
2007	146	32
2008	265	37
2009	447	161
2010	680	251
Total	1,538	481

Thailand's top-tier universities have responded to the need for ICT and software professionals by expanding and developing courses that will produce the necessary human capital in these areas. Table 2.3 indicates the regional provision of higher education courses aimed at developing ICT or software professionals.

Table 2.3 The provision of software-related education across the four regions of Thailand

Region	University and Number of Undergraduate ICT Programs Available	Names of Faculties and Courses
1.1 Chiang Mai Province	Chiang Mai University (4)	**Faculty of Science** - Computer Science **Faculty of Engineering** - Computer Engineering **College of Arts, Media and Technology** - Animation - Modern Management and Information Technology
	Payap University (4)	**Faculty of Science** - Computer Science - Software Engineering **Faculty of Business Administration** - Information Technology **International College** - Information Technology Computer
	Chiang Mai Rajabhat University (2)	**Faculty of Science and Technology** - Computer Science - Information Technology
1.2 Chiang Rai Province	Mah Fah Luang University (6)	**School of Information Technology** - Information Technology - Computer Science - Computer Engineering - Information and Communication Engineering - Multimedia Technology and Animation - Software Engineering
1.3 Pa-Yao Province	University of Phayao (4)	**Faculty of Information Technology and Communication** - Business Computer - Information Technology - Computer Science - Computer Engineering
1.3 Pitsanulok Province	Naresuan University (5)	**Faculty of Business, Economics and Communications** - Business Computer - Information Technology for Communications **Faculty of Engineering** - Computer Engineering **Faculty of Science** - Computer Science - Information Technology
2.1 Bangkok Province	Chulalongkorn University (1)	**Faculty of Engineering** - Computer Engineering

Table 2.3 The provision of software-related education across the four regions of Thailand (Continued)

Region	University and Number of Undergraduate ICT Programs Available	Names of Faculties and Courses
2.1 Bangkok Province (Continued)	Thammasart University (4)	**Faculty of Science and Technology** - Computer Science **Faculty of Engineering** - Computer Engineering **Sirindhorn International Institute of Technology** - Information Technology - Computer Science
	Kasetsart University (3)	**Faculty of Science** - Computer Science **Faculty of Engineering** - Computer Engineering - Software and Knowledge Engineering
	King Mongkut's institute of Technology Ladkrabang (4)	**Faculty of Engineering** - Computer Engineering - Information Technology Engineering **Faculty of Science** - Computer Science **Faculty of Information Technology** - Information Technology
	Ram Kamhaeng University (3)	**Faculty of Engineering** - Computer engineering **Faculty of Science** - Computer Science - Information Technology
3.1 Cholburi Province	Burapha University (4)	**Faculty of Informatics** - Information technology (Continuing Program) - Computer Science –Software Engineering - Information Technology
3.2Nakornsrithammarath Province	Walailak University (6)	**School of Informatics** - Digital Information Management - Multimedia Technology and Animation - Information Technology - Computer Science - Software Engineering **School of Engineering and Resources** - Computer Engineering
4.1 Khonkaen Province	North Eastern University (2)	**Faculty of Computer and Information Technology** - Business Computer - Information Technology
	Khon Kaen University (2)	**Faculty of Engineering** - Computer Engineering **Faculty of Science** - Computer Science

Despite the growth of employment, and the increase of those employed in software or ICT related industries, some argue that Thailand is facing a significant shortage of skilled labour, particularly in the ICT and software sectors (e.g. The Economist, 2012). The forthcoming ASEAN Economic Community (AEC) in 2015 aims to promote the free movement of labour and capital (Poapongsakorn, 2012) and this could either exacerbate or relieve the availability of skilled labour. However, recent discussions suggest Thailand could be an attractive place for skilled ASEAN knowledge workers (Bangkok Post, 2012). However, as well as availability of appropriate human capital, the software industry requires an effective technological infrastructure.

2.3.3 Technological Infrastructure

According to the World Economic Forum (2012), out of 142 countries, Thailand ranked 77th based on the 2012 Network Readiness Index (NRI). The NRI is described as the degree to which a community is ready to participate in an ICT networked world (Kirkman et al., 2002). Relatively speaking, Thailand's NRI ranking is low, but Thailand ranks above its regional neighbours (e.g. Vietnam, The Philippines). There is also debate about the NRI's effectiveness (e.g. Hanafizadeh et al., 2009) with some measures and computations obscuring the true picture. According to the Thai BOI (2012), there are more Internet hosts in Thailand than any other Southeast Asian country. Other sources confirm that rapid progress has been made in Thailand in terms of broadband and cellular connectivity. More specifically, Koanantakool et al., (2009) suggest real progress is being made in wireless broadband, grid computing, IPv6, web services and digital broadcasting. The overall effect of this progress in technological infrastructure facilitates the development of the software industry in Thailand, and is a natural prerequisite when attempting to attract FDI or build industry clusters.

2.3.4 Industry Clustering

In the mid-1980s the notion of industry clustering for high-tech industries became particularly in vogue (Glasmeier, 1988). More recently, industry clustering in the software industry has been recognized as beneficial in terms of knowledge sharing, embeddedness and overall competitiveness (Dayasindhu, 2002). In Thailand, software clusters enable strong public-private partnerships, and links with universities to promote innovation and entrepreneurship. According to Ketels (2003), Thailand's software clusters are relatively small, and do not have significance in the world market, but these clusters have been growing. A variety of software clusters have been implemented across Thailand to develop the software industry. These clusters are described below.

- Software Park Thailand – established to support and strengthen software industry clusters throughout Thailand under the National Science and Technology Development Agency (NSTDA)
- MISOLIMA Software and Technology Park – established in Chiang Mai in 2001
- E-saan Software Park – established in Khon Kaen in 2003
- Software Park Phuket – established in Phuket in 2000 to drive Phuket as an ICT city
- Samui Software Park – established in Samui in 2003 as the first private software park
- Korat Software Park – established in Nakhon Ratchasima

The implementation of these clustering initiatives across Thailand once again indicates the importance of the software industry to Thailand's wider economic strategies. Industry clustering promotes industry growth in both domestic and international software firms. Despite the growth of these clusters, Thailand faces challenges in terms of its software industry and clustering, namely an unsophisticated local demand, a shortage of specialized skills (labour), and a generally weak science and technology system (universities and intellectual property protection) (Ketels, 2003). Despite this assessment of software industry weaknesses, progress has been

made since this time, and it is clear from the evidence presented so far in this section that the software industry in Thailand is experiencing growth. Much of this growth is from foreign direct investors, who are attracted by the relatively low cost of knowledge workers.

2.3.5 Wages

Wages are particularly important in terms of attracting FDI (Ismail and Yussof, 2003). According to the Thai BOI (2012), the average monthly wage for an employee in the software industry during 2011 was US$1,056. This cost is significantly lower than wages in the US or Europe. According to SCB (2011), the wage cost in Thailand has been stable and there has not been any significant wage increase for some time. While this might be positive for investors, it also impacts potential brain drain, which may occur if other countries in the region offer higher salaries, especially with the forthcoming free movement of people offered by the AEC 2015. Software Park Thailand (2012) suggests that in preparation for the AEC, wages in the software industry should be attractive, but operating costs kept low. This will ensure that Thailand remains attractive to foreign investors, but does not suffer from a shortage of skilled knowledge workers. The research in this thesis also offers solutions to keep Thailand attractive to foreign investors in terms of ensuring that Thai knowledge workers are effectively managed, and that productivity and quality remains high. While wages are undoubtedly an important consideration for foreign direct investors, the culture, quality of life and ease of managing employees are also critical, and often neglected in the literature.

2.3.6 Work-life Balance (Quality of Life)

The quality of life in a particular country has a significant impact on investors' location decisions, and on the pool of available knowledge workers. In addition, the work-life balance experienced by knowledge workers has an impact on whether they remain with a particular organization, and in a particular location. According to HSBC (2012), Thailand is one of the best places for expats to live, thus the attraction of FDI based on quality of life is strong in Thailand. The Thai BOI (2012) also states that

Thailand is the number one place to live in the Asia-Pacific region, and they attempt to attract FDI via the phrase, ‘pleasant living, good business’.

While the quality of life in Thailand is high, foreign direct investors have difficulty understanding some of the cultural aspects of the Thai workforce and their attitude toward life (Koonmee et al., 2010), hence the need to understand Thai employees’ perspectives and perceptions on work-life balance in order to prevent issues in the workplace. While quality of life, and work-life balance impact FDI, there must be an effective connection with these foreign direct investors if Thailand is to successfully attract and sustain FDI in the software industry.

2.3.7 Attracting FDI (Investment Image)

In 2012, Thailand received 332.2 billion THB in FDI, representing an increase of 62% from the same period in 2011 (BOI, 2012). This FDI was also against a backdrop of global economic issues (Thailand Business News, 2012). Despite this, some report that Thailand is loosing ground to neighboring countries (Bangkok Post, 2012), and the floods of 2011 (the worst in 50 years) might shift Japanese FDI to regional neighbors such as Vietnam or Indonesia (Bloomberg, 2011). The attraction of FDI thus depends heavily on the factors mentioned above, including government strategy, technological infrastructure, quality of life and cost of labour. Together, these factors synergistically influence the perception of whether to invest in a country. With specific reference to the software industry, two key software locations are now analyzed with reference to these factors, namely Bangkok and Chiang Mai.

2.3.8 Bangkok’s Software Industry

As the capital city of Thailand, Bangkok is a major regional hub and the commercial center of Thailand (MICT, 2012). The BOI (2012) note that software companies have been present in Bangkok for 35 years, but originally were unable to support domestic demand, which resulted in the entry of multinational firms. These multinationals frequently failed, hence in 1986, a national IT committee was set up to investigate the promotion of Thailand’s software industry (MICT, 2012). In terms of software, Bangkok is now focused on digital content, reflected by the creation of a flagship SIPA policy, which created the Bangkok Digital Content Centre (SIPA,

2007). There is particular growth in SMEs related to digital content, animation, and games (Chooprayoon and Fung, 2007), and according to SPIA (2012), the majority of Thailand's software companies are located in Bangkok. Bangkok offers excellent global and regional connectivity, both technologically and in terms of traditional communications infrastructure such as airports. However, the direction of the Thai software industry is currently inextricably linked to the concept of the creative economy. This has resulted in strategies to develop regional clusters, and an overall policy of decentralization (Warr, 2004). This has led to the rise of the software industry in other regions, for example, Chiang Mai in the north of Thailand.

2.3.9 Decentralization: Chiang Mai's Software Industry

As part of the Thai government's drive towards decentralization, Chiang Mai has become a strong area of economic focus (Glassman and Sneddon, 2003). As part of this growth, Chiang Mai is differentiating itself as a creative city (CMCC, 2013). This has significant implications for the software industry, which is a key part of Chiang Mai's creative focus (CMCC, 2013). Under the umbrella of its national flagship programs, SIPA (2007) established Chiang Mai as a global outsourcing center. Chiang Mai has now become a center for high technology and investment in the software industry (CAMT, 2013; Rimmer and Dick, 2009). In line with the key aspects affecting FDI, CMCC (2013) is striving to make Chiang Mai an attractive place to live, work, and invest. There are eight universities in Chiang Mai, with specific focus on the software industry. For example, CAMT, at Chiang Mai University aims to provide expertise to the growing software industry in Chiang Mai. Further specific references to Chiang Mai's software industry are made throughout this chapter and the rest of the thesis where appropriate. Figure 2.4 illustrates the key factors influencing Chiang Mai's software industry in comparison to the already well-established and commercial center of Bangkok.

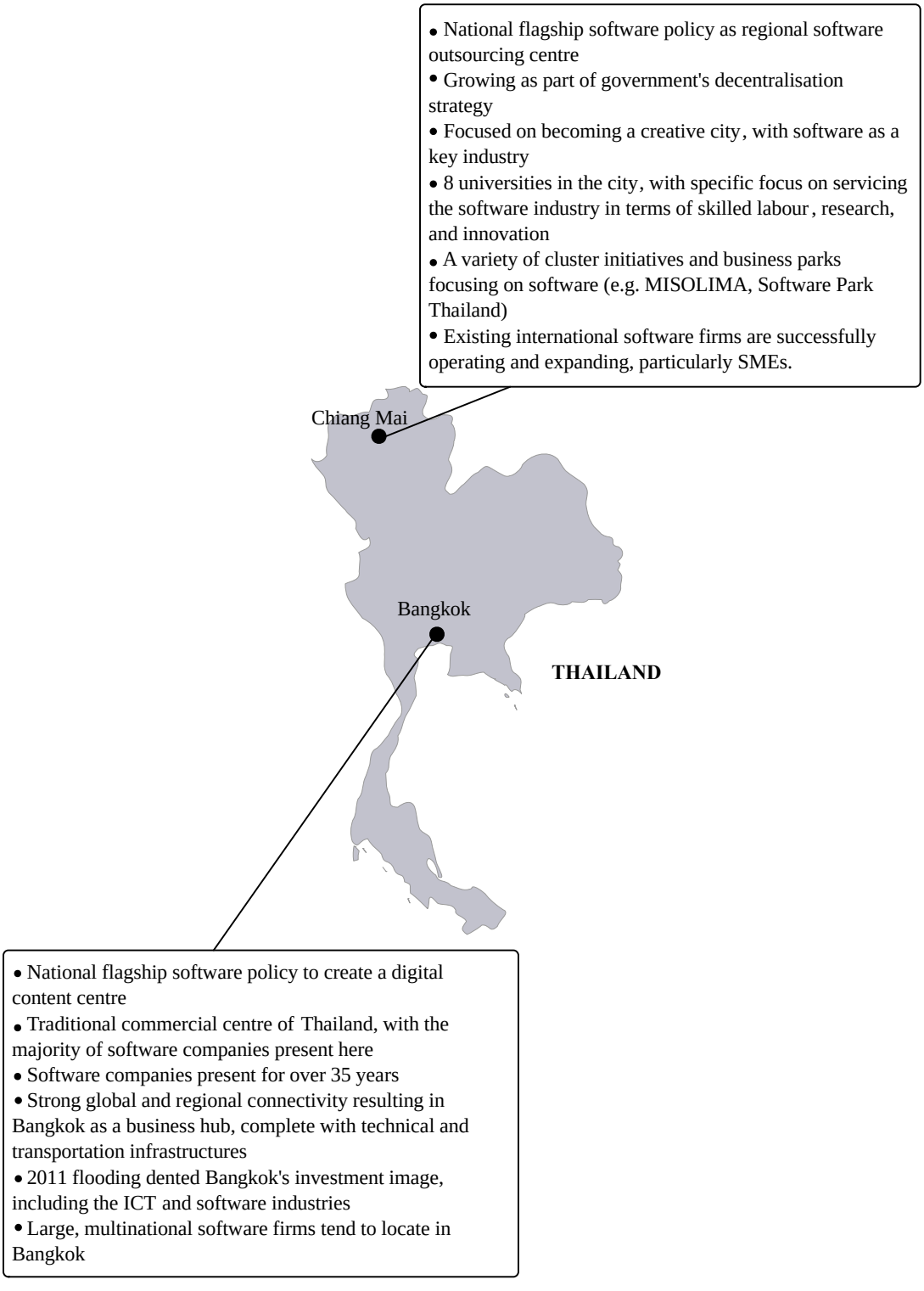

Figure 2.4 Key features of the Bangkok and Chiang Mai software industries

While the software industry is spatially variable across Thailand and relies on a variety of factors, a key characteristic of software development is that it is a quintessentially knowledge-based activity, as described below in section 2.4.

2.4 Software Development: An Intrinsically Knowledge-Based Industry

The software development industry relates to the global knowledge economy through a variety of its intrinsic features, and fits the key definitions and strands of the knowledge economy literature in multiple ways. For example, the software development industry can be described as producing both new technology, and intellectual property, and is particularly knowledge intensive. Software therefore fits both definitions of the knowledge industries, where knowledge is considered a product, and where knowledge is used as a tool. The software organizations that thrive in the knowledge economy are deeply involved in producing knowledge and organizing themselves around continuous learning and innovation.

The impact of software on the knowledge economy is exemplified by the software industry in India, where the increase in software development has also generated human capital and spilled over into other areas of the knowledge economy, resulting in general growth of India's economy (Arora and Athreye, 2002).

Software development has become a multisite, multicultural and globally distributed industry (Herbsleb and Moitra, 2001), and over the past decade a significant body of research has emerged to describe and analyze the global software development industry, which has signified both subtle nuances and paradigm shifts in the way software development is conducted. These shifts are influenced by economic, technological, cultural, and organizational issues (Damian and Moitra, 2006). There are also a wide variety of inherent day-to-day impacts arising from the global operation of the software development industry, including differences across time zones, connectivity, infrastructure, and communication with customers. The four main impacts on the software industry and the related bodies of literature are conceptualized via Figure 2.5 and explained in the corresponding sections. Figure 2.5 shows how the emergence of a globally connected software industry has resulted in software development becoming a synergistic mix of art, science and practice, with

significant rewards for firms who achieve an effective integration of these factors, as well as wider significant benefits for the host economy.

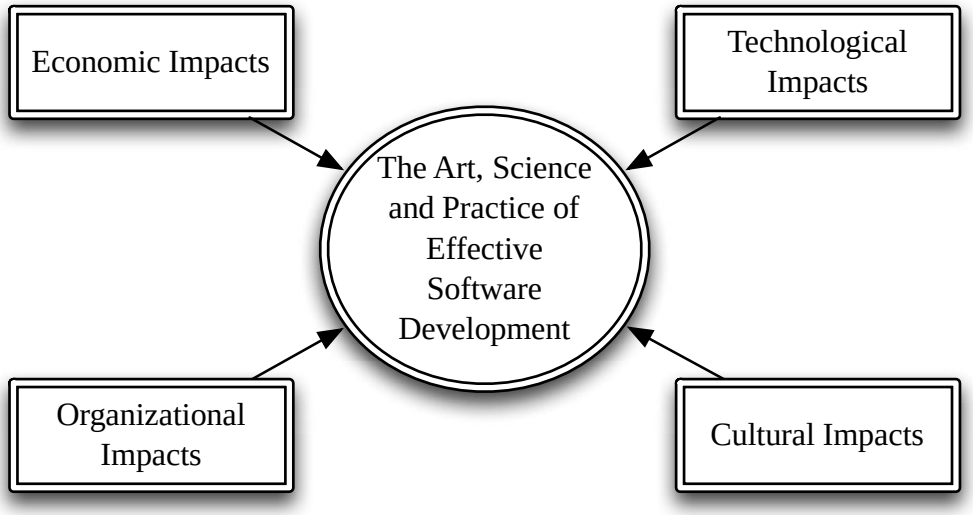

Figure 2.5 The four key impacts and associated literature bodies related to the growing software development industry

2.4.1 The Global Software Development Industry

Despite some sizeable contenders, the global software industry is fragmented, and consists mainly of small and niche firms (Nowak and Grantham, 2000). This suggests that software firms are particularly sensitive to macro economic policy, which can significantly alter the way software firms do business. Once again returning to the example of India's substantial software industry, Heeks (1996) shows that liberalization and economic policy have been central to the growth within the industry. The relationship between software development and economics is a symbiotic one, with economic policy directly affecting the software industry, and in turn, the success of the software industry having significant impacts on a country's economic growth and prosperity.

The relationship between economic, technological, organizational and cultural factors on the software development industry is best described via a literature sketch of some of the countries with the most prominently emerging software development industries. For this purpose, India, China, Thailand, and Brazil are described with a

focus on the four impacts shown in Figure 2.5 (economic, technological, organizational and cultural). The focus is on developing economies, as these show most explicitly what affects the software industry, and how this growth affects the economy. In addition, the relatively mature software development industries in the US and Europe are increasingly turning to distributing and offshoring their software development to these regions. The focus on developing economies also fits with the aim and objectives of this thesis, which focuses on the software development industry in Thailand.

2.4.2 India's Software Development Industry

India has seen significant growth in its software development industry which has led to success that others aim to emulate (Ahluwalia and Little, 2012). In 1998-1999, India's software industry was worth approximately US $4 billion, but more remarkable than this relatively small proportion of the global software industry was the sustained growth of approximately 50% per year (Arora *et al.*, 2001). In 2012, business process outsourcing of software to India (offshoring by international firms) was worth approximately US $30 billion (Invest India, 2012).

Key to India's growing software industry was the transformation to open economy policies in 1991 (Singh, 2008). This was combined with low levels of required investment, a sizeable and skilled pool of human capital, and both domestic and export demand for software and software services (Arora and Athreye, 2002). India also focused on regional hubs, or industry clustering to support growth, with a particular emphasis on Bangalore (Chaminade and Vang, 2008).

Software development in India can be characterized by a number of distinct periods, with the original activities in the 1990s being primarily related to straightforward programming and coding. As the industry has developed, firms in India have increasingly progressed to be involved in complete system design (Sahoo and Patnaik, 2009). One of the key ways in which India has grown its software industry is through foreign direct investment (FDI). FDI has been instrumental to growth in the software industry and according to Goel et al. (2012), between 1991 and 2010, FDI increased from US $129 million to US $100,000 million. With large inflows of FDI, the literature reflects a number of issues faced by foreign firms

investing in India's software industry. These primarily relate to managing human capital, for example, Agrawal *et al.* (2012) indicate that firms face a shortage of skilled workers, a high staff turnover, lack understanding about work-life balance issues and immature/incomplete HR systems and processes.

In summary, India is often seen as playing host to a large and successful software industry, which has developed since the emergence of new government strategies and policies in 1991. India's success has led it to become a frequent topic in the literature, and a regularly cited example for other countries to follow when developing their own software industries. Despite success, India has also exhibited (and continues to show) significant issues in further managing and developing the software industry. These issues are primarily related to the control of FDI and in particular, managing human capital. Therefore if India's software industry is to be used as an example for other growing knowledge economies, there should be a focus on how to effectively manage human capital and to ensure the fundamental issues related to the management of knowledge workers are addressed.

2.4.3 China's Software Development Industry

Both China and India represent economies that have experienced (and continue to experience) significant economic growth (Basu, 2009). While India's growth has primarily been related to offshore service industries, China has focused on manufacturing (Winter and Yusuf, 2007). However, more recently, China has begun to focus on deeper internationalization, primarily by attracting FDI (Yeijing, 2011).

Over longer time scales, China is focusing on improving the macro-level investment climate, but to accelerate FDI, focus is currently on creating micro-climates suitable for specific industries, including the software industry (Gregory *et al.*, 2009). The result has been the creation of specific industry clusters in certain areas, for example, the Dalian Software Park (Zhao *et al.*, 2009). These industry clusters are argued to create competitive advantage, and form the basis of China's IT revolution (Zhang, 2012), however, debate continues to pervade the literature regarding the effectiveness of industry agglomeration, including the value of clustering and specialization (e.g. Asheim *et al.*, 2009). Debate about the effectiveness of clustering is primarily focused on more developed economies, but the

specialization and creation of industry specific clusters continues to be adopted in developing economies (Cooke, 2008).

Despite China's focus and significant investment on leading edge and innovative technology for economic growth, issues remain with China's software industry (Hodgkinson *et al.*, 2011). Once again, the key issues affecting growth of the software industry in China, and the associated attraction and sustainability of FDI, relate primarily to skilled labour, and the employment of staff. This corroborates the need for international firms to explicitly understand the nature of labour when choosing where to locate their offshore operations, as well as how to recruit, train and retain staff.

2.4.4 Brazil's Software Development Industry

In a similar way to India, Brazil's software industry has grown rapidly since the liberalization of economic policy in the early 1990s, and can now be described as vibrant, dynamic, and large (Botelho *et al.*, 2003). The software industry in Brazil is comparable in size to India and China, and recent changes to the industry have seen increased levels of FDI, which have led to the deepening of technological capability (Costa and Queiroz, 2002).

Brazil's focus is now on innovating for long-term growth (Gouvea and Kassicieh, 2012), particularly through investment in education. Brazil, like India, China, and other developing knowledge economies, has realized that long-term economic growth comes from innovation and creativity (Lema *et al.*, 2012).

Brazil was originally distinct from other software developing countries due to its focus on one strand of software development; that of the domestic software market. In contrast, India was known for its focus on export and FDI. More recently, Brazil has realized that to fully develop the software industry, there is a need to focus on both the domestic and international markets. This double-stranded focus on both domestic software development and on international development via FDI is a strategy now recognized by other countries attempting to develop their software development industries. Thailand is included as one of those countries adopting the dual approach of both domestic and international development of the software industry via FDI (see sections 2.3.1, 2.3.7 & 2.4.5).

One way Brazil attempts to differentiate its software industry, is based on time zone and geographic proximity to the USA. For example, Carmel and Prikladnicki (2010) argue that while India has traditionally competed by getting the job done while the US sleeps, Brazil can get the job done while the US works, thus increasing collaboration and eliminating some of the time dependent communication issues. While the notion of time zone differentiation might seem superficial, in terms of FDI offshoring to a host country, it highlights the intrinsic importance of communication within the software development industry, which relies on effective interchanges between knowledge workers, management and customers. This is in stark contrast to less knowledge intensive industries, where collaboration might be much more straightforward and less reliant on intensive and meaningful communication. The way in which local labour and knowledge workers are managed is thus central to a foreign firm's investment in a host country, and researching such issues is of paramount importance to continued growth of the knowledge economy in developing economies.

Brazil, China and India are the largest developing software industries (Veloso *et al.*, 2003) and a portrait of there has been presented via the relevant literature. One of the ubiquitous features of these developing software industries is the management of skilled labour, or more accurately, knowledge workers. The focus of this thesis is on the software industry in Thailand, and thus a contexual understanding of Thailand's software industry is critical before further progressing the research.

2.4.5 Contextualizing Thailand's Software Development Industry

Section 2.3 has already presented and analyzed Thailand's software development industry, but this section considers the Thai software industry in the context of the global software industry, and the other specific countries outlined in this review. While India, China and Brazil have been described as the largest emerging software development industries (Veloso *et al.*, 2003), Thailand is developing a reputation as a creative and innovative player within the domain of software (Thailand Investment Review, 2012). As outlined in Chapter One, Thailand is rapidly moving away from its agrarian roots and increasingly focusing on innovation and creativity as drivers of growth (Intarakumnerd *et al*., 2002). Industry clusters have been a particular focus in Thailand's ICT and software industry. For

example, in northern Thailand, IT clusters have developed with a focus on university-industry links to supply knowledge workers.

Research suggests that in Thailand, fundamental economic conditions are more significant to attracting FDI than short-term government incentives (Larsson and Vankatesh, 2010). For example, an adequate source of effective knowledge workers and appropriate infrastructure is considered more important to those locating in Thailand than tax breaks or other incentivisation. This again corroborates the need to understand and provide effective knowledge workers to foreign firms investing in Thailand.

A key issue Thailand faces in developing its software industry is the gap between education provision and industry (Chookittul *et al.*, 2011). For example, despite the recent upgrade of Thailand's economy by the World Bank (Bangkok Post, 2012), the literature highlights that education lags significantly behind economic development, and requires more focus (Hewison, 2002). For firms operating in Thailand, this represents a significant issue, and highlights why the selection and recruitment of appropriate knowledge workers is an important challenge (Arirawanwat, 2004).

Thailand also has issues meeting international software development standards such as ISO 9000:2000 and CMMI. For example, Suwanya and Kurutach (2008) report that only 11.8% of the software companies surveyed met international standards in software process and design. The majority of firms achieving international standards are foreign firms locating in Thailand. This highlights a disparity between international and domestic software firms in Thailand and illustrates the need for international standardization and an awareness from locally trained and recruited knowledge workers in the software industry as to what these standards relate to and why they are adhered to.

As presented in Chapter One, the focus of the case study in this thesis is on a German software firm operating in Thailand. As such, while discussion so far has centered on the software development industry in developing economies, there is also a need to understand software development status in Germany, and how this contributes to decisions to offshore.

2.4.6 Germany's Software Development Industry

The software industry is vital to the German economy (Hoerndlein et al, 2012), and according to Casper and Vitols (2006), German software services and technologies are prospering. This is reflected more recently in the above average sectorial growth, and the recent ascent of the software firm SAP, to become Germany's most valuable company (Bloomberg, 2012). German software companies spend approximately 8% of their revenue on innovation, and the success of the German software industry contradicts the typical assumption of US industry dominance in software (Leimbach, 2008).

Despite success in the German software industry, issues have emerged as a result of this sustained growth and success. One of the largest issues is the lack of qualified and skilled knowledge workers. This is represented in a widening skills gap in Germany (Nicholson, 2001), which has led to an acute shortage of accessible labour within the software industry. The difficulty in finding qualified knowledge workers has led German firms toward the process of off shoring, which can successfully bridge the skills gap, but requires time and structural adjustment. As with many other developed economies that undertake off shoring, successfully completing the process requires considerable effort. This effort comes in the form of navigating legal and political issues, and successfully understanding the host country's culture and work style (Peeters, *et al.*, 2009). The desire of developing economies to attract FDI often means that political and legal issues are less problematic than in the past. As noted earlier, Larsson and Vankatesh (2010) corroborate this by showing that firms are more attracted to countries where there is an adequate pool of qualified knowledge workers, than by tax breaks or incentivisation. This raises the question of how to successfully select, recruit, train and sustain knowledge workers while operating in a host country.

So far, the literature review has covered some of the key nations where software development is important, and has shown that the majority of issues in the software industry are related to the way in which knowledge workers are managed. In more developed economies, there are skills shortages, which have resulted in steadily rising wage costs (Trendle, 2008). To offset these skills shortages and the resulting increase in wages, off shoring to developing economies occurs, but firms face significant issues in managing international knowledge workers.

Developing economies also face issues in delivering effective knowledge workers, with a mismatch between their education and employer needs often causing difficulty in supplying industry with appropriate knowledge workers. The most common method to circumvent such issues has been the development of industry clusters, where universities, businesses, and infrastructure are agglomerated to improve competitive advantage. What is clear from the literature is that managing international knowledge workers with a view to achieving the most effective performance is challenging, and an issue warranting further research.

Before considering the current theories regarding the management of knowledge workers, it is necessary to consider the traditional approaches to managing employees and why these are no longer effective or suited to managing knowledge workers in an offshore environment.

2.5 Human Resources (HR)

The traditional method of managing a firm's employees is via human resources management (HRM/HR). The notion of human resources (HR) has been in existence since the 1900s, when HR was primarily about industrial relations and the utilization of labor as replaceable parts within a large manufacturing process (Vosburgh, 2007). It is important to distinguish between the term 'human resources' and the more practical 'human resources management'. Human resources (HR) refers to the individuals making up an organization, and should not be confused with knowledge capital, which refers more specifically to the knowledge that individuals contribute to an organization (Brinkley, 2006). Human resources management (HRM/HR) can be traced to the early 1960s, when Chandler (1962) defined HRM as an activity to achieve the long-term goals and objectives of an organization through the allocation of human resources. Cowling and Mailer (2012) provide a more up to date view of HRM and suggest it is no longer simply about the commoditization of staff, and now includes the processes of attracting, selecting, training, assessing and rewarding employees. The history of HR has meant it has morphed and changed to match continually shifting economic paradigms and styles of industrial organization (Hall, 2003). Figure 2.6 illustrates the most significant styles of HR since its inception.

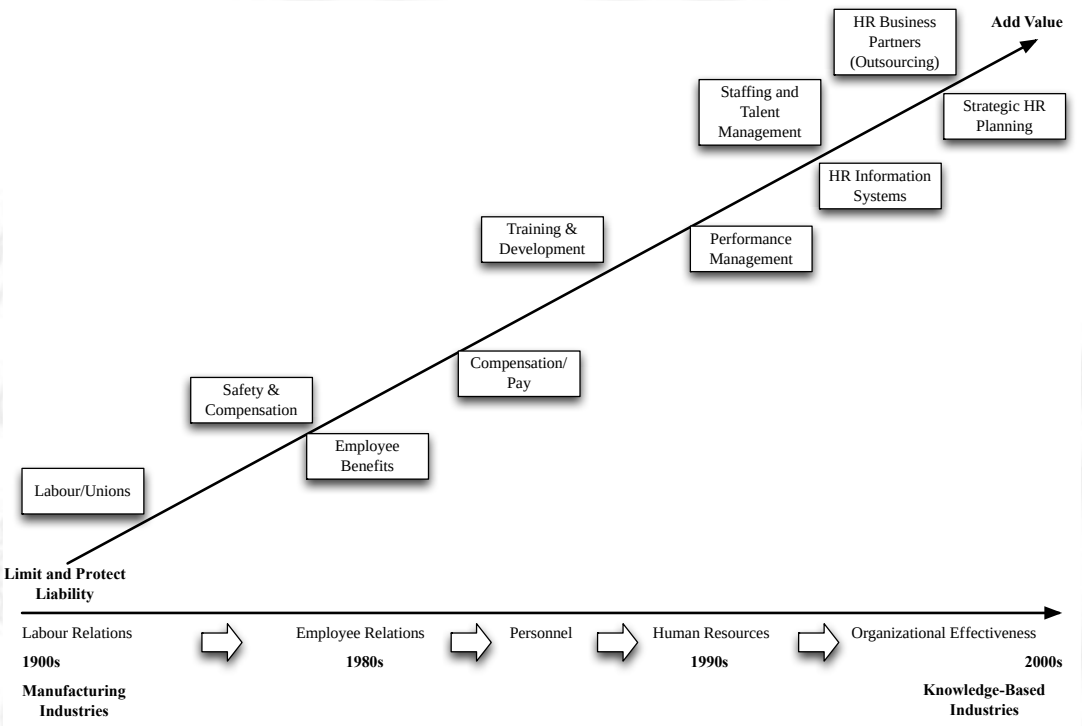

Figure 2.6 The Evolution of HR Function (Adapted from Vosburgh, 2007)

As shown in Figure 2.6, HR encompasses a variety of functions, and these functions have grown and morphed to match industry changes over time. While the early function of HR was primarily about managing labour relations and engaging with trade unions, the latest realm of HR is specifically focused on adding value to firms through their employees (Hall, 2003). In the interim period, HR has gone through stages of focus related to the particular developments within industry. For example, in the 1980s, personnel grew substantially as a conceptual and empirical area of focus (Guest, 1991). However, policies of 'hire and fire' have now been equated with poor employee performance, and the crisis management approach to HR, whereby employees were hired quickly to meet specific demands, has also declined in popularity. The current focus of HR is firmly on achieving business goals through effective planning (Compton, 2009). Horwitz *et al.* (2006) highlight the importance of attracting, motivating and retaining knowledge workers, and go on to report that HR policies are often piecemeal in their approach and suggest there is not enough cross

cultural research to understand how to manage knowledge workers in the context of international settings.

There are significant and fundamental shifts occurring in the way knowledge is being used (Haas, 1991), the way in which society operates, and in how people are employed. Such changes are fuelled by technology and therefore require new ways of thinking in order to address and overcome the challenges associated with these changes. According to Marsh and Kleiner (2004), the changes mean that standard ways of thinking about power and control, the relationship between employee and employer, and the tools and processes for managing people are now insufficient to meet the challenges. The traditional modes and models of employment are no longer in existence. Table 2.4 indicates the differences between the traditional style of employment, and the new contemporary trends in how people are employed.

Table 2.4 Traditional employment vs. contemporary trends

Traditional Employment Concepts and Expectations	Contemporary Trends
Career for life	Contracts
Job security	Uncertainty
Loyalty to firm	Freelance, professional and mercenary behavior, loyal to profession/area of work
One track career	Multi-faceted career
Pay based on seniority	Paid based on performance and results
Clear responsibilities	Knowledge, competencies and skills

The changing trends in work mean that traditional notions of managing employees using HR are not always applicable. The increasing role of knowledge work in the growing knowledge economy suggests that new styles and methods of managing knowledge workers are needed. The key challenges HR faces in the current environment of the knowledge economy, and in the context of knowledge work are as follows:

- **HR is viewed as bureaucratic**

The overarching view of HR is that it consists of bureaucracy and is mainly concerned with the official and legal aspects of employing staff (Jackson and Schuler, 1995). Perceptions of HR being forward thinking or lean, are scant. In terms of knowledge workers and highly skilled staff, the bureaucratic aspects of HR and the perception of bureaucracy must be shed.

- **Individuals and organizations do not view HR with high esteem**

According to the Society for HR Management (2012) over half of organizations do not hold HR in high esteem.

- **HR is often reactive rather than proactive in its approach**

HR has commonly been criticized (Rynes et al., 2002) as being reactive in its approach to workplace problems and the management of employees, and is attempting to shift to become more proactive.

- **The function of HR is scattered and lacks focus**

HR has a broad remit (Tyson, 2006), and as a result, the tasks performed by HR are wide and varied, which can result in a lack of focus. The function of HR varies considerably according to particular industries and geographical areas.

- **HR is viewed as an impediment to creativity**

The function and style of HR management is often viewed as impeding creativity and constructive changes (Vosburgh, 2007). Therefore in a knowledge-based industry, where creativity is critical to competitive advantage, HR is not necessarily the most suitable perspective from which to manage knowledge workers.

- **There is a lack of alignment between HR and overall business strategy**

The final challenge and obstacle to the use of HR in managing knowledge workers, is the discontinuity between HR processes and practice, and the overall business strategy of an organization. In knowledge industries there is a crucial requirement that knowledge workers meet the overall strategy of the organization in order to ensure

sustained competitive advantage, and this once again demonstrates the need for more effective methods to manage knowledge workers.

There is a compelling need for knowledge industries to pursue a diligent effort in recruiting, retaining and planning for the employment of knowledge workers (MiHR, 2011). This is particularly so for younger employees, who are now motivated by different factors, and who possess skills which are in high demand. There is a need within the knowledge economy to manage a new type of employee, requiring clear development and growth opportunities, a suitable work-life balance and appropriate maintenance of their skills and knowledge. The discipline of knowledge management shows evidence in the literature of effective theories and tools to manage knowledge workers within the knowledge economy. Before considering this literature, there is a need to outline the nature of knowledge work, and knowledge workers more explicitly, in order to understand why the traditional approaches are no longer suited to managing these types of workers, and why knowledge management provides significant potential, particularly in the domain of software development as a knowledge industry.

2.6 Davenport's Working Knowledge: Knowledge Work, and Knowledge Workers

Knowledge work is the driver of the knowledge economy, and can be characterized by a number of distinguishing elements when compared to the traditional view of employees and work. In general, knowledge work has no specific meaning, but most literature defines knowledge work by comparing it against more traditional manual work, and ignores any differentiations within the group of knowledge workers (Ramirez and Nemhard, 2004). One exception to this is Davenport and Prusak (1998), who identified four types of knowledge worker.

According to Davenport and Prusak (1998, p.5), knowledge can be defined as, *"…a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In*

organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, process, practices, and norms". They go on explain the theory known as working knowledge, by postulating that organizations operating in the knowledge industries act as a type of knowledge market. In such a market, there are knowledge buyers, knowledge sellers, and knowledge brokers. Knowledge buyers seek to purchase knowledge as a solution to a particular problem, while knowledge sellers are known as having a significant or particular body of knowledge that can be leveraged to solve an issue. Finally, knowledge brokers make connections between the knowledge buyers and sellers. The importance of Davenport's working knowledge concept to knowledge management is illustrated by Choo (2003), who states that Davenport's work is the most frequently cited theory in the knowledge management literature.

Oliver (2012) commented that the advantage of Davenport and Prusak's (1998) working knowledge concept is that it provides a rationale for knowledge sharing, based around the value of knowledge, and the potential consequences of lost knowledge. Davenport (2005) expands by providing advice on the processes that facilitate knowledge sharing. For example, during times when the cost pressure facing organizations reduces the available funds for the technological codification of knowledge and related knowledge-supporting activities, the notion of working knowledge highlights that knowledge involves individuals making judgments and providing insights. Davenport's working knowledge is sometimes hindered by the continuing lack of a clear definition of knowledge, and in turn results in difficulty gaining acceptance of KM and knowledge practices.

Davenport (2005) categorized four types of approach to knowledge work in a classification structure for knowledge-intensive processes. The first type is the integration model, which refers to systematic and repeatable knowledge work, followed by the transaction model, which is defined as routine knowledge work. The collaboration model involves improvisational knowledge work, and finally judgment-oriented knowledge work is categorized within the expert model. Knowledge work is placed into these categories based on the complexity of the knowledge work and the level of independence during the work. While these classifications are useful, Margarayan et al. (2011) noted in their empirical studies that the vast majority of

knowledge workers could not be grouped into any one of Davenport's four knowledge work types. Results confirm that the expert model of knowledge work was most useful for categorizing knowledge workers.

Although knowledge workers are viewed as specialists, who are dealing with innovative and thoughtful work, they still require development during the course of their own work. Specifically, they need to develop and improve their work performance so they effectively utilize and apply knowledge, and successfully collaborate with others (knowledge sharing). Focusing on the individual level of knowledge worker performance is thus important to facilitate knowledge worker capabilities in effectively creating, distributing and applying knowledge. In line with this, Davenport (2011) suggests that a focus on individual knowledge worker performance rather than organizational level knowledge performance may accelerate an organization's improvement process. What is clear from Davenport's theory, and its popularity in the literature, is that knowledge workers are a key part of an organization involved in knowledge-based activities.

2.6.1 Knowledge Workers

The term 'knowledge worker' was first coined by Peter Drucker in 1959. It is important for knowledge workers to identify themselves as part of the work environment because they work in an organizational environment where they do not get the benefits from a traditional and formal bureaucratic structure (Scott, 2005).

Thailand's economy has experienced significant and rapid structural change from its traditional agrarian focus (Martin and Warr, 1994), becoming increasingly centered on participation in the global economy, and in particular, moving toward a knowledge-based economy (APEC, 2000). As a key part of its economic and social development, Thailand has placed a strong focus on IT (Ministry of ICT, 2009), with innovation policy adopting the two main approaches of increasing the skill and technological capability of Thai firms, and encouraging FDI (OECD, 2011).

IT-related FDI correlates strongly with the overall success of Thailand's IT sector (Tan and Leewongcharoen, 2005), and there have been a number of strategies to increase investment in the industry. For example, in northern Thailand, the MISOLIMA Software and Technology Park aims to develop industry clusters,

international collaborations and investments (MSTP, 2010), and there are a significant number of bright and experienced programmers in Thailand (Thailand Board of Investment, 2011).

According to Groh and Wich (2012), the ability to attract and sustain FDI relates to four main aspects associated with the economic, legal/political, infrastructure and business environment of a country. Each of these components represents a variety of challenges associated with encouraging and sustaining FDI, such as market size and openness, law and contracts, corruption, transport links, and employee pay (Nunnenkamp and Spatz, 2004). A significant body of literature has exposed the macro economic issues associated with FDI (e.g. Kornecki, 2010; Sosukpaibul, 2007; Kongruang, 2007), but there is relatively little assessment of how to manage day-to-day issues experienced by international firms operating abroad, such as the problems encountered when recruiting, training and sustaining a diverse and intercultural workforce. There is also a scarcity of literature related to managing knowledge workers in the specific context of an internationally diverse software development industry, where the effective management of employees is critical to a company's success.

According to Reich (1991), firms are dependent on their knowledge workers to maintain competitive advantage, and as a result, only those firms that motivate their knowledge workers to perform in alignment with productivity and innovation goals will succeed (Amar, 2004). The most successful strategies for recruiting, motivating and retaining knowledge workers have thus become an issue of considerable debate (Horwitz et al., 2006). However, despite acknowledgement in the literature of the need to motivate knowledge workers, many workplaces are not structured to promote knowledge worker innovation and creativity, and there is a requirement to understand the characteristics of knowledge workers' performance (Acsente, 2010), especially in terms of their motivation, satisfaction and the subsequent effects on work quality. Figure 2.7 illustrates the concept of a knowledge worker and how this relates to ideas, performance and individuals/communities. The key aspect of knowledge workers is that their intellectual capital, social capital and emotional capital gives them the ability and know how to move between organizations and environments to suit their own personal needs. This means that for any organization active within the knowledge

economy, there is a need to understand and make suitable provision for knowledge workers in order to retain the foundation of the organization and sustain competitive advantage. Those organizations that do not understand knowledge workers risk loosing their advantage within an industry. Therefore, international companies offshoring their activities must ensure they understand local knowledge workers and the effects of culture, or they risk loosing the potential advantages of offshoring and the host country risks loosing the benefits from the associated FDI.

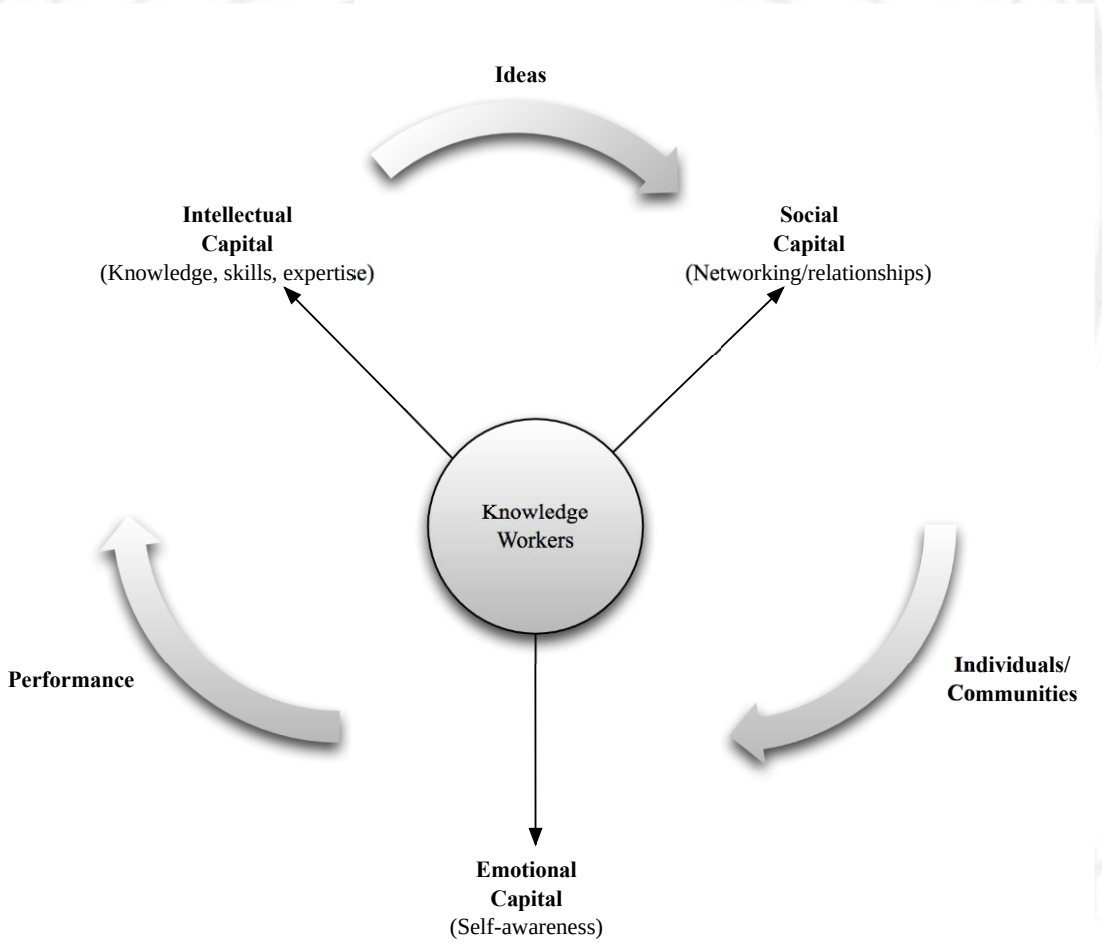

Figure 2.7 The three types of knowledge capital that knowledge workers require and the relationship with performance, ideas and communities.

The complexity of knowledge work and knowledge workers means that traditional approaches to managing knowledge workers are no longer suitable. For example, HRM has been frequently shown as inadequate or slow in its response to

managing knowledge workers (e.g. Thite, 2004; Hislop, 2003; Stovel, 2002). Knowledge management on the other hand, is particularly suited to the task of managing knowledge work and knowledge workers. A knowledge management approach to the recruitment of international knowledge workers in Thailand might be an effective way to solve the issues associated with employing international knowledge workers. The off shoring of knowledge work and employment of international knowledge workers has led to increased interest in the concept of workforce diversity, which must be understood to effectively manage knowledge workers so they achieve their full performance potential.

2.7 Diversity in the Workforce

The notion of globalization has moved from a primarily political and economic construct grounded in observation, to become a real and practical effect, which has impacts on individuals, organizations and economies. Globalization has particularly wide-ranging effects on companies who choose to offshore their activities, meaning they become global employers (Bardhan et al., 2013). Many companies have moved to capitalize on the skills that a diverse workforce provides in increasingly competitive global markets (Joplin and Daus, 1997). The result is that globalization, off shoring, and the associated global employment have resulted in an increased interest in workplace diversity, and more specifically, how to manage a diverse workforce.

Managing diversity in the workforce is crucial for companies who recruit staff internationally. Managing a diverse workforce can be defined as voluntary organizational actions which combine employees from different backgrounds to fit organizational structures through well-planned policies. Burke and Ng (2006) suggest that a diverse global workforce places a high premium on cross-cultural skills and sensitivities. Workforce diversity can relate to both international diversity and cross-national diversity, but in line with the research objectives, this thesis considers workforce diversity from an international, cross-cultural perspective. When managing a diverse workforce, the traditional human resource approach has often been adopted to overcome barriers. For example, cultural audits might be used to identify obstacles faced by employees of different backgrounds, or the sensitivity to workforce

differences could be attenuated by strategies to promote adversity in communication and collaboration (Barak, 2011). While HR attempts to solve problems associated with workforce diversity, there are clear advantages for organizations that can operate successfully with a diverse workforce, particularly in the knowledge-based creative industries. For example, diversity is a recognizable source of creativity and innovation that can lead to significant competitive advantage. In contrast, workforce diversity can also cause misunderstanding, suspicion, and conflict in the workplace, which can ultimately result in absenteeism, poor work quality, low morale, and loss of competitiveness. Basset-Jones (2005) therefore argues that firms seeking competitive advantage through workforce diversity face a paradoxical situation. Wentling and Palma-Rivas (1998) corroborate this by stating that the primary reasons for managing workforce diversity are to improve productivity and remain competitive, to form better work relationships among employees, to enhance social responsibility, and to address legal concerns.

In the case of international firms operating in knowledge-based sectors, knowledge transfer from the parent corporation to offshore subsidiaries is affected by differences in the national culture of the parent corporation and the subsidiary. This is evident in the case study firm in this thesis, which is affected by differences between the German and Thai culture. Transferring knowledge can be especially difficult when the source and recipient do not share common beliefs, assumptions, and cultural norms (Boh *et al.,* 2013). In response to these issues, a variety of research literature has attempted to provide solutions to managing a diverse workforce.

According to Wentling (2004), the factors most likely to drive the success of diversity initiatives are top management support and a strategic plan for workforce diversity. More specifically, this should include the integration of diversity initiatives into an organization's strategic plan, and recognize that diversity is a business imperative, which results in a culture that values diversity. With specific reference to knowledge-based industries, evidence suggests that the success of the knowledge transfer process relies on individuals' trust of HQ and their openness to diversity. These represent key factors influencing local employees' ability to learn and obtain knowledge from foreign management and HQ. The extent to which alignment exists between the organization's corporate culture and the individual's cultural values

appears to make very little difference to the knowledge transfer process from HQ (Boh *et al.* 2013). Communication is also one of the most critical factors influencing the success of workforce diversity. Effective communication ensures a high level of performance and productivity for human and intellectual capital, and provides business organizations with significant competitive advantage in their expanded markets, and in the wider global economy (Okoro and Washington, 2012).

Research suggests that a positive view of employee diversity by managers can have a positive impact on organizational outcomes (Garib, 2013). However, the common practical effect of a diverse workforce is the paradoxical situation noted above, where managers realize the benefits and advantages offered by a diverse workforce, but cannot transform these into reality. This results into what Sumita and Raghu (1996) term the vicious and virtuous facets of workforce diversity.

Solving the issues associated with workplace diversity is often left to the domain of human resources and human resource managers, but this often results in a strategy of conformity, or ignores crucial aspects of knowledge work. One of the key weaknesses in human resources management is that it attempts to promote equality at work, while also encouraging diversity (Kirton and Greene, 2010). When considered together, diversity and equality become paradoxical, which explains why HR often manages diversity in the workforce, but does not always embrace it to enhance performance and competitive advantage. In terms of knowledge work, managing diversity can significantly enhance performance, creativity and innovation. Evidence suggests that workforce diversity can become a source of economic strength (e.g. Lee and Nathan, 2010). However, such diversity requires effective tools to ensure that knowledge workers become a source of performance, creativity, innovation and economic resilience rather than a hindrance.

This research therefore utilises the tools of knowledge management, which are naturally orientated toward the effective management of knowledge workers and individual differences, thus embracing workforce diversity. The case study in this work illustrates how learning can be managed among knowledge workers in a diverse multinational workplace to improve their work performance, and avoid the potential obstacles that may arise from the cultural discontinuities in the workplace.

To effectively manage these knowledge workers and understand the cultural dynamics associated with a diverse workforce, the process of recruitment and selection in Thailand must first be contextualized.

2.8 Recruitment and Selection in Thailand

In public and private sector businesses in Thailand, familism has been a common and long standing practice, serving as a traditional framework for recruitment. This is primarily due to expectations that this method of recruitment ensures trustworthiness and loyalty, which are highly valued by employers. Thus in Thailand, the most important positions in an organization will often be reserved for family members or long-serving workers. Performance is also considered a minor issue when compared to the qualifications of a job candidate (Roongrerngsuke, 2010). Lawler *et al.* (1995) state that HRM practices in Thailand rely heavily on social networks, or personal contacts. In contrast, European HRM management is usually competency based. The difference between recruitment, selection and training processes between Europe and Thailand means organizations operating in the knowledge economy must consider how they can most effectively recruit, select and train knowledge workers. When international organizations offshore in Thailand, the process of recruitment, selection and initial training becomes critical to their success. As a way to circumvent the prevalence of familism and search for effective knowledge workers, international firms often rely on making connections with local Thai universities to ensure they can recruit the knowledge workers required by the organization. Hershberg et al. (2007), corroborate this, suggesting that by fostering spatially proximate links, and building human relationships, universities can directly assist firms and industry clusters through the provision of appropriately qualified knowledge workers.

Owing to issues of training and development, some executives suggest that in the 21st century, the key problem with training staff relates to employers' and employees' assumptions about how businesses should run under the current political, economic and social conditions. In Thailand, there is a pressing need for employers and employees to change their beliefs, and redefine quality/performance standards in

order to adjust themselves to new organizational cultures, and to be ready to learn new skills throughout their working life (Roongrerngsuke, 2010).

A number of changes to staff training have impacted the recruitment and selection process. For example, although in-house training has been conducted to reduce overall training costs, online-training has been introduced to promote self-learning in many organizations. When employees join an organization, orientation has been utilized to speed up the process of learning and performance for newcomers in the workplace. The orientation period is one of the most critical times for knowledge workers joining an organization, and cross-cultural research is crucial to understand how to most effectively recruit, train and retain these knowledge workers (Horwitz et al., 2003).

Orientation programs are thus systemized to transfer information about the organization (e.g. history, culture, mission, strategies, products, structure, rules and regulations) and the job requirements of the new recruit. Examples of orientation strategies are ice-breaking workshops, buddy systems, coaching and mentoring by a direct supervisor, and other forms of workshop.

In Thailand, organizations have potential to design a continuous and systematic program to train employees of different levels to help them perform their current job effectively, as well as be better prepared to succeed their future careers. Currently, small and medium sized enterprises face obstacles in HRM, particularly in terms of limited budgets for recruitment and training, as well as a deficient understanding of HRM. Such obstacles prevent the design of a suitable, systematic and continuous human resource development tool for their employees (Roongrerngsuke, 2010). In summarizing the recruitment, selection and training of employees, Table 2.5 compares Germany and Thailand with respect to issues affecting the management of knowledge workers.

Table 2.5 Comparative components of human resource management in Thailand and Germany

Issues	Germany	Thailand
Importance of job	Self-fulfillment Job loss: shameful experience (DeGroot, 1994)	Buddhism doctrine based. Accept current state of life as a consequence of one's past life and thus work is carried out for a good next life. (Lawler, and Suttawet, 2000)
Recruitment	Age: hiring factor Employee contract (DeGroot, 1994)	Past: family relations Present: specific qualifications, knowledge, competence and experience (Siengthai and Bechter, 2004)
Probationary period	Maximum length of a probation period: six months. Shorter probation periods are allowed e.g. 3 months. Employee dismissal without justification and two weeks advance notice period. (Pfeifer and Luenburg, 2009)	No specific Thai law regarding a probationary period, but after 120 days employees are entitles to severance pay. Before completion of this 120-day period, their employment can be terminated any time (Duncan and Vipamaneerut, 2011). There is a frequent disregard for Thai labour law (Hewison and Chiu, 2009)
Employment	Early retirement age 55 or older to keep higher pension rate and to maintain self-esteem (DeGroot, 1994)	Economy shifting from agricultural and manual work to knowledge-based employment in order to better compete in the global knowledge economy (Delgado and Boncheva, 2012), and therefore a significant need exists for reform to the Thai labour laws.
Termination	Personality mismatch Social justification Mandated termination notice period (DeGroot, 1994)	Termination of employment is usually due to process loopholes, dishonesty and pressure to perform (Ermongkonchai, 2010).

To develop the processes associated with the recruitment, selection and orientation of Thai knowledge workers employed by a German organization requires a clear understanding of the literature and theory associated with the management of knowledge workers.

2.9 Managing Knowledge Workers: Knowledge Management (KM)

As an alternative to traditional HR practices of managing knowledge workers, KM offers its own set of tools, models and methods to effectively manage knowledge workers. As already stated throughout this chapter, knowledge workers are considered a critical component of success for businesses operating in the knowledge industries. Knowledge workers are often considered as human capital, whereby firms must extract value from knowledge to succeed. In the case of knowledge workers, organizations must understand how to effectively manage this human capital to extract value and utilize it in the form of competitive advantage. The Skandia model was proposed as a way to manage a firm's knowledge resources (including human capital) in order to transform knowledge into tangible value.

In the Skandia knowledge model, human capital is inextricably linked with intellectual capital, and the model describes how to convert knowledge into value. Intellectual capital is defined by the notion that individuals cannot be replaced by machines. Roos et al. (2005) indicate that intellectual capital includes competence, attitude, skill, tacit knowledge, and an individual's personal networks. The value of human capital comes from knowledge workers' competence, attitude and intellectual agility, with competence propagating from employees' knowledge, skills, talent and know-how. Unlike knowledge, attitude is a soft skill influenced by three main factors, including being motivated to learn from one's mistakes, demonstrating correct behavior, and an ethical perspective to generate value or what is termed 'conduct'. Intellectual agility is the ability to use knowledge and skills by expanding and applying them to work in order to increase learning (Roos *et al.*,1998). To sum up, intellectual capital as driven by human capital is significant in supporting an organization to achieve its business objectives and reach its full market potential. The Skandia model is illustrated in Figure 2.8.

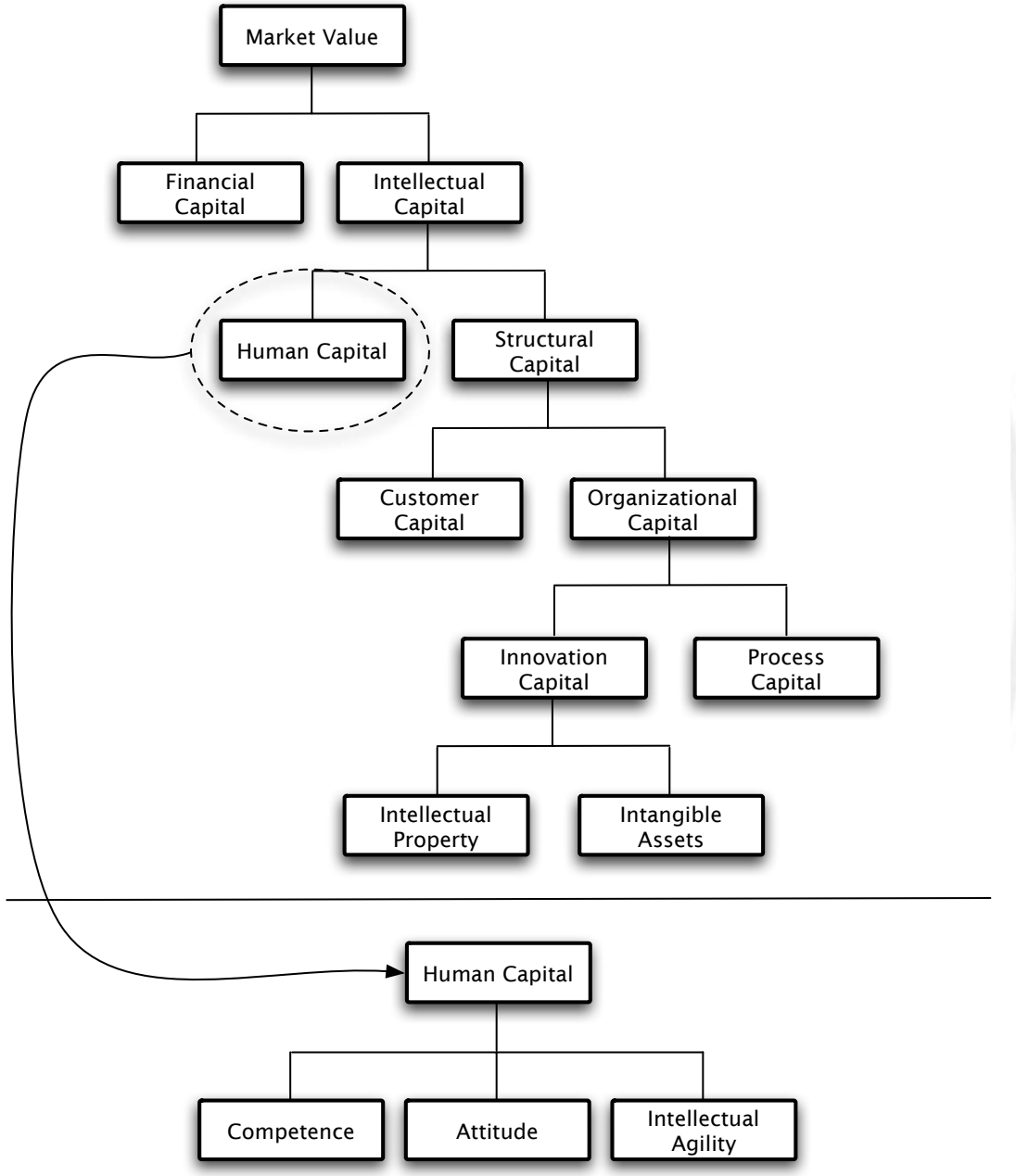

Figure 2.8 The Skandia model and associated importance of human capital

While the Skandia model focuses on the conversion of knowledge to value, other models attempt to assess whether this knowledge transformation has been successful. For example, although the Skandia model illustrates the components of knowledge and the relationships between human and intellectual capital, there is no explicit method to evaluate employees and the degree of success in converting

knowledge to value. However, other tools, frameworks and models provide a useful way to evaluate human capital within an organization.

Reflecting the importance of knowledge workers and intellectual capital, Kaplan and Norton (1996) include the key tenets of learning and growth in a performance management system known as the Balanced Scorecard. It focuses on three perspectives, including employee capabilities and information systems. The third perspective encapsulates motivation, empowerment, and alignment. From the perspective of the Balanced Scorecard, learning is more than just training, and the focus on mentoring and coaching are helpful to increase employees' knowledge. Knowledge workers must embark on life-long learning and continuous improvement for both their own self-improvement and organizational productivity. To improve learning and growth increases employees' skills, which in turn bring about better quality in business processes. The cycle of benefits of the Balanced Scorecard is shown in Figure 2.9. Despite the obvious utility of evaluating human capital within an organization, the Balanced Scorecard tends to focus on measurable outputs and somewhat ignores the softer measures of knowledge workers. The Balanced Scorecard implementation also relies on many formal and informal processes, as well as both written and unwritten rules (Mooraj et al., 1999). Thus to achieve effective use of knowledge and management of knowledge workers, there must be provision within an organization to effectively share and learn from this knowledge.

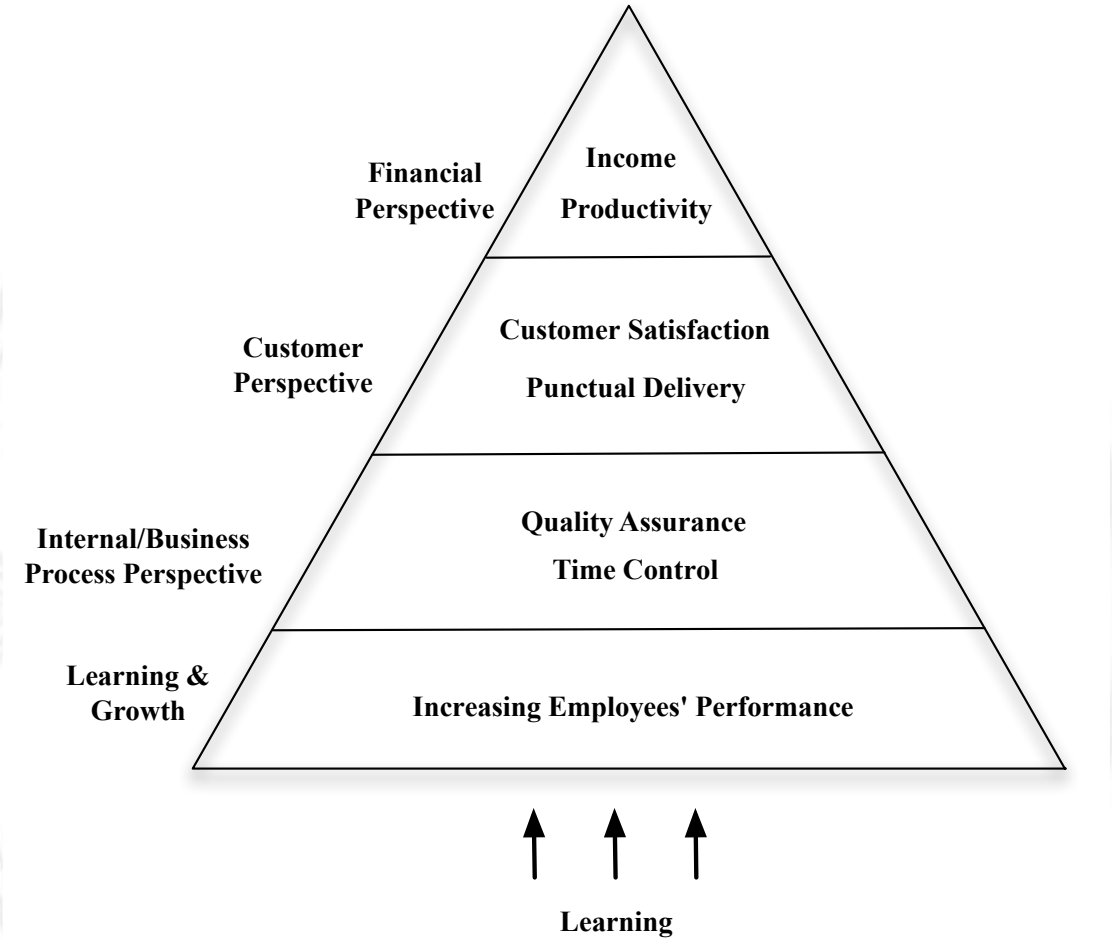

Figure 2.9 Balanced Scorecard and associated business benefits (adapted from Kaplan and Norton, 1996)

In a learning organization, knowledge can be created, acquired, transferred and modified to reflect new insights (Garvin, 1998). To complete this in a knowledge creating company, management must be responsible for the value-creating actions of an organization's knowledge. Identifying what knowledge the organization currently has, and making tacit knowledge both accessible and useable can fulfill this responsibility. The organization's approach to knowledge sharing dictates how it learns and utilizes its knowledge resources. Huysman and Wit (2003) suggest that knowledge sharing is a critical part of effective knowledge management. Figure 2.10 illustrates this knowledge sharing process, which is fundamental for organizations attempting to improve their recruitment, selection and orientation processes (Cabrera and Cabrera, 2002). Without knowledge sharing, organizations cannot improve their

training/orientation. To ensure that knowledge workers are effectively prepared for work ahead, knowledge sharing can set an appropriate tone and help newly recruited employees avoid potential mistakes in their work. The second issue management must respond to relates to an organization's competitive situation, meaning that it must exploit knowledge more effectively than its competitors (Krogh et al., 2000).

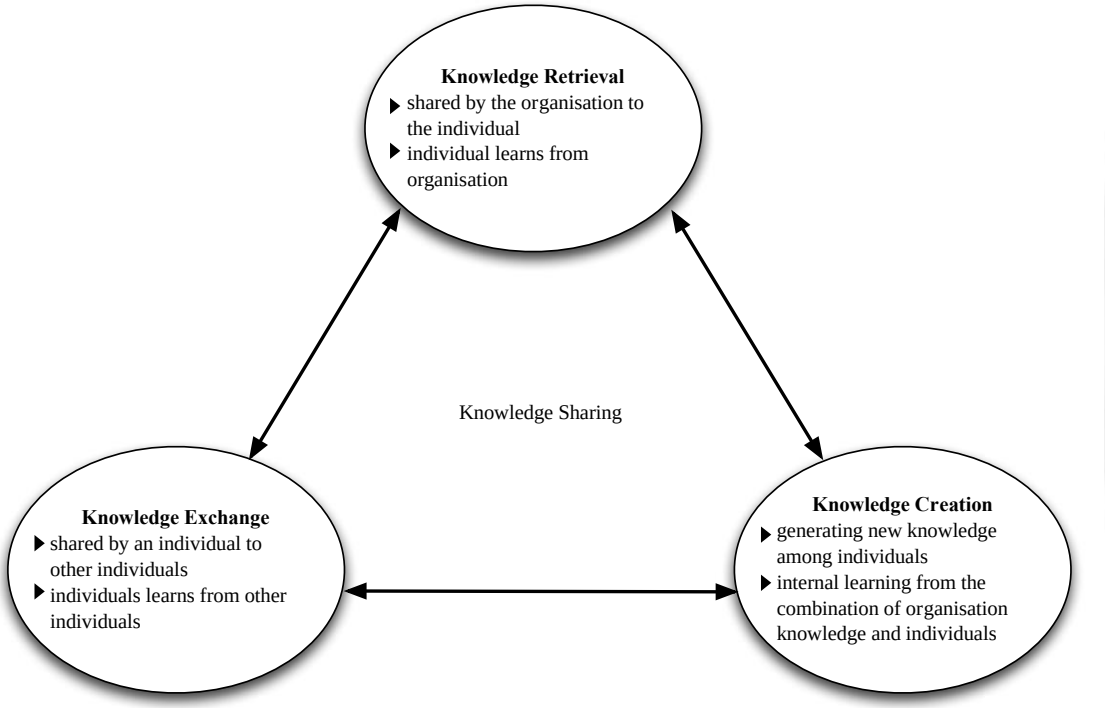

Figure 2.10 Types of knowledge sharing and the interrelationships (adapted from Huysman and Wit, 2003)

The pervasive element in the literature regarding knowledge workers is that in order to achieve maximum potential value from such employees, they must be managed. The notion of change management and performance development is critical to managing knowledge workers and achieving maximum value from these employees.

2.10 Change Management and Performance Development

Change can be described as a type of improvement within the work environment that affects employees' action. Creating change is complex, as it is

managed through employees' attitudes, and conditioned by feelings towards that change (Newstrom and Davis, 2002).

Knowledge based organizations require strategic flexibility to succeed (Hitt et al., 1998), and must therefore recruit knowledge workers who can deal with dynamic environments. Human resource managers should consider training programs that allow employees to effectively understand change and to cultivate skills needed for effective change throughout the organization. A review of the relevant literature indicated almost twenty major reasons for employee resistance to change, which can be further categorized into three main factors, including personal factors, organizational factors, and factors specific to change itself. The details of these 20 factors are presented in Table 2.6 (Rosenburg and Mosca, 2011).

Table 2.6 Major reasons for resistance to change (Adapted from Rosenburg and Mosca, 2011)

Major reasons for the resistance to change		
Personal factors	**Organizational factors**	**Factors specific to change itself**
Employees' attitudes/disposition toward change	Poor leadership	The content of change (an ill-conceived change/ relevance of the goals of change)
Fear of the unknown (uncertainty)	Dysfunctional organizational culture	Poor implementation planning
Lack of understanding of the firm's intentions	Organizational size and rigidity	
Fear of failure	Lack of management support for the change (organizational commitment)	
Disruption of routine	Lack of participation due to top-down steering	
Increased workload (due to downsizing or employee learning voluntarily/ involuntarily	Organizational political conflict	
Lack of rewards for implementing change	Internal conflict for resources	
Perceived loss of control, security, or status	Lack of consequences for inadequate or poor performance	

To enforce change to happen, tools to managing change are essential. Here are some examples of change management tools based on knowledge management concept. Analytical Hierarchy Process (AHP) is applied to support the decision making for complicated multi-criteria problems where both qualitative and quantitative aspects of a problem need to be incorporated. However, this method requires mathematics to enable people to rank tangible and intangible factors against each other to set priorities (Saaty, 1977; Saaty, 1990; Vaidaya &Kumar, 2006).

Pareto analysis (PA) can help separate major causes of a problem from minor to major ones in form of statistics to foster change in the process. This also can be done at the end of the problem solving process to see whether the solutions work. Examples of studies applying pareto analysis are various. Here are some examples. Galperin (1997) compared pareto analysis with the balance space approach using many examples to demonstrate the interrelation and the difference of the two methods. Karuppusami and Gandhinathan (2006) used pareto analysis (PA) to analyze and sort the findings according to the frequency of occurrences. The result of their study helped smoother the penetration of total quality management program in organizations.

The next method introduced in the literature review is soft system methodology (SSM). It is the general method to investigate and learn about problematic situations. The advantage is to help resolve conflict among users and stakeholders in the organization (Rodríguez-Ulloa, 2003; Checkland and Poulter, 2010). Why Why Diagrams is also useful for change management. The idea is focused on the continuous asking of the question "why" and finds answers to it (Gano, 2007). When no more answers to the question are found, the root causes are identified. In addition, business process reengineering (BPR) is a redesigning method to replace the day to day operations which cannot support the decision process. Its main purpose is to adjust the business process to fit customer needs (Varun *et al*, 1995; Lin *et al*, 2011; Cheng *et al*., 2012; Setegn *et al.* 2013).

To fulfill organizational change, total quality management (TQM) is a well known philosophy to manage organizational performance and quality. From a human perspective, TQM focuses on customers' needs in order to generate other improvements in the organization (Beshkol, 2012; Zakuan *et al*., 2012; Karuppaiyan,

2012; Hamdi *et al*, 2012). A famous tool for organizational change and problem solving based on quality management approach is Deming cycle or Plan Do Check Act (PDCA). To plan means to identify and analyze problems. To do refers to developing and practice solutions. To check is to measure how effective the solution is and analyze ways to improve it. To act involves the process of implementation of improved solution (Saxena *et al*., 2004; Cole, 2002).

According to those change management tools mentioned, the problem identification and causes are focused and the results are presented quantitatively or qualitatively. It is significantly seen that the tools mentioned above are designed for problem solving in a way that problem issues and causes are investigated to provide knowledge for facilitating change in the organizations' processes. In addition, some change management tools concentrate on the result of change which aims to serve customer needs not promoting organizational members' learning.

In this research, force-field analysis is considered more suitable to be used as a change management tool because it not only helps an individual identify problems, but also shows the differences of current problems and what possible solutions are available. The next section explains what force field analysis is. Furthermore, the details about force field analysis application are presented in Chapter 3.

Creating change is an essential component of managing knowledge workers (Holbeche, 2006). Successful knowledge workers are those who are dynamic and flexible, and are thus able to respond to the continually shifting knowledge work in today's economy. To understand and generate such change within individuals (or knowledge workers), a wide variety of theories have been presented, but one of the most prominent is Lewin's theory of change, which subsequently led to the development of force field analysis.

2.10.1 Lewin's Theory of Change and Force Field Analysis

Knowledge workers, like any other types of employee, are driven and influenced in their work by many factors. There are a wide variety of ways to assess and study such influencing factors, but one of the most common is the theory developed by Kurt Lewin (1939), who made significant contributions to understanding the factors or forces which influence a situation. Lewin's work was originally attributed to psychology, but later the work was recognised for its role in

organisational change management. The work developed into ‘force field analysis’, and is recognised within knowledge management as a powerful way to gain a comprehensive overview of forces acting upon a particular situation. In this work, force field analysis is taken as a tool to understand the forces affecting knowledge workers at the case study.

Lewin’s work is multi-faceted, and the proposed theory of change consists of a variety of theories/concepts with a holistic notion of what he designated ‘planned change’. Lewin’s theory of change has been modified adapted, and is now referred to in many studies as ‘force field analysis’ and is utilized within a problem-solving framework to implement planned change in the context of a broad spectrum of group and organizational issues.

In relation to group dynamics, Lewin (1939) stated that it is not the similarity or dissimilarity of individuals that constitute a group, but the interdependence of fate. Lewin discovered the two issues of a group that determine its influence on certain forces, and how these forces may be manipulated to produce desired change group.

Lewin’s work identified three stages of change: unfreezing, changing, and refreezing. Unfreezing is the condition when previous ideas are washed away so that new practices can be instilled. In practical terms, this pertains to managers who should ready their employees for new practices. Changing is the stage of change where new ideas are learned. This process helps employees to think, give reasons and perform their work more effectively. Finally, refreezing refers synchronizing what has been learned into real practice. In other words, employees adopt new ideas into their routine behaviors. The three stages of change are illustrated in Figure 2.11.

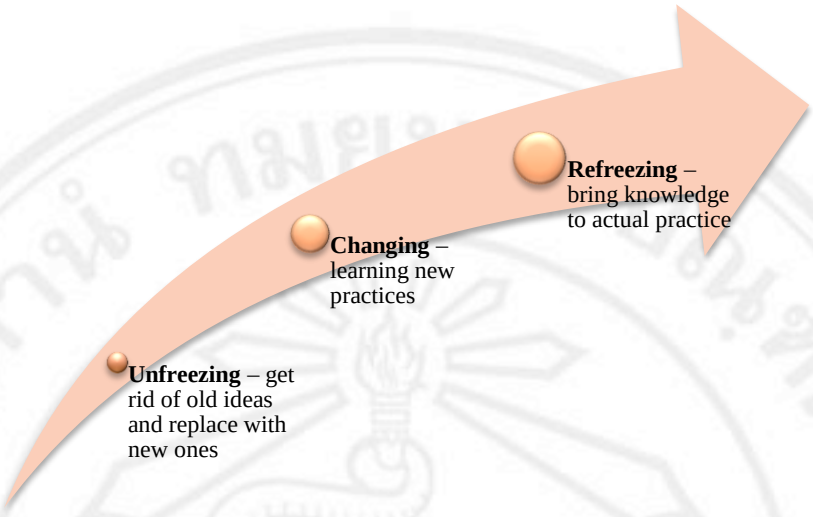

Figure 2.11 Lewin's three stages of change

Previous studies have utilized force-field analysis as a tool to foster behavioral change within organizations. Driving and restraining forces create a gap, which requires equilibrium. Methods are then introduced to stimulate the occurrence of change, for example, supporting forces are added or restraining forces removed. Alternatively, the strength of a supporting force is increased and a restraining force is converted to create a supporting force (Newstrom and Davis, 2002). By using the contrast of restraining and driving forces, clear success can be achieved in solving problems (Harwell, 2000). However, force-field analysis can be biased, with the results based on planners' experience, cognitive style, personality and mental models. As a result, Schwering (2003) adopts the 7S framework to prevent cognitive bias and heuristic errors in force-field analysis. Thakkar, Deshmukh, and Shastree (2006) also employed force-field analysis in the context of total quality management (TQM). This helps develop understanding within self-financed technical institutions to be clearly addressed in each phase of TQM. This signifies that force-field analysis becomes a more effective tool when applied in synergy with other specific analysis frameworks. While TQM has been used in previous literature, it is not suitable for SMEs operating in the software for a variety of reasons, as explained below.

2.10.2 Total Quality Management (TQM)

Total Quality Management (TQM) is recognized for emphasizing customer needs and contributing to organizational efficiency and effectiveness by focusing on process orientation and continuous improvement (Annika and Alänge, 2012). While TQM is a popular and well-known philosophy to manage organizational performance and quality, it does not necessarily represent the most useful tool for SMEs or companies managing a diverse workforce. TQM is a philosophy dominated mainly by large companies. Small businesses are cited as lagging behind larger ones when it comes to introducing and adopting TQM (Yusof and Aspinwall, 2000). TQM is an approach to identifying, investigating and implementing quality and process improvements, but while it has been successful in large organizations, its implementation in SMEs has been slow and relatively unsuccessful (Ghobadian and Gellear, 1996). This is mainly because the practices recommended by TQM are often unsuitable for application to different work types or diverse cultures (Dawson, 1995). Thus anyone wishing to apply TQM in specific, specialized areas of work or SMEs (e.g. the software industry) must redefine and adapt TQM to suit. When SMEs do undertake the implementation of TQM, it should be a gradual progression and selection of appropriate quality tools and initiatives, begun when necessary, and with the ultimate aim of continuous improvement in the organization (Yusof and Aspinwall, 2000).

A further issue with TQM is that there are many vague descriptions and few definitions of what TQM really is (Hellsten and Klefsjö, 2000). This has led to research such as that by Powell (2006), who suggests that tacit and behavioral features of TQM are what drive success, not the tool itself. In line with this sentiment, organizations that acquire such tacit aspects can outperform those utilizing TQM. The issue then becomes how to obtain these tacit and behavioral aspects of TQM. Once again, knowledge management offers appropriate tools and processes to aid with the transformation toward this goal.

From a human perspective, TQM focuses on customer needs in order to generate other improvements in the organization. In contrast, KM focuses on stimulating the organization's people (knowledge workers) to learn for the better and expects customer satisfaction to become a natural outcome. This signifies that TQM

and KM have different goals and different strategies to improving organizational performance.

While TQM has so far been described as focusing mainly on the organization rather than the individual, TQM does reflect the three integrated and important components of leadership management, process and product excellence, and human resource excellence (Suganthi and Samual, 2004). Although TQM does focus to some degree on human resource management, its work performance improvement strategies are often insufficient. In addition, while TQM components were advocated to be sound and effective practices for leadership, customer focus, relations with suppliers, employee inter-relationships, information/communication systems, and management of processes and products, Singh and Smith (2004) found insufficient statistical evidence to suggest that TQM is directly related to innovation. Furthermore, the implementation of TQM programs appears to require radical reforms, which are sometimes insurmountable, particularly in basic organizational areas such as culture and leadership styles (Roldán, Leal-Rodríguez, and Leal, 2012)

To solve the issues associated with TQM and human development, Jain and Gupta (2012) presented two important components of TQHRM. These were an employee development system, and an empowerment management system. Claims were made that these ideas would be useful as a way to track the success and relationship between TQM and HRM, as well as the resulting effects on organizational performance.

TQM does not provide any particular tools or focus related to workforce diversity and cultural differences. Instead, it focuses primarily at the organizational level of management through policy and strategy. Therefore in this work, knowledge management allows the gap that TQM leaves to be filled, mainly by allowing individuals to learn for their own self-improvement, which will then lead to organizational improvements. The software industry is also composed of a variety of SMEs, where TQM is not well suited. Instead, knowledge management aims to create the necessary behavioral and tacit aspects associated with TQM to allow individuals to thrive, which will in turn lead to improved creativity, innovation, and overall organizational performance and quality.

While TQM has been shown as unsuitable in this research, the previous section noted the need to combine force-field analysis with other frameworks to instigate change among knowledge workers. In this research, force-field analysis is linked with critical work performance incidents at the case study. These critical incidents were derived using the software specific CMMI model, and identified by both the employer and employees. The driving force represents creativity, which is the condition set by the management team, and led by senior software developers who are expected to support employees' performance. The restraining force represents the current reality that employees face during their work assignments. Both the senior developers and current employees were then able to rank the impact severity of each driving force or restraining force. Levels of driving force and restraining force were derived from Likert scales. The application of force-field analysis in this study is explained in methodological detail in Chapter Three, however the need to integrate force-field analysis with software specific work incidents leads to a theoretical consideration of managing knowledge workers employed within the software industry, which is related to maturity levels and quality assurance.

2.11 Maturity Levels, Software Quality Assurance, and Increasing Software Developers' Performance

The need to formalize and optimize the processes related to software development resulted in Carnegie Melon University creating the Capability Maturity Model (CMM), and later the Capability Maturity Model Integration (CMMI) (Herbsleb et al., 1997). The CMM in turn led to the inception of the Software Engineering Institute (SEI) at Carnegie Melon University. The initiation of the CMM in 1991, and later the SEI, aimed to improve both processes and organizational capabilities within the field of software development and the software industry (Paulk, 1996).

Within the software industry, managing knowledge workers and the associated change necessary for innovation is critical to remain successful and competitive. Maturity models/levels such as the CMM, are considered one potential method of monitoring and measuring performance. A maturity model is generally considered as an approach describing the development of an individual or process

through time. In maturity levels, individuals or organizations progress through levels towards an idealized end state. With specific reference to knowledge management, maturity models can enable organizations to build up their knowledge management functions, and use the maturity levels to create mutual understanding and consensus among an organization's stakeholders. Maturity models are a useful way to provide an organization with a holistic and comprehensive overview of a particular aspect. While maturity levels/models are useful for organizations, there is no single maturity model, and the complexity of an organization's operation precludes the use of maturity levels for anything but specific and focused uses (Klimko, 2001). In the software development industry, one of the primary maturity frameworks to ensure competitiveness is the Capability Maturity Model Integration (CMMI).

2.11.1 Capability Maturity Model Integration (CMMI)

The CMMI was developed by the Software Engineering Institute (SEI) and chosen in this research to model the causality of work performance and quality problems, as it is a tool commonly used to improve software processes to produce high quality software, on time and at low cost (Al Yahya, *et al.*, 2010). Galorath (2006) discovered that most software projects fail due to several key reasons, all of which are related to employee involvement, such as a lack of understanding project management, insufficient time to effectively plan the project, and a loss of focus when the project is under way. As a potential solution to these issues, CMMI provides objective insights into issues and processes, along with the ability to objectively identify and manage risks, and provide early detection and resolution of problems (Goldenson, 2003). CMMI consists of five maturity levels with Level 5 guaranteeing the quality of software and being the most desired stage. In Thailand however, very few software companies achieve CMMI certification at level 5, as this requires significant testing (Stevens, 2007).

CMMI based process improvement can result in enhanced project performance and higher quality software products if the measures of performance and related practices are combined.

CMMI process areas (PAs) can be grouped into the following four categories to understand their interactions and links with one another regardless of their defined

level, including process management, project management, engineering, and support. Figures 2.12 – 2.15 illustrate how these process areas affect the organization.

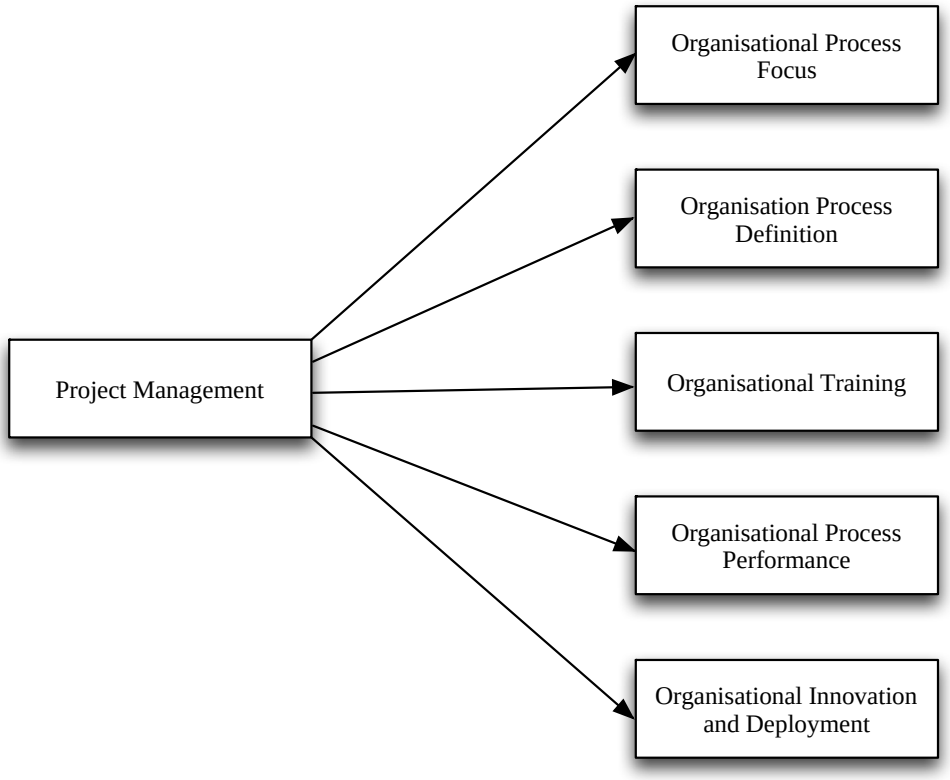

Figure 2.12 Process management area of the CMMI

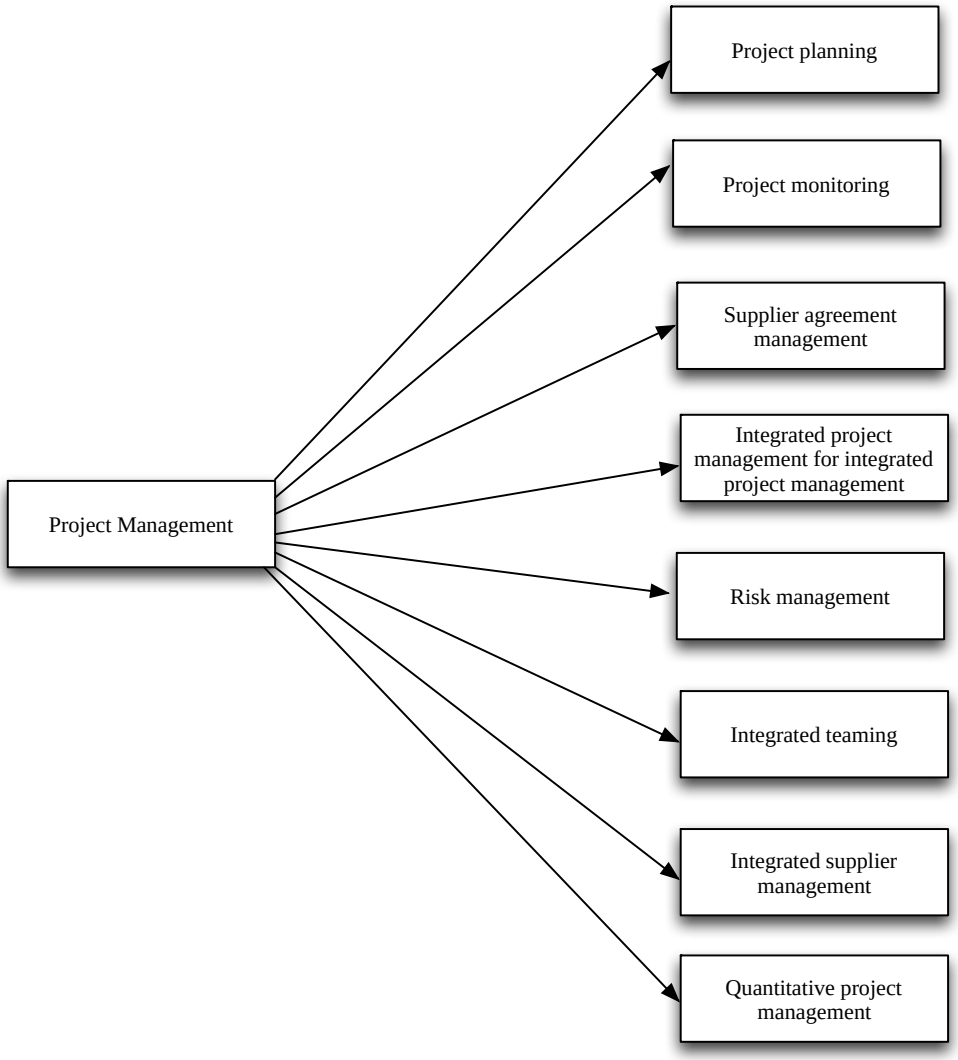

Figure 2.13 Project management process area of the CMMI

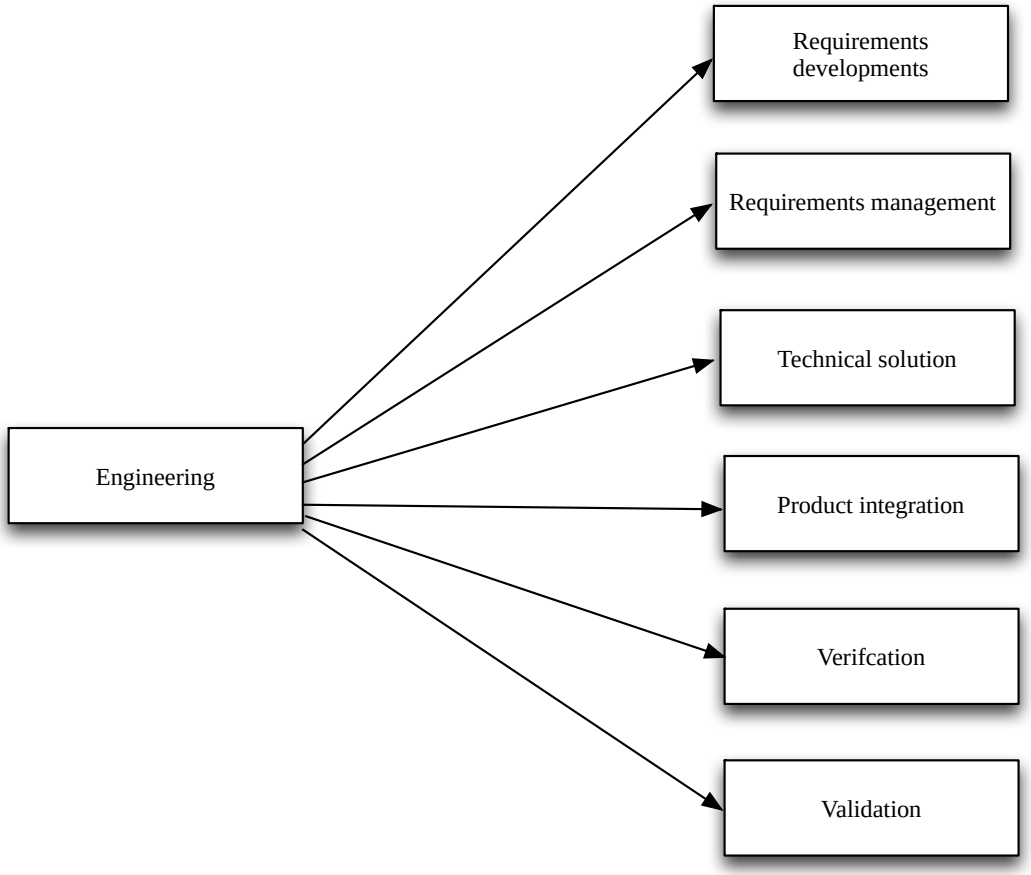

Figure 2.14 Engineering process area of the CMMI

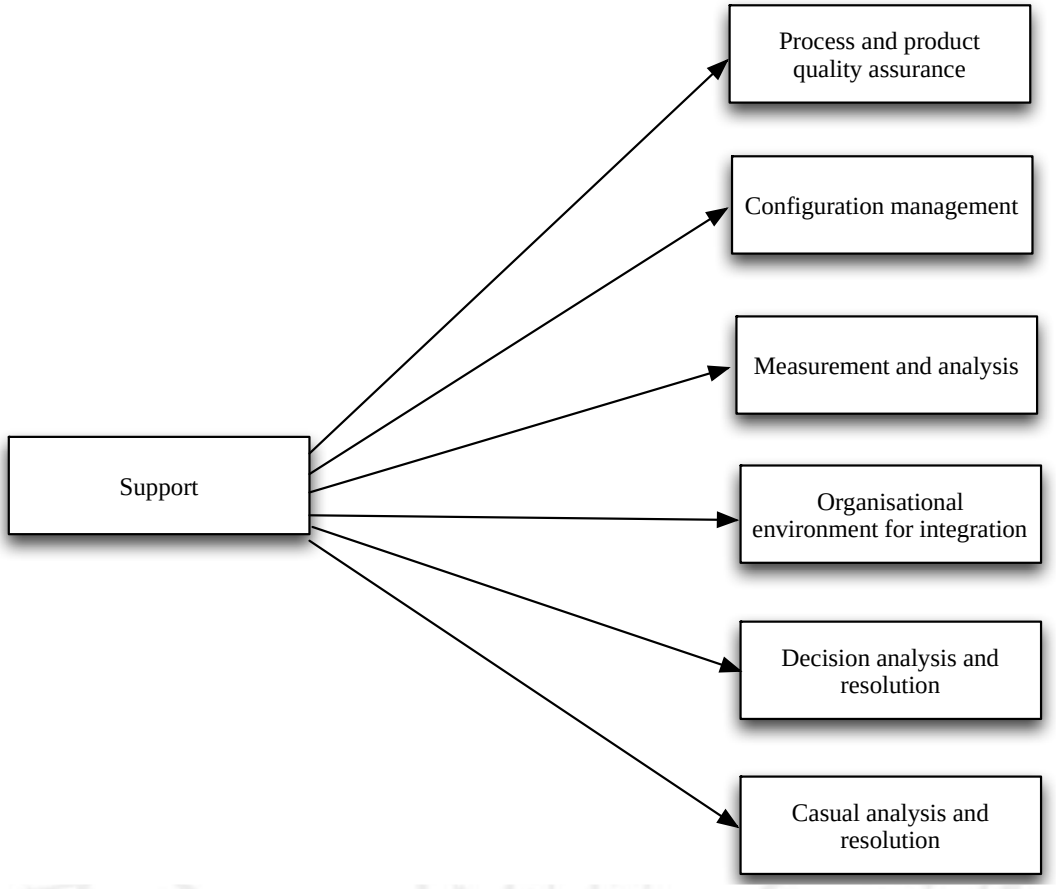

Figure 2.15 Support process area of the CMMI

These four process areas fit into the five CMMI maturity levels, which comprise the following levels:

- Level 1(initial level)
- Level 2 (managed level)
- Level 3 (defined level)
- Level 4 (quantitatively managed)
- Level 5 (optimizing level)

The organization can choose the focus of its process improvement efforts by prioritizing and selecting the process areas that most require improvement. The process areas are organized by maturity levels, with each process area defined by a set of goals and practices. Two categories of goals and practices are defined at each

maturity level, which are generic goals and practices, and subsequently, more specific goals and practices. The five CMMI maturity levels are shown in Figure 2.16.

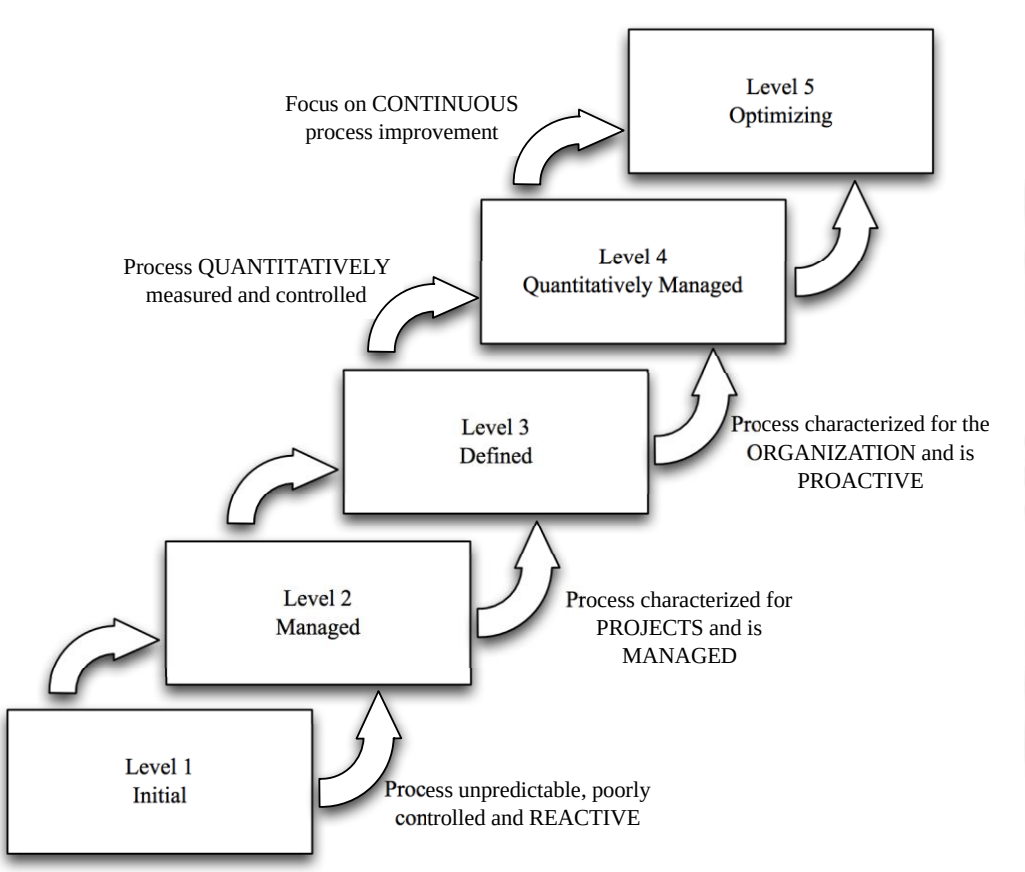

Figure 2.16 CMMI maturity levels

The maturity levels are measured by the achievement of both the specific and generic goals that apply to each predefined set of process areas. The details and characteristics of each maturity level are described below, while Table 2.7 provides a concise overview of each level.

- The initial process (maturity level 1) is *ad hoc* and chaotic. The working environment is not stable. The success of the project depends on the leadership of the organization. The products are adequate, however the cost of production is over budget and the product overdue. As a result, there is no sustainable success at this maturity level.

- The software production requirements at the managed level (maturity level 2) are managed more effectively and software processes are planned, performed, measured and controlled. There is a commitment between project stakeholders, and therefore work products are revised and reviewed with control.

- At the defined stage (maturity level 3),the processes are well characterized and described in terms of standards, procedures,tools and methods.The scope of the standards, process descriptions and procedures in level 3 is more detailed and rigorous than maturity level2 It is managed proactively because the understanding of the interrelationships between process activities and measurement is more detailed in terms of process, products and services.

- Maturity level 4 or the quantitatively managed level sets objectives that can be quantitatively measured for quality and process performance. These measures are in turn used as the criteria when managing processes related to meeting the needs of customers, end users, the organization and the process implementer. Level 4 is distinguishable from level 3 as the process performance is controlled by statistical and other quantitative techniques. At maturity level 3, processes are qualitatively predictable.

- Maturity level 5 is termed the optimizing level. At this level, processes are continually improved based on a quantitative understanding of the common causes of the inherent variation in processes. Maturity level 5 has been revised to reflect changing business objectives, and used as the main criteria in managing process improvements. The effects of deployed process improvements are measured and evaluated against the quantitative process-improvement objectives. The optimizing processes are innovative, and depend on participation from those within the organization as well as appropriate business values and organizational objectives. Searching for ways

to accelerate and share learning therefore enhances the optimizing level and associated processes. Level 5 differs from level 4 due to the type of process variation addressed. Level 4 processes are concerned with addressing special causes of process variation, and providing statistical predictability of the results, whereas level 5 assesses variation and changes the process to improve process performance.

Table 2.7 The relationship of maturity levels, the focus of work, key process areas and results (adopted from Chrissis et al., 2003)

Level	Focus	Key Process Areas	Results
5 - Optimizing	Continuous Process Improvement	• Organizational Innovation and Deployment • Causal Analysis and Resolution	Highest Quality/ Lowest Risk
4 - Quantitatively Managed	Quantitatively Managed	• Organizational Process Performance • Quantitative Project Management	Higher Quality/ Lower Risk
3 - Defined	Process Standardization	• Requirements Development • Technical Solution • Product Integration • Verification • Validation • Organizational Process Focus • Organizational Process Definition • Organizational Training • Integrated Project Mgmt (with IPPD extras) • Risk Management • Decision Analysis and Resolution • Integrated Teaming (IPPD only) • Org. Environment for Integration (IPPD only) • Integrated Supplier Management (SS only)	Medium Quality/ Medium Risk
2 - Managed	Basic Project Management	• Requirements Management • Project Planning • Project Monitoring and Control • Supplier Agreement Management • Measurement and Analysis • Process and Product Quality Assurance • Configuration Management	Low Quality/ High Risk
1 - Initial	Process is informal and *ad hoc*	-	Lowest Quality/ Highest Risk

The CMMI emphasizes technology and processes within a software development environment, and this focus can result in a lack of organizational stability (Nandyal, 2007). Real organizational stability comes from a balance achieved through the effective management of people, processes and technology. The weakness of CMMI in achieving organizational stability led to the implementation of P-CMM as a tool to operate in tandem with CMMI to achieve the organizational stability derived from effectively managing people, processes and technology.

2.11.2 People Capability Maturity Model (PCMM)

The CMMI has been criticized in the literature for focusing too heavily on technology and processes within an organization at the expense of considering people (Bach, 1994). As a response to this, the People Capability Maturity Model (P-CMM) proposed a framework to improve people from a holistic organizational perspective. According to Curtis et al. (2009), P-CMM is regarded as a well-tested set of human capital management practices acting as a roadmap to continuously improve the capability of an organization's workforce. The main objective of P-CMM is to improve the capability of the workforce. Curtis et al. (2001, p.4) described workforce capability as "the level of knowledge, skills, and process abilities available for performing an organization's business activities." The success of a workforce shows that an organization has a level of readiness to perform significant business activities, produce effective results, and obtain benefits from investing in process improvement or advanced technologies.

While other more traditional workplaces might improve their people by understanding their employees' satisfaction and attitude, P-CMM focuses on workforce practices by deciding and prioritizing which capability should be improved and then integrates this knowledge with other process improvement activities. P-CMM treats workforce development as an organizational process. However, to understand which capabilities employees are lacking, and therefore which maturity level to focus on, there should be focus on the individual as well as the organization. The focus of P-CMM is firmly at an organizational rather than individual level.

In order to achieve organizational efficiency and effectiveness, the competency of manpower within an organization is crucial. For this reason, the P-CMM framework can be utilized to train and develop knowledge workers. Ultimately, P-CMM has been created to reinforce workforce capability, just like the CMMI attempts to implement and improve software development processes and technology within the organization.

When developing software, knowledge is considered as the main raw material. Even though software functions can be automated, knowledge is required as a basic input, and acts as the genesis of computer automation. To develop software requires a variety of skills and activities, such as studying handbooks, consulting design topics via teamwork, creating models to assess plans, as well as participating in the organization's training (e.g. workshops or conferences). The creation of successful software developers is essential to serve the increasing needs of software development. It is also necessary to understand rapidly changing technology, programming languages, and business applications, as well as support the trustworthiness of software networks, particularly in life-critical and business-critical applications.

The severe deficiency of software experts during 1990s was an example of the issues a shortage in software developers could cause, and as noted in section 2.4, many countries are still facing a skills gap related to software development, hence these companies often choose to offshore their software development activities to other countries (e.g. to Thailand). Offshoring software development expands the pool of available workforce and helps to mitigate an actual or potential crisis in software development talent. However, offshoring software development is not without issues and there is an increasing staff turnover within software firms who offshore their development activities. For example, in India, there has been a knowledge worker turnover rate of 30% each year (Embar, 2001).

Supply and demand for knowledge workers in the field of technology and software engineering has shifted in parallel with advances and development in technology. As a result, there is a shortage of skilled knowledge workers, which exacerbates issues and results in some of the following key issues:

- Increased staff turnover rate
- Loss of crucial system knowledge
- Increases in staff wages and benefits
- The need to hire more staff
- A rising workload
- Extra time to complete work
- Tension in the workplace
- A decline in staff well-being and a poor balance of life, work and family
- An increased cost of living
- Incomplete work

The serious problems associated with recruiting and retaining knowledge workers can also result in deficient employee training, incorrect performance response from workers, less chance of workers finding an appropriate job making use of their skills, and noncompetitive payment. This exemplifies the need for changes to the way people are managed in some software companies in order to improve their development practices. Owing to these issues in the practice of software development, P-CMM has been employed in several organizations worldwide. P-CMM has also expanded beyond software engineering to become a tool used in other types of organization, as shown in Table 2.8.

Table 2.8 The examples of the types of organization utilizing P-CMM to manage people

Organization Types Utilising P-CMM	
▪ Business Process Outsourcing	▪ Information Technology
▪ Hospitality	▪ Consulting
▪ Construction	▪ Defense contractors
▪ Insurance	▪ Pharmaceuticals
▪ Government Agencies	▪ Defense Agencies
▪ Energy/Utilities	▪ Software Development
▪ Banking/Financial Services	▪ Management Information Systems

In order to promote and advocate the accomplishment of CMMI maturity levels, the application of P-CMM is also required. P-CMM provides the basis of forming a culture to facilitate the achievement of each CMMI maturity level. Initial criticisms of CMMI related to the practical experience of organizations applying the model, who found they must significantly adjust the management of people in order to achieve the process and technology strands of CMMI. Thus, P-CMM was designed as a way to tackle the people issues within the organization. P-CMM expands upon and offers added dimensions of people and culture which are lacking in CMMI. The synergy of P-CMM and process maturity frameworks such as CMMI can reinforce the capability of the workforce to form a culture which is able to successfully implement organizational process improvements. Individuals are required to develop their knowledge and skills in alignment with the P-CMM. Managers and directors must ensure their workforce possess the necessary skills to effectively accomplish their work. The five P-CMM maturity levels are shown in Figure 2.17 and described below.

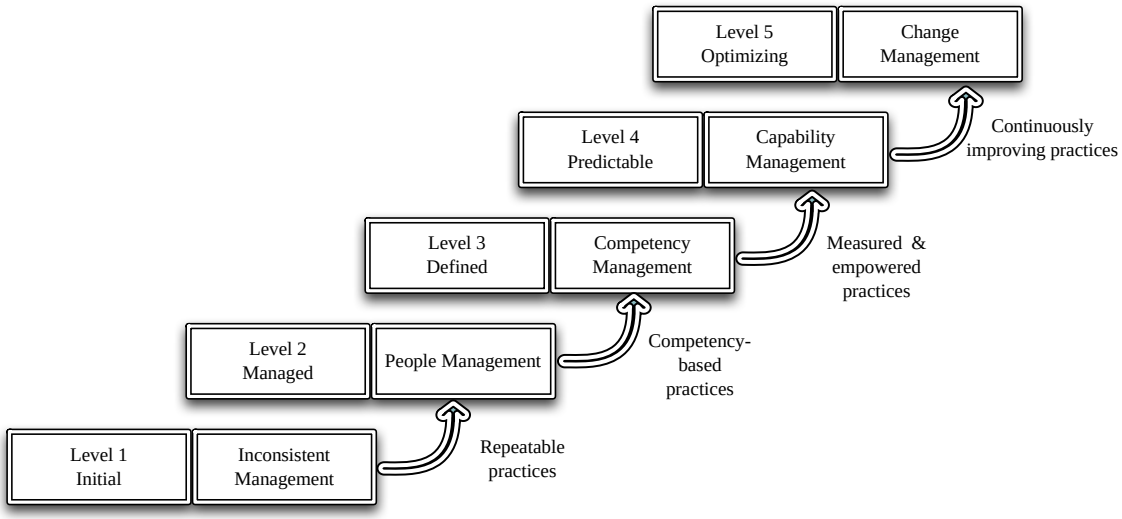

Figure 2.17 The five P-CMM maturity levels

2.11.2.1 P-CMM Maturity Level 1: Inconsistent Management

Difficulty maintaining capable individuals is the hallmark of organizations belonging to this level. The practices of a workforce operating in a low-maturity P-CMM organization are usually considered as contradictory and specific, despite the presence of significant talent. The main characteristics are divided into four sections including performing practices, displacement of responsibility, ritualistic practices, and an emotionally detached workforce.

2.11.2.2 P-CMM Maturity Level 2: People Management

In this stage, directors are required to employ the manpower activities as the antecedent responsibilities. They need to concentrate on the operation and advancement of performers in the organization. The responsibilities of managers are hiring, cooperation and engagement, supplying, directing performance, progressing skills, as well as determining compensation.

2.11.2.3 P-CMM Maturity Level 3: Competency Management

P-CMM level 3 relates to developing workforce competencies in alignment with the overall business strategy and objectives.

2.11.2.4 P-CMM Maturity Level 4: Capability Management

In alignment with the CMMI level 4, P-CMM level 4 relates to quantitatively managing and measuring workforce performance. It includes making performance predictions and empowering and integrating workforce competencies.

2.11.2.5 P-CMM Maturity Level 5: Change Management

Level 5 of the P-CMM is about continuously improving workforce performance and innovation. At this level, there should also be an alignment between individual employee competencies, and the overall business strategy and objectives.

The five maturity levels are each supported by four process areas in the workplace, which are detailed below.

2.11.2.6 Process Area 1: Developing Individual Capability

Developing individual capability begins at P-CMM level 2. The focus of this process area at level 2 concentrates on the skills that individuals need to accomplish. At the defined level, the focus shifts from individual skills, to the workforce competencies an organization needs to fulfill its current and strategic business objectives. Workforce competencies must be based on the organization's identification of the knowledge, skill, and process requirements. Based on these requirements, an organization-wide development program is established to assist individuals to gain the capabilities and competencies most relevant to their assignment and career (competency development). At the predictable level, mentors use competency-based assets and other competency development materials to achieve defined objectives, while assisting those with less experience to develop their capability. At the optimizing level, the continuous improvement of an individual's capability is the focus. They are also empowered to improve their personal work processes that will in turn enhance their individual work performance. The individual lessons learned are beneficial for the organization to incorporate into defined competency-based processes.

2.11.2.7 Process Area 2: Building Workgroups and Culture

Managed level 2 is where efforts begin to improve coordination and interaction among people. At the defined level, an organizational capability for coordinating work dependencies is established and supported by the coordination skills of individuals. At this managed level, the burden, in coordination with the workforce, can be reduced by defining the work processes used in each workforce competency. A competency-based process explains how individuals in a specific workforce apply their knowledge, perform their skills, and apply their process abilities in the context of an organization's defined business processes. At the predictable level, the organization makes use of the capabilities based on competency-based processes. When each competency community accomplishes its work processes, the organization upgrades its coordinating work dependencies through the formally defined interfaces among competency communities in P-CMM maturity level 3.

2.11.2.8 Process Area 3: Motivating and Managing Performance

At the managed level, individual performance based on their work is used for motivating and managing performance. Discussion about work performance takes place to identify ways to improve it. Successful work performance will be recognized, however, failed work characteristics will be managed. At the defined level, performance is managed as part of workforce competencies, which are defined in relation to levels of knowledge, skill, and process ability. Workforce practices are established and adjusted to motivate the development of additional capability in one or more workforce competencies. At the predictable level, performance is controlled quantitatively. Since people perform in similar competency-based processes, the organization can quantify the capability of these processes and compare current performance to past experience. This way, future expectations can be quantitatively estimated for both planning and managing work. At the optimizing level, quantitative process performance is used to ensure organizational performance in terms of whether it meets business objectives. The evaluation of performance data is across individuals, workgroups, and units.

2.11.2.9 Process Area 4: Shaping the Workforce

Shaping the workforce relates to the effort utilized to shape the workforce to meet business needs. At the managed level, this relates mainly to creating best practices when recruiting and selecting employees. This ensures the organization has employees with the skills necessary to achieve business objectives. At the defined level, the organization moves beyond recruitment and selection practices to define the competencies required to meet business strategies and objectives. At level 3 of the maturity level, workforce activities occur with a direct understanding of how they contribute to the business strategy and objectives. At level 4, the focus once again becomes quantitative, with the capability of the workforce being quantified and then used to evaluate the impact of the workforce on achieving its strategic objectives. At the optimizing level (level 5), the organization seeks to continuously improve and innovate its workforce capability.

While the CMMI and P-CMM are adopted by many organizations (both inside and outside the software engineering domain), there are a variety of key issues with applying the P-CMM to the management of knowledge workers. Firstly, the P-CMM was developed from a western epistemological perspective, without a large amount of empirical testing (Bach, 1994). This means the P-CMM is not well suited to managing cross-cultural issues. Secondly, P-CMM is primarily about quantitative people-management processes and subsequent evaluation. It has also been accused of creating organizations who focus on chasing certification rather than results (Rose et al., 2008). The final major issue with P-CMM relates to its focus on the organization as a whole, without consideration of individual employees and their contribution. Due to these issues, the theory of personal mastery, emerging from Senge's (1990) fifth discipline, offers an opportunity to manage individuals as well as take into account cultural aspects.

2.12 Personal Mastery

With a similar objective of P-CMM, but with a focus on the softer, individual aspects of people development, the fostering of personal mastery within the workplace helps increase organizational development aimed at building a learning organization. Personal mastery is the sense of accomplishment from activities that are important. It is the success which brings about both career and life satisfaction (Childress, 2007). According to Senge (1993), personal mastery is the first step when people learn the fifth discipline, including personal mastery, mental models, building a shared vision, and team learning. The learning does not occur if an individual is not inspired by a strong intention and enthusiasm, which signifies their personal mastery. This means that learners need to realize where they want to go, and must therefore determine where they are. Senge (1993, p.59) defined personal mastery as, *"a set of practices that support people, children and adults in keeping their dreams whole while cultivating an awareness of the current reality around them"*. It is something beyond competence and skills, even though it is grounded in competence and skills. The meaning of personal mastery is, *"approaching one's life as a creative work, living life from a creative as opposed to reactive viewpoint"* (Senge, 1990, p.141). In this research, personal mastery is understood as a process of lifelong learning and growth

that can be developed to support employees' job performance and work satisfaction. Figure 2.18 illustrates the five components of the fifth discipline, of which personal mastery represents the foundation.

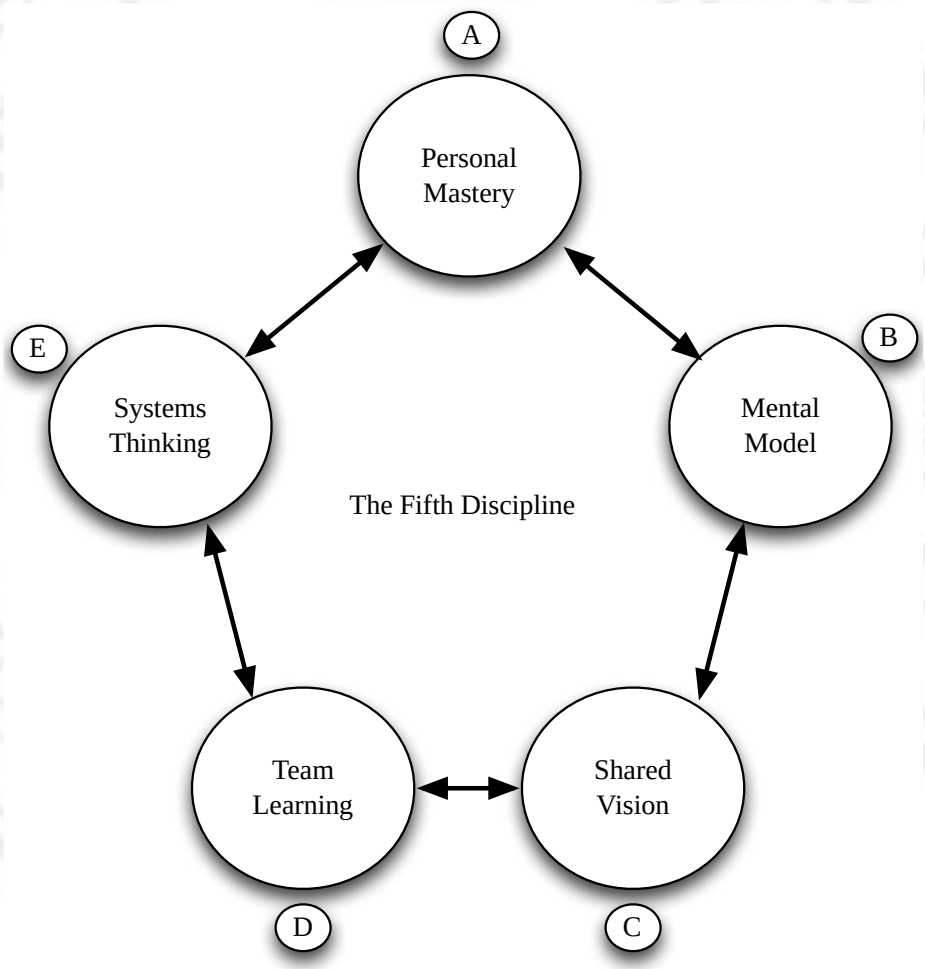

Figure 2.18 The five components of the fifth discipline, of which personal mastery is the foundation (adapted from Senge, 1990)

Personal mastery is essential for the success of a company for two key reasons. Firstly, the commitment of people with high levels of personal mastery will result in a workforce that takes more initiatives, has a broader and deeper sense of responsibility in their work, and can learn faster. Secondly, it is considered that, *"to seek personal fulfillment only outside of work and to ignore the significant portion of our lives which we spend working, would be to limit our opportunities to be happy and complete*

human beings" (O' Brian, in Senge, 1990, p. 143). Learning helps to expand personal capacity to create the results they desire; therefore, creating an organizational environment which encourages all its members to develop themselves towards the goals and purpose they choose is essential. If employees enjoy what they are doing, they have the ability and influence to push the company to achieve business excellence.

Nobody can increase another's personal mastery, however, it is possible to set conditions that encourage and support people who want to increase their own levels of personal mastery. This idea challenges the traditional view of motivation theory, and its questionable method of the carrot and stick approach pertaining to reward and punishment. Some managers encourage aspiration and inspiration by promoting personal mastery. Instead of believing in the assumption that people are primarily driven by wealth, fame and fear, it is sensible to assume that people can contribute and accomplish organizational commitment because they want to learn and do good work for its own sake, and to be recognized as people (Senge, 1994). The two crucial methods of building personal mastery include creating a personal vision and holding creative tension. Figure 2.19 provides a visual conceptualization of the stages in personal mastery.

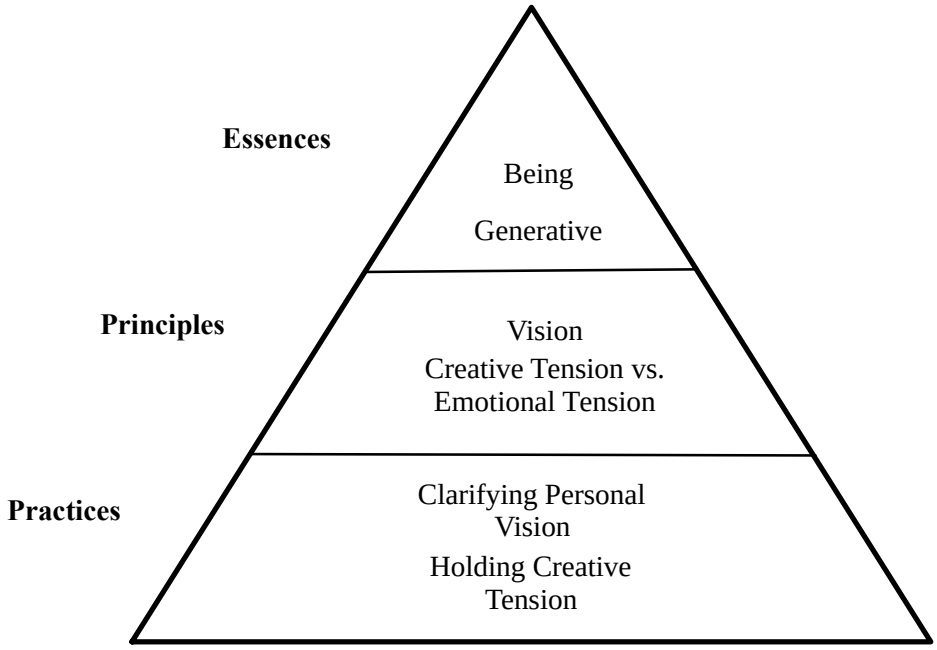

Figure 2.19 The components of personal mastery

Recent studies suggest that personal mastery is highly influential on organizational performance (e.g. Song and Kolb, 2012; Marques, 2012). Based on the work of Garcia-Morales *et al.* (2006), personal mastery influences organizational performance both directly and indirectly through organizational learning and innovation. Achieving personal mastery relies on individuals carefully contemplating and thinking about their current realty and generating creative tension. Critical thinking is therefore a key foundation to the achievement of personal mastery and is a central part of the research in this thesis.

2.13 Critical Theory and Critical Thinking

Critical theory is based on Marxism for its methods and tools. Being critical means being explainable, practical, and normative; for example, explaining what is wrong with current social reality, identifying actors to change it, and then providing clear norms for criticism, and practical goals for the future. Based on Marxist theoretical concepts, critical theory discusses the ways in which people accept as normal, a world characterized by significant inequities and the systematic exploitation of the many by the few, as well as how this might be changed for the better. However, critical theory should not be equated with Marxism. Most key authors in this domain

work outside the orthodox Marxian tradition and do not regard capitalism as the enemy. Critical theory is an approach that offers guidance to human action that aims to produce enlightenment and emancipation, a form of knowledge that is multidimensional, avoiding the reduction of knowledge to linear, quantitative-empirical perspectives; it is reflective, opening the doors to new possibilities by exploring unexamined assumptions and comparing these with the resonance of lived experience (Carr, 2000).

Critical theory takes place in the context of the management of change in organizations (Carr, 2000). An organizational competency model constructed through the use of critical theory has the potential to offer greater employee and client satisfaction, more effective and efficient service delivery and expanded community involvement through a redefined public interest (Jurie, 2000). The relevance of critical theory to the study of corporate culture is a managerial praxis and organizational discourse (Ogbor, 2001). It is also concerned with attempts to show how organizational ideologies operate in resistance to change that is engendered by training. A generalized chronological illustration of critical theory is presented in Figure 2.20, which illustrates the development of critical theory and thinking to its current application in knowledge management.

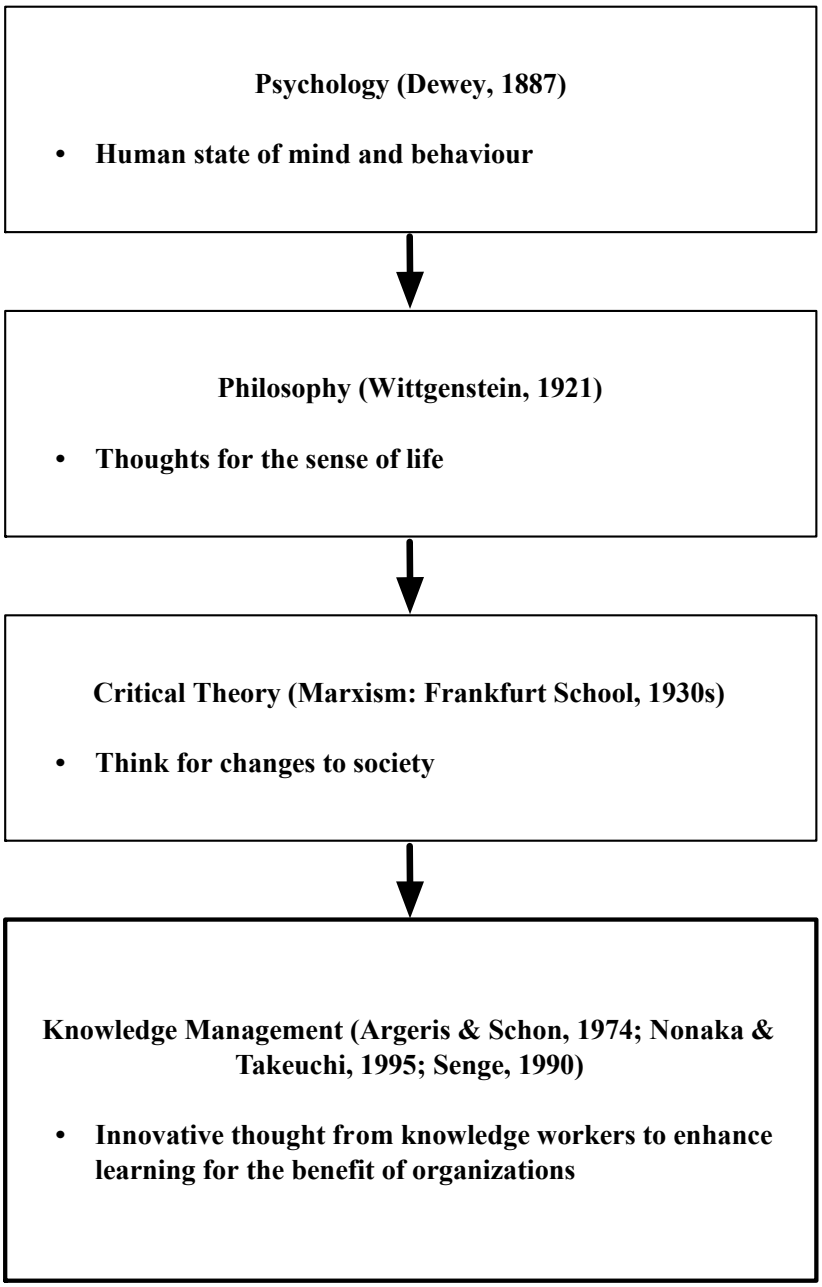

Figure 2.20 A **chronological generalization of critical theory/thinking and its resulting integration into knowledge management**

Warnick and Inch, as cited in Petress (2004, p.463), reveal critical thinking as, *"involving the ability to explore a problem, question, or situation; integrate all the available information about it; arrive a solution or hypothesis; and justify one's position."* Petress (2004) proposed six characteristics of critical thinking: sufficiency, relevance, reliability, consistency, recency and objectivity. Sufficiency is an adequate

amount of support for claims. The evidence stated to be relevant to the topic is called relevance. Reliability supports arguments based on trustworthy sources. Consistency occurs when supporting details go along with what is known from other experiences, observations, and sources. Recency describes the support with recent information. Finally, objectivity includes materials that are undistorted and directed by experts.

Employees can face a number of stressful circumstances within an organization. Job-related stress can be caused, for instance, by unclear job expectations and descriptions, short deadlines, responsibility without decision-making authority, routine tasks, racism, sexism, ageism, the growth of multinational firms, and depersonalizing communication in the workplace (Johnson and Julie, 1997). Critical reasoning from employees' reflection is beneficial for the company to check the organizational environment. According to Natale and Ricci (2006), improving critical thought in the workplace goes a long way to achieving individual and organizational excellence. This can help the organization to foresee the risks of insufficient manpower and plans for recruitment as well as employee retention strategies in the future. In this research, critical thinking is applied to investigate respondents' perceptions towards work-life balance and how it affects their decision to leave or stay with their employer.

The strands of literature presented so far indicate that to understand knowledge workers' perceptions towards work-life balance, there is a requirement for a framework to understand the complexity of their thoughts (critical thinking) and a need to gather knowledge related to work-life balance and share it between employees and managers (knowledge management). These two aspects are now brought together within a case study to understand Thai perceptions towards work-life balance in a multinational software development firm.

The critical incident technique (CIT) can be used as a tool to create critical thinking. It is a set of procedures for collecting and analyzing reports of incidents. The CIT revolves around three main features, firstly, a description of a specific situation. Secondly, an account of the actions or behaviour of a key player in the incident, and, finally, the outcome or result. CIT is beneficial in helping researchers understand the knowledge-related behaviours critical to complex situations and proceedings (Hettlage and Steinlin, 2006), and provides organisations with both a starting point and a

process for advancing organisational development through a learning experience (Davis, 2006).

Identifying critical incidents via the CMMI, and using force field analysis helps new employees to respond effectively to problematic events during their probationary period. The story-telling process recounting previous critical incidents is the means to foster the personal vision of new employees in the sense that they are warned about future work problems that might occur.

2.14 Chapter Summary and Research Focus

This chapter has illustrated four aspects of literature related to the research problem, including the political, cultural, economic and theoretical context of the research problem. Together this multifaceted context illustrates the deficit in the literature, and thus shows how this research can make a contribution to knowledge.

The first part of this chapter has shown how the knowledge economy represents a growing share of the wider economy, especially in Thailand where the government has encouraged growth in knowledge industries. In considering these knowledge industries, software engineering is one of the key drivers of growth and is represented by large software engineering industry clusters in many countries, including Brazil, India, China, and Thailand. For Thailand, attracting FDI from international firms has become an important driver of growth. Conversely, for countries such as Germany, a skills shortage exists, which is driving software engineering offshore, both to alleviate this skills gap, and to achieve a cost reduction in labour. It is clear from the literature that the offshoring of knowledge work creates issues associated with managing knowledge workers employed in an intercultural working environment. Despite acknowledgement of this issue, there is a deficit of literature with relevant research or appropriate tools of how to tackle it. This is particularly so for Thailand, where the literature focuses on Asian (Confucian) styles of management, but mostly ignores the impact of western management styles on knowledge work. This context and lack of literature clearly demonstrates the impetus for the research set out in this thesis, and justifies the research objectives presented in Chapter One.

The second part of this literature review has presented the existing processes, tools and methods for managing knowledge workers, and generating the change required for the creation of knowledge innovation and reduction of issues associated with work performance and quality. The key theories of personal mastery, Lewin's theory of change, and critical thinking have been introduced, while tools such as the CMMI and P-CMM have been critiqued as ways to manage people in the software engineering industry.

Overall, the literature in this chapter has demonstrated the need for research which understands how to effectively manage recently recruited knowledge workers operating within a multicultural workplace. Thailand and Germany have been a specific focus in the literature, with Thailand hosting FDI and providing a local pool of qualified knowledge workers (software engineers). The mismatch between Thai knowledge workers and German workplace requirements suggests that research must attempt to understand how to generate effective change in Thai knowledge workers so that they meet the requirements of FDIs and can operate within the boundaries of cultural expectations that may differ from their own perceptions and expectations. Chapter One introduced the research problem along with the research aim and objectives, while this chapter has expanded, contextualized and related the research problem to the relevant literature. Chapter Three now moves to explain how the research problem is addressed via an appropriate methodology.