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An investigation into the factors affecting knowledge management adoption and practice in the life insurance business

Li-Su Huang[1]
Mohammed Quaddus[2]
Anna L. Rowe[2] and
Cheng-Po Lai[3]

[1]Mingdao University, Taiwan; [2]Curtin University, Australia; [3]Nanhua University, Taiwan

Correspondence: Li-Su Huang,
Department of Finance, Mingdao University,
369 Wen-Hua Road, Peetow,
Changhua 52345, Taiwan.
Tel: +886 4 887 6660, ext. 7710;
Fax: +886 4 887 9013;
E-mail: lisuhuang@mdu.edu.tw

Abstract
Knowledge management (KM) is crucial for organizations to enhance competitive advantage. While the issues of KM have been widely discussed by numerous researchers, there is a paucity of studies pertaining to KM adoption and practice for the life insurance industry. Therefore, this paper aims to investigate the main factors affecting the life insurance business in adopting and applying KM. An exploratory field study utilizing an inductive methodology involving a multiple-case study approach was undertaken by conducting interviews with 10 key knowledge workers from life insurance enterprises in various stages of KM development and use. We utilized content analysis techniques to identify the factors with their associated variables and further developed a research model. This study offers a comprehensive model for future KM research and provides managerial implications for organizations, particularly life insurance enterprises, to better realize the worth of KM and the possible impediments involved in the processes of adopting and implementing KM.
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Introduction

The trend of globalization does not only provide opportunities for firms to bring products and services to wider market, but also increases the intensity of competition. To survive in such an extremely competitive environment, organizations should utilize their knowledge resources effectively for creating competitive advantages and developing a greater ability to act and adapt (Handzic *et al*., 2008). Treating knowledge as a significant organizational resource, studies in the area of knowledge management (KM) have grown dramatically over the last decade (Hislop *et al*., 2000; Feng *et al*., 2004). Particularly, KM has become the focal point for debates on mechanisms to facilitate firms acquiring greater competitive edge in the emerging global information economy (Clarke & Turner, 2004). Thus, according to Carlsson (2001, p. 195), KM in this study is defined as 'the process of identifying, managing and leveraging individual and collective knowledge to support the firm becoming more competitive'. The definition highlights the primary components of KM in the increasingly competitive world. First, both individual and collective knowledge should be identified. Second, KM involves the process of collecting and integrating the knowledge. Third, KM is primarily employed to increase competitiveness.

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Life insurance can be seen as an arrangement through which the risk of specific individuals can be shared by the general majority of people (Hsiao, 2003). In contrast to other industries, the products sold by the life insurance business are comparatively 'invisible' and 'untouchable' (Hsiao, 2003). 'People' play an important role in conveying the knowledge and services to the customers in the life insurance industry. Besides, most of the life insurance contracts were long term and therefore the life insurance enterprises should provide lasting, sometimes lifelong, services for the customers. KM would be imperative for life insurance enterprises to enhance performance and gain a competitive edge (Wang, 2005). KM has been enriched with methods, ideas and technologies by contributions from diverse sources as management science, social science and information science areas (Gherardi, 2000; Spender, 2003; Hung, 2004). However, there is a dearth of empirical studies of KM adoption and practice conducted in the life insurance industry. Meanwhile, little research is available on people's perceptions that may affect the practice of KM through their attitudes. Therefore, some questions emerge as: What must be done to adopt or initiate KM in the life insurance business? What factors are important in KM adoption and applications in the life insurance enterprises? These are the main research questions in this study. This study addresses these research questions via undertaking a qualitative field study among the life insurance enterprises in Taiwan. A conceptual framework was suggested based on extensive literature reviews on Innovation Diffusion (ID), Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA). Utilizing semi-structured interview techniques, 10 in-depth interviews were conducted to collect the data to develop a comprehensive model. The primary objectives of this research are therefore as follows:

(1) To identify the factors and variables for or against KM adoption and practice through the employees' perceptions in the life insurance business in Taiwan.
(2) To examine how the factors and variables affect KM adoption and practice in this context.
(3) To investigate how KM is perceived to affect the performance of the organization in this context.

This article is organized into five sections beginning with this introduction. The next section presents the research background with relevant KM literature and the main theories applied in forming the conceptual framework. This is followed by research method section, which describes the processes of data collection and data analysis approach. Emanating from the data, the subsequent section presents the results of this study revealing the main factors and variables affecting the adoption and practice of KM in the life insurance enterprises. A comprehensive model of KM adoption and practice is thus emerged from the literature review and the field study. Finally, conclusions and future research directions are presented.

Research background

The life insurance business has been growing exponentially and playing a significant role in the financial industry in Taiwan. According to the important indexes of insurance industry in Taiwan (Taiwan Insurance Institute, 2009), the total asset of Taiwan life insurance industry in 2007 was NT$ 8.721 billion or 21.86% of the total assets of financial institutions nation wide. The population of household registered in Taiwan was 22.958 million up to 2007, and the ratio of life insurance policies to population was 1.96%. The premium income of Taiwan life insurance industry in 2007 was US$ 49,813 million and ranked top 10 globally. Due to the enormity of premium income from the general public, and the associated social responsibility, the life insurance enterprises aim at providing better professional knowledge and services to achieve superseding competitive advantages.

The life insurance industry is an example of a knowledge-based industry with its main products being insurance contracts, which are commitments supported by professional knowledge and services. Nonetheless, the life insurance business has been facing the problems involved in dealing with more and more documents, customers' demands for rapid and quality services, as well as selling various and complicated policies (Wang, 2005). The CEO of Cathay Life Insurance Company, ranking top in the life insurance industry in Taiwan, sensed that it had been losing competitive advantages since the organization was large with more than 20,000 employees and information could not be transmitted smoothly. Therefore, Cathay Life Insurance Company recognized the significance of KM and inaugurated its so-called 'quiet revolution', that is, KM project (Microsoft, Taiwan, 2005). Given the fact that KM has been widely applied in organizations (Bonner, 2000; Alavi & Leidner, 2001), the topic of KM has not been well explored by researchers empirically in the life insurance sector. Therefore, this research attempts to fill this gap by examining the adoption and practice of KM among life insurance enterprises based on the literature as elaborated below.

Knowledge and KM

Concepts and practices evolved through the 1990s realized that knowledge was perhaps the critical resource, compared to land, machines or capital (Drucker, 1993; Earl, 2001). The nature of knowledge has been described as 'justified true belief' (Nonaka & Takeuchi, 1995). Nonetheless, definitions of knowledge range from 'complex, accumulated expertise that resides in individuals and is partly of largely inexpressible' to 'much more structured and explicit content' (Davenport & Prusak, 1998; Becerra-Fernandez & Sabherwal, 2001). According to Davenport and Prusak (1998), knowledge is a fluid of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. Moreover, Bollinger and Smith (2001) describe knowledge as 'the understanding, awareness, or familiarity

acquired through study, investigation, observation, or experience over the course of time'; that is, knowledge is an individual's interpretation of information based on personal experiences, skills and competencies. For example, in the case of life insurance business, 'knowledge' comprises the familiarity and professional capability in underwriting, claim, customer services and so on.

KM has also been defined in numerous ways depending on the purpose of research. Alavi and Leidner (1999) define KM as 'a systemic and organizationally specified process for acquiring, organizing and communicating both tacit and explicit knowledge for employees so that other employees may make use of it to be more effective and productive at work'. Duffy (1999) describes KM as 'a process capitalizing on organizational intellect and experience to drive innovations'. The American Productivity & Quality Center (2007) advocates that KM is the strategies and processes of identifying, capturing and leveraging knowledge to help the firm compete. Earl (2001) suggests that KM can be viewed from seven dimensions with their focuses as follows: (i) system: technology; (ii) cartographic: maps; (iii) engineering: processes; (iv) commercial: income; (v) organizational: networks; (vi) spatial: space; and (vii) strategic: mindset; namely, it aims at knowledge capability and knowledge is seen as a key resource and KM as a way to gain competitive advantage. This research mainly takes the strategic standpoints and adopts the definition, as stated earlier in the introduction, proposed by Carlsson (2001).

Managing knowledge well can develop new opportunities, creating value for customers, obtaining competitive advantages or improving performance (Lloria, 2008). The activities of KM include knowledge capture, documentation, retrieval and reuse, creation, transfer and sharing of its knowledge assets integrated in its operational and business processes (Dayan & Evans, 2006). The processes of KM adoption and practice would involve the systematic organization, planning, scheduling, monitoring, and deployment of people, processes, technology and environment, with appropriate targets and feedback mechanisms, to facilitate the retention, sharing, identification, acquisition, utilization of knowledge and new ideas, in order to achieve strategic aims, for example, improved competitiveness or improved performance, subject to financial, legal, resource, political, technical, cultural and societal constrains (Lehaney *et al*., 2004).

The empirical studies on KM in Taiwan are summarized in Table 1. Most of the existing research in Taiwan centres on the subjects of KM strategies and their effects on performance. Few studies were found to investigate the external factors that could affect KM applications via employees' perceptions. However, the review identifies the significance of KM strategies and mechanisms with their influences on performance, and reveals a list of external factors affecting the adoption and practice of KM in a context of the organizations in Taiwan.

ID and related theoretical bases

Rogers (1995) depicts an innovation as an idea, practice or object that is perceived as new by an individual or another unit of adoption. While KM has been used and operated in the business world for decades, its applications (e.g., recognition of knowledge, development of information system and support of organization), have only been initiated recently in the life insurance enterprises (Yang, 2004). Accordingly, KM is viewed as an innovation to Taiwan life insurance enterprises and their employees in this study. The role of KM among the life insurance enterprises can thus be examined by the following innovation characteristics: (i) relative advantage: how KM is perceived as better than the idea it supersedes; (ii) compatibility: how KM is seen consistent with the values, experiences and need of potential adopters; (iii) complexity: the difficulty of understanding and using KM; (iv) trialability: the degree to which KM may be experimented with on a limited basis; and (v) observability: the ability to have the results of KM visible to others. Further, diffusion of an innovation is proposed by Rogers (1995) to be the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). In this study, the social system, that is, a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal (Rogers, 1995), refers to a life insurance enterprise along with its employees. Hence, KM adoption and practice refers to the process by which KM is communicated via certain channels over time among the employees of the life insurance enterprises. ID has attracted much interest researchers in several areas such as new information technology (IT), electronic data interchange and internet (Baptista, 1999; Carter *et al*., 2001; Wolcott *et al*., 2001). However, there is little literature found on the adoption and use of KM in the life insurance domain. Thus, this study lays emphasis on the adoption and diffusion of innovation to develop a KM model for the life insurance business.

The TRA, drawn from social psychology, has been suggested as a primary theoretical foundation and gone through rigorous testing in diverse disciplines predicting human behaviours (Ajzen & Fishbein 1980; Swanson, 1982; Sheppard *et al*. 1988; Venkatesh *et al*., 2003). It is suggested that a person's behaviour is a function of the person's intention determined by the attitude toward the act and the beliefs about the expectations of others, that is, social normative beliefs (Ajzen & Fishbein, 1980). The person's attitude toward the behaviour is affected by the beliefs that the behaviour will lead to certain outcomes and by his or her evaluation of the outcomes. The subjective norms are influenced by the beliefs that specific referents think that the person should or should not perform the behaviour and by the motivations to comply with the specific referents (Ajzen & Fishbein, 1980). Extended from the TRA, TAM (Davis, 1986) proposes that a person's intention to use technology is

Table 1 Empirical studies on KM in Taiwan

Industry	*Main findings*	*Reference*
High-technology, conventional and financial industries	1. Over 50% of the major corporations were currently involved in KM. 2. KM applications usually began with internal logistical operations. 3. KM activities were mostly carried out via traditional education and training. 4. The corporations lacked systematic KM technical tools. 5. The relationship between KM and performance was found to be significant in the high-tech industry, whereas insignificant in the conventional industry; little KM was found in the financial industry' practical operations. 6. KM implementation was reliant on the core value of individual corporation.	Chou (2001)
High-technology	1. The characteristics of an organization would affect its KM culture. 2. KM strategies played a moderating role in the relationship between KM culture and KM performance. 3. KM performance had positive effects on the organizational performance.	Wang (2002)
High-technology	1. Systematic KM strategies resulted in better organizational performance in terms of efficiency, product quality, innovativeness and the ability to respond to customers. 2. The characteristics of a KM system had a positive impact on the organizational performance.	Wu (2004)
Steel	KM implementation, for example, Knowledge accumulation, transfer and diffusion, would influence the core competences of the engineers, which in turn affected their job performances.	Lin (2001)
Biotechnology	KM strategies would affect the business performance via their impacts on organizational core competence.	Wu (2003)
Manufacture	1. The major KM mechanisms were education, training, knowledge transferring and knowledge utilization. 2. Knowledge-oriented culture and the emphasis on innovation were found to have a significant, positive influence on KM performance.	Wu (2004)
Pharmaceutical	The seven critical factors in adopting a KM system were: a benchmark strategy and knowledge structure, the organizational culture, IT, employee involvement and training, leadership and commitment of senior management, a learning environment and resource control, as well as evaluation of professional training and teamwork.	Hung *et al.* (2005)
Banking	The level of KM and its applications, for example, active, moderate and passive, were shown to have impact on the bank performance.	Wang (2004)
Life insurance	1. Most of the attention was paid to KM system development, while the acknowledgment regarding KM had not been reached among the employees extensively. 2. There was in general a lack of KM divisions that were specifically designed for promoting and implementing KM. 3. The KM projects could hardly result in significant performance in a short time. 4. Lack of corporate vision may make it difficult to put KM into place in a life insurance company. 5. The life insurers should adopt innovative strategies and actions to create the business value.	Yang (2004)

determined by perceived usefulness (PU) and perceived ease of use (PEOU). PU refers to the degree to which a person believes that using a particular system would enhance his or her job performance, while PEOU refers to the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). Davis *et al.* (1992) expanded TAM to suggest that an individual's intention to use computers is influenced by extrinsic motivations, perceiving an activity to be instrumental in achieving valued outcomes, as well as intrinsic motivations, referring to the performance of an activity for no apparent reinforcement other than the process of performing the activity *per se*. TAM has been extensively used and accepted as a robust model to investigate IT acceptance and usage (Taylor & Todd, 1995; Venkatesh *et al.*, 2003).

Although little work has been published utilizing the TRA and TAM on the research of KM, the TRA helps explaining why an employee would accept/apply KM. The suggestions of TAM can be applied in examining what benefits KM would bring to the employees in increasing their job performance and whether KM projects with relevant IT usage are easy or complicated for the employees. Yang (2004) also reported that the life insurance enterprises in Taiwan put most of their efforts on IT in having KM into place. Therefore, it is considered plausible that the TRA and TAM may enlighten our understanding of this phenomenon in this research.

Conceptual framework

There is abundant literature on the adoption and diffusion of innovations (Norton and Bass, 1987; Nakicenovic & Grubler, 1991; Rogers, 1995; Quaddus & Intrapairot, 2001; Xu, 2003). Previous innovation studies have identified a number of factors which affect the adoption and diffusion of innovations (Belassi & Fadlalla, 1998; Agarwal & Prasad, 2000; Liu, 2004). Most of the innovation research also uses the TRA (Ajzen & Fishbein, 1980) and Davis (1986) TAM. The TRA model (Ajzen & Fishbein, 1980) posits that external variables, for example, individual demographic variables, would affect intentions and behaviours indirectly through beliefs, outcome evaluations and normative beliefs. TAM studies, such as Davis (1986), Davis *et al.* (1989), Igbaria *et al.*, (1995) and Szajna (1996), point out that individuals, system design features and organizational characteristics could be the external variables that have influences on the technology acceptance and usage through perceived of usefulness, PEOU and attitudes. Both the TRA and TAM models provide a base for this research with the external variables as the causes of perceptions.

Furthermore, organizations have launched KM initiatives, to create strategic competitiveness (Holsapple & Wu, 2008) by promoting productivity (Wiig & Jooste, 2003), adding to agility (Dove, 2003), fostering customer loyalty (Housel & Bell, 2001) and increasing innovation (Amidon & Mahdjoubi 2003). Alavi and Leidner (1999) reported that the perceived organizational benefits of KM scheme could be shown in two primary dimensions: process improvement (e.g., enhancing communication, reducing problem-solving time, better serving the clients and providing accountability) and organizational outcomes (e.g., cost reduction, increased sales, personnel reduction and higher profitability). Consequently, this study postulates that, some external factors influence the employees' perceptions, namely 'PU', 'complexity' and 'subjective norm', which in turn affect their attitudes toward KM adoption, and the practice of KM would be influenced by such attitudes and have impact on the perceived performance for the organization.

Research method

While the conceptual framework developed for embracing KM is derived from generalizable TRA and TAM theoretical models, one must be mindful of the uniqueness of the life insurance business in Taiwan. First, KM in the life insurance sector has not been well investigated. Second, understanding the social construction and meaning of KM adoption in Taiwan may differ from those in the West, thereby requiring preliminary 'emic' analysis. An 'emic' research describes the unique values of a particular society (i.e., Taiwan), whereas an 'etic' analysis applies to generalised theoretical model across several societies (Brislin, 1976).

Hence, to fine-tune the proposed conceptual framework, which had been based on the literature, this research utilized an inductive methodology involving a multiple-case study approach (Yin, 2003). The choice of an inductive (qualitative) approach was governed by the lack of adequate existing KM research on the life insurance sector – particularly, in Taiwan. The strength of multiple cases lies in their capability to seek 'emic' knowledge from participants and permit replication logic, ensuring that the insights gained are not idiosyncratic to a single case but instead are consistently replicated (literally or theoretically) across multiple cases. In fact, its 'emphasis on developing constructs, measures and testable theoretical propositions makes inductive case research consistent with the emphasis on testable theory within mainstream deductive research' (Eisenhardt and Graebner, 2007, p. 25).

In developing a comprehensive research model for future survey, we conducted an exploratory field study to explore why and how the life insurance business would adopt and apply KM via their employees' believes, attitudes and activities. This qualitative field study of multiple-case approach focused on capturing respondents' interpretations of multiple realities rather than measuring an assumed single reality of adopting KM. The 'realities' presented by the interview participants must be interpreted and understood (Rowe, 2006).

According to Glock (1987), a major source of data in survey research was the qualitative interview conducted in the planning phases of the research. Such interviews, with a small but roughly representative sample of the population, provided an indispensable way to learn about the nature of variation and how to operationalize it (Glock, 1987). The details of our field study research processes are presented as follows.

Sample selection

The sample of this study relied on available subjects, who were close at hand or easily accessible (Zikmund, 2000). The main criteria for selecting the subjects were that they must be knowledge workers involved in some knowledge tasks in their organizations. There were 21 local life insurance enterprises and eight foreign life insurance enterprises operating in Taiwan (Taiwan Insurance Institute, 2009). Among the 29 life insurance enterprises

in Taiwan, 10 interviewees, including managers and staff from six life insurance companies with various backgrounds in different stages of KM practice, were invited via telephone to participate in the field study. In four participating companies, that is, enterprise B, enterprise C, enterprise D and enterprise F, two interviews were conducted for each company, respectively. All the participants took part in this research on a voluntary basis and were also diverse in terms of position, tenure and gender.

Data collection

The data were collected by using the semi-structured interview approach. An interview protocol was designed based on the conceptual framework as described above. The semi-structured interview protocol (see Appendix) aimed at exploring the factors and variables affecting the adoption and practice of KM in the life insurance enterprises. We developed the interview schedule following the guidelines proposed by Berg (2004). The guiding semi-structured questions focused on the following areas of information which was required in this research: (i) general perception and understanding of KM; (ii) the adoption and application processes of KM; (iii) the motivations to adopt and apply KM; (iv) the major factors influencing the initiation of KM in the organization and the links between those factors; (v) obstacles to having KM put into place in the organization; (vi) incentives that would encourage employees to apply KM; (vii) resources and facilitating factors of KM implementation; and (viii) the benefits of KM for both employees and the organization.

A pre-test was conducted using the guiding semi-structured questions to interview the first respondent. With minor adjustments made based on the feedbacks from the pre-test, the interview questions proved to be working well in achieving the research objectives of this study. Finally, 10 interviews in total were conducted in the field study. The tacit knowledge derived from initial interviews was of such in-depth quality that it facilitated the refinement of the interview protocol and sharpened research directions. The interviews were audio taped whenever possible and field notes were immediately documented within 3 days in Taiwan, so as not to lose the vital nuance and cues observed. The taped interviews were transcribed and rigorously reviewed for errors by the principal researcher. Tapes were carefully listened to following Strauss and Corbin (1990), and corrections were made.

Data analysis

The focus of this study also required that 'content analysis' (Patton, 1990; Berg, 2004; Silverman, 2000) of interview transcripts be used from the firm participants' perspective, leading to 'emic' or 'insiders' approach to the development of categories. As Patton (1990, p. 381) says, 'Content analysis is the process of identifying, coding, and categorizing the primary patterns in the data. This means analyzing the content of interviews and observations'.

Interviews and field notes are often not amenable to analyses until the information they convey has been condensed. An objective coding scheme was applied to interpret the interview transcripts and field notes. As the nature of this study is more exploratory than confirmatory, content analysis is cost-effective and useful in analysing interview data (Berg, 2004).

The procedures of content analysis were divided into two stages. The first stage dealt with single interview transcripts by the following steps (Berg, 2004, p. 285):

(1) Review the interview transcripts thoroughly and find the key themes and patterns.
(2) Produce labels for these key themes and phrases.
(3) Revise the labels to be the systematic categories, which match the literature.
(4) Sort the interview transcripts into the systematic categories.
(5) Find the links among the factors and variables for the individual interview.
(6) Provide the tables of systematic categories with the factors and variables from each interview.

The second stage of content analysis dealt with cross interview transcripts, and aimed at the integration of all the individual factors, variables and links from all interviews, in order to develop a comprehensive model of KM adoption and practice. The stepwise procedures in the second stage are as follows (Berg, 2004, p. 286):

(1) Revisit the individual interview transcripts with the systematic categories of factors and variables, as well as their links obtained from the first stage.
(2) Examine the differences and similarities of the variables in each factor.
(3) Combine the similar variables and generate a common name, while retaining the unique variables.
(4) Integrate the links among the factors among the six enterprises.
(5) Establish the tables of integrated factors, variables and their links.
(6) Propose the comprehensive model of KM adoption and practice.

Results

Background information

Table 2 presents the background information of the enterprises involved in this research. There were one foreign life insurance enterprise, two local life insurance enterprises, and three local life insurance enterprises with foreign capital, of which some were new entrants while others were existing enterprises, which had history for decades. The number of employees in the enterprises ranged from 300 to over 3000. The interviewees' positions varied from department manager to general staff and their tenures ranged from 4 to 22 years.

Table 2 Background information of the interviews

Enterprise	*A*	*B*	*C*	*D*	*E*	*F*
Type of enterprise	Local life insurance enterprise	Local life insurance enterprise	Foreign life insurance enterprise	Local life insurance enterprise with foreign capital	Local life insurance enterprise with foreign capital	Local life insurance enterprise with foreign capital
Enterprise history	50 more years	5 more years	15 more years	15 more years	5 more years	40 more years
No. of employees	Around 900	Around 300	Around 3000	Around 300	1000 more	3000 more
Position of interviewee	Chief of Customer Service Section	1. Vice Manager of Human Resource Department 2. Manager of Education & Training Department	1. Senior Deputy Manager of Admin. Service Section 2. General staff of Claim Department	1. Assistant Manager of Chief Information Officer (CIO) 2. Chief of Policy Alteration Section	Assistant Manager of Policy Assessment Department	1. Supervisor of Agency Training & Development Department 2. Manager of Claim Department
Tenure of Interviewee in the enterprise	22 years	6 years 7 years	14 years 4 years	16 years 15 years	9 years	11 years 13 years
Gender of interviewee	Female	Male Male	Female Female	Female Female	Male	Male Male
KM adoption and applications	Had some parts of KM implicitly	Initiated a few parts of KM	Promoted KM actively for years	Adopted and applied KM widely for years	Started the early stage of KM	Applied KM implicitly in the daily work

The participating enterprises were involved in different stages of KM adoption and practice.

Factors and variables of KM adoption and practice

Twelve factors and 93 variables were identified from this field study through extensive content analysis procedures. The factors and variables have been labeled, where possible, in line with the literature (e.g., Ajzen & Fishbein, 1980; Davis, 1986, 1989; Rogers, 1995; Belassi & Fadlalla, 1998; Alavi & Leidner, 1999, 2001; Holsapple & Joshi, 2000; Gold *et al*. 2001; Venkatesh *et al*., 2003). For instance, the variable, rules and regulations, is identified according to Holsapple and Joshi (2000) indicating that environmental influences, for example, governmental and political climate, played a pivotal role in the success of KM in organization. As the interviewee from enterprise A said, 'The external environments, especially the rules and regulations, would influence our acceptance of KM'. Nevertheless, unlike past research, the variables gathered in each factor and their meanings are more specific to KM, particularly its adoption and practice in the life insurance business. For example, the results from the field study bring out 'KM promotion' as distinct from KM practice. The interviewees stressed that, before implementing KM, there should be some KM promotion schemes, such as KM plan or project, guidelines and training, that appear to signify an external factor in influencing the employees' opinions regarding KM and deciding whether or not they would adopt and apply KM in undertaking their daily tasks. Emerging from the data were some variables pertaining to 'environments and industrial factors' (e.g., too much paper usage in the life insurance industry).

Table 3 shows the list of variables identified in each factor, as well as the anonymous companies which mentioned the variables. Out of the 93 identified variables, the eight variables confirmed by all enterprises were: *hardware infrastructure*, *software infrastructure*, *KM manager*, *top management support*, *vision, value and objective*, *time saving*, gathering knowledge, as well as *attitude toward KM adoption*. Twenty-one variables were stated by more than four enterprises. Most of the enterprises emphasized that the employees' attitudes toward KM would affect their perceptions concerning KM. Having the KM team, taking the appropriate strategy and policy, as well as creating a culture of trust and commitment were also important to the adoption of KM.

Links among the factors

Table 4 presents the causal links among the factors of KM adoption and practice. The information regarding the perceived links emerged during the interviews and was extracted from the interview scripts through content analyses. For example, the link from environments and industrial factors to PU was identified in enterprise A based on the following statement: 'in the trend that KM has been applied in many organizations, adopting KM would help improve our performance at work and let us feel more competent'.

Comprehensive model

Figure 1 presents the comprehensive model of KM adoption and practice, which has been developed based

Table 3 Factors and variables of KM adoption and practice

Factor	*Variable*	*Enterprise*					
		A	*B*	*C*	*D*	*E*	*F*
Environments and industrial factors	Industrial competition	✓		✓			✓
	Trend	✓		✓	✓		✓
	Rules and regulations	✓					
	Customer complaints and disputes	✓					
	High development of IT				✓		
	Use of a great amount of paper				✓		
Individual characteristics	Educational background		✓	✓	✓		✓
	Position	✓	✓	✓	✓		
	Work domain	✓					✓
	Computer background and skill	✓	✓	✓	✓		
	Individual innovativeness	✓	✓	✓		✓	
	Work attitude	✓	✓	✓		✓	✓
	Personality	✓	✓			✓	✓
	Habit of using computers and internet			✓	✓		
	Loyalty and belonging to the company	✓					✓
IT support	Hardware infrastructure	✓	✓	✓	✓	✓	✓
	Software infrastructure	✓	✓	✓	✓	✓	✓
	Correct and integrated information	✓		✓	✓		✓
	Compatibility	✓	✓	✓			
	Function	✓			✓	✓	✓
	Data updating and maintenance				✓	✓	
	Testing and adjustment				✓	✓	✓
	Security of data and system	✓		✓	✓		
	Cooperation and communication			✓	✓	✓	✓
	Funny and interesting design			✓	✓		
KM promotion	KM manager	✓	✓	✓	✓	✓	✓
	KM plan or project			✓	✓	✓	✓
	KM team		✓	✓	✓	✓	✓
	Top management support	✓	✓	✓	✓	✓	✓
	Human and financial support	✓	✓				✓
	Transmission of the KM mission		✓	✓	✓	✓	
	Time schedule and guidelines	✓	✓			✓	✓
	Training			✓			✓
	Participation of the department representatives		✓		✓	✓	✓
	Support of time and space	✓		✓		✓	
	Knowledge transfer channel	✓	✓	✓			
	Knowledge type			✓		✓	✓
	Reward for KM			✓		✓	✓
	KM performance evaluation	✓	✓		✓		
Organizational characteristics	Size	✓		✓		✓	
	Structure			✓			✓
	Vision, value and objective	✓	✓	✓	✓	✓	✓
	Strategy and policy	✓	✓	✓	✓	✓	
	Organizational learning	✓	✓	✓			
	The system for duty rotation and acting duty	✓			✓		✓
	Employee turnover rate			✓		✓	
	History of organization			✓			
	Variety of product			✓			
Cultural factors	Knowledge-intensive culture	✓	✓		✓		✓
	Team-work culture	✓		✓		✓	✓
	Trust and commitment	✓		✓	✓	✓	✓
	Respect			✓	✓	✓	✓

Table 3 (*continued*)

Factor	*Variable*	*Enterprise*					
		A	*B*	*C*	*D*	*E*	*F*
Perceived usefulness	Work and service quality	✓	✓				
	Work quantity	✓	✓				
	Time saving	✓	✓	✓	✓	✓	✓
	Efficiency	✓	✓		✓		
	Making it easier to work	✓		✓			
	Convenience and flexibility	✓		✓	✓	✓	✓
	Meeting the needs at work	✓					✓
	Effectiveness			✓	✓		
	Professional competency	✓	✓			✓	✓
	Reducing the mistakes				✓		
	Reducing the duplicate work		✓				
	Making it easier to learn				✓	✓	
Complexity	Not friendly to use				✓	✓	✓
	Taking too much time				✓	✓	✓
	Not simple, clear and short enough			✓			
	No assistance in time	✓					✓
	Lack of accessibility				✓	✓	✓
	Not easy in the practical operation	✓	✓				✓
Subjective norm	Peer pressure	✓			✓		✓
	Co-workers' adoption and comments			✓			
	Supervisor		✓				✓
	Senior management			✓			
	Opinion leader						✓
	Requirement of company	✓	✓			✓	
Attitude toward KM adoption	Attitude toward KM adoption	✓	✓	✓	✓	✓	✓
KM practice	Gathering knowledge	✓	✓	✓	✓	✓	✓
	Identifying Knowledge			✓			
	Organizing knowledge		✓	✓	✓	✓	✓
	Sharing knowledge		✓		✓	✓	✓
	Converting knowledge		✓			✓	
	Using knowledge		✓			✓	
	Having knowledge management a part of ordinary jobs			✓	✓		✓
Perceived expected performance	Customer service	✓		✓		✓	✓
	Overall operational efficiency	✓	✓	✓	✓	✓	
	Cost down		✓	✓	✓	✓	✓
	Ability to adapt to changes	✓					
	Reputation and public praise			✓		✓	
	Improving workers' quality			✓			
	Providing information for decision makers				✓		
	Keeping the record of workers' experience in the company			✓	✓		
	Decreasing the impact of turnover				✓		✓

on the conceptual framework as described earlier with the factors and variables identified in the field study (as presented in Table 3). Accordingly, this research proposes that the adoption and practice of KM can be observed as per the model that involves the following:

External Factor → Perception → Attitude → KM Practice → Perceived Performance

Discussions and implications

Theoretical implications

This study confirmed the significance of the relationship posited by the TRA model, in which a positive perception of the benefits translated into a positive attitude, which in turn affected their behaviours in conducting KM activities. The results also supported that perceive usefulness,

Table 4 Causal Links among the Factors

Factors	*Enterprise*					
	A	*B*	*C*	*D*	*E*	*F*
Environments and Industrial Factors → Perceived Usefulness	✓	✓	✓	✓		✓
Individual Characteristics → Perceived Usefulness	✓	✓	✓		✓	✓
Individual Characteristics → Complexity	✓	✓	✓	✓	✓	✓
Individual Characteristics → Attitude toward KM Adoption	✓					✓
IT Support → Perceived Usefulness	✓	✓	✓	✓	✓	✓
IT Support → Complexity	✓	✓	✓	✓	✓	✓
KM Promotion → Perceived Usefulness	✓	✓	✓	✓	✓	✓
KM Promotion → Complexity	✓				✓	✓
Organizational Characteristics → Perceived Usefulness	✓	✓	✓	✓	✓	✓
Organizational Characteristics → Complexity						✓
Cultural Factors → Perceived Usefulness	✓	✓	✓	✓		
Cultural Factors → Subjective Norm		✓	✓	✓	✓	✓
Perceived Usefulness → Attitude toward KM Adoption	✓	✓	✓	✓	✓	✓
Complexity → Attitude toward KM Adoption		✓	✓	✓	✓	✓
Complexity → Perceived Usefulness	✓				✓	
Subjective Norm → Attitude toward KM Adoption	✓	✓	✓	✓	✓	✓
Attitude toward KM Adoption → KM Practice	✓	✓	✓	✓	✓	✓
KM Practice → Perceived Expected Performance	✓	✓	✓	✓	✓	✓

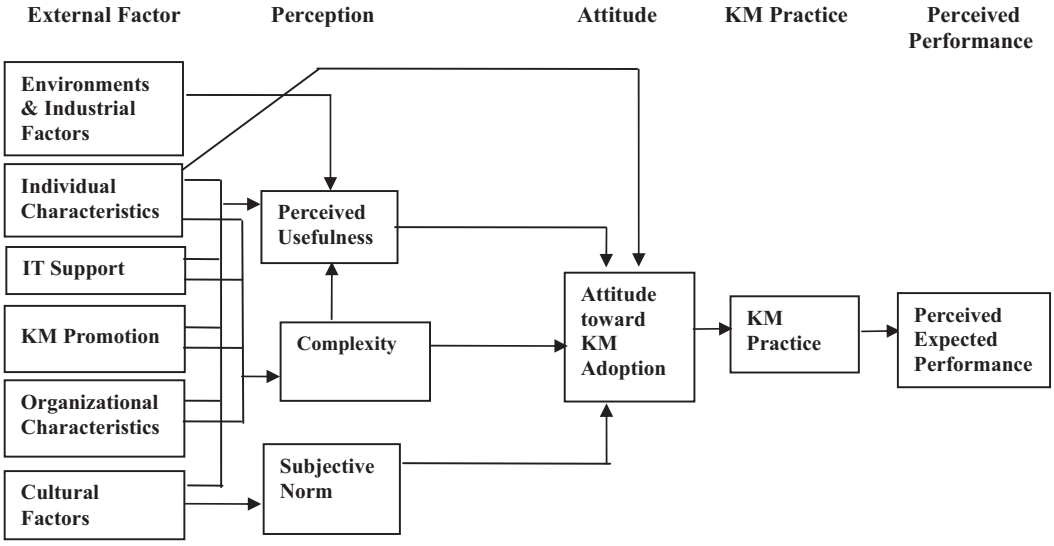

Figure 1 Comprehensive model of KM adoption and practice.

complexity and subjective norm, which were the perceptive factors adapted from the TRA, TAM and ID, had significant influences on KM practice via employees' attitudes toward KM adoption. To extend the existing theories, this study identified environments and industrial factors, individual characteristics, IT support, KM promotion, organizational characteristics and cultural factors, as the external factors that affected the perceptive factors in the context of KM adoption and practice. Further, we suggest that KM practice would improve the organizational performance in operational efficiency, customer service, ability to adapt to changes, etc. The comprehensive model of KM adoption and practice as presented in Figure 1 is particularly unique, since it is developed based on both the literature and the data collected from 10 interviewees in the life insurance business. This comprehensive model can be taken as a research model for proposition development and further empirical investigation. Further research is required to develop appropriate research hypotheses to carry on with the above research. The researchers plan to examine this model further using structural equation modelling

(Barclay *et al*., 1995) to test a number of hypotheses. Parts of this model can also be extracted and examined in detail. For example, how the external factors affect complexity can be studied to identify the potential initiatives and obstacles for people to adopt and apply KM in an organization. This model also indicates the processes involved in KM, as well as the perceived performance that the KM practice is expected to bring for the organization. Future studies can further explore the exact KM activities in the life insurance industry and the influence of KM practice on organizational performance.

Managerial implications

In terms of managerial implications, the comprehensive model shows a practical model of KM adoption and practice in the life insurance enterprises. The managers would realize that, whether KM brings benefits for the employees to enhance their job performance, if KM is difficult to operate, and how other people think of KM, might influence their attitudes to adopt KM and thus affect the implementation of KM. Further, the factors and variables are gathered from the real world. As a result, the model is more specific for the life insurance business in adopting and employing KM. Organizations, especially the life insurance enterprises in Taiwan, may find this model quite useful in providing the elements for successfully adopting and using KM, and realize the barriers embedded in KM processes.

Conclusions

This study presents an inductive approach utilizing multiple-case method to seek the main factors, variables and links of KM adoption and practice among the life insurance enterprises in Taiwan. A conceptual framework was proposed first by literature reviews. On the basis of the conceptual framework, a more extensive research model was then developed using the data collected from the field study, which was undertaken by inviting 10 interviews from six different life insurance enterprises. The interviewees were varied in terms of position, tenure and gender. The enterprises were in different phases of KM adoption and practice. The interviews were transcribed by the researchers, and the contents were analysed utilizing content analysis approach. The data resonated well with the literature and the analyses resulted in 12 factors and 93 unique variables. The casual models for six individual enterprises were developed first and then combined to propose the comprehensive model of KM adoption and practice.

The findings generally supported the conceptual framework with some revisions, revealing that several external factors would affect employees' perceptions concerning KM and their attitudes, which would in turn influence KM practice and have impact on the perceived performance for the organization. All enterprises highlighted the importance of sufficient *hardware and software infrastructure*, *KM manager*, support from *top management*, *vision, value and objective* of an organization, collecting knowledge, as well as *attitude toward KM*, in determining the employees' perceptions of KM. Organizations, particularly those in the life insurance business, which attempt to adopt or embark on KM, can look into the variables carefully for managing knowledge effectively.

This study contributes to the KM literature in the sense that it developed a comprehensive model drawing from rich qualitative evidence that enhanced generalized conceptual framework facilitating future 'testable theoretical propositions' (Eisenhardt and Graebner, 2007, p. 25). Most of the existing studies on innovation adoption and diffusion have been quantitative in nature such as confirmatory study by testing hypotheses. In addition, there is paucity in studies that investigate the factors and variables of KM adoption and practice in the context of life insurance enterprises. Therefore, this exploratory study adopting qualitative methodology involving a multiple-case study approach proposed a research model combining the literature based on deductive mainstream research with inductive field study. From the practical perspectives, this study provides a better understanding of the determinant factors and variables of KM among the life insurance enterprises. The model can help organizations, particularly life insurance enterprises, to better design their KM schemes and generate fruitful outcomes for both employees and organizations.

In conclusion, this exploratory multiple-case study is a fresh comprehensive model 'that bridges well from rich qualitative evidence to mainstream deductive research' (Eisenhardt and Graebner, 2007, p. 30). This comprehensive model can be utilized for future studies in examining the adoption and applications of KM in the life insurance industry. The researchers attempt to further examine this comprehensive model by taking quantitative research method through empirical surveys. A structural equation modelling technique will be used to test the research model and the relevant proposed hypotheses. This study can also be extended for KM research in other financial service business, for example, banks and various geographic contexts.

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Appendix

Interview protocol

Background questions

I. What type of life insurance enterprise is your organization?
(Is it a foreign or local life insurance enterprise?)

II. How many employees are there in your organization?
(Ranges will be specified if the participant is reluctant to answer)

III. What is your position in the organization?

IV. How long have you worked in the organization?

V. How long have you worked in the life insurance industry?

VI. Does your organization adopt or/and apply KM?

VII. What is, if any, the major KM project, strategy or procedure in your organization?

Guiding semi-structured questions

KM perception and practice*

Q.1. What is your perception of knowledge and KM?
(What do you think are the main activities involved in KM?)

External factors affecting KM adoption

Q.2. What would encourage you to consider the adoption of KM?
(What are the incentives?)
(What should be done before making the decision to adopt KM?)

Q.3. What do you think are the main factors that may influence people's attitude to adopt KM in your organization, for example, improving job performance, easy to learn and use and pressure from other people?

Q.4. What would influence people's perception of KM, for example, competition, individual characteristics, IT[a] infrastructure, organization and culture?

Q.5. What would encourage people to adopt and apply KM, for example, customer demand, security of data, knowledge manager, explicit strategy and culture?

Q.6. What do you think are the barriers to adopt and apply KM in your organization?

*Perceived Usefulness (PU)**

Q.7. What are the benefits of KM to you?
(How can KM help you to perform your job better?)

Complexity

Q.8. What would disturb you (or make you feel uneasy) to adopt and implement KM?
(What would make you feel difficult to adopt or apply KM?)

*Subjective Norm (SN)**

Q.9. Do you think that the adoption and application of KM is a normal practice in the life insurance industry?
(How would you be affected by KM adoption and implementation of others, for example, your competitors, co-workers and managers?)

Q.10. What would make people more willing to adopt and apply KM?
- Link between PU/complexity/SN and attitude to adopt KM
- Link between attitude to adopt KM and practice of KM
- Link between complexity and PU

Q.11. What would prevent people from adopting and applying KM?

Q.12. What needs to happen (i.e., put it into place) to adopt KM?
- Link between environments/individual/IT/organization/culture and PU/Complexity/SN

Perceived expected performance

Q.13. How do you see the practice of KM would affect your organizational performance?
(How do you see the adoption of KM would improve your organizational performance?)
- Link between KM practice and perceived expected performance

Thank you.

**Note*: KM: knowledge management; IT: information technology; PU: perceived usefulness; SN: subjective norm

About the authors

Li-Su Huang is currently Assistant Professor and Director at Department of Finance at Mingdao University in Taiwan. She received her Master of Science in Insurance at Hartford University, U.S.A, and Ph.D. in Graduate Business from Curtin University in Australia. Her research interests lie in the areas of knowledge management, strategies, as well as insurance business operation and management. She has published and presented internationally on these topics in journals and conference proceedings.

Mohammed Quaddus received Ph.D. from the University of Pittsburgh, M.S. from University of Pittsburgh and Asian Institute of Technology. His research interests are in information and decision systems, logistics and supply chain information management, risk management in supply chain, Radio Frequency Identification in supply chain and related areas. Dr Quaddus has published over 200 papers in refereed journals, international conferences and chapters in books. His publications have appeared in *European Journal of Information Systems*, *Decision Support Systems*, *Supply Chain Management – An International Journal*, *Rural Sociology* among many others. He has successfully supervised over 30 doctoral students. In 1996 and 2005, he received 'researcher of the year'

award from Curtin Business School, Curtin University of Technology, Australia. Currently, he is a Professor of Information and Decision Systems with the Graduate School of Business, and Deputy Dean of research, Curtin Business School, Curtin University of Technology, Australia.

Anna L Rowe (Ph.D., M.Com, B.Bus) is a Certified Practising Accountant by profession who is a senior lecturer and researcher of the Governance and Corporate Social Responsibility unit. She has worked in industry for 10 years prior to joining the Graduate School of Business, Curtin University. Her research interests include corporate environmental management, triple-bottom-line reporting, knowledge management and action research in education for sustainability. Recent publications in refereed journals include: *Journal of International Business Strategy*, *Journal of the Asia-Pacific Centre for Environmental Accountability*, *International Journal of Business Research*, *International Journal of Management Education*, *Review of Business Research* and *Public Management Review Journal*. She is on the editorial board of the *Asia-Pacific Centre for Environmental Accountability* journal and Guest Editor of *Greener Management International* – Special Issue 50 (China).

Cheng-Po Lai is Associated Professor and Chairman at Institute of Financial Management, Nanhua University, Taiwan. He completed his Master of Science in Insurance, and Master of Business Administration at Hartford University in U.S.A., and Ph.D. in Business Administration majoring in Finance at National Chung Cheng University in Taiwan. His current field of research is focused on strategy management, risk management and corporate governance. He is Project Director of 'Cointegration and Performance of the Strategic Groups in Property and Casualty Insurance Industry: The Case of Taiwan' (NSC94-2416-H-265-001) supported by National Science Council, Taiwan.