Perceived Relationships among Knowledge Management, Total Quality Management, and Organization Innovation Performance: A Thai Study

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ABSTRACT

The purpose of this study was to examine the relationships among Knowledge Management (KM), Total Quality Management (TQM), and organization innovation performance (INNO), and to determine the role of KM implemented through TQM in INNO.

KM was adopted as an independent variable with four subgroups: knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application. TQM was adopted as a second independent variable and as a mediator with five subgroups: top management support, employee involvement, continuous improvement, customer focus, and database decisions. Two subgroups of INNO were explored as the dependent variable: product innovation and process innovation.

Data were collected via a paper-and-pencil questionnaire using postage distribution to 500 human resource development managers in Thailand, with responses from 470 usable responses, for a response rate of 94%. The nine instruments were combined and translated into Thai by two linguistics professors in Thailand. Collected data were analyzed using SPSS and LISREL. Factor analyses and Structural Equation Model (SEM) analyses were conducted in order to answer two research questions: (a) are there positive relationships among KM, TQM, and INNO? and (b)to what extent does KM implemented through TQM improve INNO? Confirmatory Factor Analysis (CFA) was conducted to identify a variable factor structure of independent variables, dependent variables, and mediators. SEM analysis was performed to investigate the relationships among the three variables in general and their relationships through mediation.

The results showed that: (a) KM strongly and positively influenced INNO and TQM, and TQM enhanced INNO; therefore, hypotheses 1, 2, and 3 were supported; (b) the overall relationship via TQM as a mediator was supported; therefore, hypothesis 4 was supported.

In brief, all four hypotheses were positively supported. A conclusive summary is provided along with a contributive discussion. Implications and contributions to HRD researchers and practitioners are discussed, and recommendations are offered. Also included are conclusive final thoughts accompanied by the limitations of this study.

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CHAPTER 1

INTRODUCTION

Organizations today experience a common challenge: the need to improve their performance in order to benefit from rapid change and to create or regain competitive advantage. Further, the competition to gain and retain customers is becoming even more difficult. "Global competition is driving organizations to become leaner and more streamlined" (Paper, Rodger, & Pendharkar, 2001, p. 85); therefore, organizations are repeatedly forced to make change (Birkner & Birkner, 1998). The need to respond quickly to this change shows no sign of slowing down (Hammer, 2001; Zhang, 2006). Indeed, this need acts as a driving force behind a number of innovative change strategies in organizations, such as knowledge management (KM) and total quality management (TQM) (Lawler, Mohrman, & Benson, 2001; Wang, 2008). Both strategies focus on improving processes as a way to make the organization more effective (Lawler et al., 2001). Such approaches can be used as instruments to improve processes (Gryna, 1998) that can lead to organization innovation. In the best of situations, innovation will improve performance, increase value, and lead the organization to sustain competitive advantage (Barsh, 2007; Gloet & Terziovski, 2004). Therefore, it is important for the organization to understand the relationships among KM, TQM, and organization innovation performance in order to achieve competitive advantage.

Background and Overview of Issues

Knowledge is regarded as a critical resource for sustainable competitive advantage (Bock & Kim, 2002; Davenport & Prusak, 1998; Drucker, 1993; Quinn & Rivoli, 1991; Toffler, 1990). Unlike traditional production resources, such as capital,

labor, and land, knowledge appears to be the only meaningful resource in the knowledge economy (Drucker, 1993). In this era, products and services rely mainly on intellectual capability rather than physical input or natural resources (Powell & Snellman, 2004). The intertwined exchanges of strategic and tactical knowledge and those of tangible value and benefits are becoming the sources of value and wealth (Allee, 2003). Therefore, in order to survive in the new era, organizations need to embrace a new equation for success--knowledge equals power.

As a way to leverage knowledge, the concept of KM was initiated in the 1990s. According to Rastogi (2000), KM refers to "a systematic and integrative process of coordinating organization-wide activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups in pursuit of major organizational goals" (p. 40). Its key idea is to generate and share new knowledge, as well as to ensure that the right people get the right knowledge in the right place at the right time (APQC, 2003; O'Dell & Grayson, 1998).

There are two main views of KM: the technological view and the organizational view (Hanson, Nohria, & Tierney, 1999; Hunter, Beaumont, & Lee, 2002). The technological perspective, or the codification strategy, of knowledge management emphasizes explicit knowledge that is easy to codify and store in databases and access through information systems (Nonaka & Takeuchi, 1995; O'Dell & Grayson, 1998; Stewart, 1997). On the other hand, the organizational view, or the personalization strategy, puts more emphasis on tacit knowledge that is socially constructed and embedded in people's heads and social relationships (Allee, 2003; Nonaka, 1998). This does not mean that the organizations should implement only one perspective.

Organizations should focus on one perspective as the primary approach and utilize the other as the supporting approach in order to achieve competitive advantage (O'Dell & Grayson, 1998; Sveiby, 1997).

The recognition of TQM as a key to achieving sustained long-term competitive advantage has been widely promoted around the world (Dean & Bowen, 1994; Prajogo & Sohol, 2001; Oakland & Porter, 2004). TQM is not a new concept. It has been existed for a while. However, with the overabundance of quality approaches available, it is important to revisit the fundamentals (Oakland & Porter, 2004). According to Basterfield (2003), TQM is classified as both a philosophy and a set of guiding principles for the foundation of a continuously improving organization. It incorporates fundamental basic management techniques, improvement methods, and technical tools in a disciplined approach (Basterfield, 2003). TQM implementation proposes not only to improve product quality and service, but also to reduce costs and improve customer satisfaction (Longest, Rakich, & Darr, 2000). Even though it appears to have produced mixed results, when properly implemented, TQM has been credited with providing benefits for organizations (Oakland & Porter, 2004).

Innovation has received extensive attention as playing a critical role in maintaining sustainable competitive advantage (Prajogo, Power, & Sohal, 2004; Prajogo & Sohol, 2003; Tushman & Nadler, 1986). Innovation engages the application of new ideas in products, processes, services, management, and marketing (Singh & Smith, 2004; Vakola, 2000). It varies from a major change to a million little things that improve the operations of the organization (Edenenius, Keller, & Lindbald, 2011; Singh & Smith, 2004). In its best form, innovation has the ability to improve performance, solve

problems, increase value, and enhance competitive advantage, all of which are essential to the concept of differentiated strategy (Gloet & Terziovski, 2004; Porter, 1985). Hence, in order to compete in an ever-changing environment, companies must create new products, services, and processes and adopt innovation as a way of life (Breznitz, 2006; Tushman & Nadler, 1986).

Thailand is a country located in the center of Southeast Asia, neighboring with Myanmar, Laos, Cambodia, and Malaysia (Country Intelligence Agency, 2013) (see map below). Thailand is an export-driven country. Thailand's exports consist primarily of agricultural products, including rice and fish, as well as textiles, rubber, automobiles, computers and other electronic appliances, and jewelry (Tourism Authority of Thailand, 2013).

Figure 1. Map of Thailand.

Although the economy of Thailand is the 2nd largest in Southeast Asia, organizations in Thailand face unprecedented levels of competition similar to the challenges experienced in most developing countries (Ministry of Commerce, 2012). This powerful competition is a result of rapidly expanding international trade, the gradual removal of trade protection, deregulation of key industries, reform of labor markets and industrial relations, and rapid technology changes (World Trade Organization, 2000). In addition, the gradual removal of trade protection; especially the ASEAN Economic Community (AEC), has a great impact on this competition (Department of Trade Negotiation, 2012). Thai organizations find themselves competing intensely with multinational and local companies for customers in both domestic and export markets (Breznitz, 2006; Singh & Smith, 2004). Organizations that have better quality products and more advanced knowledge to create or improve products and services will survive and thrive in the marketplace. Consequently, quality and knowledge play important roles in Thailand.

If organizations understand the relationships among KM, TQM, and innovation performance, they will be better able to sustain long-term benefits, increase values, and achieve competitive advantage. This study will investigate the interrelationships of knowledge management, TQM, and organizational innovation performance in Thailand.

Purpose of the Study

The concept of KM is gaining more attention from researchers and practitioners in many fields due to its potential benefits to individuals and organizations. However, the view of KM itself is changing. Numerous researchers have recognized the importance of the relationships between KM and innovation performance (Davenport & Prusak, 1998;

Hall & Andriani, 2003; Nonaka & Takeuchi, 1995), while some researchers have suggested a relationship between KM and TQM (Hsu & Shen, 2005). Nonetheless, few studies have examined the relationships among KM, TQM, and organization innovation performance.

The ultimate goal of the present study is to investigate the relationships among KM, TQM, and organization innovation performance. To that end, the specific objectives of this study are to:

1. Examine the relationships among KM, TQM, and organization innovation performance.
2. Determine the role of KM implemented through TQM in organization innovation performance.

Significance of the Study

The study will contribute to theory and practice in Thailand in several ways. First, although KM, TQM, and innovation performance are widely recognized by both researchers and practitioners as being critical to an organization, not many studies have been conducted on this topic in the Thai context. Further, there are few empirical studies to support the relationships among these constructs (Ju, Lin, Lin, & Kuo, 2006). Most studies on this topic have been limited to literature reviews. Moreover, several studies have focused only on the relationship between KM and TQM (Hsu & Shen, 2005; Ju et al., 2006), the relationship between KM and innovation performance (Basadur & Gelade, 2006; Darroach & McNaughton, 2002; Gloet & Terziovski, 2004), or the relationship between TQM and innovation performance (Prajogo & Sohol, 2003; Singh & Smith, 2004). There is only one identified study investigating how organizations' KM initiatives

influence innovation performance through TQM practice (Hung, Lien, McLean, & Fang, 2006). Therefore, a study focusing on the practical dimensions of these relationships, especially in a Thai context, is needed.

Second, many organizations are trying to implement KM initiatives and TQM practices. Some organizations are a success, but others are a failure (Hsu & Shen, 2005; Oakland & Porter, 2004; Reed, Lemak & Mero, 2000). The concept of KM and TQM are abstract therefore, they are difficult to apply. Embedded within the processes of KM and TQM is the need for commitment by top management (Hsu & Shen, 2005). Top management commitment means leading by example, providing training and education, and supporting a culture in which teams can flourish (Reed, Lemak, & Mero, 2000). The KM process and TQM practice are systems with interactive components, and committing to just one part of the system is unlikely to produce the desired effects. Successful implementation means that effort and persistence are required to find the right balance for each organization. Attempts to imitate what other organizations do are probably worthless. Therefore, the organization needs to explore its own needs for leadership, the use of teams, education and training, and culture development to fit its own brand of KM and TQM in order to generate innovation and sustainable competitive advantage.

Finally, this study will link HRD and KM. As HRD normally has vital knowledge of employees in the organization, it is positioned to take a more active role in KM (Evans, 2003). Further human resource is viewed as the key source of innovation and competitive improvement (Klett, 2011). Given that the human factors of KM have been gaining increased attention (Evans, 2003; Hislop, 3003), more research on this focus is needed. This study will help HRD to have a better understanding of how KM relates to

innovation performance. Further, it will help HRD to have a better understanding of how TQM practice, the hypothesized mediator in this study, impacts this relationship. TQM and KM can be seen as tools to initiate change in organizations that can lead to organization innovation from an organization development point of view (Saru, 2007; Zetie, 2002). Further, understanding how KM, TQM, and innovation performance relate will help HRD professionals determine which initiative and intervention will add value to the organization and can better assist in implementing organization strategy.

Research Questions

This study addresses the following research questions:

1. Are there positive relationships among KM initiatives, TQM, and organization innovation performance?
2. To what extent do KM initiatives implemented through TQM improve an organization innovation performance?

Hypotheses

To answer the research questions above, four testable propositions were derived from the literature and existing studies.

Knowledge Management Initiatives and Its Impact on Organization Innovation Performance

KM appears to be an important concept and is often cited as an antecedent of innovation (Carneiro, 2000; Darroach & McNaughton, 2002; Nonaka & Takeuchi, 1995; Prajogo et. al, 2004). Gloet and Terziovski (2004) explored the relationship between knowledge management practices and innovation performance and found both positive and negative relationships. The humanistic or HR approach to KM and innovation

performance were found to be significantly and positively related, whereas the IT or technology focused approach to KM and innovation performance are found to be negatively related. Although this study implied that the organization should emphasize the humanistic approach to KM more when developing strategies for product and process innovation, a simultaneous approach of humanistic and IT should be implemented in the organization (Gloet & Terziovski, 2004). Capon, Farley, Lehmann, and Hulbart (1992) argued that knowledge acquisition and creation facilitates innovation. Organizations that spend money on research and development to create new ideas and knowledge lead innovation (Barsh, 2007; Capon et al., 1992). Lin and Lee (2005) found that knowledge application positively influenced innovation, whereas, knowledge dissemination and transfer did not influence innovation. The reason why knowledge dissemination and transfer did not influence innovation might be the nature of relationships among employees in Taiwanese organizations. Employees may be afraid of sharing their expertise with colleagues who would use this knowledge to get promoted at their expense. However, they concluded in their study that this might not be true in other cultures (Lin & Lee, 2005).

On the other hand, there are some studies that have confirmed that knowledge dissemination and transfer are important in the innovation process (Cavusgil, Calantone, & Zhao, 2003; Hall & Andriani, 2003, Liebowitz, 2002). In their study of tacit knowledge transfer and firm innovation capability, Cavusgil et al. (2003) validated that transferring tacit knowledge and obtaining tacit knowledge from partner firms affects organization innovation performance. Moreover, the results from Prajogo et al. (2004) confirmed that KM has a significant positive relationship with both product and process

innovation. They further emphasized that KM play an important role in determining organization innovation performance. Organizations that desire to become innovative product and process developers will need to focus on their KM and creativity capability as their first step (Prajogo et al., 2004). Based on these and other studies, it was hypothesized in this study that knowledge management initiatives enhance organization innovation performance.

H1: KM initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) will enhance organization innovation performance (product innovation and process innovation).

Knowledge Management Initiatives and Its Impact on Total Quality Management

The idea that both KM and TQM have great influence on an organization's strategic competence has drawn attention. Organizations can be effective in managing new knowledge through quality-related activities (Edenenius et.al, 2011). Even though one is viewed as continuous improvement and the others is viewed as radical improvement, there are many examples that show that the combination of KM and TQM can extensively enhance competitive advantage, and that they are related and compatible (Hsu & Shen; 2005; Lee & Asllani, 1997; McAdam & Leonard, 2001). Many scholars have recognized this viewpoint and have attempted to link KM and TQM (Molina, Montes, & Fuentes, 2004; Yang, 2004). Hsu and Shen (2005) mentioned that KM coexists with TQM as both share similarities, including results orientation, people-based management, teamwork, leadership, and delighting the customer. Hung et al. (2006) confirmed that KM initiatives significantly and positively contribute to TQM. It is,

therefore, hypothesized in this study that knowledge management initiatives positively influences total quality management.

H2: KM initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) will be positively associated with TQM (top management support, employee involvement, continuous improvement, customer focus, and database decisions).

Total Quality Management and Its Impact on Organization Innovation Performance

Authors suggesting a positive relationship between TQM and innovation have argued that organizations employing TQM will provide a prolific environment for innovation as TQM supports principles that match well with innovation (Kanji, 1996; Mahesh, 1993; Prajogo & Sohol, 2001; Roffe, 1998). According to Juran (1995), the principle of customer focus leads to organization innovation in terms of repetitively creating and launching new products into the market to meet changing needs by pushing the organization constantly to identify new customer needs and expectations. Similarly, continuous improvement involves change and creative thinking in work processes and provides a solid foundation on which innovations can be successfully implemented (Jha, Noori, & Michela, 1996; Singh & Smith, 2004). Finally, employee involvement and management support are also significant to the success of organizational innovation (Prajogo & Sohol, 2003).

On the other hand, several scholars have rejected the positive relationship between TQM and innovation, claiming that TQM supports some principles and practices that obstruct innovation (Prajogo & Sohol, 2003; Slater & Narver, 1998; Wind &

Mahajan, 1997). Continuous improvement is an example. Continuous improvement involves regulatory standards and activities that are practiced and well understood by everyone in the organization (Prajogo & Sohol, 2003). Consequently, control and stability is the foundation of a continuous improvement process (Imai, 1986; Jha et al., 1996). Although standardization is necessary for conformance and error reduction, from an innovation point of view, employees could be trapped into staying with the existing work process (Glynn, 1996; Kanter, 1983). Even though there are some criticisms about the relationship between TQM and innovation, many empirical studies (Prajogo &Sohol, 2003; Roffe, 1998, Singh & Smith, 2004; Young, Charns, & Shortell, 2001) have shown a positive relationship between TQM and organization innovation performance. Therefore, based on these studies, it is hypothesized in this study that TQM enhances organization innovation performance.

H3: TQM (top management support, employee involvement, continuous improvement, customer focus, and database decisions) will enhance organization innovation performance (product innovation and process innovation).

Knowledge Management Initiatives and Its Indirect Impact on Organization Innovation Performance via Total Quality Management

As suggested by Prajogo et al. (2004), future studies should add quality performance as an independent variable to help demonstrate a clearer relationship. Hung et al. (2006) demonstrated that TQM plays an important role in transforming the contributions of KM processes into organization innovation performance. Therefore, this study will use TQM as a mediator in the relationship between KM and innovation.

H4: KM initiatives will be indirectly associated with organization innovation performance via the mediator, TQM.

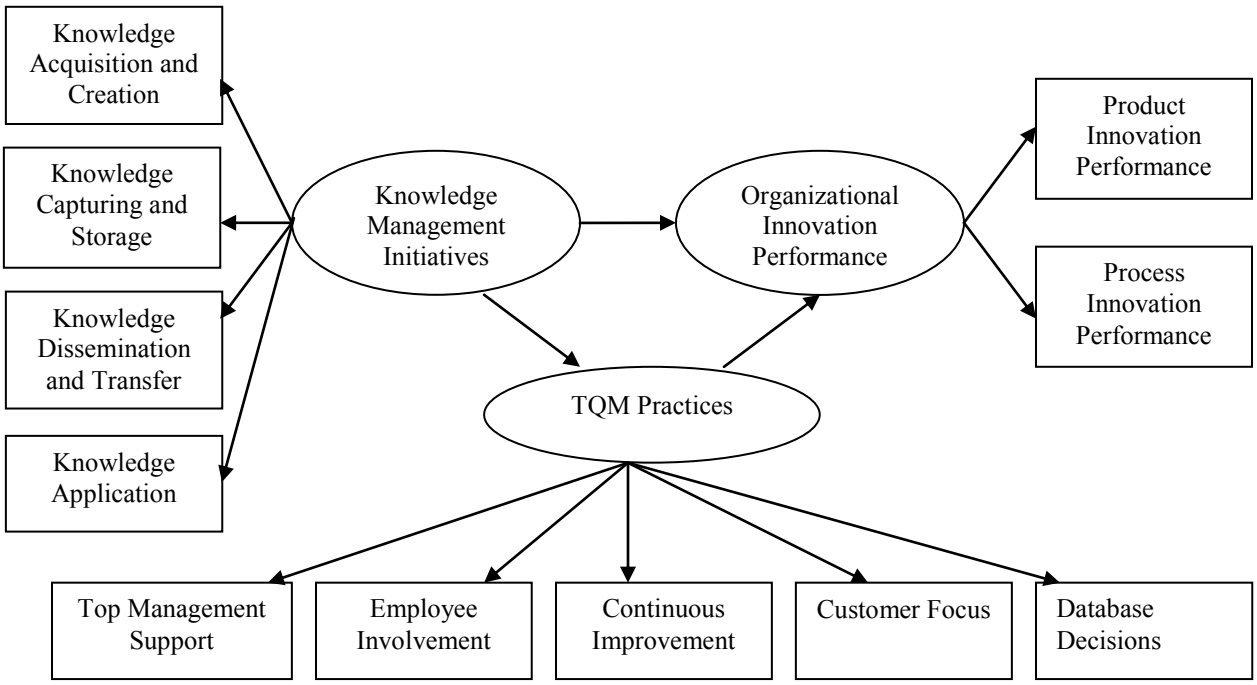


Figure 2. The research framework.

Assumptions

The assumptions of this study are:

1. Organization innovation performance is measurable through employee perception.
2. The respondents are the most knowledgeable about business strategies practiced in the organization.
3. Language barriers are not great enough to render the survey instrument not understandable or to have multiple meanings.

Definitions of Key Terms

The following terms articulating the theories and concepts in this study are defined in this section.

Knowledge

Knowledge is 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 in and is applied in the minds of "knowers." In organization, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms. (Davenport & Prusak, 1998, p. 5)

Knowledge Management (KM)

Knowledge management refers to a systematic and integrative process that helps organizations find, select, organize, distribute, and transfer important information, knowledge, experience, and expertise necessary for activities such as problem solving, dynamic learning, strategic planning, and decision-making to achieve the organization goals (Gupta et al., 2000; Lawson, 2003). Knowledge management processes include organization-wide activities of knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application by individuals and groups to pursue the major organizational goals (Lawson, 2003; Rastogi, 2000).

Organization Innovation Performance (INNO)

Innovation can be defined as new or improved products, processes, services, and operations emerging from the implementation and adaptation of knowledge and practice that create added value to both customer and organization and differentiate the organization from others (Gloet & Terziovski, 2004). The adoption of innovation is generally intended to contribute to organization performance (Damanpour, 1991). Therefore, organization innovation performance is associated with the way organizations adopt and adapt to changes in markets, technology, and competition (Dougherty & Hardy, 1996). The abbreviation of INNO will be used for organization innovation performance throughout the study because of the large number of times that it was mentioned.

Total Quality Management (TQM)

"TQM is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve and exceed customer expectations" (Antony, Leung, Knowles, & Gosh, 2002, p. 551).

Limitations of the Study

The limitations of this study include:

1. The original measurement instrument was designed according to a western context and in the English language.
2. The respondents were limited to HRD professional (HRD Managers and Directors of HRD).
3. The results from the survey were limited to the respondents' perceptions only and thus are subject to sole source error.

4. The study comprised only some business sectors; care was required when generalizing results to other business sectors.

Summary

Many Thai organizations find themselves competing intensely not only with the local but also multinational companies. Only organizations that have better quality products and more advanced knowledge to create or improve products and services will survive in the market. This study investigates the interrelationship of knowledge management, TQM, and organization innovation performance to enhance organization capability in achieving competitive advantage. The purposes of this study were to: (1) examine relationships among KM, TQM, and organization innovation performance, and (2) determine the role of KM implemented through TQM in organization innovation performance. This study provides insights for HRD research and practice in connecting knowledge management, total quality management, and organization innovation performance, increasing HRD's involvement in knowledge management, and directing strategic HRD efforts.

The following chapters will present the literature review, methodology and methods, results, and conclusions and implications of the present study.

CHAPTER 2

LITERATURE REVIEW

This chapter provides an overview of the three topics related to the relationships among knowledge management initiatives (KM), total quality management practices (TQM), and organization innovation performance (INNO), along with mapping out the existing knowledge relevant to the model. Due to the limited number of studies that have explored these relationships, the literature is also limited.

Knowledge Management

Before determining what KM is, it is important to understand the concept of knowledge.

Knowledge

Knowledge is noted as one of the most important resources contributing to decision-making and enhancing the competitive advantage of organizations (Carrillo et al., 2004; Nonaka & Takeuchi, 2004). Knowledge is a complicated concept to define and measure. Knowledge can be defined ranging from conceptual to practical and narrow to broad. Wiig (1993) described knowledge as encompassing truth and beliefs, perceptions and idea, decisions and expectations, and methodologies and know-how. Yang (2003) defined knowledge as "human beings' understanding about reality through mental correspondences, personal experience, and emotional affection with outside objects and situation" (p. 108). Beckman (1999) described knowledge as reasoning about information and data vigorously to facilitate performance, problem solving, decision making, and learning. Helmers (1999) defined knowledge as the accumulation of information and experience that allows people to react to new situations by synthesizing a response from

past data and actions. DeTienne and Jensen (2001) described knowledge as information that has been used and becomes a part of a person's knowledge-based experience and behavioral patterns. Davenport and Prusak (1998) defined knowledge 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" (p. 5). From the definitions above, data, information, and knowledge are not the same, but they are related.

Data are observed and recorded as results. Data are facts that have no meaning in and of themselves that can be either qualitative or quantitative in nature (Jessup &Valacich, 1999). Information is data to which meaning has been added by being categorized, classified, corrected, and condensed. It is organized and analyzed data (Allee, 2003). Even though the terms information and knowledge are often used interchangeably, there is a clear distinction between them.

There are various categories of knowledge, for example, tacit and explicit; stocks and flows of knowledge; human, social, and structured knowledge; subjective and objective knowledge; rule-based and background knowledge; objective and process knowledge; and so forth (Choo, 1995; DeLong & Fahey, 2000; Dierickx & Cool, 1989; Nonoka, 1998; Nonaka & Takeuchi, 1995; Polanyi, 1966; Sveiby, 2001; Sveiby, 2010).

The most frequently used classification is explicit and tacit knowledge. Explicit knowledge is more visible and technical in nature. It can be easily stored, transferred, distributed, and accessed (Nonaka& Takeuchi, 1995). Examples include manuals, books, databases, and intranets. On the other hand, tacit knowledge is personal and context specific. Hence, it differs from person to person and is difficult to communicate and

formalize (Nonaka & Takeuchi, 1995; Polanyi, 1966). Tacit knowledge, on the other hand, is demonstrated through actions, embodied in personal experience, and difficult to express through mere verbal instruction; individuals know it but cannot articulate it. It is passed along to others through direct experience. The importance of tacit knowledge is not more or less than explicit knowledge as it is often embedded not only in documents and presentations, but also through person-to-person contacts (Davenport & Prusak, 1998).

Dierickx and Cool (1989) demonstrated that the underlying knowledge of a firm may be conceptualized as stocks and flows of knowledge. Stocks of knowledge are accumulated knowledge assets that are internal to a firm; in contrast, flows of knowledge are knowledge streams into the firm and are assimilated over time to become stocks of knowledge.

DeLong and Fahey (2000) classified knowledge into human knowledge, social knowledge, and structured knowledge. Human knowledge, being mostly tacit, is what individuals know. Social knowledge is in relations among individuals and groups. It embraces synergetic knowledge that is largely tacit. This form of knowledge is the result of working and learning together. Lastly, structured knowledge is embedded in the processes and infrastructure of a social system so it is explicit and rule-based.

Although various experts provided different definition of knowledge, the most popular classification is tacit and explicit knowledge. However, the appropriate categories of knowledge used in this study are object and process. For the object view, knowledge can be identified and handled in an information system (Sveiby, 1997). Researchers and practitioners in this field tend to focus on construction of information

management systems and groupware. Therefore, they emphasize the use of new development of information technology (Sveiby, 2001). If knowledge is viewed as an object in KM, the focus is on building and managing knowledge stock (Hsu & Shen, 2005). In contrast, for the process view, knowledge is viewed as a complex set of dynamic skills and know-how that is constantly changing (Sveiby, 2001). Researchers and practitioners in this field tend to focus on learning and managing these skills and know-how individually or on an organizational level (Sveiby, 2001). If knowledge is viewed as process in KM, the focus is on the knowledge creation, transferring or sharing, and distribution process (Hsu &Shen, 2005). However, the organization should balance both views in order to achieve competitive advantage (Alavi & Leidner, 2001).

Knowledge Management

KM is a fundamental process for managing organizations. It is explained as a very people-dependent activity and largely information technology-independent (Armbrecht et al., 2001; Davenport & Prusak, 2000). As with defining knowledge, there is no agreement about the definition of KM. Therefore, KM has been defined in different ways.

Wiig, one of the pioneers of KM, defined KM as "systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprises knowledge-related effectiveness and returns from its knowledge assets" (Liebowitz, 1999, p. 6). Hibbard (1997) posited that KM is the process of capturing an organization's collective expertise and distributing it to get the most out of it. For Tiwana (2000), KM is the management of original knowledge in order to create business value and generate competitive advantage. KM facilitates the creation, communication, and application of all kinds of knowledge to achieve business goals. Darroch and McNaughton (2001)

proposed that KM is the management function that creates, locates, and manages the flow of knowledge within an organization to ensure that knowledge is used effectively and efficiently for the long-term benefit of the organization. Davenport and Prusak (1998), Seng et al. (2002), and Wickramasinghe (2003) viewed KM as the process of creating value from an organization's intangible resources. Yodwisisak (2004) defined KM as the process of achieving the organization's goals by creating value from the intangible resources that are intrinsic in its human capital. Consequently, KM is a strategy of getting the right knowledge to the right people at the right time and helping people share and put that knowledge into action in ways that attempt to improve organizational performance (O'Dell & Grayson, 1998).

From the above definitions, KM is a broad strategy. This wide-ranging definitional scope has led many scholars break down the concept and refers to key aspects of the KM process rather than creating a brief and simplified definition.

Nonaka and Takeuchi (1995) emphasized the interaction between explicit knowledge, which can be articulated in formal language, and tacit knowledge, which is hard to articulate with formal language, hence leading to the creation of new knowledge. The combination of these two categories makes it possible to conceptualize four modes of conversion: 1) Socialization (sharing and creating tacit knowledge through direct experience); 2) Externalization (articulating tacit knowledge through dialogues and reflection); 3) Combination (systemizing and applying explicit knowledge and information); and 4) Internalization (learning and acquiring new tacit knowledge in practice).

O'Dell and Grayson (1998) and Radding (1998) also put forward the idea that KM is the process of tapping a hidden asset by capturing, organizing, transferring, and using knowledge to create customer value, as well as achieving operational excellence and product innovation. Furthermore, Becerra-Fernandez, Gonzalez, and Sabherwal (2004) addressed that to manage knowledge is: 1) to create new knowledge, 2) to store knowledge, 3) to distribute knowledge and 4) to re-use knowledge. These four key activities seem to occur in a repetitive process if knowledge is managed effectively.

In addition, Allee (2003) added that the process for creating, sustaining, and renewing knowledge to improve organizational performance and create value is also important in KM. Scarborough, Swan, and Preston (1999) agreed with these views but also stressed the importance of enhancing learning and performance in organizations. Rastogi (2000) further emphasized a systematic and integrative process of coordinating organization-wide activities of storing, diffusing, developing, and deploying knowledge in the pursuit of organizational goals. Grover and Davenport (2001) also added knowledge generation and knowledge codification as key aspects of KM.

KM definitions vary widely, with concepts that range from a broad concept to a process view. For the purposes of this study, a KM definition that incorporates both broad and process views is desirable. Thus, the definition adopted is that KM refers to a systematic and integrative process that helps organizations find, select, organize, distribute, and transfer important information, knowledge, experience, and expertise necessary for activities such as problem solving, dynamic learning, strategic planning, and decision making to achieve organization goals (Gupta et al., 2000; Lawson, 2003).

From this definition and the key aspects of the KM process above, the approaches to classifying activities in the knowledge chain may vary in terms of name and type of categories.

Therefore, the KM process in this context was grouped into similar core activities: knowledge acquisition and creation; knowledge capturing and storage; knowledge dissemination and transfer; and knowledge application. These processes were used as the major concepts of KM in this study. These processes lead to the success of KM in an organization.

Knowledge acquisition and creation need not only to be undertaken during the first step of a KM program, but also continuously evolve and emerge. Knowledge acquisition and creation are defined as the improved use of existing knowledge and effectively producing new knowledge through active conversation that is externalized and distributed as new knowledge (Choo & Bontis, 2002; Hung et al., 2006; Lawson, 2003). The acquisition and creation of organizational knowledge involves not only organization knowledge related to the organization's purposes, vision, mission, and principles (Allee, 2003), but also the sharing and circulating of personal experience (Chawalitworakul, 2012; Gold, Malhotra, &Segars, 2001). At this stage, the organizational members are forced to view reality in new perspectives. They have to generate new ideas by breaking down rigid thinking and assumptions (Chawalitworakul, 2012). To maximize the impact of information collected and knowledge acquired, organization members are encouraged to share their best practices, new techniques, and lessons learned with their colleagues, wherever they are in the organization (Yodwisitsak, 2004).

Knowledge capturing and storage are the processes of identifying new knowledge as relevant and important for current and future use and storing that unit of knowledge in reasonable forms so that others in the organization can access it (Lawson, 2003; Zack, 1999). Knowledge capturing and storage become important when knowledge is created (Hung et al., 2006) or acquired from other sources and adapted it for internal use. At this stage, organization members usually try to organize and transform the acquired knowledge into written material or other forms to store (Yodwisitsak, 2004).

Knowledge dissemination and transfer are critical in KM processes (Bock & Kim, 2002; Lee, 2000). Knowledge transfer and knowledge sharing are often used interchangeably (Bock & Kim, 2002). Knowledge dissemination and transfer describe the business processes that distribute and transmit knowledge among individuals or groups participating in process activities within or across organizations via information systems or through personal interaction (Bock & Kim, 2002; Lawson, 2003; Lin & Lee, 2005; Sinthavalai, 2011). During the dissemination and transfer processes, knowledge should be presented in useful and appropriate formats, making it understandable and directly interpretable by users (Lee, 2011; Ribrerie, 2001).

Knowledge application refers to processes of making knowledge more active and relevant for organizational application and applying knowledge to new situations in which users can learn and generate new knowledge and having effective storage and retrieval mechanisms that allow the organization to access that knowledge easily (Lawson, 2003; Lin & Lee, 2005; Sinthavalai, 2011).

Quality Initiatives

Two quality initiatives are described in this section: IS! 9000 certification and total quality management.

ISO 9000 Certification

The International Organization for Standardization, commonly known as ISO, is an international standard-setting body composed of representatives from diverse national standards organizations to promote worldwide proprietary, industrial, and commercial standards (ISO, 2011). One of the most popular is ISO 9000. ISO 9000 series of standards is related to quality management systems and is intended to help organizations ensure that they meet the needs of customers and other stakeholders, while meeting legal and regulatory requirements related to the product (Poksinska, Dahlgaard, & Antoni, 2002).

Adopting ISO 9000 standards is viewed as a stepping stone for total quality management. Therefore, the ISO 9000 series of standards has gained a lot of attention within the business world because of its widespread adoption by thousands of organizations worldwide and the domino effect of these companies' certifications on their competitors and suppliers (Gotzamani et al., 2006). Further, ISO 9000 certification brings benefits to the organization and its stakeholders; especially in the area of significant improvements in profit margin, growth in sales, and earnings per share (Sharma, 2005).

Total Quality Management

Total quality management (TQM) began in Japan after the Second World War and spread to the USA in the 1980s, mostly in U.S. manufacturing companies facing competition from Japan (Easton & Jarrell, 1998; Sun, 2000; Tamawimok, 2012). TQM is

one of several quality approaches used by many organizations. Management has used TQM as an approach to enable organizations to become more customer and quality focused (Easton & Jarrell, 1998; Thailand Productivity Center, 2012). When fully adopted and effectively practiced, TQM delivers many advantages, including improved employee involvement, improved communications, increased productivity, improved quality and less rework, improved customer satisfaction, reduced cost of poor quality, and strengthened organizational business performance and competitive advantage (Antony et al., 2002; Thailand Productivity Center, 2012).

TQM has become widely accepted as a significant business strategy, especially after the creation of the Malcolm Baldrige National Quality Award (MBNQA) by the U.S. Congress in 1987 (Easton & Jarrell, 1998). Several leading organizations have participated in the award, such as Ritz-Carlton Hotel, AT&T, Motorola, Boeing, and Xerox (Antony et al., 2002; Easton & Jarrell, 1998).

Similar to many business strategies, TQM is a broad concept and has various definitions. In the seminal works on TQM, Crosby (1996), Deming (1986), Feigenbaum (1991), Ishikawa (1985), and Juran (1995) stressed that customers define quality, and, consequently, quality generates customer satisfaction leading to improved competitive position. They further stressed that, in conjunction with customer focus, the elimination of the high costs of waste and rework are equally important to the organization in achieving the strategy. Antony et al. (2002) defined TQM as "an integrative management philosophy, principles, methods and tools aimed at continuously improving the performance of products, processes and services to reach and exceed customer expectation and satisfaction" (p. 551). According to Maguad (2006), TQM highlights

continuous improvement and a systems perspective to achieve customer satisfaction and long-term organizational success. It involves problem prevention, process improvement, and a team-based approach to problem solving and product improvement incorporating all departments in the organization. Furthermore, Gryna (1993) emphasized that TQM is the system of activities aimed at achieving delighted customers, empowered employees, higher revenues, and lower costs.

There is no apparent concern about a TQM definition; however, there are similar principles mentioned, such as continuous improvement and customer satisfaction. Therefore, instead of providing a brief definition of TQM, this study will emphasize the principles embodied in TQM. The seminal TQM literature includes focus on concepts such as customer satisfaction, cost reduction, leadership and top management commitment, training and education, teams, and culture (Crosby, 1996; Deming, 1996; Feigenbaum, 1991; Ishikawa, 1985; Juran, 1995).

According to Easton and Jarrell (1998), TQM uses a process focus, systematic improvement, company-wide emphasis, customer focus, management-by-fact, employee involvement and development, cross-functional management, supplier performance and supplier relationships, and recognition of as a critical competitive strategy. Consistent with Besterfield (2003), TQM principles include instilling a quality culture, the so-called quality chain (treating each element as a customer and producer simultaneously), quality assurance, commitment to continuous improvement, and the support of top management. According to DeCock and Hipkin (1997) and Ross (1995), TQM principles contain a strategic link to organizational goals, identifying customers, understanding their expectations, employee participation, top management support, and continuous

improvement. Oakland and Porter (2004) proposed a new generation of TQM focusing on relationships between hard and soft foundations. The soft foundations, including effective leadership, commitment to meeting customer requirements, communicating the quality message, and recognizing the need to change the culture to achieve total quality, encase the hard foundations (four Ps), consisting of planning, performance, process, and people, to ensure successful implementation (Oakland & Porter, 2004).

As a result of what constitutes TQM, there is a convergence of opinion that, when organizations implement TQM practices, they are engaged in the following principles: (1) top management support; (2) employee involvement; (3) continuous improvement; (4) customer focus and (5) data-based decisions. These five principles are also considered as the major constructs of TQM practices in this study.

First, top management support is possibly the most important principle in TQM. Top management support in TQM requires the top management to provide an inspiring vision, set strategic directions that are understood by all, and encourage values that guide employees (Kubiak, 2005). For TQM to be successful, top management must be committed to leading employees.

Second, employee involvement is only gained after fear has been driven from the workplace, when empowerment has occurred, and management has offered the proper environment. Since quality is a company-wide process, it engages everyone in the organization with no exceptions in seeking out quality problems and corrects them (Watson, 2008).

Third, continuous improvement is a major driving force for TQM. Continuous improvement constrains an organization to be both analytical and creative in finding

ways to become more effective at meeting stakeholder expectations. Without improvement, the performance of all systems become stagnant (Feigenbaum, 2008)

Fourth, customer focus ultimately determines the level of quality. No matter what an organization does to promote quality improvement training of employees, integrating quality into the design process, upgrading computers, or buying new measuring tools, the customer determines whether the efforts are worthwhile (Kubiak, 2005; Watson, 2006).

Fifth, data-based decisions help organizations improve decision making accuracy, achieve consensus, and allow prediction based on past history through continually collecting and analyzing data. Data on performance measures are necessary are necessary in order to know how well an organization is performing (Watson, 2008).

Organization Innovation Performance

There are numerous definitions of innovation in the literature. According to Singh and Smith (2004), innovation engages new ideas in products, processes, services, management, or marketing in organizations. The concept of innovation involves more than research and development or the application of technology.

Livingstone, Palich, and Carini (1998) defined innovation as new products or processes that enhance organizational value, ranging from copyrights and newly developed products to inventive uses of information and effective human resource management systems. Carnegie and Butlin (1993) equated innovation with something new or improved done by an organization to create considerable added value, either directly to the organization or to its customers. Consistent with Bates and Khasawneh (2004), innovation refers to the implementation and application of new knowledge and practices. These include the organization's capability in creating new ideas and adopting

these ideas in expanding new and improved products, services, and operations. New Zealand's Department of Statistics (2010) also defined innovation as the introduction of a new or significantly improved product or service to market and the introduction of a new or significantly improved process within a business. Furthermore, Reed (2001) mentioned that innovation is a process or product that is a central component of organizations' activities and strategies in order to survive, to lead, and ultimately to develop competitive advantage in an increasingly competitive business world.

Although several definitions of innovation are mentioned above, most definitions share common themes involving new ideas that are turned into new products, processes, and services. Further, innovation can range from a major discovery to many little things that will improve the organization's operations (Barsh, 2007; Singh & Smith, 2004). Therefore, in this context, innovation can be defined as new or improved products, processes, services, and operations emerging from the implementation and adaptation of knowledge and practice that create added value to both customers and the organization and differentiate the organization from others (Gloet & Terziovski, 2004). The adoption of innovation generally intends to contribute to organization performance (Damanpour, 1991; Edenenius, Keller, & Lindbald, 2011; Laursen & Salter, 2006; Thailand Management Association, 2012). As Damanpour (1991) put it clearly in the context of an organization, "the adoption of innovation is generally intended to contribute to the performance or effectiveness of the adopting organization" (p. 556). Hence, in this research, organization innovation performance refers to how organizations adopt and adapt to changes in markets, technology, and competition (Dougherty & Hardy, 1996).

According to Darroch and McNaughton (2002), innovation can be categorized into different types, depending on different resources and core competencies affecting innovation. Kanji (1996) identified six types of innovation--product, process, application, system, core competencies, and horizontal transfer. Gopalakrishnan and Bierly (2001) sorted innovation into six types: administrative, technical, product, process, radical, and incremental. Yamin, Gunasekaren, and Mavonda (1999) grouped innovation into three types: administrative, product, and process. Prajogo et al. (2004) recognized two types of innovation performance (INNO)–product and process. From these categorizations, this study groups organizational innovation into two major types–product and process.

Product innovations are any new and improved products or services that are introduced by the organization for the benefit of customers (Alegre, Lapiedra, & Chiva, 2006; Knight, 1967). Further, product innovations are defined as emerging technology or a combination of technologies being utilized to produce products for consumption (Tornatsky, 1983). The result of product innovation is a new product introduced into the market (Alegre, Lapiedra, & Chiva, 2006; Boone, 2000; Thailand Management Association, 2012).

Process innovations, on the other hand, are the "introduction of new elements in the organization's task, decision, information system or its physical production or service operations" (Knight, 1967, p. 482). Process innovations also include improvements in the process for product manufacturing (Kanji, 1996) or a change in the way products are made or delivered (Tushman & Nadler, 1986). The result of process innovation is a reduction in a firm's costs (Boone, 2000).

Among diverse factors being considered as antecedents of INNO, many authors have emphasized the significance of people as the essential component in any innovation (Claver, Llopis, Garcia, & Molina, 1998; Kanter, 1983; Woodman, Sawyer, & Griffin, 1993). Given the importance of people in innovation, knowledge has been concerned with innovation capability (Prajogo et al., 2004; Prajogo & Ahmed, 2006). KM appears to be an important concept and is often cited as an antecedent of innovation (Carneiro, 2000; Darroach & McNaughton, 2002; Nonaka & Takeuchi, 1995; Prajogo et. al, 2004). Gloet and Terziovski (2004) explored the relationship between KM practices and INNO and found both positive and negative relationships. The humanistic or HR approach to KM and INNO were found to be significantly and positively related, whereas, the IT or technology focused approach to KM and INNO are found to be negatively related. Although this study implied that the organization should emphasize the humanistic approach to KM more when developing strategies for product and process innovation, a simultaneous approach of humanistic and IT could be implemented in the organization (Gloet & Terziovski, 2004). Capon, Farley, Lehmann, and Hulbart (1992) argued that knowledge acquisition and creation facilitate innovation. Organizations that spend money on research and development create new ideas and knowledge-led innovation (Capon et al., 1992). Lin and Lee (2005) found that knowledge application positively influenced innovation, whereas knowledge dissemination and transfer did not influence innovation. This might be explained by the nature of relationships among employees in Taiwanese organizations. Employees may be afraid of sharing their expertise with colleagues who would use this knowledge to get promoted at their expense. However, they concluded in the finding from their study might not hold in other cultures (Lin & Lee, 2005).

On the other hand, some studies have confirmed that knowledge dissemination and transfer are important in the innovation process (Cavusgil, Calantone, & Zhao, 2003; Hall & Andriani, 2003, Liebowitz, 2002). In their study of tacit knowledge transfer and firm innovation capability, Cavusgil et al. (2003) validated that transferring tacit knowledge and obtaining tacit knowledge from partner firms affects INNO. Moreover, the results from Prajogo et al. (2004) confirmed that KM has a significant positive relationship with both product and process innovation. They further emphasized that KM plays an important role in determining INNO. Organizations that desire to become innovative product and process developers will need to focus on KM and creativity capability as their first step (Prajogo et al., 2004). Based on these research studies, it is hypothesized that KM enhances INNO. This leads to the first hypothesis:

H1: KM initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) will enhance INNO (product and process innovation).

Relationships among the Variables

The idea that both KM and TQM have great influence on an organization's strategic competence has drawn attention. Even though one is viewed as continuous improvement and the others is viewed as radical improvement, there are many examples that show that the combination of KM and TQM can extensively enhance competitive advantage, and that they are related and compatible (Hsu & Shen; 2005; Lee & Asllani, 1997; McAdam & Leonard, 2001). Many scholars have recognized this viewpoint and have attempted to link KM and TQM (Molina, Montes, & Fuentes, 2004; Yang, 2004). Hsu and Shen (2005) mentioned that knowledge coexists with TQM as they share

similarities, including results orientation, people-based management, teamwork, leadership, and delighting the customer. Hung et al. (2006) confirmed that KM initiatives positively contribute to TQM.

Moreover, Lim, Ahmed, and Zairi (1999) proposed using Deming's plan-do-check-act (PDCA) cycle as the four steps for KM to become an integral part of an organization's quality strategy. The four steps are capturing or creating knowledge (plan), sharing knowledge (do), measuring the effects (check), and learning and improving (act) (Lim et al., 1999). From an organization development (OD) context, Zetie (2002) claimed that the concepts of KM and TQM are closely linked and originate from OD. The recognition of the relationship between TQM and KM has both theoretical and practical implications. From a theoretical perspective, the implication is a possibly broader use of explanatory models developed in a specific context. From a practical point of view, TQM and KM can be seen as tools for initiating change in the organization (Zetie, 2002). Ju and his colleagues (2006) focused on the practical dimension of TQM and KM. They attempted to identify a clearer relationship between TQM and KM using both qualitative and quantitative research. They found that TQM is positively associated with KM, and KM contributes positively to TQM (Ju et al., 2006). It is, therefore, hypothesized that KM positively influences TQM through top management support, employee involvement, continuous improvement, and customer focus. This then leads to the second hypothesis:

H2: KM initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) are positively associated with TQM practices (top management

support, employee involvement, continuous improvement, customer focus, and database decisions).

There is a need to reconsider the role of TQM in determining INNO as existing literature has pointed out that there are conflicting arguments regarding the relationship between TQM and INNO (Prajogo & Sohol, 2001). Authors suggesting a positive relationship between TQM and innovation have argued that organizations employing TQM will provide a prolific environment for innovation as TQM supports principles that match well with innovation (Kanji, 1996; Mahesh, 1993; Prajogo & Sohol, 2001; Roffe, 1998; Thailand Quality Award, 2012). According to Juran (1995), the principle of customer focus leads to organization innovation in terms of repetitively creating and launching new products into the market to meet changing needs by pushing the organization constantly to identify new customer needs and expectations. Similarly, continuous improvement involves change and creative thinking in work processes and provides a solid foundation on which innovations can be successfully implemented (Jha, Noori, & Michela, 1996; Singh & Smith, 2004). Finally, employee involvement and management support are also significant to the success of INNO (Prajogo & Sohol, 2003).

On the other hand, several scholars have rejected the positive relationship between TQM and INNO, claiming that TQM supports some principles and practices that obstruct innovation (Prajogo & Sohol, 2003; Slater & Narver, 1998; Wind & Mahajan, 1997). According to Slater and Narver (1998), a customer-focused viewpoint can simply guide organizations to focus on incremental improvements for current products and services rather than generating new solutions that can lead to real innovation. Customer

focus, therefore, may not lead to real innovation. The organizations that utilize a customer focus may not recognize customers' latent needs; consequently, the organization fails to promote generative learning through the search for the unexploited potential in markets (Wind & Mahajan, 1997). Likewise, continuous improvement involves regulatory standards and activities that are practiced and well understood by everyone in the organization (Prajogo & Sohol, 2003). Consequently, control and stability are the foundation of a continuous improvement process (Imai, 1986; Jha et al., 1996). Even though standardization is necessary for conformance and error reduction, from an innovation point of view, employees could be trapped into staying with the existing work process (Glynn, 1996; Kanter, 1983).

Although there are some criticisms about the relationship between TQM and INNO, many empirical studies (Prajogo & Sohol, 2003; Roffe, 1998, Singh & Smith, 2004; Young, Charns, & Shortell, 2001) have shown a positive relationship between TQM and INNO. Therefore, based on these studies, it is hypothesized that TQM enhances INNO. This leads to the third hypothesis:

H3: TQM (top management support, employee involvement, continuous improvement, customer focus, and database decisions) enhances INNO (product and process innovation).

As suggested by Prajogo et al. (2004), future studies should add quality performance as an independent variable to help demonstrate a clearer relationship. Hung et al. (2006) demonstrated that TQM plays an important role in transforming the contributions of KM processes into INNO. Therefore, this study used TQM practices as a

mediator in the relationship between KM initiatives and organization INNO. The fourth hypothesis proposed is:

H4: KM initiatives (KM) are indirectly positively associated with INNO via the mediator, TQM.

Summary

This chapter provides a review of the literature on the three primary constructs of knowledge management, total quality management, and organization innovation performance. It also provides the literature support for the four hypotheses tested in the study.

CHAPTER 3

METHODS

This chapter provides an overview of the research methods used. The purposes of this study were to explore the potential relationships among knowledge management (KM), total quality management (TQM), and organization innovation performance (INNO) and to determine the role of KM implemented through TQM on INNO in Thai organizations. A correlational study design was used as it fit these purposes. As the constructs in this study (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, knowledge application, top management support, employee involvement, continuous improvement, customer focus, database decisions, product innovation performance, and process innovation performance) cannot be derived from direct measurement; perceptual measurements were used for this study.

A positivistic research paradigm was used. According to Bartlett (2005), a survey research method is the most frequently used data collection method in organization research; therefore, a survey with paper-and-pencil format was utilized to collect data on participants' perceptions of their KM initiatives, TQM, and INNO in their organizations. The following sections describe the population and sample, instruments, data gathering process, and data analysis.

Population and Sample

The population in this study consisted of human resource development (HRD) managers working in different business sectors in the Bangkok area and provinces in the central and eastern regions of Thailand. I chose these areas as most Thai businesses operate in these areas. These areas included Bangkok, Samutprakarn, Samutsakorn,

Samutsongkram, Nakornpathom, Nakornnayok, Chonburi, and Rayong. HRD managers were selected as respondents because they have good knowledge and a realistic view of the organization as a whole (Zheng, 2005). Further, the boundary between HRD and human resource management (HRM) is not clear, especially in Thailand. HRD managers in this study were identified as those responsible for planning and implementing human resources issues and who worked in the following departments: human resources, personnel, training and development, human resource development, and human resource management.

The Management System Certification Institution of Thailand (MASCI) provided a list of organizations registering for the ISO 9000 level quality management system standard. MASCI is an institute under the Ministry of Industry and is recognized as a leading institute for ISO standards certifying and training nationwide. It is believed that ISO 9000 standard implementation is a stepping stone on the TQM journey (Anderson, Daly, & Johnson, 1999; Antony et al., 2002). The standard obliges organizations to document their standard practices and procedures that all employees must constantly follow. Receiving ISO 9000 registration shows that the organization has reached the minimum standard for quality systems set forth by these standards (Anderson et al., 1999). There were 850 companies registered for the ISO 9000 level standard with MASCI in the sampling area. Nevertheless, only 500 companies agreed to participate in the study, for a participation rate of 58.8%.

Further, the Thailand Productivity Institute (FTPI) provided a list of companies registering for the Thailand quality award for performance excellence. FTPI is under the Ministry of Industry and is supported by the Foundation for Thailand Productivity

Institute. The Thailand Quality Award for Performance Excellence is an award for organizations achieving world-class management level. It is comparable with the Malcolm Baldrige National Quality Award (MBNQA) in the USA. There is only one award category offered annually to all types of organizations with business operations in Thailand. TQM and KM are the main criteria for the award; therefore, it can be concluded that companies registering for the award practice TQM and KM. There were 30 companies registered for the award in 2010. However, all companies on the FTPI list were included on the list provided by MASCI. Therefore, 500 HRD managers from those companies were invited to participate in the study.

Target Number of Responses

Structural Equation Modeling (SEM) requires an appropriate sample size in order to produce reliable estimates (Hair, Anderson, Tatham, & Black 2008). Therefore, the target number of responses was determined based on the following logic. Hair et.al (2010) recommended the required sample size of 5-20 participants per parameter. Gorsuch (1983) suggested at least five participants per parameter and not less than 100 individuals per data analysis. Harris and Schaubroeck (1990) proposed a sample size of 200 at least to assure robust structural equation modeling. Kline (2010) advised that a very complicated model needs a sample size of 200 or larger, whereas Bagozzi and Yi (2012) proposed that the sample size should be above 100, preferably above 200. Further, after evaluating different models based on various numbers of respondents, Yuan, et al. (2010) agreed that a sample size of between 300 and 400 should be appropriate for SEM.

There were 90 parameters from the model. Therefore, 540 HRD managers were set as the target number of responses (6 x 90 parameters). However, only 500 HRD

managers accepted the invitation to participate in this research, I anticipated an 80% response rate. With a sample of 500 and a response rate of 80%, a response group of 400 was anticipated, which fits within many of the suggested sample sizes reviewed above.

The process used in maximizing response rate is detailed in the section labeled Data Collection Procedures in this chapter. The final number of respondents was 470 for an 87.03% response rate.

Demographic Information

Demographic information included the business sector of the organization, the type of organization, the headquarters location, the number of employees in the organization, the current position in the organization, the years of service in the current position, gender, age, and education. Detailed demographic information is in Table 1.

Table 1

Sample Composition by Demographic Characteristics (n = 470)

Demographic	Category	Frequency	%
Business sector of organization	Textiles	250	53.2
	Electronics	100	21.3
	Automobile and Parts	70	14.9
	Metal Products	50	10.6
Type of organization	Locally Own Business	355	75.5
	Multinational Organization	67	14.3
	Joint Venture Organization	48	10.2
Headquarter location	Asia	425	90.4
	USA	25	5.3
	Europe	20	4.2
Numbers of employees in organization	1–100 employees	42	8.9
	101–1,000 employees	233	49.6
	1,001–10,000 employees	195	41.5
Current position in organization	Human Resource Development Manager	180	38.2
	Human Resource Manager	155	34.0
	Human Resource Management Manager	135	28.7
Years of services in current position	0-2 years	55	11.7
	3–5 years	158	33.6
	6-8 years	172	36.6
	More than 8 years	85	18.1
Gender	Male	320	68.1
	Female	150	31.9
Age	31–40 years old	211	44.9
	41–50 years old	170	36.1
	21–30 years old	82	17.5
	51–60 years old	7	1.5
Education	Bachelor's degree or equivalent	289	61.5
	Master's degree	180	38.3
	Doctoral degree	1	0.2

The major business sector represented in the sample (53.2%) was in the textile business. The majority of respondents (75.5%) worked for locally owned businesses. The majority of headquarters were located in Asia (90.4%). Respondents were predominantly male (68.1%). Most respondents were between 31 and 40 years old (44.9%).

Instrumentation

A self-administered paper-and-pencil survey was used to examine the hypothesized relationships among KM, TQM, and INNO. A seven-point Likert-type scale ranging from strongly disagree (1) to strongly agree (7) was used to indicate the level of agreement. The survey instrument contained items representing the three important constructs in this study: KM initiatives, TQM, and INNO.

First, the KM initiatives were measured using 28 items with 7 items for each dimension of KM. To measure knowledge acquisition and creation, I adapted items from Gold et al. (2001) and Lawson (2003). To measure knowledge capturing and storage, I adapted items from Al-Busaidi and Olfman (2005) and Lawson (2003). To measure knowledge dissemination and transfer and knowledge application, I adapted items from Lawson (2003) and Lin and Lee (2005).

Second, TQM was measured using 35 items with 7 items for each dimension. Employee involvement and database decisions were measured using items based on Antony, Leung, Knowles, and Gosh (2002) and Powell (1995). Top management support was measured using items from Singh and Smith (2004) and Zeitz, Johannesson, and Ritchie (1997). Continuous improvement and customer focus were measured using items from Antony et al. (2002) and Zeitzet al. (1997).

Finally, INNO was measured using 14 items adapted from Singh and Smith (2004) and Prajogo and Sohol (2003) with 7 items for each of product innovation and process innovation. The criteria for measuring innovation performance were the number of innovations, the speed of innovation, the level of innovativeness, and being the first in the market. These four criteria of innovation were applied to both product and process innovation. The respondents were asked to evaluate the organization's innovation performance against the key competitor in the industry to minimize industry effect based on their perceptions.

Instrument Translation

The nine components were combined into one instrument and then translated into Thai. To ensure that the Thai translation correctly reflected the meaning and nuances of the original instruments, back-translation was conducted.

The instrument was translated into Thai by two professors in the Linguistics program at Chulalongkorn University. They have extensive experience in translating from English to Thai. The translated instrument (Thai version) was then translated back into English by a bilingual translation expert. I compared the back-translated instrument (English version) with the original version. Differences between the translations were found in translating certain words, such as "knowledge transfer" instead of "knowledge sharing" and "initiative" instead of "creative." I rewrote the items that had problems. After that, the corrected items were retranslated.

After the second round of translation, the back-translated version was similar to the original. I contacted the first two translators and provided the last version of the

translation to the experts, particularly the items that were problematic. They affirmed the accuracy of the changes in the Thai translation and were satisfied with the final product.

Pilot Tests

After the instrument was translated and back-translated, three pilot tests were performed. First, 25 HRD managers were selected from the target population as a convenience sample based on personal acquaintances, and they were asked to complete the instrument and comment on any problems that they had. After reviewing their comments, some items were found to be unclear. I found that these problems mainly came from the differences in word order between Thai and English rather than in the selection of words. The respondents appeared to understand what those items meant but felt that the expressions were awkward. To respond to this issue, I changed the word order, keeping the original ideas. Furthermore, some items were dropped because they represented the same ideas as other items. Some typing errors were also found in Sections I and II; these were corrected. The 25 respondents to this pilot test were not included in the pool from which the final sample was selected.

After revising the instrument based on the results of the first-round pilot test, a second pilot test was undertaken. I used a panel of Thai students at the University of Minnesota and the Ohio State University to ensure that all items were clear. I distributed the instrument, along with explanations and definitions, to five Thai master's and doctoral students (three from the University of Minnesota and two from the Ohio State University). This group was asked to specify which type of orientation each item addressed. In spite of having addressed word order concerns from the first pilot, this

group still pointed to differences in word order between Thai and English rather than the selection of words. Additional revisions were made based on this feedback.

A third-round pilot test was performed with the revised instrument. Ten HRD managers were conveniently sampled from the target population based on personal acquaintance. I confirmed that all items were now understood without problems. These respondents were also not returned to the sampling pool.

Through these processes, the final instrument for data collection was produced with 9 items in Section I, 33 items in Section II, 40 items in Section III, and 17 items in Section IV. The contents of the written survey are summarized in Table 3. The English final version is shown in Appendix A and the Thai final version is in Appendix B.

Reliability of Instrument Based on Collected Data

Cronbach's alpha reliability coefficients of the instrument scales were calculated. The data collected from the questionnaire showed moderately high reliability, with Cronbach's alphas ranging from .78 to .81. The 33 items measuring KM found Cronbach's alphas ranged from .78 to .79. The 40 items measuring TQM had Cronbach's alphas ranging from .78 to .79. The 17 items measuring INNO showed Cronbach's alphas ranging from .80 to .81. Reliability coefficients of measures satisfied a conservative minimum level (Cronbach's (α) > .70) (Hair et al., 2010). Reliabilities are presented in Table 2.

Table 2

Reliability Coefficient of Knowledge Management Initiatives, TQM Practices, and Organizational Innovation Performance (n=470)

Measure	Scale	Number of Items	Cronbach's Alpha (α)
KM Initiatives	CCO	3	.78
	KAC	7	.79
	KCS	7	.79
	KDT	7	.78
TQM Practices	TQM	5	.78
	TMS	7	.79
	EIV	7	.79
	CIM	7	.78
	CUF	7	.78
	DTD	7	.78
INNO	IPPIN	7	.80
	IPINO	7	.81

Note. CCO: Compared with competitor, KAC; Knowledge acquisition and creation, KCS: Knowledge capture and storage, KDT: Knowledge dissemination and transfer, TQM: My organization, TMS: Top management support, EIV: Employee, CIM: Continuous improvement, CUF: Customer focus, DTD: Database decisions, IPPIN: Product innovation, IPINO: Process innovation.

Validity

The content validity and construct validity of this survey instrument were examined using confirmatory factor analysis (CFA) and expert reviews.

Content validity. Content validity was conducted to ensure that the data collected were valid. According to Badri, Davis, and Davis (1995), content validity depends on how well the measurement items are created in order to cover the content domain of the

variables being measured. However, the content validity of this questionnaire was based on previous studies. According to Nunnally (1987), an instrument has content validity if it has a representative collection of items and if rational methods of test construction were used previously. Therefore, it could be assumed that the questionnaire has content validity based on the results of earlier studies.

In addition, two Thai academics and three Thai practitioners were asked to review the instrument to examine the clarity in the meaning of the items for refinement of the questionnaire. Both academic experts were faculty members at Kasetsart University. One taught and published many books and articles regarding human resource management and knowledge management. The other taught and published many books and articles regarding human resource development, organization development, and organization innovation performance. The three practitioners were HRD professionals who worked in different industries. One worked in the textile industry and had considerable experience with ISO 9000, TQM, and INNO. Another practitioner worked in the banking industry and had considerable experience with KM and TQM. The final expert worked as a freelance consultant and had considerable experience with INNO and KM.

Based on their comments, the survey instrument was adjusted as follows. The experts suggested that, as the instruments for this study were combined into one instrument and were originally developed in English, it was important to ensure that the meaning of all translated questions was correct and complete. Further, some questions were written in phrase form and some in sentence form. Consequently, it was necessary that the items be rewritten in sentence form, not in phrase form, to make the meaning clearer. Based on this change, the Likert-type scale was changed from “very dissatisfied”

to "strongly disagree" and "very satisfied" to "strongly agree." The content of the final version of the survey instrument is summarized in Table 3.

Table 3

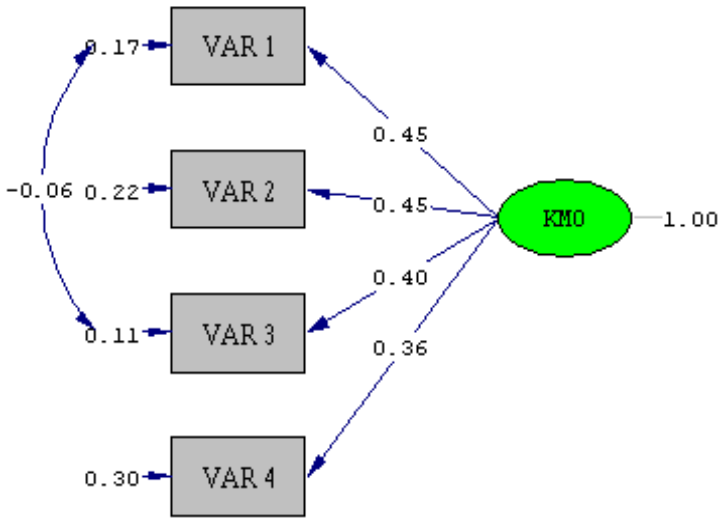
Content of the Final Survey

Section	Contents	Level of Measurement	Number of Items
Demographic Information	- Business sector of the organization (item 1)	Nominal	1
	- Type of organization (item 2)	Nominal	1
	- Headquarter location (item 3)	Nominal	1
	- Number of employees in the organization (item 4)	Nominal	1
	- Current position in organization (item 5)	Nominal	1
	- Years of service in current position (item 6)	Nominal	1
	-Gender (item 7)	Nominal	1
	- Age (item 8)	Nominal	1
	- Education (item 9)	Nominal	1
KM	- My organization (item:10.1,10.2)	Interval	2
	- Compared with competitor (item:11.1-11.3)	Interval	3
	- Knowledge acquisition and creation (item:12.1-12.7)	Interval	7
	- Knowledge capture and storage (item:13.1-13.7)	Interval	7
	- Knowledge dissemination and transfer (item:14.1-14.7)	Interval	7
	- Knowledge application (item:15.1-15.7)	Interval	7
TQM	- My organization (item:10.3-10.7)	interval	5
	- Top management support (item:11.1-11.7)	Interval	7
	- Employee(item:12.1-12.7)	Interval	7
	- Continuous improvement (item:13.1-13.7)	Interval	7
	- Customer focus (item:14.1-14.7)	Interval	7
	- Database decisions (item:15.1-15.7)	Interval	7
INNO	- Compared with key competitor (item:16.1-16.3)	Interval	3
	- Product innovation (item:17.1-17.7)	Interval	7
	- Process innovation (item:18.1-18.7)	Interval	7

Construct validity of the instrument based on collected data. After collecting the data for the study, a confirmatory factor analysis (CFA) using the LISREL program was conducted to examine the factor structure. According to Yuan (2005), one of the most important steps in structural equation modeling is to confirm that the model fits the data. Model fit is the issue of how the model that best represents the data reflects underlying theory (Hooper, Coughlan, & Mullen, 2008). Therefore, a good-fitting model is one that is reasonably consistent with the data and so does not require respecification (Kenny, 2012). As the instruments used to create the instrument for this study had already been subjected to psychometric testing, the intent of doing a confirmatory factor analysis within the three subsets of this study's instrument was to determine if the same sub-sections held up within the Thai context.

The criteria that researchers often use to conclude that the model is a good fit or is acceptable are as followed: (a) the Non-Normed Fit Index (NNFI) exceeds 0.95 (Sharma, Mukherjee, Kumar, & Dillon, 2005); (b) the Comparative Fit Index (CFI) exceeds 0.93 (Byrne, 1994); (c) the Goodness of Fit Index (GFI) exceeds 0.90 (Byrne, 1994); (d) the Adjusted Goodness of Fit Index (AGFI) exceeds 0.95 (Tabachnick & Fidell, 2007); and (e) the Root Mean Square Residual (RMR) is less than 0.08 (Hu & Bentler, 1999). Good models have small RMR (Tabachnick & Fidell, 2007).

Measuring knowledge management initiatives. Results of CFA revealed evidence for the construct validity of the KM initiatives scales. The factor structure moderately fit the data: (1) Chi-Square = 0.39 (df =1, P≥0.535); (2) NNFI = 1.007; (3) CFI = 1.000; (4) GFI = 1.000; (5) AGFI = 0.996; and (6) RMR = 0.00216. The Overall fit indices for the model were a good fit as NNFI, CFI, and GFI>0.90, AGFI> 0.80, and RMR< 0.02.



Chi-Square = 0.39 (df=1,P≥0.535)

Non-Normed Fit Index (NNFI) = 1.007

Comparative Fit Index (CFI) = 1.000

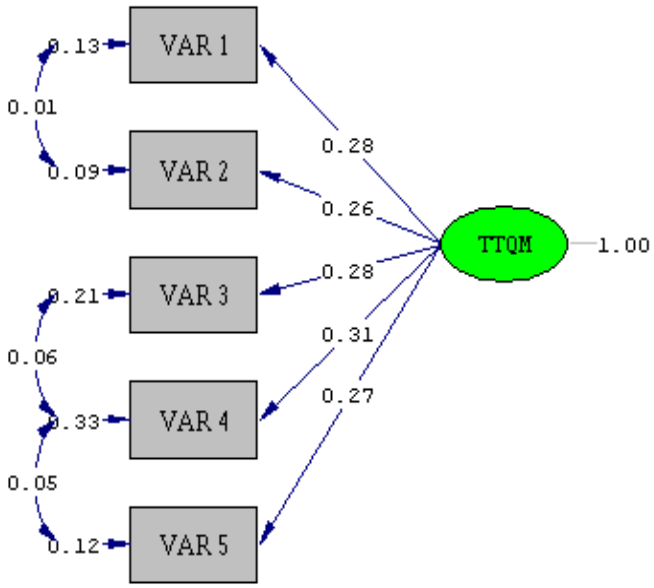
Goodness of Fit Index (GFI) = 1.00

Adjust Goodness of Fit Index (AGFI) = 0.996

Root Mean Square Residual (RMR) = 0.00216

Figure 3. Measurement model of knowledge management initiatives.

Measuring total quality management. The results of the CFA for the TQM scales revealed their construct validity. The factor structure moderately fit the data: (1) Chi-Square = 0.78 (df = 2, P ≥ 0678); (2) NNFI = 1.010; (3) CFI = 1.000; (4) GFI = 0.999; (5) AGFI = 0.995; and (6) RMR = 0.0014. The overall fit indices for the model were a good fit as NNFI, CFI, and GFI> 0.90, AGFI> 0.995, and RMR< 0.0014.



Chi-Square = 0.78 (df = 2, P≥0.678)

Non-Normed Fit Index (NNFI) = 1.010

Comparative Fit Index (CFI) = 1.000

Goodness of Fit Index (GFI) = 0.999

Adjust Goodness of Fit Index (AGFI) = 0.995

Root Mean Square Residual (RMR) = 0.0014

Figure 4. Measurement model of TQM practices.

Measuring organization innovation performance. It was not possible to calculate a CFA for INNO as there were only two items in each of the two scales. As a result, only content validity could be determined for INNO.

Data Collection Procedures

In accordance with established University of Minnesota regulations, approval (see Appendix C) was obtained from the Institutional Review Board (IRB). IRB review and approval is required for any research involving human subjects. The objectives of IRB

are to protect human subjects involved in research from inappropriate risk and to ensure that human subjects consent to their research participation.

After getting approval from the IRB, data collection was conducted in Thailand. I first made a phone call to the HRD managers of all organizations on the provided lists and explained the purpose and process of the research to ask for their participation and consent. Only 500 organizations agreed to participate; others either could not be reached or declined participation. After receiving their oral consent, I sent an official letter (See Appendix D). A consent form was not needed as completion of the survey was accepted as a clear indication of consent.Then, a survey instrument (Appendix B) was mailed within Thailand to each participant with a request to return it in the stamped envelope within two weeks. A cover letter (Appendix E) explaining the purpose of the study accompanied the questionnaire, assuring participants of anonymity. Respondents were checked off on a master list based on a number that had been placed on each survey. After two weeks, I called the non-respondents to remind them as mentioned in the cover letter and to find out whether the questionnaire had been lost in the mail. I mailed a second set of a questionnaire, a cover letter, and a stamped envelopes to non-respondents who did not get the questionnaire or who had misplaced it. I made telephone calls to follow up with this group of non-respondents after a week from the second mailing date. Data were not included when surveys arrived later than two weeks after the second follow-up. After these follow-up procedures, the final number of useable cases obtained was 470 for an overall response rate of 94%.

Analysis of Data

Data analysis procedures were consistent with the research purposes. Descriptive statistics (e.g., means, standard deviations, skewness, and kurtosis) provide the basic information about the instrument variables. I used correlational statistics to describe the relationships among KM, TQM, and INNO. To test the model of KM, TQM, and INNO, and the subsets of each, hierarchical regression analysis was conducted. Hierarchical regression analysis was used to test whether the data collected supported the proposed model, based on the literature review. Hierarchical regression analysis shows the correlational relationships between variables either directly or indirectly. In both types of correlation, there is no evidence that changes in one variable necessarily cause changes in other variables.

For additional data analysis, I used structural equation modeling (SEM) with the LISREL program (Hair et al., 2010; Kline, 1998). According to Kuhnel (2001), structural equation modeling (SEM), a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions, was developed by Joreskog in 1960. SEM is appropriate for both theory testing and theory development as SEM allows both confirmatory and exploratory modeling. However, SEM is normally viewed as a confirmatory rather than exploratory technique (Garson, 2009). Although SEM analyses frequently involve a certain exploratory element, a researcher tend to use SEM to determine whether a certain model is valid rather than use SEM to find a suitable model (Garson, 2009). As with this research, I used SEM for theory testing.

According to Wiratchai (2005), in SEM, interest usually focuses on latent variables, being KM, TQM, and INNO in this research, rather than on the manifest variables used to measure these constructs. Since measurement is recognized as difficult and error-prone. SEM users aim to derive unbiased estimates for the relations between latent constructs by explicitly modeling measurement error. For this purpose, SEM allows multiple measures to be associated with a single latent construct.

Summary

This chapter reviewed the methodology and methods used in this study. A quantitative survey was designed to answer the research questions. From a population of ISO 9000 listed organizations, the data were collected from a sample of 500 HRD managers in 500 organizations located in Bangkok and the central and eastern regions of Thailand. The response rate was 94%, with 470 useable surveys returned after two follow-ups. The instrument was composed of four parts: demographic information, KM, TQM, and INNO.

The instrument was translated into Thai, and back-translation was conducted with comparison between original and back-translated items. Content validity was determined with the use of previously used items, expert review, and three sets of pilot tests. Confirmatory factor analysis (CFA) was conducted for construct validity, and the scales were confirmed. The number of items for INNO was too few to allow for CFA. Reliability was measured by Cronbach's coefficient alpha, yielding moderately high coefficients, ranging from .78 to .81.

To analyze the data, I used descriptive statistics to provide the basic information about the instrument variables. I also used correlational statistics to describe the

relationships among KM, TQM, and INNO, hierarchical regression analysis to determine the factors contributing most to the outcome variables, and structured equation modeling to determine fit with the proposed model.

CHAPTER 4

RESULTS

The purpose of this study was to explore the potential relationships among knowledge management initiatives (KM), total quality management practices (TQM), and organization innovation performance (INNO). A combination of nine instruments was used to collect data from 470 HRD manager respondents in the Bangkok area and provinces in the central and eastern regions of Thailand (Samutprakarn, Samutsakorn, Samutsongkram, Nakornpathom, Nakornnayok, Chonburi, and Rayong). This chapter provides a description of the results related to the dependent (INNO) and independent variables (KM and TQM). The results of the survey are reported through the examination of descriptive statistics, correlational statistics, and multiple regression analysis. Then, the results of the hypothesized model testing are presented.

Descriptive Statistics for Instrument Scales

This section provides a descriptive statistic analysis of the three designated variables, KM, TQM, and INNO. All variables were treated as parametric variables using means, standard deviations, skewness, and kurtosis. Further, to test the normal distribution of collected data, the Kolmogorov –Smirnov Test was used.

For the purpose of precise and convenience in presenting data, I decided to use abbreviation for the variables in this chapter. The following abbreviations are:

KM1 stands for knowledge acquisition and creation.

KM2 stands for knowledge capturing and storage.

KM3 stands for knowledge dissemination and transfer.

KM4 stands for knowledge application.

TQM1 stands for top management support.

TQM2 stands for employee involvement.

TQM3 stands for continuous improvement.

TQM4 stands for customer focus.

TQM5 stands for database decisions.

INNO1 stands for product innovation.

INNO2 stands for process innovation.

Knowledge Management Initiatives

KM illustrates a systematic and integrative process that helps organizations find, select, organize, distribute, and transfer important information, knowledge, experience, and expertise necessary for activities such as problem solving, dynamic learning, strategic planning, and decision-making to achieve the organization's goals (Gupta et al., 2000; Lawson, 2003). The results show that most organization had insufficient and weak KM initiatives (mean = 16.06, SD = 1.16, right skewness, value of kurtosis = .387). The results also found that the minimum score of KM was 8 and the maximum score was 21

Total Quality Management

TQM is intended to improve continuously the performance of products, processes, and services to attain and exceed customer expectations (Anthony et al., 2002). The results show that most organization had a low rate of TQM practices (mean = 23.87, SD = 1.86, right skewness, value of kurtosis = .171). The minimum score of TQM practices was 19 and the maximum was 30.

Organization Innovation Performance

INNO explains how organizations adopt and adapt to changes in markets, technology, and competition (Dougherty & Hardy, 1996). The results show that most of the organizations had low INNO (mean = 9.90, SD = 1.73, right skewness, value of kurtosis = 41.623). The minimum score of INNO was 8 and the maximum score was 22

The means, standard deviations, skewness, kurtosis, minimum scores, and maximum scores are presented in Table 4.

Table 4

Descriptive Statistics of Knowledge Management Initiatives, Total Quality Management Practices, and Organization Innovation Performance (n =470)

	Mean	SD.	Min	Max	Skewness	Kurtosis	Coefficient of Variation
KM	16.06	1.16	13	22	.71	.387	0.07
TQM	23.87	1.86	19	30	.62	.171	0.08
INNO	9.90	1.73	8	22	4.52	41.632	0.17

The histograms of KM, TQM, and INNO are presented in Figure 5, Figure 6, and Figure 7, respectively.

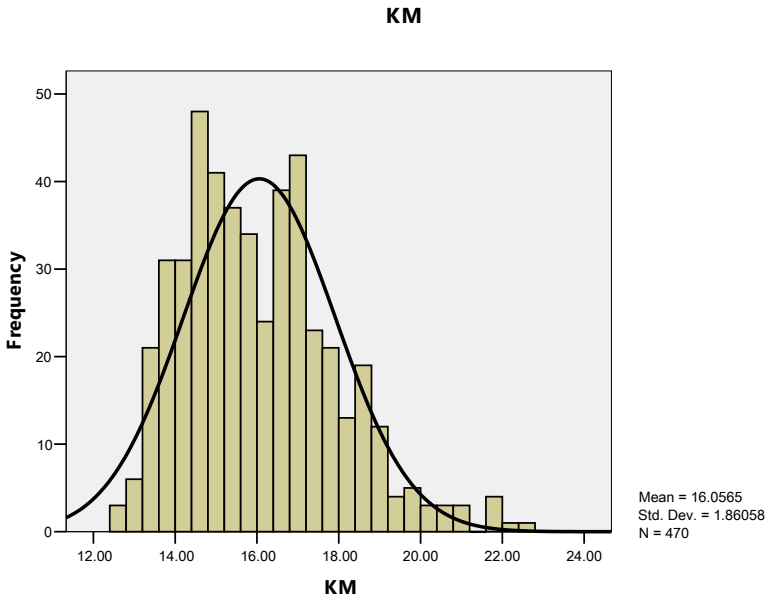


Figure 5. Histogram of knowledge management initiatives.

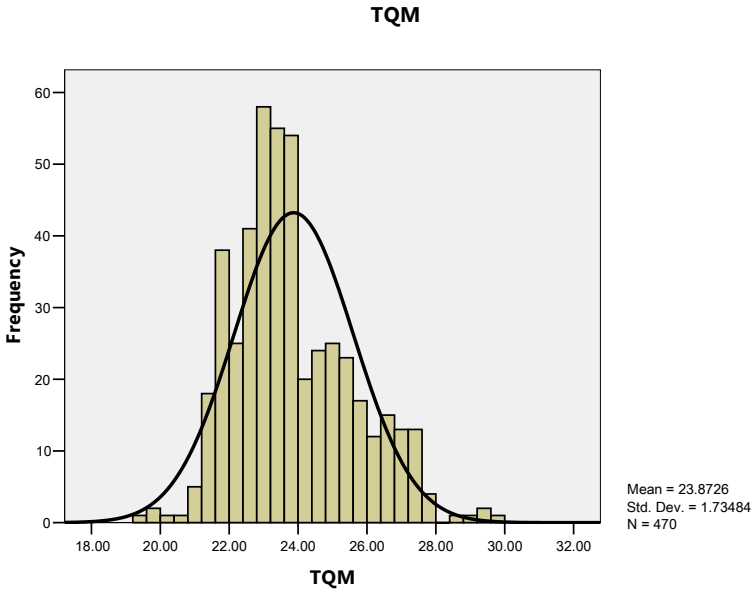


Figure 6. Histogram of total quality management practices.

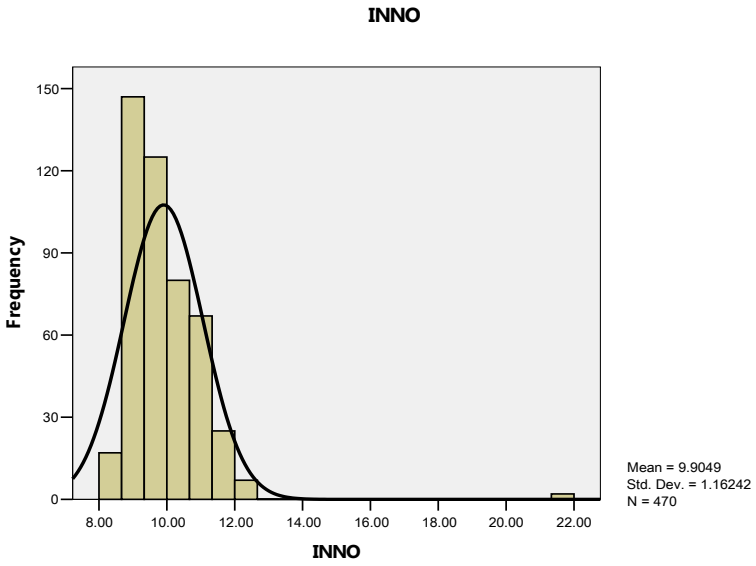


Figure 7. Histogram of organization innovation performance.

The Kolmogorov-Smirnov Test results are presented in Table 5.

Table 5

The Result of Normal Distribution of Sample

Variables	Kolmogorov - Smirnov		
	Statistic	df	Sig.
KM	.319	470	000
TQM	.127	470	000
INNO	.166	470	000

Correlational Statistics

The correlation coefficients among the subses of KM, TQM, and INNO were examined. Table 6 shows the inter-correlation of the subset of the variables.

Table 6

Inter-correlation of the Variable Subsets

Variables	KM1	KM2	KM3	KM4	INNO1	INNO2	TQM1	TQM2	TQM3	TQM4	TQM5
KM1	1.00										
KM2	0.51	1.00									
KM3	0.38	0.53	1.00								
KM4	0.39	0.38	0.44	1.00							
INNO1	0.26	0.16	0.12	0.20	1.00						
INNO2	0.20	0.24	0.15	0.20	0.11	1.00					
TQM1	0.28	0.29	0.20	0.29	0.24	0.22	1.00				
TQM2	0.29	0.25	0.27	0.31	0.22	0.25	0.44	1.00			
TQM3	0.34	0.32	0.25	0.33	0.27	0.27	0.30	0.36	1.00		
TQM4	0.29	0.27	0.16	0.24	0.30	0.24	0.29	0.31	0.43	1.00	
TQM5	0.36	0.27	0.30	0.34	0.33	0.23	0.39	0.40	0.32	0.45	1.00

The independent variable KM had four observable variables, knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application. Each pair had a positive and significant correlation, ranging from 0.38 to 0.53. The strongest pair was knowledge capturing and storage (KM2) and knowledge dissemination and transfer (KM3). The independent variable TQM had five observable variables, top management support, employee involvement, continuous improvement, customer focus, and database decisions. Each pair had a positive and significant correlation, ranging from 0.29 to 0.45. The strongest pair was the customer focus (TQM4) and database decisions (TQM5). The dependent variable INNO had two observable variables. Product innovation (INNO1) and process innovation had a positive and significant correlational coefficiency of 0.11.

The correlation coefficients among KM, TQM, and INNO were examined as shown in Table 7.

Table 7

Correlations Matrix among Variables, Means, and Standard Deviations

Variables	INNO	KM	TQM	Mean	SD.
INNO	1.00			9.90	1.73
KM	.34**	1.00		16.06	1.16
TQM	.48**	.53**	1.00	23.87	1.86

Note.**p < .01; n = 470

The correlation matrix reveals a significant relationship among KM, TQM, and INNO. The two independents variable (KM and TQM) have a significant correlation with the dependent variable (INNO) ($p < .01$). KM was positively correlated with INNO (0.34). TQM was positively correlated with INNO (0.48). TQM was positively correlated with KM (0.53).

Before using the LISREL program, it is important to check all variables for multicollinearity. There are three ways to do this. First, the correlation of each pair of variables must not exceed 0.6. Second, tolerance close to 0 shows a strong correlation, while tolerance close to 1 shows a weak correlation. Third, a high variance inflation factor (VIF) close to 10.0 shows multicollinearity.

The result of the correlational analyses found that the tolerances of all variables were > .19, and the variance inflation factors (VIF) of all variables were < 5.3. Therefore, there was no multicollinearity.

Multiple Regression Analysis (MRA)

For this study, MRA was used to examine variance. A two-step hierarchical regression analysis using "method enter" was applied.

In hierarchical multiple regression analysis, it is important to determine the order in which variables are entered into the regression equation (Mitzi, 2007). The researcher who wants to control for some variables will perform a multiple regression with these variables as the independent variables. From this analysis, the researcher identifies the variance accounted for by this corresponding group of independent variables. Then, the researcher runs another multiple regression analysis by adding a new set of independent variables to the original independent variables. This allows the researcher to examine the contribution above and beyond the first group of independent variables (Mitzi, 2007).

In the first step, I added the KM variable to the equation as it contributed the most to variance. When the independent variable (KM) was added to the equation, KM had a statistically significant correlation with the dependent variable (INNO) ($F = 61.48$, $df = 468$, $p < .001$) with a correlation magnitude of .34, explaining 11.6% of the variance.

In the second step, when the second independent variable (TQM) was added to the equation, the two independent variables (KM and TQM) correlated with the dependent variable (INNO) at a statistically significant level at $p < .001$ ($F = 78.84$, $df = 467$, $P = .00$), correlation magnitude = .49, and both variables accounted for 24.1% of the variance in the dependent variable (INNO). TQM added 12.5% to explaining the variance. The regression equations are as follows.

Step 1 $INNO = 6.486 + .213KM$ (Raw Score Regression Equation)

$Z_{INNO} = .341Z_{KM}$ (Standard Regression Equation)

Step 2 $INNO = 1.983 + .075KM - .281TQM$ (Raw Score Regression Equation)

$Z_{INNO} = .120Z_{KM} + .420\ Z_{TQM}$ (Standard Regression Equation)

More details are presented in Table 8.

Table 8

Result of Hierarchical Regression Analysis based on Main Variables

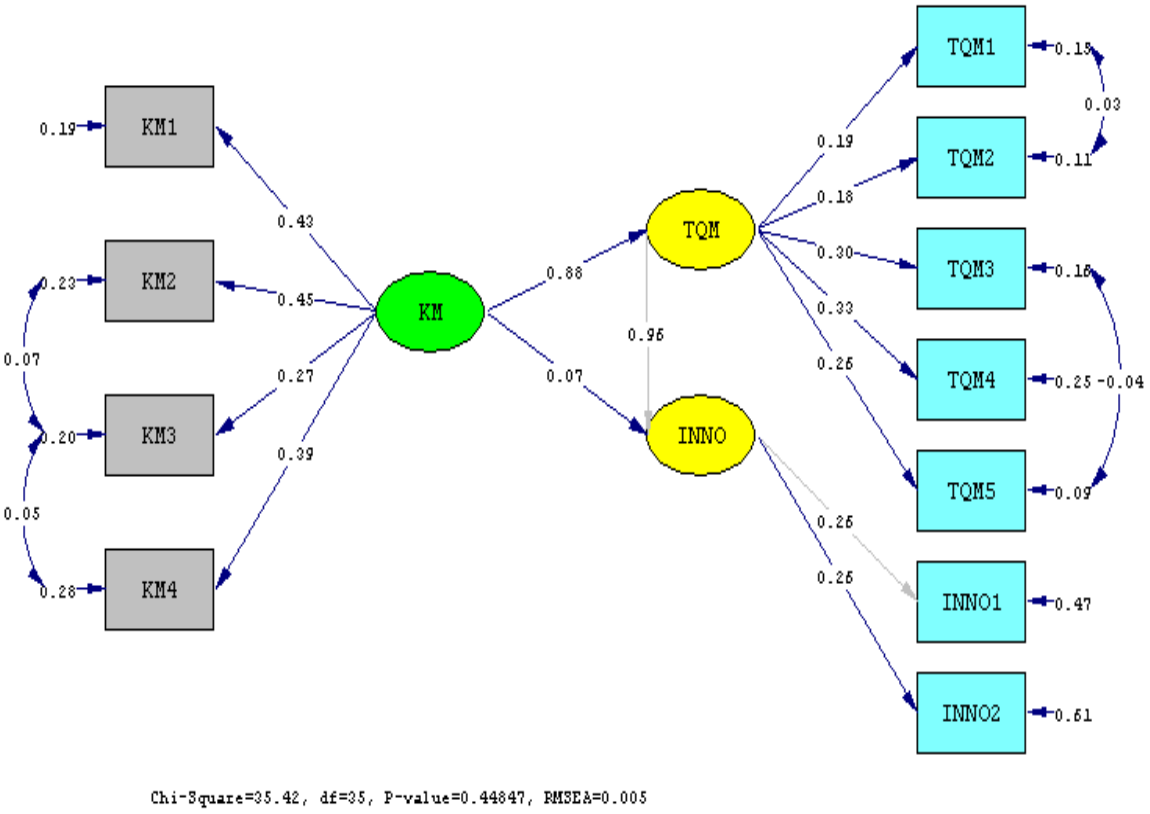
IV	r	Step1			Step2		
		b	SE.	beta	b	SE.	beta
Constant		6.49**	.44	-	1.98**	.65	-
KM		.57**	.03	.49	.58**	.03	.49
TQM					-.22**	.07	-.07
R		.34			.49		
R^2		.17			.11		
Adjusted R^2		.11			.24		
F		61.48			78.84		
df		468			467		
P		.00			.00		

From Table 8, the standardized regression coefficients (beta) of KM and TQM are 0.49 and - 0.07 respectively. The standardized beta gives a measure of the contribution of each variable to the model. The multiple correlation coefficients (R), a measure of the correlation between independent variables (KM and TQM), and dependent variable (INNO), equals 0.49 while R^2 equals 11%. R^2 is the square of this measure of correlation and indicates the proportion of the variance in INNO which is accounted for by my model. Fundamentally, this is a measure of how good a prediction of INNO I can make by knowing KM and TQM. On the other hand, R^2 is likely to fairly over-estimate the success of the model when applied to the real world, as a result an Adjusted R^2 value is calculated which takes into account the number of variables in this model and the number of observations (participants) this model is based on. This Adjusted R^2 value gives the most useful measure of the success of this model. I have Adjusted R^2 value of 0.24; therefore, this model has accounted for 75% of the variance in INNO. Consequently, it

can be concluded that, a significant model emerged (F = 78.84, df = 467, P = .00, Adjusted R^2 = 24%).

Confirmation of Hypothesized Model

The full model of the structured equation model of KM, TQM, and INNO (Figure 8) shows the influence of the variables. The criteria for fit are described in Chapter 3. The factor structure moderately fits the data: (1) Chi-Square = 35.42 (df =35, $p \geq 0.448$); (2) NNFI = 0.999; (3) CFI = 0.999; (4) GFI = 0.986; (5) AGFI = 0.974; and (6) RMR = 0.0098. The overall fit indices for the model are a good fit as NNFI, CFI, and GFI >0.90, AGFI > 0.80, and RMR< 0.02. Figure 8 shows the model.



Chi-Square = 35.42 (df =35, P≥ 0.448)

Non-Normed Fit Index (NNFI) = 0.999

Comparative Fit Index (CFI)= 0.999

Goodness of Fit Index (GFI) = 0.986

Adjust Goodness of Fit Index (AGFI) = 0.974

Root Mean Square Residual (RMR) = 0.0098

Figure 8. Full structural model.

To interpret the full SEM model shown in Figure 8, some words need to be described (Anglim, 2007). First, the rectangle is a symbol of the observed variables, such as the subscales based on the items from the questionnaire. In Figure 8, the rectangles are knowledge acquisition and creation (KM1), knowledge capturing and storage (KM2), knowledge dissemination and transfer (KM3), knowledge application (KM4), top

management support (TQM1), employee involvement (TQM2), continuous improvement (TQM3), customer focus (TQM4), database decisions (TQM5), product innovation (INNO1), and process innovation (INNO2). Second, the ellipse is a symbol of the latent variables that are estimated from the observed variables. In Figure 8, the ellipses are KM, TQM, and INNO. Third, the single-headed arrows show the predictive relationships. In Figure 8, these show not only the relationships among the three main variables, but also the relationships between a subset and the main variable. For example, the arrows from KM point to KM1-4 to show the relationships between KM and its indicators. Then, the arrow pointing from KM to TQM shows a positive relationship. Last, the double-headed arrows show correlations. Figure 8 shows correlations within the subsets. The correlation between KM2 and KM3 is an example.

Testing Hypotheses

Four hypotheses were proposed in this study:

Hypothesis1: Knowledge management initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) will enhance organization innovation performance (product innovation and process innovation).

Hypothesis 2: Knowledge management initiatives (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application) will be positively associated with total quality management practices (top

management support, employee involvement, continuous improvement, customer focus, and database decisions).

Hypothesis 3: Total quality management practices (top management support, employee involvement, continuous improvement, customer focus, and database decisions) will enhance organization innovation performance (product innovation and process innovation).

Hypothesis 4: Knowledge management initiatives will be indirectly associated with organization innovation performance via the mediator, total quality management practices.

These hypotheses were examined through the path coefficients and total effect sizes of the constructs in the hypothesized model.

Hypothesis 1 is supported. There is a path coefficient of 0.07from KM to INNO.

Hypothesis 2 is supported. KM had positive influences on TQM. There is a significant path coefficient of 0.88 from KM to TQM.

Hypothesis 3 is supported. TQM provided a considerable and positive impact on INNO (0.96).

Hypothesis 4 is supported. KM had positive influences and indirect effect on INNO through TQM.

For the above results, it is concluded that KM exhibited an indirect influence on INNO with TQM as the mediator, but it had almost no direct influence.

Summary

The statistics support the conclusion that the factor structure fits the data: The overall fit indices for the model are a good fit. The hypothesized model was thus

supported. The four hypotheses were examined in the light of the model. Hypothesis 1, KM will enhance INNO, was supported by a statistically significant but meaningless path coefficient of 0.07. Hypothesis 2, KM will be positively associated with INNO, was supported by a significant path coefficient of 0.88. Hypothesis 3, TQM will enhance INNO, was supported. TQM provided a considerable and positive impact on INNO (0.96). Hypothesis 4, KM will be indirectly associated with INNO via TQM, was supported. KM had positive influences and indirect effect on INNO through TQM (0.88*0.96=0.84). Further summary of the research, implications, limitations, and final conclusions are discussed in the following chapter.

CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDTIONS

This chapter begins with a summary of the study, followed by a discussion of the results. Recommendations based on the results are then discussed.

Summary

In this section, a summary of the study is presented, including: (1) the purpose of the study; (2) the research methodology and methods, and (3) results.

Purpose of the Study

The purpose of the study was to investigate the relationships among knowledge management initiatives, total quality management practices, and organization innovation performance in Thai organizations.

The research questions were as follows:

3. Are there positive relationships among KM initiatives, TQM, and organization innovation performance?
4. To what extent do KM initiatives implemented through TQM improve an organization's innovation performance?

Research Methodology and Methods

The following summary of the research methodology includes the instrument, the population and sample, and the data analyses.

Instrument. The instrument was composed of four parts. First, the beginning part of the instrument was designed for demographic information. Second, the KM initiatives were measured using 33 items with 5 items for employees' perceptions about KM in their organization and 7 items for each of four dimensions of KM. To measure knowledge

acquisition and creation, the researcher adapted the items from Gold et al. (2001) and Lawson (2003). To measure knowledge capturing and storage, the researcher adapted the items from Al-Busaidi and Olfman (2005) and Lawson (2003). To measure both knowledge dissemination and transfer and knowledge application, the researcher adapted the items from Lawson (2003) and Lin and Lee (2005).

Third, TQM was measured using 40 items with 5 items for employees' perceptions about quality approaches in their organizations and 7 items for each of the five TQM dimensions. Both employee involvement and database decisions were measured using items based on Antony, Leung, Knowles, and Gosh (2002) and Powell (1995). Top management support was measured using items taken from Singh and Smith (2004) and Zeitz, Johannesson, and Ritchie (1997). Both continuous improvement and customer focus were measured using items taken from Antony et al. (2002) and Zeitz et al. (1997).

Finally, organization innovation performance was measured using 17 items with 3 items for employees' perceptions of their organization's innovation. The other items in the questionnaire were adapted from Singh and Smith (2004) and Prajogo and Sohol (2003) with 7 items for both product innovation and process innovation. The respondents were asked to evaluate the organization's innovation performance against the key competitor in the industry to minimize industry effect based on their perceptions.

To assure validity within the Thai context, five experts (two academics and three practitioners) reviewed the instrument. These experts recommended suggestions for the addition and modification of statements, questions, and the format of the survey instrument. Two bilingual experts (linguistic faculty members) translated the

questionnaire into Thai, and another bilingual expert translated it back into English in order to confirm accurate translation.

Content validity was examined in a series of instrument revisions and pilot tests. Construct validity was confirmed through a confirmatory factor analysis (CFA), Reliability, measured by Cronbach's coefficient alpha on the final data, was reasonable, ranging from .78 to .81.

To analyze the collected data, descriptive statistics, correlational statistics, and Hierarchical Regression Analysis were conducted.

Population and Sample

The target population of this research was HRD managers who worked in different business sectors in the Bangkok area and provinces in the central and eastern regions of Thailand. A sample of 500 HRD managers was recruited from the 500 organizations agreeing to participate in the research from the 800 registered for ISO 9000 and the Thailand quality award for performance excellence. The final number of useable cases obtained, after two follow-ups, was 470, for an overall response rate of 94%.

Results

The study results showed a significant relationship among knowledge management initiatives (KM), total quality management practices (TQM), and organization innovation performance (INNO). KM variables were positively correlated among themselves, as were the TQM variables and the INNO variables.

Hypothesis testing, based on a structured equation modeling, led to the following findings. KM was found to be positively but minimally associated with INNO (path coefficient = 0.07, $p < 0.05$). KM was found to affect TQM positively (path coefficient =

0.88, $p < 0.05$). TQM positively impacted INNO (path coefficient = 0.96, $p < 0.05$). KM had a positive relationship and indirect influence on INNO through TQM (indirect effect = 0.84, $p < 0.05$).

Discussion

The study results are discussed in the following sections. The section is organized in order of the research questions.

Relationships among Knowledge Management Initiatives (KM), Total Quality Management (TQM), and Organization Innovation Performance (INNO)

The study results provided support for the position that there were relationships among KM, TQM, and INNO. The following paragraphs discuss each of the three variables and their relationship, connecting the study findings with existing literature.

Relationship between knowledge management initiatives and organization innovation performance. Knowledge management initiatives had no statistically significant direct influence on organization innovation performance. This finding only partially reflects the findings of the limited literature on this relationship reviewed in chapter 2. Even though Gloet and Terziovski (2004) found that the humanistic approach to knowledge management initiatives and organization innovation performance were significantly and positively related, they did not mention which dimensions of the initiative that they measured. Prajogo et al. (2004) emphasized that knowledge management initiatives have a significant positive relationship with both product and process innovation. Unlike Lin and Lee (2005), they mentioned using knowledge application and knowledge dissemination and transfer as knowledge management initiatives in their study. This study found that knowledge application positively influenced innovation, whereas knowledge dissemination and transfer did not influence innovation. Unlike these studies, the dimensions of knowledge initiatives used in the study did not directly affect innovation.

This might be explained by the nature of the relationship among employees in Thai organizations. Unlike employees in western countries, Thai employees may be afraid of losing their knowledge power. They are afraid of exchanging and sharing their knowledge with colleagues who might use this knowledge to get promoted at others' expense. As a result, the process of creating and utilizing knowledge are missing from the link with KM. This could impact its relationship with INNO.

Relationship between knowledge management initiatives and total quality management. KM is positively associated with TQM. This finding is consistent with the body of research that has found a positive contribution of KM to TQM (Hsu & Shen, 2005; Hung et al., 2006; Zetie, 2002). All four KM processes were found to facilitate TQM. Hung et al. (2006) confirmed that KM initiatives had a positive relationship with TQM. Hsu and Shen (2005) also mentioned in their study that knowledge coexists with TQM as they share similarities, including results orientation, people-based management, teamwork, leadership, and delighting the customer. According to McAdam and Leonard (2001), KM and TQM constitute an interactive relationship during business processes. These two had the strongest link; especially in the area of continuous improvement (Zhao & Bryar, 2001). Organizations could learn from their experiences and apply these experiences and knowledge with the organization if they wanted to survive in the ever-changing market. Therefore, TQM is a management practice that can assist organizations in nurturing their knowledge and ability to change (Hung et.al, 2010).

Relationship between total quality management practices and organization innovation performance. TQM enhances INNO. Many authors have argued that organizations employing total quality management will provide a productive environment

for innovation as TQM supports principles that match well with innovation (Kanji, 1996; Mahesh, 1993; Prajogo & Sohol, 2003; Roffe, 1998). Singh and Smith (2004) further mentioned that continuous improvement as a total quality management theme involves change and creative thinking in work processes and provides a solid foundation on which innovations can be successfully implemented. This study backed up these positions with empirical data.

According to the literature review, Osayawe and McAndrew (2005) mentioned how TQM created an environment that favors innovation and taking risks for the satisfaction of clients' needs by solving problems through the incorporation of stakeholders, who make use of quality control within the organization. In such a way, KM and TQM are complementary. A synergistic combination of KM and TQM formed a cycle of improvement and development, leading to organization excellence and INNO (Zhao & Bryar, 2001). The finding of this research also corresponds with Hung et al. (2006 and 2010) who demonstrated the important role of total quality management practices in transforming the contributions of knowledge management processes into organization innovation performance.

Recommendations

The following recommendations, based on the findings from this study, are presented in three parts: recommendations for practice, especially HRD professionals in Thai organizations; recommendations for future research; and recommendations for theory.

Recommendations for Practice

The results of this research provide valuable information for HRD and HR professionals to understand the relationships existing among knowledge management initiatives, total quality management, and organization innovation performance in Thai organizations. The study results can help HRD professionals support and direct knowledge management efforts in their organization. There is another theme that emerged from this study that could direct HRD professionals' efforts in maximizing their knowledge management efforts.

If the goal of KM is INNO, this research suggests that HRD professionals should not put time and energy into KM initiatives. Rather, putting time and energy into TQM has much greater impact. Organizations spend millions of dollars in establishing IT and knowledge management systems that capture, store, and improve access to knowledge, but this does not bring INNO or expected business results (Evan, 2003) unless KM impacts TQM, as this study has shown that it can. In order to do that, they need to step up in using total quality management tools as mediators so as to help organizations increase their INNO. As HRD professionals possess expertise in change (Gilley & Maycunich, 2000), they can help educate their business partners in how best to facilitate TQM to increase INNO. This finding may contradict Holbeche (as interviewed in Evans, 2003) who mentioned that, by allowing people to freely move and have access to KM, opportunities for learning new knowledge and innovation performance would occur.

Recommendations for Future Research

First, future studies are needed to extend the current research. Such studies might use mixed methods to enhance the depth of the study. This study was a quantitative

study; therefore, paper and pencil questionnaires were used to collect the data. In the future, researchers might want to collect data both qualitatively and quantitatively in order to get insight and appropriate information. The example might interview the panel experts in the field to get in-depth information and use that information to develop their own questionnaire. Such research can also contribute to indigenous theory development related to these variables.

As mentioned, this study employed measurements from different existing instruments. The measurement problems that arose in this study should be addressed in future research. Using measurements from different sources, there might be a chance that the resulting measure might not have been integrated sufficiently. Further, the culture and norms of the countries from which the instrument was developed differ from Thailand. Therefore, the results might not have been appropriate within the Thai context. It would be better for future researchers to develop their own measurement related to the literature and the interview script, as mentioned above. For future research questions, it will be interesting to use another quality tools besides TQM or another management tools to understand more about this relationship. It also will be interesting if future researchers would add other areas of innovation, such as service innovation, to examine other dimensions of the relationship.

The unit of analysis in this study was the organization. It may not be appropriate to expect informants to give accurate perceptions of their whole organization, especially in large organizations. Future research could focus the level of analysis on the business unit. Further, multiple respondents from each organization could be included so that different perspectives are incorporated in viewing organizational reality. Responses from

multiple respondents may be averaged so as to reflect a more balanced view of the organization

Organizational size, industry, organization type, and the business environment may have effects on KM, TQM, and INNO. Large organizations tend to have systematic way to keep their quality data and innovation performance compared with small organizations. Further, the industry that those organizations are in and the organization types play an important role. The textiles and garment companies emphasize TQM and INNO more than the organizations in hospitality industry. Thai organizations and multinational organizations also focus on different areas of KM, TQM, and INNO.

The organizations environment affects KM, TQM, and INNO. Organizations in different markets compete differently. Future studies could control for possible effects in examining the relationship between KM, TQM, and organizational INNO.

Given the strength of the influence form TQM to INNO, it would be very interesting to try to determine why there has been demise in TQM. Likewise, given the weak relationship between KM and INNO, it would be interesting to try to determine why KM has become such an important construct in Thai organizations. The findings related to both variables seem to confirm that decisions to use a specific approach in an organization is often far more related to what is currently important in an organization or country, rather than choosing tools that are likely to have the greatest positive effect.

Recommendations for Theory

With regard to theoretical implications, this research makes the following contributions. First, a framework involving KM, TQM, and INNO was developed in Thailand. The findings of this research can be used as a framework in building a

relationship between knowledge management and organization innovation performance. Even though quality management is viewed in some literatures as an obstacle in initiating or creating new ideas or products, TQM in this framework showed otherwise. To date, there is one of only a couple of conceptual frameworks in Thailand to address these relationships.

Second, the measurement of KM, TQM, and INNO in Thai settings was developed and validated. The measurement used in this research came from several instruments that were validated through research. Further, the KM, TQM, and INNO measurement was validated through CFA after modification. Moreover, this is the only measurement existing in Thailand in this context. Therefore, Thai organizations might be able to use this measurement to verify the relationship of KM, TQM, and INNO in their organizations if they need it.

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Appendix A

English Version of Final Instrument

Knowledge Management Assessment, Total Quality Management, and Organization

Innovation Performance Instrument

Thank you very much for participating in this survey. Your input is very valuable. Please answer the following questions regarding your organization based on your current perceptions.

You will be asked to provide some demographics information and to rate how each statement describes your organization. Answers can range from strongly disagree (1) to strongly agree (7). It will take approximately 15 minutes to complete the questionnaire.

Section I: Demographic Profile

1. The business sector of my organization is
   _____ Textiles _____ Automobile and Part
   _____ Metal products _____ Electronics
   _____ Others, please specify _____
2. Which type of the organization below best describes your organization?
   _____ Multinational Corporation
   _____ Joint Venture
   _____ Thai Organization
3. If the answer is yes to the above question, your parent company's headquarters is in
   _____ USA _____ Asia
   _____ Europe _____ Others, please specify _____
4. The total number of employees in my organization is
   _____ 1-100 _____ 101-1,000
   _____ 1,001-10,000 _____ More than 10,001
5. What is your current position in your organization?
   _____ Human Resource Development Manager
   _____ Others, please specify _____
6. Length of time in my current position is
   _____ 0-2 years
   _____ 3-5 years
   _____ 6-8 years
   _____ 8 + years
7. Your gender
   _____ Male
   _____ Female
8. I am in the age group
   _____ 21 to 30
   _____ 31 to 40
   _____ 41 to 50
   _____ 51 to 60
   _____ Others

9. Which of the following best describes your highest level of formal education?
_____ Bachelor's degree or equivalent
_____ Master's degree,
_____ Doctoral degree,
_____ Others, please specify _____

Section II: Knowledge Management Assessment

Knowledge management is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities, such as problem solving, dynamic learning, strategic planning, and decision-making. Knowledge management processes include knowledge acquiring and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application.

Please base your answer on your experience working in the HR department of your organization.

10. My organization:							
	Strongly Disagree						Strongly Agree
10.1 has a knowledge management program	1	2	3	4	5	6	7
10.2 has a knowledge management training in place	1	2	3	4	5	6	7

11. Compared with key competitors, my organization:							
	Strongly Disagree						Strongly Agree
11.1 is more successful	1	2	3	4	5	6	7
11.2 is growing faster	1	2	3	4	5	6	7
11.3 is more innovative	1	2	3	4	5	6	7

12. My organization is effective in:							
	Strongly Disagree						Strongly Agree
12.1 absorbing knowledge from individuals into the organization	1	2	3	4	5	6	7
12.2 absorbing knowledge from business partners into the organization	1	2	3	4	5	6	7
12.3 encouraging employees to present new ideas without fear	1	2	3	4	5	6	7
12.4 converting knowledge into design of new products	1	2	3	4	5	6	7
12.5 having a mechanisms for acquiring knowledge from different sources such as employees, customers, business partners, and competitors	1	2	3	4	5	6	7
12.6 having a mechanisms for creating new knowledge from existing knowledge to improve	1	2	3	4	5	6	7

successive projects							
12.7 acquiring knowledge about product and services within the industry	1	2	3	4	5	6	7
12.8 providing technology that allows employees to search and retrieve stored knowledge (e.g. individual, a specific system, a database)	1	2	3	4	5	6	7
12.9 Utilizing databases, repositories and information technology applications to store knowledge for easy access by all employees	1	2	3	4	5	6	7
12.10 Utilizing various written devices such as newsletter, manuals to store the knowledge they captured from employees	1	2	3	4	5	6	7
12.11 having mechanisms to patent and copyright new knowledge	1	2	3	4	5	6	7
12.12 responding to employees ideas and documents them for further development	1	2	3	4	5	6	7
12.13 having mechanisms for converting knowledge into action plans and the design of new products and services	1	2	3	4	5	6	7
12.14 providing technology that allows employees to collaborate with others inside and outside the organization	1	2	3	4	5	6	7
12.15 having processes for distributing knowledge throughout the organization	1	2	3	4	5	6	7
12.16 having mechanisms in place to transfer knowledge from employees, customers and business partners into the organization and from the organization to individuals	1	2	3	4	5	6	7
12.17 having a standardized reward system for sharing or transferring knowledge	1	2	3	4	5	6	7
12.18 designing processes to facilitate knowledge sharing or transferring across functional boundaries	1	2	3	4	5	6	7
12.19 having knowledge in the form that is readily accessible to employees who need it (e.g. intranet, internet, libraries, resource center, and other forum)	1	2	3	4	5	6	7
12.20 showcasing new ideas from employees to other staff	1	2	3	4	5	6	7
12.21 having regular symposiums, lectures, conferences, and training session to share knowledge	1	2	3	4	5	6	7
12.22 having processes filtering knowledge	1	2	3	4	5	6	7
12.23 having processes for applying experiential knowledge	1	2	3	4	5	6	7
12.24 having processes for applying knowledge to critical competitive needs and quickly links sources of knowledge to solve new problems	1	2	3	4	5	6	7
12.25 having different methods for employees to	1	2	3	4	5	6	7

further develop their knowledge and apply them to new situations							
12.26 having mechanisms to protect knowledge from inappropriate or illegal use inside and outside of the organization	1	2	3	4	5	6	7
12.27 having methods to analyze and critically evaluate knowledge to generate new patterns and knowledge for future use	1	2	3	4	5	6	7
12.28 applying knowledge learned from mistakes	1	2	3	4	5	6	7

Section III: Total Quality Management

TQM is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve and exceed customer expectations.

13. My organization:							
	Strongly Disagree						Strongly Agree
13.1 certify ISO 9000 standard	1	2	3	4	5	6	7
13.2 certify other quality standard, please specify _____	1	2	3	4	5	6	7
13.3 has quality management or quality assurance program in place	1	2	3	4	5	6	7
13.4 initiate total quality management program	1	2	3	4	5	6	7
13.5 has quality management training and update ISO standard	1	2	3	4	5	6	7

14. In my organization:							
	Strongly Disagree						Strongly Agree
14.1 top management follow up on suggestions for improvement	1	2	3	4	5	6	7
14.2 top management assign sufficient people to do quality-related activities	1	2	3	4	5	6	7
14.3 top management accept responsibility for quality, show concern for the need for quality, set clear goals for quality improvement, and commit to quality	1	2	3	4	5	6	7
14.4 top management generates consensus on future direction and try to plan ahead for changes that might affect employees performance	1	2	3	4	5	6	7
14.5 quality regard as top competitive priority and there is a strong commitment to quality at all levels	1	2	3	4	5	6	7
14.6 top management encourage long-term strategic thinking	1	2	3	4	5	6	7

14.7 top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders	1	2	3	4	5	6	7
14.8 increasing employee involvement in design and planning	1	2	3	4	5	6	7
14.9 having a more active employee suggestion system	1	2	3	4	5	6	7
14.10 increasing employee autonomy in decision-making	1	2	3	4	5	6	7
14.11 increasing employee interaction with customers and suppliers	1	2	3	4	5	6	7
14.12 recognizing employee for superior quality performance	1	2	3	4	5	6	7
14.13 fully training employee for the work they perform	1	2	3	4	5	6	7
14.14 encouraging employee to work in team	1	2	3	4	5	6	7
14.15 continuous quality improvement is an important goal	1	2	3	4	5	6	7
14.16 employees are encouraged to improve the quality of their product	1	2	3	4	5	6	7
14.17 employees believe that quality improvement is their responsibility	1	2	3	4	5	6	7
14.18 employees analyze their work products to look for ways of doing a better job.	1	2	3	4	5	6	7
14.19 feedback provides to employees on their quality performance	1	2	3	4	5	6	7
14.20 managers assume active roles as facilitators of continuous improvement, coaches of new methods, mentors, and leaders of empowered employees	1	2	3	4	5	6	7
14.21 managers and employee periodically reviews quality issues in meetings	1	2	3	4	5	6	7
14.22 employees in work unit know who their customers are	1	2	3	4	5	6	7
14.2 3employees think of their customers when doing their work	1	2	3	4	5	6	7
14.24 employees often measure their external customers' needs (customers outside the organization)	1	2	3	4	5	6	7
14.25 employees often measure their internal customers' needs (customers inside the organization)	1	2	3	4	5	6	7
14.26 customers are encouraged to provide feedback	1	2	3	4	5	6	7
14.27 customers help design new processes, products, or services	1	2	3	4	5	6	7
14.28 processes or activities increase customer satisfaction	1	2	3	4	5	6	7
14.29 employees use statistical charts to check on the	1	2	3	4	5	6	7

quality of their work or services							
14.30 employees collect data on the quality of their work or services	1	2	3	4	5	6	7
14.31 employees keep data to trace work improvements	1	2	3	4	5	6	7
14.32 employees collect data on the amount of time it take to get the job done	1	2	3	4	5	6	7
14.33 employees keep records or charts measuring the quality of their work displayed at their work station	1	2	3	4	5	6	7
14.34 quality data (cost of quality, defects, errors, scraps, etc.) are used as tools to manage quality	1	2	3	4	5	6	7
14.35 quality data are available to manager, supervisors, and employees	1	2	3	4	5	6	7

Section IV: Innovation Performance

15. Compared with key competitors, my organization:							
	Strongly Disagree						Strongly Agree
15.1 is more successful	1	2	3	4	5	6	7
15.2 is growing faster	1	2	3	4	5	6	7
15.3 is more innovative	1	2	3	4	5	6	7

16. My organization is effective in:							
	Strongly Disagree						Strongly Agree
16.1 increasing the level of newness (novelty) of new products	1	2	3	4	5	6	7
16.2 using the latest technological innovations in new product development	1	2	3	4	5	6	7
16.3 enhancing the speed of new product development	1	2	3	4	5	6	7
16.4 increasing the rate and the number of new products introduced to the market	1	2	3	4	5	6	7
16.5 boosting up the number of new products that is first-to-market (early market entrants)	1	2	3	4	5	6	7
16.6 rewarding innovators (those who come up with new products or services)	1	2	3	4	5	6	7
16.7 actively encouraging employee's creativity	1	2	3	4	5	6	7
16.8 participating in the technological competitiveness	1	2	3	4	5	6	7
16.9 revising the updated or novelty of technology used in processes	1	2	3	4	5	6	7

16.10 enhancing the speed of adoption of the latest technological innovations in processes	1	2	3	4	5	6	7
16.11 increasing the rate of change in processes, techniques and technology	1	2	3	4	5	6	7
16.12 rewarding innovators (those who come up with new ways of doing things)	1	2	3	4	5	6	7
16.13 encouraging employee to try new and better ways of doing their job	1	2	3	4	5	6	7
16.14 promoting creative thinking and creativity	1	2	3	4	5	6	7

Appendix B

Thai Version of Final Instrument

แบบประเมินการจัดการความรู้ การจัดการด้านคุณภาพ และนวัตกรรมองค์กร

ขอขอบพระคุณเป็นอย่างยิ่งที่กรุณาให้ข้อมูลในการตอบแบบสอบถามครั้งนี้
ข้อมูลของท่านเป็นประโยชน์อย่างมากในการวิจัย
กรุณาตอบคำถามเกี่ยวกับองค์กรตามความคิดเห็นของท่าน

คำถามในส่วนแรกจะเกี่ยวกับข้อมูลพื้นฐานของท่านและองค์กร ในส่วนที่สอง สาม และสี่ จะเป็นคำถามเกี่ยวกับการจัดการความรู้ (Knowledge Management) การจัดการด้านคุณภาพ (Total Quality Management) และนวัตกรรมองค์กร (Organization Innovation Performance) ตามลำดับ โดยเป็นการประเมินว่าข้อความในแต่ละข้อตรงกับบริบทขององค์กรท่านมากน้อยเพียงใด สำหรับคำตอบจะมีหลายระดับ ตั้งแต่ไม่เห็นด้วยอย่างยิ่ง (1) จนถึงเห็นด้วยอย่างยิ่ง (7)

ส่วนที่ 1 ข้อมูลพื้นฐาน

1. องค์กรของท่านประกอบธุรกิจประเภทใด

   _____ ธุรกิจสิ่งทอ _____ ธุรกิจยานยนต์และชิ้นส่วนประกอบ

   _____ ธุรกิจโลหะภัณฑ์ _____ ธุรกิจเครื่องใช้ไฟฟ้า และอิเลคทรอนิกส์

   _____ อื่นๆ โปรดระบุ _____

2. องค์กรของท่านเป็น

   _____ องค์กรระหว่างประเทศ

   _____ องค์กรร่วมทุน

   _____ องค์กรของคนไทย

3. หากคำตอบของท่านในข้อ 2 เป็นองค์กรระหว่างประเทศ หรือองค์กรร่วมทุน โปรดระบุที่ตั้งสำนักงานใหญ่ของท่าน

   _____ สหรัฐอเมริกา _____ เอเชีย

   _____ ยุโรป _____ อื่นๆ โปรดระบุ _____

4. The total number of employees in my organization is

   _____ 1-100 _____ 101-1,000

   _____ 1,001-10,000 _____ มากกว่า 10,001

5. ตำแหน่งปัจจุบันของท่านในองค์กร

   _____ ผู้จัดการฝ่ายพัฒนาทรัพยากรมนุษย์ _____ อื่นๆ โปรดระบุ _____

6. ระยะเวลาที่ท่านอยู่ในตำแหน่งงานปัจจุบัน

_____ 0-2 ปี _____ 3-5 ปี

_____ 6-8 ปี _____ ตั้งแต่ 8 ปีขึ้นไป

7. เพศ

_____ ชาย _____ หญิง

8. ท่านอยู่ในกลุ่มช่วงอายุใด

_____ 21-30ปี _____ 31-40ปี

_____ 41-50 ปี _____ 51-60 ปี

_____ มากกว่า 60 ปีขึ้นไป

9. การศึกษาระดับสูงสุดของท่าน

_____ปริญญาตรี หรือเทียบเท่า _____ ปริญญาโท

_____ ปริญญาเอก _____ อื่นๆ โปรดระบุ _____

ส่วนที่ 2 การประเมินการจัดการความรู้ (Knowledge Management)

การจัดการความรู้ (KM) คือ กระบวนการแลกเปลี่ยนเรียนรู้ ข้อมูล องค์ความรู้ หรือความชำนาญในด้านต่างๆที่จำเป็นในการทำงาน เช่น การแก้ไขปัญหาและตัดสินใจ และการวางแผนกลยุทธ์ เป็นต้น โดยกระบวนการจัดการความรู้นั้น แระกอบไปด้วย การได้มาและการสร้างความรู้ (Knowledge acquiring and creation) การจัดเก็บความรู้ (Knowledge capturing and storage) การแลกเปลี่ยนความรู้(Knowledge dissemination and transfer) และการประยุกต์นำความญู้ไปใช้ (Knowledge application)

กรุณาตอบคำถามตามประสบการณ์ของท่านในตำแหน่งงานปัจจุบัน โดยที่ 1=ไม่เห็นด้วยอย่างยิ่ง และ 7=เห็นด้วยอย่างยิ่ง

10. องค์กรของข้าพเจ้า							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
10.1 มีโปรแกรมการจัดการความรู้	1	2	3	4	5	6	7
10.2 มีการฝึกอบรมเกี่ยวการจัดการความรู้	1	2	3	4	5	6	7

11. เมื่อเปรียบเทียบกับคู่แข่งที่สำคัญแล้ว องค์กรของข้าพเจ้า							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
11.1 ประสบความสำเร็จมากกว่า	1	2	3	4	5	6	7
11.2 เติบโต และขยายกิจการเร็วกว่า	1	2	3	4	5	6	7
11.3 มีนวัตกรรมใหม่ๆ มากกว่า	1	2	3	4	5	6	7

12. องค์กรของข้าพเจ้ามีประสิทธิภาพในการ							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
12.1 มีกระบวนการประยุกต์ใช้ความรู้ที่ได้จากประสบการณ์	1	2	3	4	5	6	7
12.2 ใช้เทคโนโลยีที่ช่วยให้พนักงานดึงความรู้ที่จัดเก็บอยู่มาใช้ได้ (เช่น ข้อมูลส่วนบุคคล ข้อมูลเฉพาะระบบ เป็นต้น)	1	2	3	4	5	6	7
12.3 มีกระบวนการสำหรับเผยแพร่ความรู้ไปทั่วองค์กร	1	2	3	4	5	6	7
12.4 มีกระบวนการสำหรับคัดเลือก กลั่นกรองความรู้	1	2	3	4	5	6	7
12.5 ประยุกต์ความผิดพลาดในอดีตให้เป็นความรู้	1	2	3	4	5	6	7
12.6 มีการฝึกอบรมเพื่อเป็นการแลกเปลี่ยนเรียนรู้อยู่เป็นประจำ	1	2	3	4	5	6	7
12.7 ใช้เทคโนโลยีเพื่อช่วยให้พนักงานทำงานร่วมกับผู้อื่นได้	1	2	3	4	5	6	7
12.8มีระบบตอบแทน หรือให้รางวัลที่เป็นมาตราฐานสำหรับการแลกเปลี่ยนความรู้	1	2	3	4	5	6	7
12.9ใช้เครื่องมือที่เป็นลายลักษณ์อักษรต่างๆ สำหรับการจัดเก็บความรู้จากพนักงาน เช่น จดหมายข่าวและคู่มือการปฏิบัติงาน	1	2	3	4	5	6	7
12.10มีระบบ หรือวิธีการได้มาซึ่งความรู้จากแหล่งต่างๆ เช่น จากพนักงาน ลูกค้า และบริษัทคู่แข่ง	1	2	3	4	5	6	7
12.11สร้างความรู้ใหม่จากความรู้เดิมที่มีอยู่เดิมเพื่อใช้ในอน	1	2	3	4	5	6	7

าคต							
12.12นำเสนอความคิดใหม่ๆ ของพนักงานให้พนักงานคนอื่นๆ ได้รับทราบ	1	2	3	4	5	6	7
12.13มีเครื่องมือ ระบบ หรือวิธีการสำหรับการแปลงความรู้ไปใช้ในการออกแบบผลิตภัณฑ์ใหม่ๆ	1	2	3	4	5	6	7
12.14มีเครื่องมือในการสร้างสรรค์ความรู้ใหม่ๆ จากความรู้ที่มีอยู่เดิมเพื่อปรับปรุงโครงการอย่างต่อเนื่อง	1	2	3	4	5	6	7
12.15มีกระบวนการสำหรับการประยุกต์ใช้ความรู้เมื่อมีความจำเป็น หรือเมื่อมีการแข่งขันขึ้น	1	2	3	4	5	6	7
12.16ออกแบบกระบวนการเพื่อช่วยให้การถ่ายโอนความรู้ระหว่างหน่วยงานง่ายขึ้น	1	2	3	4	5	6	7
12.17ซึมซับความรู้จากตัวบุคคลสู่องค์กร	1	2	3	4	5	6	7
12.18มีระบบ หรือวิธีการสำหรับการถ่ายโอนความรู้จากตัวบุคคลไปยังองค์กร	1	2	3	4	5	6	7
12.19มีระบบ หรือวิธีการป้องกันการใช้ความรู้ที่ไม่เหมาะสม	1	2	3	4	5	6	7
12.20มีความรู้ในรูปแบบที่พร้อมใช้งานที่มีความจำเป็น เช่น อินทราเน็ต อินเตอร์เน็ต ห้องสมุด ศูนย์ค้นคว้า และแหล่งอื่นๆ	1	2	3	4	5	6	7
12.21ซึมซับความรู้จากหุ้นส่วนธุรกิจสู่องค์กร	1	2	3	4	5	6	7
12.22ใช้โปรแกรมคอมพิวเตอร์สำหรับการจัดเก็บความรู้เพื่อให้พนักงานทุกคนเข้าถึงได้อย่างสะดวก	1	2	3	4	5	6	7
12.23ได้มาซึ่งความรู้เกี่ยวกับผลิตภัณฑ์ในอุตสาหกรรมของตน	1	2	3	4	5	6	7
12.24มีกลไก ระบบ หรือวิธีการสำหรับการจดลิขสิทธิ์ความรู้ใหม่ๆ	1	2	3	4	5	6	7
12.25สนับสนุน ส่งเสริมให้พนักงานแสดงความคิดใหม่ๆ ได้อย่างเต็มที่ โดยปราศจากความกลัว	1	2	3	4	5	6	7

12.26จัดทำบันทึกความคิดและประสบการณ์ของพนักงานเพื่อใช้ในการพัฒนาในอนาคต	1	2	3	4	5	6	7
12.27มีวิธีการที่หลากหลายสำหรับพนักงานในการประยุกต์ใช้ความรู้ของตนกับสถานการณ์ใหม่ๆ	1	2	3	4	5	6	7
12.28การแปลงใช้ความรู้เพื่อการออกแบบผลิตภัณฑ์ใหม่ๆ	1	2	3	4	5	6	7

ส่วนที่ 3 การประเมินการจัดการคุณภาพ (Total Quality Management)

การจัดการคุณภาพ (TQM) คือ แนวความคิดการบริหารแบบบูรณาการณ์ที่มุ่งเน้นการพัฒนาคุณภาพของผลิภัณฑ์ กระบวนการและการบริการเพื่อให้ได้ตรงตามความต้องการของลูกค้า หรือเนื่อความคาดหวังของลูกค้า

13. องค์กรของข้าพเจ้า							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
13.1 ได้รับมาตราฐาน ISO 9000	1	2	3	4	5	6	7
13.2 ได้รับมาตราฐานด้านคุณภาพอื่นๆ ระบุ _____	1	2	3	4	5	6	7
13.3 มีโปรแกรมการจัดการด้านคุณภาพหรือการประกันคุณภาพ	1	2	3	4	5	6	7
13.4 มีการฝึกอบรมเกี่ยวกับการจัดการคุณภาพ	1	2	3	4	5	6	7
13.5 มีการฝึกอบรม และมีการ update มาตราฐาน ISO เป็นประจำ	1	2	3	4	5	6	7

14. องค์กรของข้าพเจ้า							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
14.1 ผู้บริหารระดับสูงติดตามการแนะนำในการพัฒนา	1	2	3	4	5	6	7
14.2 ส่งเสริมการมีส่วนร่วมของพนักงานในการวางแผน	1	2	3	4	5	6	7

14.3 เป้าหมายสำคัญคือการปรับปรุงคุณภาพอย่างต่อเนื่อง	1	2	3	4	5	6	7
14.4 พนักงานในแต่ละหน่วยงานทราบว่าใครคือลูกค้าของตน	1	2	3	4	5	6	7
14.5 ผู้จัดการและพนักงานมักจะประชุมทบทวนประเด็นเรื่องคุณภาพอย่าสม่ำเสมอ	1	2	3	4	5	6	7
14.6 บุคคลอื่นสามารถเข้าถึงข้อมูลด้านคุณภาพได้ง่าย	1	2	3	4	5	6	7
14.7 ผู้บริหารระดับสูงคำนึงถึงเรื่องคุณภาพในฐานะที่เป็นเรื่องสำคัญต่อการแข่งขันของธุรกิจ	1	2	3	4	5	6	7
14.8พนักงานวิเคราะห์ผลงานของตนเพื่อปรับปรุงการทำงานของตน	1	2	3	4	5	6	7
14.9มีระบบการให้คำแนะนำพนักงานตลอดเวลา	1	2	3	4	5	6	7
14.10ลูกค้าช่วยองค์กรในการออกแบบสินค้าใหม่	1	2	3	4	5	6	7
14.11 มีการนำข้อมูลด้านคุณภาพของการทำงาน (ต้นทุนด้านคุณภาพ สินค้าที่ไม่ได้คุณภาพ การทำงานที่ผิดพลาดและสินค้าที่ทีกำจัดทิ้งเนื่องจากไม่ได้คุณภาพ) มาใช้ในการจัดการคุณภาพ	1	2	3	4	5	6	7
14.12ผู้บริหารแน่ใจว่าพนักงานตระหนักถึงภารกิจของตนในภาพรวม	1	2	3	4	5	6	7
14.13มีการสนับสนุนให้ลูกค้าให้ข้อมูลตอบกลับแก่องค์กร	1	2	3	4	5	6	7
14.14ผู้จัดการมีบทบาทสำคัญในการช่วยให้มีการพัฒนาอย่างต่อเนื่อง	1	2	3	4	5	6	7
14.15พนักงานทำบันทึกคุณภาพงานของตน	1	2	3	4	5	6	7
14.16ผู้บริหารระดับสูงสนับสนุนงานด้านกลยุทธ์	1	2	3	4	5	6	7
14.17สนับสนุนให้พนักงานพัฒนาคุณภาพผลิตภัณฑ์ของตน	1	2	3	4	5	6	7
14.18มีการประเมินผลการปฏิบัติงานของพนักงานในเรื่องคุณภาพของการปฏิบัติงาน	1	2	3	4	5	6	7

14.19ฝึกอบรมและพัฒนาพนักงานอย่างสม่ำเสมอเพื่อประโยชน์ต่องานที่ตนเองรับผิดชอบ	1	2	3	4	5	6	7
14.20พนักงานประเมินความต้องการของลูกค้าภายนอกองค์กรอยู่เสมอ	1	2	3	4	5	6	7
14.21พนักงานเก็บข้อมูลเรื่องเงวลาที่ใช้ในการทำงานชิ้นหนึ่งๆ	1	2	3	4	5	6	7
14.22ผู้บริหารระดับสูงกำหนดเป้าหมายชัดเจนสำหรับการพัฒนาด้านคุณภาพ	1	2	3	4	5	6	7
14.23 พนักงานเชื่อว่าการปรับปรุงคุณภาพเป็นงานของตน	1	2	3	4	5	6	7
14.24สนัสนุนให้พนักงานทำงานเป็นทีม	1	2	3	4	5	6	7
14.25พนักงานประเมินความต้องการของลูค้าภายในอยู่เสมอ	1	2	3	4	5	6	7
14.26กิจกรรมในองค์กรมีส่วนช่วยเพิ่มความพึงพอใจให้ลูกค้า	1	2	3	4	5	6	7
14.27ส่งเสริมให้พนักงานตัดสินใจด้วยตนเอง	1	2	3	4	5	6	7
14.28พนักงานเก็บข้อมูลที่เกี่ยวกับคุณภาพงานของตน	1	2	3	4	5	6	7
14.29ส่งเสริมให้พนักงานมีปฏิสัมพันธ์กับลูกค้า	1	2	3	4	5	6	7
14.30ผู้บริหารระดับสูงรับผิดชอลเรื่องคุณภาพ	1	2	3	4	5	6	7
14.31พนักงานคำนึงถึงลูกค้าของตนขณะปฏิบัติงาน	1	2	3	4	5	6	7
14.32พนักงานเก็บข้อมูล หรือใช้ชาร์ทสำหรับตรวจสอบคุณภาพงานของตน	1	2	3	4	5	6	7
14.33สนับสนุนพนักงานที่มีการปฏิบัติงานด้านคุณภาพที่เป็นเลิศ	1	2	3	4	5	6	7
14.34ผู้บริหารระดับสูงจัดให้มีพนักงานมากพอสำหรับการทำกิจกรรมด้านคุณภาพ	1	2	3	4	5	6	7
14.35พนักงานเก็บขข้อมูลเพื่อหาแนวทางการปรับปรุงการทำงาน	1	2	3	4	5	6	7

ส่วนที่ 4 การประเมินนวัตกรรมขององค์กร (Innovation Performance)

15. เมื่อเปรียบเทียบกับบริษัทคู่แข่งที่สำคัญแล้ว องค์กรของข้าพเจ้า							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
15.1 ประสบความสำเร็จมากกว่า	1	2	3	4	5	6	7
15.2 กำลังเติบโต และขยายกิจการเร็วกว่า	1	2	3	4	5	6	7
15.3 มีการริเริ่มสร้างสรรค์สิ่งใหม่มากกว่า	1	2	3	4	5	6	7

16. องค์กรของข้าพเจ้ามีประสิทธิภาพในการ							
	ไม่เห็นด้วยอย่างยิ่ง						เห็นด้วยอย่างยิ่ง
16.1 เพิ่มระดับความทันสมัยแปลกใหม่ในผลิตภัณฑ์	1	2	3	4	5	6	7
16.2 ส่งเสริมความสามารถในการสร้างสรรค์	1	2	3	4	5	6	7
16.3 มีส่วนร่วมในการแข่งขันด้านเทคโนโลยี	1	2	3	4	5	6	7
16.4 เพิ่มความเร็วในการพัฒนาผลิตภัณฑ์	1	2	3	4	5	6	7
16.5 ทบทวนความทันสมัยในกระบวนการใช้เทคโนโลยี	1	2	3	4	5	6	7
16.6 เพิ่มอัตราการนำผลิตภัณฑ์ใหม่สู่ตลาด	1	2	3	4	5	6	7
16.7 สนับสนุนอย่างจริงจังให้พนักงานใช้ความคิดสร้างสรรค์	1	2	3	4	5	6	7
16.8 ให้รางวัลกับผู้ที่ค้นหากระบวนการทำงานใหม่ๆ	1	2	3	4	5	6	7
16.9 เพิ่มอัตราการเปลี่ยนแปลงในกระบวนการทำงาน	1	2	3	4	5	6	7
16.10 เพิ่มความรวดเร็วในกระบวนการนำนวัตกรรมใหม่มาใช้	1	2	3	4	5	6	7
16.11 ให้รางวัลกับผู้สร้างสรรค์ผลงานใหม่ๆ	1	2	3	4	5	6	7
16.12 ใช้เทคนิคล่าสุดสำหรับการสำหรับการพัฒนาผลิตภัณฑ์ใหม่ ๆ	1	2	3	4	5	6	7
16.13 เพิ่มจำนวนผลิตภัณฑ์ใหม่ๆ ที่ตลาดยังไม่เคยมีมาก่อนเพื่อเป็นรายแรกของตลาด	1	2	3	4	5	6	7
16.14 สนับสนุนให้พนักงานทดลองใช้วิธีการอื่นๆ ที่ดีกว่าในการทำงาน	1	2	3	4	5	6	7

Appendix C

Thai Cover Letter

1014 27th Ave. SE #B
Minneapolis, MN 55414
U.S.A.

5 มีนาคม 2551

เรียน ผู้จัดการฝ่ายทรัพยากรมนุษย์

ดิฉัน นางพิมพิมน คงพิชญานนท์ นักศึกษาปริญญาเอก ด้านการพัฒนาทรัพยากรมนุษย์ ณ มหาวิทยาลัยมินิโซต้า มลรัฐมินิโซต้า สหรัฐอเมริกา
ดิฉันขอความร่วมมือจากท่านในการตอบแบบสอบถาม ซึ่งเป็นส่วนหนึ่งของวิทยานิพนธ์ หาท่านต้องกานบทสรุปของงานวิจัยชิ้นนี้ กรุณาให้ที่อยู่ในส่วนท้ายของแบบสอบถาม ดิฉันจะส่งบทสรุปไปให้ภายหลัง

วัตถุประสงค์ของงานวิจัยชิ้นนี้ เพื่อที่จะศึกษาความสัมพันธ์ระหว่างการจัดการความรู้ (Knowledge Management) การจัดการด้านคุณภาพ (Total Quality Management) และนวัตกรรมขององค์กร (Organization Innovation Performance)
การศึกษานี้จะเป็นประโยชน์กับองค์กรที่ต้องการนำการจัดการความรู้มาใช้ เพื่อก่อให้เกิดประโยชน์สูงสุด โดยผ่านกระบวนการจัดการทางด้านคุณภาพ บทสรุปของงานวิจัยนี้อาจช่วยให้องค์กรเพิ่มขีดความสามารถในการแข่งขันได้

คำตอบของท่านไม่มีถูกหรือผิด ดังนั้นขอความกรุณาตอบคำถามทุกข้อตามความคิดเห็นของท่าน คำตอบของท่านจะไม่ได้รับการเผยแพร่ในกรณีใดๆ ทั้งสิ้น ดิฉันจะนำเสนอเฉพาะบทสรุปที่วิเคราะห์แล้วเท่านั้น

ถ้าท่านไม่ต้องการหรือไม่สามารถตอบแบบสอบถาม กรุณาส่งแบบสอบถามกลับ และทำเครื่องหมายที่ส่วนท้ายของแบบสอบถามว่าท่านไม่สามารถตอบแบบสอบถามฉบับนี้ได้ ด้วยเหตุนี้ท่านจะไม่ได้รับแบบสอบถามอีกครั้ง และจะไม่ได้รับโทรศัพท์ตามผลของแบบสอบถาม ดิฉันขอรับรองว่าการตัดสินใจของท่านจะไม่มีผลต่อความสัมพันธ์ของท่านและมหาวิทยาลัยมินิโซต้าและองค์กรของท่านเอง

หากท่านต้องการแบบสอบถามชุดภาษาอังกฤษ กรุณาติดต่อได้ที่ที่อยู่ข้างต้นหรือทาง email address: pimpimons@hotmail.com

เมื่อท่านตอบแบบสอบถามเรียบร้อยแล้ว กรุณาส่งกลับในซองที่แนบมาให้ หากท่ามีคำถามใดๆ กรุณาติดต่อดิฉันได้ที่ที่อยู่ข้างต้นหรือ email address:

pimpimons@hotmail.comหรืออาจารย์ที่ปรึกษา Prof. Dr. Gary McLean, email address: mclea002@umn.edu

ขอแสดงความนับถือ

นางพิมพิมน คงพิชญานนท์

Appendix D

Consent Form

Consent Form

Perceived Relationships among Knowledge Management, Total Quality Management, and Organization Innovation Performance: A Thai Study

You are invited to participate in a dissertation study on the relationships among knowledge management, total quality management, and organization innovation performance.

Expected participants are managers who work in Human Resource function and managers in an organization. We ask that you to read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Pimpimon Kongpichayanond, a PhD candidate of Human Resource Development at the University of Minnesota. The purpose of this study is to investigate the relationships among knowledge management, total quality management, and organization innovation performance.

Procedures:

If you agree to be in this study, we would ask you to do a survey. The survey will ask you to identify the characteristics of your organization knowledge management initiatives, total quality management, and organization innovation performance, based on your observation. It takes approximately 15 minutes to complete the questionnaire.

Risks and Benefits of being in the Study

The study will potentially contribute to existing knowledge and research regarding knowledge management initiatives, total quality management, and organization innovation performance. It may provide new ideas as to how to enhance organization

innovation performance through knowledge management and total quality management. There will be no physical or psychological risks in participating in this study.

Compensation:

There will be no other compensation for participating in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report the researcher might publish, the researcher will not include any information that will make it possible to identify you and your organization. Research records will be stored securely and only researcher and the researcher's advisor will have access to the data.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or your organization. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

You may contact the researcher Pimpimon Kongpichayanond at pimpimons@hotmail.com, or by phone at 651-270-0169. The researcher's advisor is Dr. Gary N. McLean. You may contact Dr. Gary N. McLean at mclea002@umn.edu or by phone at 612-624-4901. If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D528, Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You can copy and keep this page for your record.

If you agree to participate in this study, please sign here to indicate you have read the consent form and return this page together with your completed questionnaire.

Signature: _____