



Strategic fit among knowledge attributes, knowledge management systems, and service positioning

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Abstract

Knowledge management systems (KMSs) support high-quality services while shaping and improving positioning of services. Given such strategic importance of KMS, this study explores the effects of different types of KMS, which respond to the attributes (i.e., diversity and tacitness) of collective knowledge, on service (re-)positioning. Through a case study of a financial consulting company at the core of KMSs, combinations of the two knowledge attributes are used to determine which type of KMS (i.e., information library, deepened stock, thought islands, and shared brain) offers the greatest efficiency and effectiveness in service (re-)positioning. The joint concerns of service innovation scope and specificity are also considered. Finally, the study discusses the theoretical and practical implications on KMS design and functionality in the new business age of service innovation.

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Introduction

Knowledge management (KM) has been consistently recognized as the primary motivation for constructing information systems to improve organizational capability and business excellence (Sarvary, 1999; Alavi & Leidner, 2001). Although knowledge management systems (KMSs) have been found to be directed by corporate strategy and positioning (Avgerou, 1993), precise and rich analyses based on KMSs can facilitate the development of corporate strategies (Hendriks & Vriens, 1999). Developments in information and communications technology have reshaped the managerial processes, styles, and business models in modern organizations. Even the most traditional industries have witnessed the efficiency and effectiveness achieved by the integration of business and information systems. Companies increasingly rely on information systems to generate knowledge-based business intelligence to improve their service quality and value creation (Van de Ven, 2005; Su & Lin, 2006; Snowden, 2009).

Although the importance of systems to manage tacit and diverse knowledge regarding the provision of products and/or services with appropriate positioning is well recognized, the research has generally tended to ignore the nature of the tacitness and diversity of knowledge. Studies have offered inconclusive findings on the effectiveness of KMSs, partially due to the difficulty of identifying a universally applicable set of contexts, application methods, and knowledge attributes for KMSs (Butler & Murphy, 2007). Ironically, technology that simplifies the management of knowledge and

information can also result in reinforcing the division of functions within organizations (Newell *et al*, 2001). Organizations possess implicit and diverse working knowledge that must be integrated for efficient and effective task implementation (Bradley *et al*, 2006). Thus, the tacitness and diversity of knowledge are very likely to characterize the collective knowledge bases in organizations (Tsai, 2005). Meanwhile, knowledge is also dispersed in and across sub-organizational units (Tsoukas, 1996; Cohendet *et al*, 1999), which implies that any integration must be grounded on sound IT-supported environments.

Prior studies have assessed the benefits of KMSs in facilitating service innovation and service positioning by examining before-and-after changes without understanding the mediating factors contributing to such changes. Innovation, as an important decision in organization (especially regarding intangible types, such as service innovation), requires precise opportunity identification, strategic positioning, and alignment between knowledge/capability and environments (de Jong & Vermeulen, 2003; Poyhonen & Smedlund, 2004; Goll *et al*, 2007). A proper design of a KMS may aid groups in resolving problems that require a variety of knowledge (Gray, 2000) and can thus influence the services or solutions provided to the customers. Studies have also shown that the influence of a KMS on a unit's collective knowledge behaviour may be altered by the degree of diversity present in the unit (Gibson & Vermeulen, 2003). Moreover, the generally static view of this issue limits its explanatory power in the context of service repositioning. Nevertheless, repositioning (i.e., recurrent activities involving service positioning at multiple points in time) is critical for strategizing in rapidly changing markets.

As shown in Figure 1, the research objective of this study is to investigate the interrelationships among the diverse and tacit nature of collective knowledge, the functioning KMS, and the consequences of service (re-)positioning. Specifically, we investigate the influences of KMS on organizational service (re-)positioning by explicating the influences of collective knowledge attributes on KMS design. A case study was conducted on a consulting company as an example of the knowledge-based service industries in which knowledge workers leverage their collective intelligence for successful client service.

Literature review

KMSs

Modern organizations rely primarily on valuable knowledge and knowledge activities. People make decisions

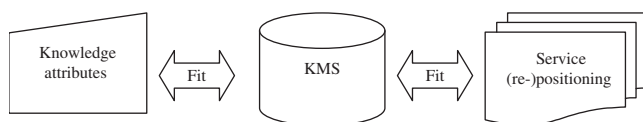


Figure 1 An iterative fit model of knowledge attributes, KMS, and service (re-)positioning.

and complete task requirements by implementing knowledge they have acquired. Internal knowledge market mechanisms often govern the functioning of such knowledge activities (Brydon & Vining, 2006). Most challenging is the fact that the most valuable knowledge is often tacit and consists of thoughts on a variety of topics that may cause inefficiency within organizational knowledge markets (Nonaka *et al*, 2000; Brydon & Vining, 2006).

KMSs, which are capable of handling a broader scope and volume of information, faster processing ability, and a reach expansive enough to include system components such as terminals or distant co-workers, are designed to help face this challenge by overcoming the cognitive limits of human beings. However, a KMS can also fail because of human error factors (Malhotra, 2003), or it may lead to paradoxical outcomes in terms of the system and organizational effectiveness (Newell *et al*, 2001). Such failures in KMSs often affect a firm's internal integration and external service provision because business services are often embodied in knowledge transformation within innovation systems (Muller & Zenker, 2001).

Tiwana & Bush (2005) posited that the purpose of building a KMS in consulting services is to manage a wide array of types of knowledge and their sources (i.e., collective or individual experiences, value, analytic information, perspective and even intuition) with systematic and well-planned methods. Nonetheless, research and practice both face difficulties in execution because of the diverse composition and tacitness of knowledge (Mitchell, 2006). Many successful instances of KMSs are built on the premise of managing explicit and logical knowledge.

Knowledge-based service (re-)positioning

Service positioning is critical in determining the value of the services offered by companies to their target customers (Wilson, 1988). Information systems (here, the KMSs) improve such positioning by providing analytical and logical materials that guide the decisions and actions of the service-offering organization toward the most beneficial and efficient approach (Sambamurthy & Subramani, 2005). The research literature offers a considerable number of methods and tools for service (re-)positioning, which can be separated into several analytical categories including service-trait-based (Moorman *et al*, 1993), customer-process-based (Kellogg & Nie, 1995), capability- or functionality-based (Cenfetelli *et al*, 2008), or customer-contact-based (Skaggs & Youndt, 2004; Frei, 2008) service positioning.

Knowledge has been playing an increasing role in service positioning and implementation because knowledge-based services have received increasing attention in recent decades (Su & Lin, 2006; Amara *et al*, 2009). KMSs in the present age have strategic importance beyond their ability to complete daily task operations (Tiwana, 2003). Because knowledge and KM are key foundations for innovative services (Díaz-Díaz *et al*, 2006), a better understanding of knowledge and its management systems facilitates service

positioning by providing precise evaluations of service capability and potential costs and flaws.

There are four types of service costs and flaws: communication cost, coordinative cost, opportunism, and operational risk (Poppo & Zenger, 1998). A critical reason for such service costs is the incapacity of service providers to manage and utilize service knowledge. Sarvary (1999) defined service professionals as knowledge brokers who bridge and integrate knowledge across different fields to provide knowledge-based value to customers. Due to the often broad scope of knowledge areas for specific services or customer requirements, inter-professional coordination and cooperation is necessary, and conflict and misunderstandings can often emerge in the absence of such cooperation. Therefore, knowledge parallels its managerial systems in determining the internal cooperation of professionals in the process of service (re-)positioning and provision.

Diversity and tacitness as knowledge attributes

To perform knowledge-based services effectively, providers must first understand the nature or the attributes of knowledge. The tacitness and diversity of knowledge are often discussed in the literature as potential barriers, impediments, or challenges for effective knowledge (Grimaldi & Torrisi, 2001). For organizational goals, collective, rather than individual, knowledge is often the most valuable (Argote, 1999). In such cases, knowledge must be explicated for public use. Moreover, an understanding of knowledge not only means an understanding of the individual pieces of knowledge but also an understanding of the effective collection or combination of those fragmented pieces.

Therefore, KMSs and knowledge-based service (re-)positioning cannot be discussed without jointly considering the tacitness and diversity of knowledge. Surprisingly, however, few studies have focused on the fit among these key elements for knowledge-based organizations. Because information or knowledge alone can improve the development of a business or organization, there is great potential for an increasingly diverse knowledge base in modern organizations. At the same time, a minority of organizations may still maintain relatively homogeneous knowledge bases (such as a company that only sells one or a few related products). Research is thus required to classify and investigate the different strategic uses of KMSs for service (re-)positioning in different contexts.

Methodology

We explore the issues that occur at the intersection of knowledge diversity, KMSs, and service (re-)positioning. For such a task, a case study is a suitable approach to gain rich data from a real-world example of a service positioning-oriented KMS construction (Yin, 1994). Piloting data collection was conducted together with a preliminary Academic-Industry Collaboration project but not this research project. Data from this pilot study enabled the

formation of critical ideas for the authors to fully develop their core arguments. However, those data were not presented in the article, due to their preliminary nature. But what have been learnt have been transformed and expressed as the authors' reflection and/or arguments in the present paper.

VATM is a consulting company that possesses leading financial service knowledge and experience compared with its competitors in Taiwan. Its main service areas include enterprise finance strategy and planning, accounting and auditing, tax affairs, business investment and financial forecasting. By the year 2008, the company had become aware of its inefficiency in managing and reusing its accumulated but diverse service knowledge. Although separate software packages were used for the operational tasks in different functional departments, the necessity of a KMS for integrated works and strategic foresights became obvious when the company encountered difficulties in recurrent communication, resource waste, and knowledge gaps among its professionals. VATM's information infrastructure for KM was still in its infancy, incapable of coping with the company's increasingly broad scope of service and accumulated knowledge. Therefore, late in the year 2008, VATM decided to implement a customized KMS for its core operations relating to its customers and their service experiences. The authors had the opportunity to participate in and observe the planning, design, and implementation of the KMS as a change process (see Appendix A). Internal and external expert opinions were solicited in interviews (see Appendix B for the full list of the interviewees). Most of the interviewees were interviewed twice. In addition to observation and expert interviews, we collected materials such as secondary data from magazines, newspapers, and similar sources to gain a greater understanding of industrial and company-level background information. The analysis and interpretation of the qualitative data were subject to an inter-researcher validation process. The research team (not including the interviewees) were the author, an independent industry practitioner, and two doctoral candidates majoring in Information Systems and KM.

Results, discussions, and propositions

We trace the development of the KMS chronologically for a clear presentation of our analysis. As background information, there are process charts of the KMS construction, internal and external knowledge activities, and sample screen views of the implemented KMS. Because of page limitations, please contact the corresponding author for these appendices. Before introducing a KMS, a Survey of Expectation was sent to all potential internal and external users of the system. After in-depth discussions, the KMS was then planned and designed according to Tiwana's (2003) seven-layer (i.e., interface layer, access and authentication layer, collaborative intelligence and filtering layer, application layer, transport layer, middleware and legacy integration layer, and repositories) method. We found

significantly diverse needs and requirements for the service KMS based on the various combinations of diverse and tacit knowledge.

Information systems, especially KMSs, must fit a company's knowledge-oriented goals and the nature of its knowledge. An interviewee commented that the desire for personalized KMS showed the expected nature of differentiated knowledge processing:

... so if we have very different knowledge from each other, a personalized information system working environment is critical, for we may need to be supported by IT that offers different functions for knowledge processing. (VAT-WCL-022)

The division of economic functions and managerial or market functions in one single firm increases the need for developing internal capabilities for collectively processing tacit and diverse knowledge (Katsoulacos & Tsounis, 2000). The KMS and its function in service positioning thus must take into account varying degrees of tacitness and diversity.

Through interviews and observation, we identified four types of KMS in responding to the combinations of tacitness and diversity. This typology can serve as a foundation for the more delicate design of the KMS for service positioning. We also linked the typology to the four potential service risks (costs) mentioned above (i.e., communication cost, operational risks, coordinative cost, and opportunism) (Poppo & Zenger, 1998) to the four types of KMS.

First, KMSs handling knowledge with explicit and diverse attributes are faced with the construction of an information library. If organizations construct systems to handle explicit and diverse knowledge in the form of documents, technical reports, service cases and so forth, the communication cost can be reduced by decreasing redundant interpersonal communications (e.g., asking for information that has already been stored in the KMS information library). Also, with increasing amounts and diversity of information, efforts at knowledge structuring (e.g., categorization) will be more important, in order to prevent people from becoming overwhelmed by the sheer amount of available information. The CEO of the case company commented:

Information increases once your service business is developing well. It's just like you are constantly buying or writing new books and putting them into your company's library. However, as your 'stock' of books increases, you need to find a way to manage them, not just to store them. So, if your KMS cannot assist, or automatically achieve, such information systemization jobs, it is useless, no matter how much knowledge you acquire or create. (VAT-LYC-002)

Second, tacit and diverse knowledge often results in coordination problems because people do not share others' perspectives – they cannot think and plan from others' points of view. Some KMS functions, such as the online community, are responsible not only for resolving

inefficiencies in the communication of explicit and diverse knowledge but also can alleviate the inefficiency caused by the tacitness and diversity of knowledge.

Online, instant community functions are complementary to general exchange functions such as bulletin boards, not just for real-time communication but also for the transformation from tacit to explicit knowledge. Knowledge remains diverse because much of the knowledge remains tacit and thus cannot be communicated and used in concert. (I-HSF-023)

Third, if all knowledge is similar (non-diverse) but tacitly absorbed through the use of the KMS by professionals, the organization ultimately has a 'shared brain' among all employees. This is knowledge of which many employees are aware, but they do not know (or they are not aware of the fact) that others also know it. For instance, informal social rules embedded within a company may function and be known well among different employees, but few would explicitly discuss them. A KMS to respond to such a collective knowledge attribute (i.e., non-diverse but tacit) should create opportunities for sharing of experiences. Thus, the use of categorization or grouping of users that naturally 'force' two or more users to express opinions during the same time period may be useful. As one industrial expert states:

Personalization is good. However, if the system is designed in a too-personal way, it will be too complicated, and nobody knows what others know. Grouping your professionals and their respective knowledge sometimes helps, especially if your company size is big. Divide people and system functions into small groups that maintain within-group similarity in knowledge and difference between groups. Thus, the KMS functions as a shared brain for the group. (I-TDC-011)

Finally, if the knowledge needed for high-quality service is both similar and explicit, organizations are actually accumulating a deepened stock of knowledge base. Although on the surface this combination of knowledge attributes seems the easiest to manage, there is a behavioural problem associated with offering services under such conditions. Here, on the basis of our frequent observation, we used behavioural or operational risk to refer to the possibility that professionals may be knowledgeable and capable of utilizing the KMS in providing service but purposefully hide what they know or refuse to take full responsibility for their actions. This condition raises a risk that problems may result from issues arising beyond the scope of the knowledge and the system. If the KMS is adopted to overcome the inefficiency of the internal knowledge market (Brydon & Vining, 2006), a very challenging part of leveraging a service-oriented KMS may be autonomous human motivations and actions, which are equally important in the cases of both tacit and diverse knowledge.

In sum, Table 1 illustrates how the typology of four very different forms of KMS emerged in response to different combinations of knowledge tacitness and diversity. These

Table 1 An attribute-based typology for knowledge bases and their solution to different risks

Knowledge attributes	Diverse	Non-diverse
Explicit	(I) Informative Library • Communication cost	(II) Deepened Stock • Operational risk
Tacit	(III) Thought Island • Coordinative cost	(IV) Shared Brain • Opportunism

four different types of KMS (or sub-systems) corresponding to different knowledge attributes (tacitness and diversity) can resolve the four different service risks (Poppo & Zenger, 1998). Ideally, a KMS should be capable of functioning in as many different knowledge-processing situations as possible. In our classification scheme, the four types of fit between knowledge attributes (i.e., diversity and tacitness) and KMS are all required but are insufficient for ideal knowledge processing. Following this discussion, we propose that:

Proposition 1: *The design of knowledge management systems must be implemented with joint consideration of different combinations of the two primary knowledge attributes (tacitness and diversity).*

There are two basic goals of KM, which are both fundamental but potentially in conflict: efficiency and effectiveness. The efficiency goal is to make individual knowledge more easily available and more widely applicable at the organizational level, which demands that knowledge be transformed from tacit to explicit and from complex to simple. The efficiency issue could be resolved by improving knowledge sharing capability and eliminating knowledge gaps. Expanding functions gradually to remedy the insufficiencies of each of the four types of KMS is beneficial for organizations. For example, consider the risks of the Thought Island and Shared Brain conditions of collective knowledge: one interviewee emphasized the importance of utilizing human-interaction-like knowledge activities to overcome the problem of diversity in the Thought Island condition, as well as the non-externalization of knowledge in the Shared Brain condition. Such a comment also implies the importance of building wider understandings of some, if not all, of the knowledge that is fragmentally constructed and stored across and within organizations.

Knowledge sharing is needed to shorten the knowledge gap. Such activity must be available both physically and virtually. This is not just an organizational culture issue. Information systems are important to shape such sharing without being limited by time and space. (VAT-CKL-003)

While agreeing with this comment, another interviewee stressed that such mutual understanding must be built inside out: first, among professionals within organizations,

and then with their customers, to construct a consistent company image of service capability:

... the spread of understanding toward some core elements of knowledge is important, though, we must be aware of the priority of such understandings What we should know deeply and what we can give up must be understood first (VAT-WCL-045)

On the other hand, the effectiveness goal is to achieve complete knowledge transfer or learning to build knowledge-based competitive advantages, which demands that a diverse set of knowledge be internalized as one inimitable, non-public intellectual asset (Nonaka *et al*, 2000; Brown & Duguid, 2001). An interviewee with experience in leading KMS construction projects commented:

... If you wish, you can search, retrieve, or integrate useful knowledge via KMS in a very efficient way. Ironically, such easy-to-proceed knowledge is often insufficient to provide companies with a unique identity or position for customers in the market. In contrast, you need to struggle for competitive effectiveness with the diverse or tacit knowledge, especially in the knowledge-based service industries like consulting. (I-UYT-056)

Another interviewee, typifying many other interviewees' opinions, also commented:

There has been an increasing number of consulting service companies sharing their knowledge bases with their direct customers. This is not only for operational purposes but also strategic ones – you have to build your own identity and position in professional customers' eyes. However, even though building a common knowledge base is often the purpose of communication ... one potential barrier to building your own special niche is such shared knowledge itself. By contrast, once you implement diverse knowledge bases, few can imitate all of your knowledge (and thus, your knowledge-based niche). (I-LLC-037)

Different knowledge can lead to different service positions and procedures (Coulter & Coulter, 2002). This poses challenges for partial coverage of each of the four types of specialized KMS when trying to meet all knowledge processing and service requirements. Hence, from both theoretical and practical perspectives, we reasonably argue that different KMSs designed to manage various combinations of knowledge attributes differ in their resulting efficiency and effectiveness. A KMS that is designed to handle explicit, simple knowledge (e.g., an Information Library) is expected to increase efficiency in service positioning more than one designed for processing tacit and diverse knowledge. In contrast, a KMS that is designed to process a more tacit or diverse set of knowledge (e.g., a Thought Island) is expected to achieve the goal of 'no-loss' knowledge transfer or learning for effectiveness in service positioning.

Proposition 2: *Based on collective knowledge attributes (i.e., diversity and tacitness), KMSs mainly designed for handling tacit and diverse knowledge function better for*

service (re-)positioning effectiveness, while KMSs mainly designed for processing tacit and diverse knowledge function better for service (re-)positioning efficiency.

A KMS was originally considered an operational tool that can expand human capacity (e.g., memory, time, speed of thinking etc.) in information processing. Beyond that perspective, however, a KMS can play a more important role as a strategic device that facilitates organizational strategizing. The professor we interviewed analysed both the operational and strategic roles of the KMS in service provision:

Generally speaking, once the KMS system is implemented in the company, communicative, managerial and control problems can be greatly reduced, helping the company as a knowledge-intensive organization constantly re-think its competitive position and capability in service giving. (I-TDC-033)

Moreover, service positioning may be facilitated by a KMS through delicate consideration of the knowledge attributes to be processed by the system. As one interviewee noted:

Tacit knowledge is relatively less important when entering the stage of customer service giving. On the other hand, differentiated knowledge, or knowledge that is very different from other colleagues', does not disappear as time goes by, but it can be transformed or combined into upgraded (new) knowledge for problem solving or for easier knowledge sharing. For either example, correct consideration of the knowledge attributes should be very critical as a first step for KMS design. This sets up all of the following individual and collective knowledge activities through KMS and determines a great portion of the knowledge processing's success. (VAT-LYC-034)

Information systems in organizations, including KMS, should be constructed to fulfil managerial and service support functions (Clark *et al*, 2007). Research has shown that a KMS has the potential to help people incorporate a variety of types of knowledge in problem solving (Gray, 2000). We further propose that the creation of a KMS should be optimized for success by tightly fitting the system with the knowledge attributes in responding to the service position of the organization (again, see Figure 1).

Service innovation scope and specificity constitute two important dimensions of service (re-)positioning. Service is a necessity, while service innovation is a critical factor in service providers' growth and competitive advantage. Service (innovation) scope identifies the range of services (innovations), including both the more static product and structural aspects and the more dynamic organizational and market aspects. Generally speaking, the diversity of knowledge increases as the innovative scope of service becomes broader. Thus, product or structural service innovation involves knowledge relatively more narrow in scope, while process, organizational, or market services involve a wider array of knowledge. Alternatively, service (innovation) specificity (i.e., the extent to which a service

Table 2 Fit between service positioning and KMS

Scope Specificity	Product	Structural	Process	Organizational	Market
Generic	(I) Deepened Stock		(II) Informative Library		
Restricted					
Selective	(III) Shared Brain		(IV) Thought Islands		
Unique					

is unique compared with other service providers) guides the direction of the service strategy and resource investment in articulating a consulting firm's service capability (Coulter & Coulter, 2002). Specificity also forms a differentiated position and identity for the firm compared with its competitors. Thus, service specificity represents the tacit knowledge applied to service positioning and implementation. It is reasonable to expect that higher specificity demands that companies apply more tacit, difficult-to-transfer knowledge to form a more unique service position. Table 2 summarizes our discussion that different KMSs (again, being designed to accommodate different combinations of knowledge tacitness and diversity) can fit the scope and specificity dimensions of service positioning for better performance. In summary, we propose the following:

Proposition 3: *The design of knowledge management systems for service (re-)positioning needs to fit with different combinations of knowledge attributes (tacitness and diversity); the Deepened Stock type of KMS fits better with lower service specificity (which demands lower tacitness) and narrower innovative scope (which demands less diversity); the Information Library type of KMS fits better with lower service specificity and broader innovative scope; the Shared Brain type of KMS fits better with higher service specificity and narrower innovative scope; and the Thought Islands type of KMS fits better with higher service specificity and broader innovative scope.*

Conclusion

Theoretically, the present study contributes to the significant research on KMSs (Alavi & Leidner, 2001), by conceptually and empirically incorporating the nature of knowledge (i.e., tacitness and diversity) into the discussion. We also apply such fit relations to the research on service (re-)positioning from the KMS perspective while it has been accepted as an indispensable component of a modern business system. Strategy development and implementation are both critical to service provision. Knowledge is a critical base for strategy. Thus, a KMS design based on collective knowledge to facilitate service positioning may add competitive value to firms. This study extends the research on the contextualizing theory of knowledge-oriented information technology (McDermott, 1999) by incorporating combinations of different attributes of knowledge as one particular type of context. In addition

to the focus on environments as knowledge contexts, we justify the importance of focusing on and examining the knowledge attribute combination as a critical component in KMS design for strategic development (i.e., service positioning).

Practically, for companies constructing different (sub-)KMSs for a variety of knowledge conditions characterized by different levels of knowledge tacitness and diversity, a good balance between diversity and integration of those (sub-)KMSs should be achieved. Existing research has demonstrated the importance of integrating various technologies in supporting organizational KM. More specific attention should now be paid to the integration of intra-organizational, even intra-KMS, segmentation of knowledge. Preparation to resolve such challenges includes the following actions. First, companies should explore the interface and integrative boundary objectives for those sub-systems of knowledge to achieve the best balance between fitting knowledge diversity and synergetic applications among different sub-systems for corporate-level strategy analysis and implementation. Second, KMS users should be trained to address vague and unfamiliar knowledge by utilization of the different KMSs. To respond to the tacitness and diversity as discussed in this

paper, KMSs may be designed and presented in a variety of logics, functionalities, and even interfaces. The learning requirement for such next-generation KMSs is higher than ever. Firms should incorporate such concerns into human resource training.

Moreover, beyond the tacitness and diversity in knowledge *per se*, culture-specific tacitness and diversity in knowledge processing (e.g., KMS use behaviours) is a potential area for future studies. Culture may determine the variation of the institutional, social, or psychological processes in enabling knowledge-processing and KMS use (Mason, 2003). In such a sense, people in different cultures should use KMSs with different tacitness and diversity in, for example, motivation, behaviour patterns, habits and so on. Cultural variation thus is also a reason for the existence of different ways of managing knowledge in various contexts (Hedlund & Nonaka, 1993).

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Appendix A

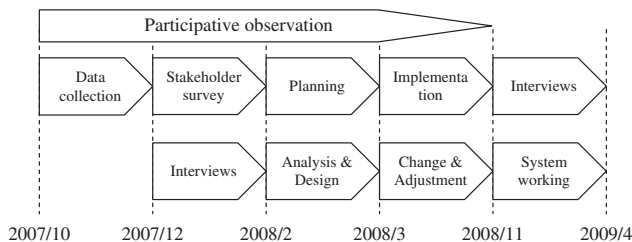


Figure A1 System implementation and participative research of KMS.

Appendix B

Table B1 External interviewees

Work	Name	Organization	Title
Industry	WYT	SJC Co. Ltd.	Chief Information Executive
Industry	WWY	IGA computer technology	CEO
Industry	HYH	IGA computer technology	Project Manager
Industry	TCD	Smart Plus KM Technology	Manager
Industry	LLC	Hamastar Technology	CEO
Industry	HSF	Hamastar Technology	Manager
Academia	TDC	National Kaohsiung Normal University	Professor & Director
Academia	YMY	Fortune Institute of Technology	Professor

Table B2 Internal interviewees of the case company

Name	Title	Education	Expertise	Tenure
LYC	CEO	MBA	Management	15
CKL	General manager	Junior College	Food science	9
CAS	Manager of tax department	College	Information management	3
CYC	Tax department	College	Finance	3
WCL	Consultant	Master	Economics	3
HYS	Consultant	College	Accountant	6

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