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The impact of empowering leadership for KMS adoption

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Abstract

Purpose – While the prior research suggests that leadership has important influences on IT acceptance and use, there has been little empirical investigation that identifies the specific managerial behaviors associated with adoption success. This study attempts to address this issue by exploring the influence of empowering leadership on knowledge management system (KMS) adoption through its effects on task-technology fit and compatibility.

Design/methodology/approach – To test the proposed research model, data were collected through a questionnaire survey sent to IT managers of 500 large companies in Taiwan.

Findings – The results show that empowering leadership has an indirect effect on KMS usage. Empowering leadership was positively related to both task-technology fit and compatibility, which in turn were both positively related to usage of KMS.

Research limitations/implications – There are two limitations to this study, requiring further examination and additional research. First, the sample was drawn from Taiwanese organizations. Hence, the research model should be tested further using samples from other countries, because cultural differences may exist between Taiwan and other countries. Second, this study obtained just 151 completed questionnaires for a 30.2 percent response rate. The limited number of respondents in the survey also causes concern. As a larger sample that brings more statistical power can provide more stable and consistent results, the study should be verified with a larger sample to increase generalization.

Practical implications – This study suggests that practitioners should not only focus on the technology issue (i.e. providing suitable knowledge to meet user needs and accruing high compatibility with user working style), but also be concerned with the impact of leadership style. Managers should consider how to empower subordinates appropriately, a decision that can indeed facilitate the development of an environment where employees participate in knowledge management activities more spontaneously. Without such appropriate leadership, however, even though firms may introduce a well-built KMS, it is unlikely that system would effectively exert its full range of benefits.

Originality/value – The results of the study will be useful to practitioners in understanding the type of leadership that should be employed in the context of KMS, thus increasing the success rate for adopting the system and further achieving knowledge management goals.

Keywords Management styles, Empowering leadership, Knowledge management, Taiwan

Paper type Research paper

Management Decision
Vol. 49 No. 7, 2011
pp. 1120-1140

0025-1747
DOI 10.1108/00251741111151172

This research is supported by grants from the National Science Council (NSC96-2416-H011-011), Taiwan.

1. Introduction

Knowledge has long been considered a key organizational assert, and its effective management is, therefore, a crucial element for sustaining organizational competitive advantage. To enable organizations to realize knowledge management activities effectively, an increasing number of firms have begun to engage in knowledge management initiatives and making substantial investments in deploying knowledge management system (KMS) (O'Brien and Marakas, 2006; Hahn and Wang, 2009). Today firms must equip themselves for more successful adoption of KMS and confront the challenges posed by such activities directly.

Unlike general-purpose information system (IS), which is designed to efficiently store large amounts of data and automatically arrange that data into specific formats and outcomes to enhance operational management achievement, KMS is designed to effectively support organizational knowledge management activities. KMS is a type of IS that supports and enhances knowledge management processes that related to the creation, storage, retrieval, diffusion, and application of knowledge within and outside an organization (Alavi and Leidner, 2001). Today KMS plays an important role in a firm's ability to effectively apply its existing knowledge while continuing to create new knowledge. With an effective KMS in place, management can maximize its organizational knowledge resources by being better able to continuously utilize, accumulate, share, and create them.

Obviously, KMS is not a general-purpose IS, but rather a system that is able to keep the patterns of knowledge practices and further institutionalizes them (Butler *et al.*, 2008; Mcdermott, 1999; Nonaka *et al.*, 1998). This shows that the success of KMS derives from fulfilling the ways that users are being-used during the work to allow system to be consistently compatible with the work styles of its users (Teo and Men, 2008). Further, since the purpose of knowledge management is to facilitate an organization's effort in managing knowledge as effectively as possible, KMS needs to provide the appropriate information/knowledge to clearly meet user task needs (Kuo and Lee, 2009; Liu and Wu, 2008). Hence, for a KMS to be tailored for the knowledge management purpose, it should not only be designed to fulfill the requirements of user tasks (Hahn and Wang, 2009; Lin and Huang, 2008; Liu and Wu, 2008), but also be compatible with the user's work style (Butler *et al.*, 2008; Teo and Men, 2008). A KMS that is well-designed can then facilitate the organization's effort in managing and leveraging knowledge, and thus increases the knowledge management benefits.

However, despite the potential benefits of an effective KMS, some firms have been disappointed in their investment in KMS because the system was not being used actively by their employees for their knowledge activities (Hahn and Wang, 2009; Quigley *et al.*, 2007; Wasko and Faraj, 2005). Evidently, getting employees to use the KMS effectively to improve knowledge management performance is still a critical issue for many researchers and practitioners (He *et al.*, 2009; Jennex and Olfman, 2004; Lin and Huang, 2008; Wu and Wang, 2006). Without consistent employee use of KMS, the system becomes ineffective as a knowledge management solution (Nevo and Chan, 2007). Therefore, understanding how best to adopt a KMS within an organization successfully remains a high priority, especially since management have made large efforts and expenditures to take knowledge management initiatives (Poston and Speier, 2005).

Many researchers have indicated that organizational managers play an important role in information technology (IT) adoption, and their leadership style can be a

significant factor in influencing implementation success and failure (Bueno and Salmeron, 2008; Kim *et al.*, 2007; Neufeld *et al.*, 2007; Stone, 1994; Tarafdar and Vaidya, 2006). Similarly, the success of KMS adoption also depends on the leadership style (Anantatmula, 2008; Butler *et al.*, 2007; Quaddus and Xu, 2005; Zhang and Faerman, 2007), as managerial behavior is extremely important in terms of endorsing the KMS and positively changing employee attitudes (Al-Busaidi and Olfman, 2005). Managers of course will influence IT adoption by virtue of their formal authority, and hence their leadership style plays a critical role in successful IT adoption (Stone, 1994).

While the prior research suggests that leadership has important influences on IT acceptance and use, there has been little empirical investigation that identifies the specific managerial behaviors associated with adoption success (Neufeld *et al.*, 2007). This study, however, does address this issue by exploring the effects of one specific set of managerial behaviors, empowering leadership, which has assumed a special importance in the context of knowledge management (Cabrera *et al.*, 2006; Chong, 2006; Hung *et al.*, 2005; Oliver and Kandadi, 2006; Singh, 2008; Srivastava *et al.*, 2006). By examining empowering leadership in KMS adoption, we hope to extend our understanding of which specific managerial behaviors can be best linked to user acceptance and use, and thus KMS success. The research model and its hypothesized relationships were empirically tested, using the structural equation modeling approach supported by AMOS software. The results of the study will be useful to practitioners in understanding the type of leadership that should be employed in the context of KMS, thus increasing the success rate for adopting the system and further achieving knowledge management goals.

2. Literature review and hypotheses development

2.1 Empowering leadership

Managerial style is often critical of creating a supportive climate and providing adequate resources for the adoption of any new technologies (Al-Busaidi and Olfman, 2005; Bueno and Salmeron, 2008; Premkumar and Roberts, 1999; Tarafdar and Vaidya, 2006). Obviously, organizational managers play a major role in IT adoption, and their leadership style can be a significant factor in influencing either implementation success or failure (Neufeld *et al.*, 2007; Stone, 1994). A manager's vision and commitment is most often cited as essential for IT implementation and can even positively influence an individual's perception of a technology, ultimately resulting in its usage (Kim *et al.*, 2007). Leadership, therefore, assumes key importance as a determinant of IT adoption; hence, managers must understand the type of leadership they need to employ for success in any IT adoption (Anantatmula, 2008).

Of the diverse leader behaviors that have been studied, empowering behaviors have assumed special importance in the context of knowledge manageme (Cabrera *et al.*, 2006; Chong, 2006; Hung *et al.*, 2005; Oliver and Kandadi, 2006; Singh, 2008; Srivastava *et al.*, 2006), as this leadership style is consistent with the inclination to provide increased autonomy to employees. Chong argues that employee empowerment is one of the most important factors for knowledge management. When employees are empowered in their jobs, they can efficiently coordinate diverse sets of activities to assist clients in fulfilling their requirements. Empowered employees with a certain degree of autonomy in task achievement can provide a useful agility to the organization's knowledge culture, which then enables and motivates these same employees to attain knowledge management

objectives (Oliver and Kandadi, 2006). Srivastava *et al.* also suggest that empowering leadership positively affects both knowledge sharing and team efficacy, which in turn both positively affects performance.

Further, Singh investigates the impact of four styles of leadership (directing, supporting, consulting, and delegating) on knowledge management practices. He finds that a delegating style is the best form of leadership style for creation, storage, sharing, application, and utilization of knowledge in a software firm. Employees who are given sufficient power, authority, and responsibility to manage their own lives at the workplace will feel freer to experiment and innovate with facts and figures on their own and not feel they are being constantly directed and supervised by their boss. Conceivably, this empowerment can be a critical development for the success of knowledge management; therefore, when firms implement KMS to support organizational knowledge activities, empowering leadership may likely facilitate and develop positive use behaviors and further improve knowledge management performance overall.

The concept of empowerment, derived from theories of participative management and employee involvement, promotes the idea that leaders should share decision-making processes and power with subordinates to enhance their performance (Martin and Bush, 2006). In general, empowering leadership has been studied from two perspectives. The first emphasizes leader actions—specifically, sharing power or giving more responsibility and autonomy to subordinates (Kirkman and Rosen, 1999; Pearce and Conger, 2003; Leach *et al.*, 2003). The second perspective emphasizes subordinates' responses to empowerment, in particular looking at their motivation (Liden and Arad, 1996; Spreitzer, 1995; Thomas and Velthouse, 1990). For this study, we chose to focus on the first perspective and investigate how perceived leadership behavior influences the usage of KMS.

Some researchers suggest that a necessary condition for empowerment is having leaders who will engage in empowering behaviors by relinquishing parts of their authority and allowing followers to make independent decisions (Bowen and Lawler, 1992; Hartline and Ferrell, 1996). We, therefore, define empowering leadership as those behaviors whereby power is shared with subordinates so as to give them increased decision-making authority with respect to the execution of their work tasks.

2.2 The relationship of empowering leadership with task-technology fit (TTF) and compatibility

It has been reported that KMS cannot deliver its full benefits because the system was not being used actively by employees for their knowledge activities (Hahn and Wang, 2009; Quigley *et al.*, 2007; Wasko and Faraj, 2005). Getting employees to actively use the system has thus become a critical issue for KMS success (Jennex and Olfman, 2004; Nevo and Chan, 2007; Wu and Wang, 2006), and managerial behaviors can be a significant factor in such successful KMS adoption by virtue of their more formal authority (Anantatmula, 2008; Al-Busaidi and Olfman, 2005; Butler *et al.*, 2007; Quaddus and Xu, 2005). As mentioned, managerial empowering behaviors can encourage employees to participate in knowledge activities more actively, and thus we hypothesize that when firms do implement IS to address knowledge management, empowering leadership will favorably encourage employees to be more willing to use KMS through its effect on TTF and compatibility. Figure 1 shows the suggested research model for this study.

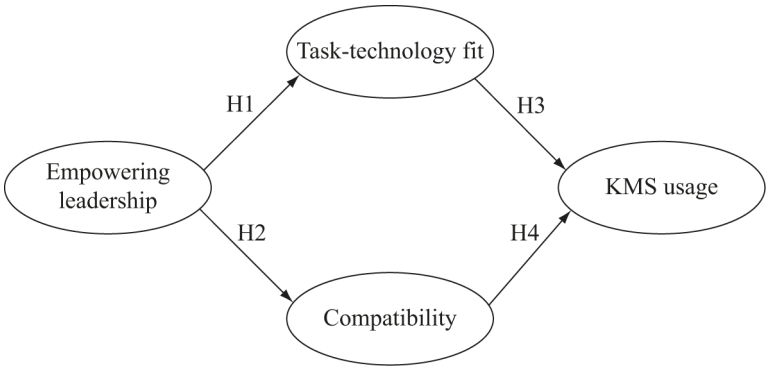


Figure 1.
Research model

Goodhue and Thompson (1995) argue that TTF is defined as the extent to which a technology provides features and supports a fit with the requirements of the task. The TTF model theorizes that a fit among the task, the technology, and the users positively influences utilization and performance. When the technology is capable of supporting the tasks at hand, it can help users execute those tasks more smoothly and easily and further reduce the cost of performing the tasks. According to the TTF model, systems will improve user performance when the technology is a good fit with the tasks it supports. Since the main purpose of knowledge management is to manage and leverage organizational knowledge effectively, a KMS should be designed to fulfill that goal. Therefore, the concept of TTF in this study is defined as the extent to which a KMS meets the information needs of the user's tasks. If a KMS can provide useful and sufficient information/knowledge to assist users in performing their tasks, then the KMS will have a high degree of TTF.

However, despite the fact that a KMS can effectively support organizational practice of knowledge management, the system cannot by itself guarantee that knowledge exchanges/sharing will in fact take place (Cabrera *et al.*, 2006). Knowledge sharing is an important component of knowledge management, as it assists in codifying the repository of available knowledge within an organization and increasing the repository of knowledge over time (Liebowitz, 1999). Without knowledge sharing by employees, even when firms have implemented an effective KMS, the system cannot achieve its best benefits and provide useful and sufficient knowledge to fulfill user needs.

Knowledge sharing does not happen automatically, and thus, empowering leadership can play an important role in making such sharing come about (Singh, 2008; Srivastava *et al.*, 2006). Previous studies have argued that effective knowledge management requires flexibility and less emphasis on work rules (Holsapple and Joshi, 2001; Rapert and Wren, 1998). In particular, low levels of centralization are more likely to favor an environment where employees participate in knowledge management activities more spontaneously (Cabrera *et al.*, 2006; Foss *et al.*, 2009; Kim and Lee, 2006; Lee and Choi, 2003; Pertusa-Ortega *et al.*, 2010). Similarly, empowering leaders who allow employees to act autonomously remove the autocratic conditions that foster a sense of powerlessness and permit subordinates the freedom to be as flexible as circumstances warrant (Arnold *et al.*, 2000). Empowering employees with a certain autonomy in their jobs can produce more agility to the organization knowledge culture (Oliver and Kandadi, 2006), and such a leadership style can encourage employees to be

more likely to share their knowledge with others (Singh, 2008). When a manager is inclined to offer empowerment and gives subordinates more autonomy in their jobs, that choice will more than likely increase employees' intrinsic motivation to knowledge sharing (Foss *et al.*, 2009).

Further, since empowering leadership encourages more responsibility and allows employees more discretion in terms of what to do and how to do it, employees will feel more personally responsible for their work outcomes (Hackman and Oldham, 1976). Employees who feel a high level of responsibility will look for more efficient ways to execute their tasks. One possible way to achieve that goal is to share their ideas and experiences with other employees (Cabrera *et al.*, 2006; Srivastava *et al.*, 2006). In such an empowerment context, the odds are higher that knowledge and organizational experiences will be effectively stored in the repository, as firms will also implement appropriate IT/IS to support these knowledge activities.

A KMS can, therefore be seen as a proper IS that provides a platform for interaction among employees for sharing ideas and experiences, and further facilitates firms to accumulate organizational knowledge. With abundant knowledge residing in a KMS, employees can effectively retrieve and capture suitable knowledge from the system and accomplish their tasks. Conceivably, it is likely that empowering leadership will encourage employees to share their knowledge through a KMS, which can provide helpful knowledge to meet user needs. Thus, we hypothesize that:

H1. Empowering leadership is positively related to task-technology fit.

Additionally, since the success of KMS relies on designing appropriate patterns to fulfill the ways that knowledge workers are being-used during the work (Butler *et al.*, 2008; Teo and Men, 2008), the system should be compatible with the users' work styles. Compatibility is defined as the extent to which a KMS is perceived as consistent with the existing values, past experiences, and needs of the users (Gumussoy and Calisir, 2009; Rogers, 1995; Ryu *et al.*, 2009). A well-designed IS that is consistent with the users' preferred style of work will satisfy their work practices and further improve their productivity. To enhance the compatibility of a KMS, therefore, users need to get involved in the system design (Butler *et al.*, 2008; Hjelmervik and Wang, 2007).

Leadership style plays an important role in motivating individuals involved in the implementation of IS (Stone, 1994), it may also explain the mixed results for the impact of user participation on system success (Lu and Wang, 1997). In particular, autocratic leadership, as contrasted with empowering leadership, does not foster full involvement in system design (Bailey and Nadler, 1979). Empowering leadership is therefore expected to be more effective in enhancing user involvement in system design and results in high compatibility of a system. Empowering leadership can facilitate experimentation, freedom of speech, and autonomous action (Goh and Richards, 1997; Lee and Choi, 2003), so it can also allow employees to have more opportunities to express their ideas openly and more freedom regarding what to do and then how to do that work. Such leadership produces a positive impact on a work-relevant system implementation by respecting specific requirements and preferences of employees, especially when those employees have more discretion to choose the appropriate IT/IS to accomplish their tasks.

Conceivably, when firms introduce a variety of KMSs to facilitate employee knowledge activities, this leadership style becomes a favorable style to use to respect

employee opinions, openly discuss any system development issues, and further encourage employees to involve in system design so as to fulfill the way they would like to work. When empowered employees are encouraged to be involved in system design, the system can be more compatible with their preferred work style and further motivate employees to be willing, even eager to use that system (Hjelmervik and Wang, 2007). Thus, we hypothesize that:

H2. Empowering leadership is positively related to compatibility.

2.3 The relationship of TTF and compatibility with KMS usage

The ability of technology to support a task is expressed by the formal model known as TTF, which suggests that IT adoption depends in part on how well the technology fits the task it supports (Goodhue and Thompson, 1995). A technology will be used well if, and only if, the functions of that technology support the user needs (Dishaw and Strong, 1999; Goodhue, 1995). Rational users will adopt a technology that allows them to complete their tasks and gain the greatest benefit. IT that does not offer a sufficient advantage will not be used (Strong *et al.*, 2006).

KMS usage is defined as the extent of a KMS being used to carry out the user's work (Igbaria *et al.*, 1995; Wu and Wang, 2006). Previous studies have suggested a positive relationship between TTF and IT usage (Dishaw and Strong, 1999; Goodhue and Thompson, 1995; Lin and Huang, 2008). Goodhue and Thompson argue that TTF is related to usage because of the link between TTF and the beliefs about the consequence of using that technology. A perceived positive match between task and technology will lead users to believe the technology to be effective and even superior for the performance of the task, producing satisfaction with the technology (Jarupathirun and Zahedi, 2007). It is expected then that users will be more likely to employ the technology. TTF is thus an essential determinant of KMS usage. If a KMS can provide the appropriate knowledge to meet user task needs, then those users will be willing to use the system to complete their work. Therefore, we hypothesize that:

H3. Task-technology fit is positively related to KMS usage.

Extensive research in the IS literature has pointed out that compatibility is an important factor in predicting and explaining IT usage (Chang *et al.*, 2008; Rogers, 1995; Teo and Men, 2008). Chang *et al.* found that the more compatible the ERP system is with user working mode, the higher will be the actual usage of the system. Teo and Men also suggested that compatibility plays a vital role in the utilization and impact of knowledge portal. Users are more likely to use a knowledge portal if the system is compatible with their individual working style.

Indeed, if a system is compatible with users' work, users will believe that the system favors the smoother execution of their work effort, in effect assisting them with better and quicker outcome of that work. A well-designed system that is consistent with the users' work process and preferred work style will fulfill their work practices and enhance the acceptance rate of that system further. Conceivably, KMS compatibility with users' habits and working style should have a positive effect on its usage. High compatibility can result in a preferable utilization of KMS. Thus, we hypothesize that:

H4. Compatibility is positively related to KMS usage.

3. Research methodology

3.1 The research sample and data collection

The population for this study was IT managers in Taiwanese companies. These IT managers were chosen as the single informant for this study because of their ability to answer questions related to e-business systems adoption (Lin and Lee, 2005). A draft questionnaire was refined through two rounds of rigorous pre-testing. The pre-testing process focused on instrument clarity, question wording, and validity. Four Management Information System doctoral students and three Management Information System professors conducted the first round of pre-testing to ensure that both the content and the wording of the questionnaire were problem free. During the second round of pre-testing, a revised questionnaire was pre-tested by 50 Executive Master of Business Administration students from National Taiwan University of Science and Technology to validate that the sentence structure of the questions were clear and understandable in terms of structure and word choices and phrasing.

The adopted sample for the research was the "Corporate 500" (the 500 largest manufacturing and service companies in Taiwan), published by *Commonwealth Magazine* in 2008. Questionnaires were mailed to these 500 IT managers with a cover letter explaining the objective of the study and an enclosed, stamped, self-addressed, return envelope. Follow-up letters were sent approximately one month after the initial mailings.

A total of 151 usable questionnaires were returned for a response rate of 30.2 percent after deletion of 16 questionable cases. The respondents were all IT managers, and 68.2 percent have been working in the IT field for more than seven years. Of that group approximately, 40.4 percent were in information technology circles, manufacturing circles (25.8 percent), and finance circles (17.2 percent). The remainders of the respondents were in wholesaling, service, and other circles. The number of employees at the companies were over 1,000 (60.3 percent), between 500 and 1,000 (15.8 percent), between 100 and 500 (20.6 percent), and fewer than 100 (3.3 percent). Table I lists the respondent's demographic characteristics, including industry type, gender, work experience, and number of employees.

3.2 Measurement development

Table II lists the construct definition of instruments and the related references. To ensure content validity, items selected from the constructs in the study were adapted from previous researches and modified for use in a KMS context. All questionnaire items used a five-point Likert scale that varied from "strongly disagree" (1) to "strongly agree" (5). Appendix 1 presents all the surveyed items. Five items of empowering leadership were adapted and based on Ahearne *et al.* (2005), Arnold *et al.* (2000), Martin and Bush (2006), Ottenbacher and Gnoth (2005), and Yoon (2005). Five items of task-technology fit were measured using the scales based on Klopping and McKinney (2004) and Lippert and Forman (2006). The scales of compatibility were measured using three items adapted from previous researches (Gumussoy and Calisir, 2009; Ryu *et al.*, 2009). KMS usage was assessed with four items based on Igbaria *et al.* (1995) and Wu and Wang (2006).

4. Discussion and conclusion

The results of hypotheses testing and statistical analysis are depicted in the section 5, and all of the research hypotheses are supported. The discussion and conclusions are supported by the analysis given at the end of the paper.

Demographic variable	Sample composition	
	n	%
Gender		
Male	119	78.8
Female	32	21.2
Work experience		
1 year or less	3	2
1-3 years	15	9.9
3-5 years	17	11.3
5-7 years	13	8.6
7 years or above	105	68.2
Industry		
Information technology	61	40.4
Manufacturing	39	25.8
Wholesaling	8	5.3
Finance	26	17.2
Service	6	4
Other	11	7.3
Number of employees		
Under 100 people	5	3.3
101-500 people	31	20.6
501-1,000 people	24	15.8
1,000 people or more	91	60.3

Note: $n = 151$

Table I.
Demographic characteristics of sample

Constructs	Definition	References
Empowering leadership	Leader behaviors whereby power is shared with subordinates so as to give them increased decision-making authority with respect to the execution of their work tasks	Ahearne *et al.* (2005); Arnold *et al.* (2000); Martin and Bush (2006); Ottenbacher and Gnoth (2005); Yoon (2005)
Task-technology fit	The extent to which a KMS meets the information needs of the user's task	Klopping and McKinney (2004); Lippert and Forman (2006)
Compatibility	The extent to which a KMS is perceived as being consistent with the existing values, past experiences, and needs of the potential users	Gumussoy and Calisir (2009); Ryu *et al.* (2009)
KMS usage	The extent of a KMS being used to carry out the user's work	Igbaria *et al.* (1995); Wu and Wang (2006)

Table II.
Formal definitions of the constructs

4.1 Discussion of theoretical model

This study examined how perceived managerial leadership behavior affects the employee usage of KMS through its effect on TTF and compatibility. The results from a structural equation modeling approach offer statistical support for hypothesized

relations. We found empowering leadership has indirect effect on KMS usage. Empowering leadership positively relates to both TTF and compatibility, which in turn both positively relate to usage of KMS. The results of this study are discussed below.

From the results, we demonstrate that there is a positive and significant relationship between empowering leadership and TTF. Owing to managerial empowering behaviors' facilitating the development of an environment where knowledge sharing comes about more spontaneously (Foss *et al.*, 2009; Singh, 2008; Srivastava *et al.*, 2006), employees will be more willing to interact and share their expertise, experience, and insights through use of a KMS. Therefore, organizational knowledge and practical experiences are effectively accumulated in a KMS, which then contributes toward providing useful and sufficient knowledge that helps fulfill user task needs.

Further, empowering leadership is found to have a significant effect on compatibility. As Anantatmula (2008) mentions, leadership plays an important role in developing and implementing KMS, and our findings further suggest that empowering behaviors can be an appropriate leadership style for facilitating and enhancing the compatibility of a KMS. Empowering leadership produces respect for employees' ideas and opinions, a favorable scenario for implementing a work-relevant system because the system can then be suitably designed to satisfy user specific requirements and preferred work style. Conceivably, when firms implement a KMS to support employee knowledge activities, such leadership will facilitate that system's success by virtue of adopting employee suggestions and opinions and including them in the system design. Through user involvement in KMS design, the system can be tailored the way users prefer to work (Butler *et al.*, 2008; Hjelmervik and Wang, 2007).

Consistent with the hypotheses presented for this research, both TTF and compatibility are also positively significant relate to KMS usage. Our version of Goodhue and Thompson (1995) proposition states that for users to be willing to use a KMS, the system should provide appropriate knowledge to meet their task needs. The result of this study supports this proposition, and is similar to the findings of previous research (Lin and Huang, 2008). Users who perceive that the task-relevant knowledge provided by a KMS is pretty abundant, useful, and up to date enough for them to perform their tasks will be more willing to use the system. Moreover, our finding indicates that the more a KMS is compatibility with user working style, the higher will be actual utilization, as concluded in previous studies (Chang *et al.*, 2008; Teo and Men, 2008). In the context of knowledge management, the ways employees execute their work presents their patterns of knowledge behaviors; hence, if such patterns can be truly embedded into a KMS, that system will be more compatible with user knowledge style, resulting in preferable and more effective utilization of the system. Evidently, for a KMS to be actively used, it should not only meet the knowledge requirements during its execution of user tasks, but also be compatible with user work habits and knowledge style.

Finally, the results of this study show that the significant influences of empowering leadership on KMS usage through TTF and compatibility. Employees with higher empowerment are likely to have a more positive perception of TTF and the compatibility of a KMS, ultimately also increasing their personal willingness to use the system. Consistent with previous studies that identify empowering leadership as an important factor for knowledge management success (Cabrera *et al.*, 2006; Chong, 2006; Hung *et al.*, 2005; Oliver and Kandadi, 2006; Singh, 2008; Srivastava *et al.*, 2006), our findings also suggest that such leadership can facilitate the adoption of KMS. By virtue

of empowering leadership in knowledge management initiatives, it will favorably stimulate employees to engage in more knowledge activities and facilitate the development of an environment that encourages them to get used to use a KMS to do these activities.

As Alavi and Leidner (1999) notes, KMS is multi-faceted and far more than just technology, and an effective KMS should encompass and address broad cultural and organizational issues. Managers who want to introduce a KMS successfully should not only pay attention to the design of the system, but also be fully concerned with the type of leadership that is employed, especially because leadership style does play a critical role in IT adoption (Neufeld *et al.*, 2007; Stone, 1994).

4.2 Implications for practitioners

This study has several key implications for KMS practitioners and managers. First, for a KMS to be successful, managers should be concerned with the most essential factor of KMS, that is, the use of the system. Without employee usage of KMS, the system will become ineffective as a knowledge management solution (Nevo and Chan, 2007). Getting employees to actively use a KMS hence turns into a critical issue for practitioners. Knowledge workers do not merely need outcomes of processed knowledge. They also require knowledge patterns that favor the effective internalization of that knowledge into their minds. Therefore, to increase users' willingness to use a KMS, the system should not only provide appropriate knowledge to meet user task needs, but also keep the patterns of knowledge activities to fulfill the ways that they are being-used during the work. Without considering the adequate and suitable provision of knowledge during tasks execution and knowledge patterns that are easily comprehended and accepted by users, there will be greater non-use of the system, producing the failure of KMS.

Second, a well-built KMS can effectively support organizational practice of knowledge management, but the system cannot guarantee by itself that such knowledge management activities will in fact take place. Managers, therefore, should consider the type of leadership to employ when introducing knowledge management initiatives. In contrast to autocratic leadership, empowering leadership is more favorable to stimulate employees engaging in knowledge activities and fosters a positive sharing culture. Managers must make an increased effort to allow employees to act autonomously, express their ideas and opinions, and make decisions within their scope of responsibility, all of which will develop an environment where employees participate in knowledge activities more spontaneously. Similarly, when firms introduce a KMS to address knowledge management, an environment of empowerment will encourage employees to be willing to use the system to support their own knowledge work. This acceptance will facilitate and indeed realize the intended purpose of knowledge management and further accumulate more organizational intellectual assets more effectively.

Third, although managerial empowering behaviors can be favorable for fostering a sharing culture, managers should still make an additional effort to encourage employees to share their knowledge and practical experience. Given the normal fear of losing their power position in an organization, people may not like sharing their unique knowledge, especially when firms introduce a KMS to keep their patterns of knowledge practices consistent and further institutionalize them. Managers thus should consider how to promote a knowledge sharing culture, such as type of organizational culture

and climate, a reward and incentive system, the relationship of social network, and a pattern of interpersonal trust and justice (Wang and Noe, 2010). If managers can actively foster a sharing culture, employees will be willing to share their knowledge and insights because they perceive that action as natural rather than forced or required. Introduction of KMS hence can effectively embed employees' knowledge patterns into the system, including user patterns of knowledge processing, retrieving, sharing, creating, and problem-solving. By keeping these patterns in a KMS, the system can become the benchmark for organizational experiences and produce ongoing organizational learning that strengthens competitive advantages.

Finally, since firms all do their own knowledge management strategies, they should choose and implement appropriate knowledge tools in different knowledge management stages. To effectively optimize these tools for user particular needs, employees should be encouraged to become involved in system design so as to tailor their knowledge style in each knowledge management stage. Without user involvement in KMS design, no system can really fulfill employees' current knowledge work and increase their willingness to use (Hjelmervik and Wang, 2007). A well-built and user-relevant KMS, therefore, cannot be just one-stop designed; rather it must be developed through effective evolutionary processes that include user involvement and adapt to practical changes within the organization. By constantly modifying and upgrading a KMS, the system can be fully tailored for present workable knowledge management strategy and exert its full benefits by virtue of leveraging user-focused knowledge within and outside the organization.

4.3 Conclusion

As leadership plays a critical role in successful IT adoption, this study has examined the influence of empowering leadership on KMS usage through its effects on TTF and compatibility. The results of our study suggest that practitioners should not only focus on the technology issue (i.e. providing suitable knowledge to meet user needs and accruing high compatibility with user working style), but also be concerned with the impact of leadership style. Managers should consider how to empower subordinates appropriately, a decision that can indeed facilitate the development of an environment where employees participate in knowledge management activities more spontaneously. Without such appropriate leadership, however, even though firms may introduce a well-built KMS, that system cannot likely effectively exert its full range of benefits.

There are two limitations to this study that require further examination and additional research. First, the sample was drawn from Taiwanese organizations only. Hence, the research model should be tested using samples from other countries, because cultural differences may exist between Taiwan and other countries. Second, this study obtained just 151 completed questionnaires for a 30.2 percent response rate. The limited number of respondents is a concern. As a larger sample will bring more statistical power can provide more stable and consistent results, this study should be verified via a larger sample to increase its generalization.

5. Data analysis and results

The hypothesized models for this study were empirically tested using structural equation modeling, supported by the AMOS7.0 program with maximum likelihood

estimation. Following Hair *et al.* (1998), we adopted a two-stage approach for the model testing. The first step involved the analysis of the measurement model, estimated by using confirmatory factor analysis (CFA) to examine the reliability and validity of the proposed constructs. The second step tested the structural model which was analyzed to examine the hypotheses.

5.1 Measurement model

The research instrument used CFA to examine the reliability and validity. Table III presents the results of the CFA analysis. For measurement model to have sufficiently good model fit, the observed normed χ^2 should not exceed 3 (Bagozzi and Yi, 1988). Other fit indices included the Non-Normed Fit Index (NNFI) and comparative fit index (CFI) should exceed the recommended cut-off level of 0.9 (Bentler, 1988). The goodness-of-fit index (GFI) also should exceed the recommended cut-off level of 0.8 (Etezadi-Amolo and Farhoomand, 1996). The root mean square error of approximation (RMSEA) should be below the cut-off level of 0.08 as recommended by Jöreskog and Sörbom (1996).

For the current CFA model, χ^2/df was 1.868 ($\chi^2 = 183$; df = 98), NNFI was 0.928, CFI was 0.941, GFI was 0.867, and RMSEA was 0.076, suggesting adequate model fit. Moreover, the results in Table III show that the composite reliability of all latent variables exceeds the 0.7 thresholds for acceptable reliability suggested by Bagozzi and Yi (1988). The convergent validity was established if all indicator loadings were

	Factor loadings	*t*-value	CR	AVE
Empowering leadership			0.87	0.63
EL1	0.656	-		
EL2	0.824	8.39*		
EL3	0.860	8.62*		
EL4	0.815	8.33		
Task technology fit			0.88	0.60
TTF1	0.714	-		
TTF2	0.784	9.00*		
TTF3	0.829	9.48*		
TTF4	0.763	8.76*		
TTF5	0.776	8.92*		
Compatibility			0.85	0.66
CP1	0.733	-		
CP2	0.778	9.09*		
CP3	0.907	9.72*		
KMS usage			0.91	0.7
KU1	0.795	-		
KU2	0.898	12.54*		
KU3	0.873	12.12*		
KU4	0.815	11.08*		

Notes: $^*p < 0.001$; CR, Composite reliability $= \frac{(\sum \lambda^2)}{\left[(\sum \lambda)^2 + \sum(\theta)\right]}$; AVE, Average variance extracted $= \frac{(\sum \lambda^2)}{\left[(\sum \lambda)^2 + \sum(\theta)\right]}$; λ = factor loading; θ = measurement error of each measured variable

Table III.
CFA results of measurement model

significant and exceeded the recommended level of 0.5 (Hair *et al.*, 1998). Table III presents the factor loadings of the measurement items. All of them exceed the recommended level of 0.5 and all *t*-values were statistically significant, indicating that the indicators were one dimensional.

Finally, to evaluate the discriminant validity, the square root of the average variance extracted (AVE) in each construct is compared with the correlation coefficients between two constructs (Fornell and Larcker, 1981). Table IV lists the correlations among the constructs, with the square root of the AVE on the diagonal. All the diagonal values exceed the correlations between any pair of constructs, providing strong evidence of discriminant validity at the construct level. Hence, the evidence of good model fit, reliability, convergent validity, and discriminant validity indicate that the measurement model was appropriate for testing the structural model at a subsequent stage.

5.2 Test of the structural model

A similar set of fit indices was used to examine the structural model. As shown in Table V, all of the model-fit indices of the structural model exceeded their respective recommended level. The ratio of χ^2 to degrees-of-freedom was 2.098 for the structural model and within the recommended level of 3. Comparison of other fit indices with their corresponding recommended values provided evidence of a good fit (GFI = 0.856, NNFI = 0.909, CFI = 0.924); and the 0.086 RMSEA value closely approached the 0.08 standard, suggesting that the model fit the data well. Hence, our study could proceed to examine the path coefficients of the model.

The results of hypotheses testing are presented in Figure 2. As expected, empowering leadership is positively related to TTF ($\beta = 0.50$, $p < 0.01$) and compatibility ($\beta = 0.31$, $p < 0.05$), providing support for *H1* and *H2*. The results also

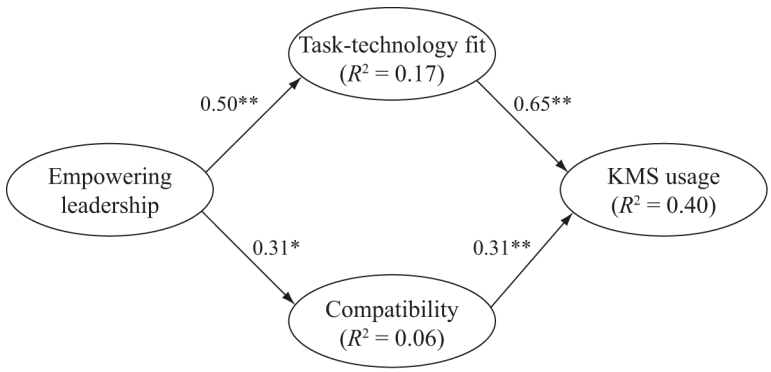
	Descriptive statistics		Correlations			
Construct	Mean	SD	EL	TTF	CP	KU
EL	3.79	0.62	*0.79*			
TTF	3.42	0.56	0.39	*0.77*		
CP	3.51	0.62	0.23	0.52	*0.81*	
KU	3.36	0.67	0.27	0.64	0.50	*0.85*

Notes: $n = 151$; Diagonal elements (in italic) represent the square roots of the AVE; Off-diagonal elements are the correlations among constructs; EL, Empowering leadership; TTF, Task-technology fit; CP, Compatibility; KU, KMS Usage

Table IV.
Discriminant validity: inter-correlation and AVE

Index	Structural model	Recommended value	References
χ^2/d.f.	209.8/100 = 2.098	≤3.00	Bagozzi and Yi (1988)
GFI	0.856	≥0.80	Etezadi-Amolo and Farhoomand (1996)
NNFI	0.909	≥0.90	Bentler (1988)
CFI	0.924	≥0.90	
RMSEA	0.086	≤0.08	Jöreskog and Sörbom (1996)

Table V.
Fit indices for measurement and structural model



Notes: *p-value < 0.05; **p-value < 0.01

Figure 2.
Results for the model

Model A Path	t-value	Model B Path	t-value	Sobel test
Empowering leadership → TTF	4.077	TTF → KMS usage	5.358	3.245
Empowering leadership → compatibility	2.558	Compatibility → KMS usage	3.309	2.039

Table VI.
Mediation results

reveal that TTF ($\beta = 0.65$, $p < 0.01$) and compatibility ($\beta = 0.31$, $p < 0.01$) positively affect KMS usage, demonstrating support for *H3* and *H4*. Moreover, the explanatory power of the research model is shown in Figure 2. The R^2 value shows that TTF and compatibility accounted for 40 percent of the variance of KMS usage. Empowering leadership explained $R^2 = 17$ percent and 6 percent of the variance of TTF and compatibility, respectively.

Additionally, we tested for indirect effects using Sobel's (1982) test, as shown in Table VI. Model A, our research model, represents a baseline model as well as including paths from the independent variable (empowering leadership) to the two mediator variable (TTF and compatibility). Against the baseline model, we added to a direct path from empowering leadership to KMS usage in Model B, which includes paths from the mediator variables to KMS usage. The Sobel test results indicated that the effects of empowering leadership on KMS usage was significantly mediated by TTF (Sobel test = 3.245, $p < 0.01$) and compatibility (Sobel test = 2.039, $p < 0.05$).

References

Ahearne, M., Mathieu, J. and Rapp, A. (2005), "To empower or not to empower your sales force? An empirical examination of the influence of leadership empowerment behavior on customer satisfaction and performance", *Journal of Applied Psychology*, Vol. 90 No. 5, pp. 945-55.

Al-Busaidi, K.A. and Olfman, L. (2005), "An investigation of the determinants of knowledge management systems success in Omani organizations", *Journal of Global Information Technology Management*, Vol. 8 No. 3, pp. 6-27.

Alavi, M. and Leidner, D.E. (1999), "Knowledge management systems: issues, challenges, and benefits", *Communications of the AIS*, Vol. 1 No. 2, pp. 2-36.

Alavi, M. and Leidner, D.E. (2001), "Review:knowledge management and knowledge management systems: conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 No. 1, pp. 107-36.

Anantatmula, V.S. (2008), "Leadership role in making effective use of KM", *VINE*, Vol. 38 No. 4, pp. 445-60.

Arnold, J.A., Arad, S., Rhoades, J.A. and Drasgow, F. (2000), "The empowering leadership questionnaire: the construction and validation of a new scale for measuring leader behaviors", *Journal of Organizational Behavior*, Vol. 21 No. 3, pp. 249-69.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation model", *Journal of Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Bailey, J.E. and Nadler, G. (1979), "A methodology which requires user participation in the design of information systems", *Computers & Industrial Engineering*, Vol. 3 No. 4, pp. 327-34.

Bentler, P.M. (1988), *Theory and Implementation of EQS: A Structural Equation Program*, Sage, Newbury Park, CA.

Bowen, D. and Lawler, E.E. III (1992), "The empowerment of service workers: what, why, how and when?", *Sloan Management Review*, Vol. 33 No. 3, pp. 31-9.

Bueno, S. and Salmeron, J.L. (2008), "TAM-based success modeling in ERP", *Interacting with Computers*, Vol. 20 No. 6, pp. 515-23.

Butler, T., Heavin, C. and O'Donovan, F. (2007), "A theoretical model and framework for understanding knowledge management system implementation", *Journal of Organizational and End User Computing*, Vol. 19 No. 4, pp. 1-21.

Butler, T., Feller, J., Pope, A., Emerson, B. and Murphy, C. (2008), "Designing a core IT artefact for knowledge management systems using participatory action research in a government and a non-government organisation", *The Journal of Strategic Information Systems*, Vol. 17 No. 4, pp. 249-67.

Cabrera, A., Collins, W.C. and Salgado, J.F. (2006), "Determinants of individual engagement in knowledge sharing", *The International Journal of Human Resource Management*, Vol. 17 No. 2, pp. 245-64.

Chang, M.K., Cheung, W., Cheng, C.-H. and Yeung, J.H.Y. (2008), "Understanding ERP system adoption from the user's perspective", *International Journal of Production Economics*, Vol. 113 No. 2, pp. 928-42.

Chong, S.C. (2006), "KM critical success factors: a comparison of perceived importance versus implementation in Malaysian ICT companies", *The Learning Organization*, Vol. 13 Nos 2/3, pp. 230-56.

Dishaw, M.T. and Strong, D.M. (1999), "Extending the technology acceptance model with task-technology fit constructs", *Information and Management*, Vol. 36 No. 1, pp. 9-21.

Etezadi-Amolo, J. and Farhoomand, A.F. (1996), "A structural model of end user computing satisfaction and user performance", *Information & Management*, Vol. 30 No. 2, pp. 65-73.

Fornell, C. and Larcker, D. (1981), "Evaluating structural equation models with unobservable variable and measurement error", *Journal of Marketing Research*, Vol. 18 No. 2, pp. 39-50.

Foss, N.J., Minbaeva, D.B., Pedersen, T. and Reinholt, M. (2009), "Encouraging knowledge sharing among employees: how job design matters", *Human Resource Management*, Vol. 48 No. 6, pp. 871-93.

Goh, S. and Richards, G. (1997), "Benchmarking the learning capability of organizations", *European Management Journal*, Vol. 15 No. 5, pp. 575-83.

Goodhue, D.L. (1995), "Understanding user evaluations of information systems", *Management Science*, Vol. 41 No. 12, pp. 1827-44.

Goodhue, D.L. and Thompson, R.L. (1995), "Task-technology fit and individual performance", *MIS Quarterly*, Vol. 19 No. 2, pp. 213-36.

Gumussoy, C.A. and Calisir, F. (2009), "Understanding factors affecting e-reverse auction use: an integrative approach", *Computers in Human Behavior*, Vol. 25 No. 4, pp. 975-88.

Hackman, J.R. and Oldham, G.R. (1976), "Motivation through the design of work: a test of a theory", *Organizational Behavior and Human Performance*, Vol. 16 No. 2, pp. 250-79.

Hahn, J. and Wang, T. (2009), "Knowledge management systems and organizational knowledge processing challenges: a field experiment", *Decision Support Systems*, Vol. 47 No. 4, pp. 332-42.

Hair, J.F., Anderson, R.L. and Tatham, W.C. (1998), *Multivariate Data Analysis*, Prentice Hall, Upper Saddle River, NJ.

Hartline, M.D. and Ferrell, O.C. (1996), "The management of customer contact service employees: an empirical investigation", *Journal of Marketing*, Vol. 60 No. 4, pp. 52-70.

He, W., Qiao, Q. and Wei, K.-K. (2009), "Social relationship and its role in knowledge management systems usage", *Information & Management*, Vol. 46 No. 3, pp. 175-80.

Hjelmervik, O.R. and Wang, K. (2007), "ICT-supported knowledge representation for development of routines in industry", *Journal of Intelligent Manufacturing*, Vol. 18 No. 4, pp. 479-85.

Holsapple, C.W. and Joshi, K.D. (2001), "Organizational knowledge resources", *Decision Support Systems*, Vol. 31 No. 1, pp. 39-54.

Hung, Y.C., Huang, S.M., Lin, Q.P. and Tsai, M.L. (2005), "Critical factors in adopting a knowledge management system for the pharmaceutical industry", *Industrial Management & Data Systems*, Vol. 105 Nos 1/2, pp. 164-83.

Igbaria, M., Guimaraes, T. and Davis, G.B. (1995), "Testing the determinants of microcomputer usage via a structural equation model", *Journal of Management Information Systems*, Vol. 11 No. 4, pp. 87-114.

Jarupathirun, S. and Zahedi, F.M. (2007), "Exploring the influence of perceptual factors in the success of web-based spatial DSS", *Decision Support Systems*, Vol. 43 No. 3, pp. 933-51.

Jennex, M.E. and Olfman, L. (2004), "Assessing knowledge management success/effectiveness models", *Proceedings of the 37th Annual Hawaii International Conference on System Sciences*, IEEE Computer Society, Piscataway, NJ.

Jöreskog, K.G. and Sörbom, D. (1996), *LISREL 8: Structural Equation Modeling*, Scientific Software International Corporation, Chicago, IL.

Kim, B.G., Park, S.C. and Lee, K.J. (2007), "A structural equation modeling of the internet acceptance in Korea", *Electronic Commerce Research and Applications*, Vol. 6 No. 4, pp. 425-32.

Kim, S. and Lee, H. (2006), "The impact of organizational context and information technology on employee knowledge-sharing capabilities", *Public Administration Review*, Vol. 66 No. 3, pp. 370-85.

Kirkman, B.L. and Rosen, B. (1999), "Beyond self-management: antecedents and consequences of team empowerment", *Academy of Management Journal*, Vol. 42 No. 1, pp. 58-74.

Klopping, I.M. and McKinney, E. (2004), "Extending the technology acceptance model and the task-technology fit model to consumer e-commerce", *Information Technology, Learning, and Performance Journal*, Vol. 22 No. 1, pp. 35-48.

Kuo, R.-Z. and Lee, G.-G. (2009), "KMS adoption: the effects of information quality", *Management Decision*, Vol. 47 No. 10, pp. 1633-51.

Leach, D.J., Wall, T.D. and Jackson, P.R. (2003), "The effect of empowerment on job knowledge: an empirical test involving operators of complex technology", *Journal of Occupational and Organizational Psychology*, Vol. 76 No. 1, pp. 27-52.

Lee, H. and Choi, B. (2003), "Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination", *Journal of Management Information Systems*, Vol. 20 No. 1, pp. 179-228.

Liden, R.C. and Arad, S. (1996), "A power perspective of empowerment and work groups: implications for human resources management research", *Research in Personnel and Human Resources Management*, Vol. 14 No. 3, pp. 205-51.

Liebowitz, J. (1999), *Knowledge Management Handbook*, CRC Press, Boca Raton, FL.

Lin, H.F. and Lee, G.G. (2005), "Impact of organizational learning and knowledge management factors on e-business adoption", *Management Decision*, Vol. 43 No. 2, pp. 171-88.

Lin, T.-C. and Huang, C.-C. (2008), "Understanding knowledge management system usage antecedents: an integration of social cognitive theory and task technology fit", *Information & Management*, Vol. 45 No. 6, pp. 410-17.

Lippert, S.K. and Forman, H. (2006), "A supply chain study of technology trust and antecedents to technology internalization consequences", *International Journal of Physical Distribution & Logistics Management*, Vol. 36 No. 4, pp. 271-88.

Liu, D.-R. and Wu, I.C. (2008), "Collaborative relevance assessment for task-based knowledge support", *Decision Support Systems*, Vol. 44 No. 2, pp. 524-43.

Lu, H.-P. and Wang, J.-Y. (1997), "The relationships between management styles, user participation, and system success over MIS growth stages", *Information & Management*, Vol. 32 No. 4, pp. 203-13.

McDermott, R. (1999), "Why information technology inspired but cannot deliver knowledge management", *California Management Review*, Vol. 41 No. 4, pp. 103-17.

Martin, C.A. and Bush, A.J. (2006), "Psychological climate, empowerment, leadership style, and customer-oriented selling: an analysis of the sales manager-salesperson dyad", *Academy of Marketing Science Journal*, Vol. 34 No. 3, pp. 419-38.

Neufeld, D.J., Dong, L. and Higgins, C. (2007), "Charismatic leadership and user acceptance of information technology", *European Journal of Information Systems*, Vol. 16 No. 4, pp. 494-510.

Nevo, D. and Chan, Y.E. (2007), "A Delphi study of knowledge management systems: scope and requirements", *Information & Management*, Vol. 44 No. 6, pp. 583-97.

Nonaka, I., Reinmoeller, P. and Senoo, D. (1998), "The 'Art' of knowledge: systems to capitalize on market knowledge", *European Management Journal*, Vol. 16 No. 6, pp. 673-84.

O'Brien, J.A. and Marakas, G.M. (2006), *Management Information Systems*, 7th ed., McGraw-Hill International, New York, NY.

Oliver, S. and Kandadi, K.R. (2006), "How to develop knowledge culture in organizations? A multiple case study of large distributed organizations", *Journal of Knowledge Management*, Vol. 10 No. 4, pp. 6-24.

Ottenbacher, M. and Gnoth, J. (2005), "How to develop successful hospitality innovation", *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 46 No. 2, pp. 205-22.

Pearce, C.L. and Conger, J.A. (2003), *Shared Leadership: Reframing the Hows and Whys of Leadership*, Sage, Thousand Oaks, CA.

Pertusa-Ortega, E.M., Zaragoza-Sáez, P. and Claver-Cortés, E. (2010), "Can formalization, complexity, and centralization influence knowledge performance?", *Journal of Business Research*, Vol. 63 No. 3, pp. 310-20.

Poston, R.S. and Speier, C. (2005), "Effective use of knowledge management systems: a process model of content ratings and credibility indicators", *MIS Quarterly*, Vol. 29 No. 2, pp. 221-44.

Premkumar, G. and Roberts, M. (1999), "Adoption of new information technologies in rural small businesses", *Omega*, Vol. 27 No. 4, pp. 467-84.

Quaddus, M. and Xu, J. (2005), "Adoption and diffusion of knowledge management systems: field studies of factors and variables", *Knowledge-Based Systems*, Vol. 18 Nos 2-3, pp. 107-15.

Quigley, N.R., Tesluk, P.E., Locke, E.A. and Bartol, K.M. (2007), "A multilevel investigation of the motivational mechanisms underlying knowledge sharing and performance", *Organization Science*, Vol. 18 No. 1, pp. 71-88.

Rapert, M. and Wren, B. (1998), "Reconsidering organizational structure: a dual perspective of frameworks and processes", *Journal of Managerial Issues*, Vol. 10 No. 3, pp. 287-302.

Rogers, E.M. (1995), *The Diffusion of Innovation*, 4th ed., Free Press, New York, NY.

Ryu, M.-H., Kim, S. and Lee, E. (2009), "Understanding the factors affecting online elderly users' participation in video UCC services", *Computers in Human Behavior*, Vol. 25 No. 3, pp. 619-32.

Singh, S.K. (2008), "Role of leadership in knowledge management: a study", *Journal of Knowledge Management*, Vol. 12 No. 4, pp. 3-15.

Sobel, M.E. (1982), "Asymptotic intervals for indirect effects in structural equations models", in Leinhart, S. (Ed.), *Sociological Methodology*, Jossey-Bass, San Francisco, CA.

Spreitzer, G. (1995), "Psychological empowerment in the workplace: dimensions, measurement, and validation", *Academy of Management Journal*, Vol. 38 No. 5, pp. 1442-65.

Srivastava, A., Bartol, K.M. and Locke, E.A. (2006), "Empowering leadership in management teams: effect on knowledge sharing, efficacy, and performance", *Academy of Management Journal*, Vol. 49 No. 6, pp. 1239-51.

Stone, R.A. (1994), "Leadership and information system management: a literature review", *Computers in Human Behavior*, Vol. 10 No. 4, pp. 559-68.

Strong, D.M., Dishaw, M.T. and Bandy, D.B. (2006), "Extending task technology fit with computer self-efficacy", *Database for Advances in Information Systems*, Vol. 37 Nos 2/3, pp. 96-107.

Tarafdar, M. and Vaidya, S.D. (2006), "Challenges in the adoption of e-commerce technologies in India: the role of organizational factors", *International Journal of Information Management*, Vol. 26 No. 6, pp. 428-41.

Teo, T.S.H. and Men, B. (2008), "Knowledge portals in Chinese consulting firms: a task-technology fit perspective", *European Journal of Information Systems*, Vol. 17 No. 6, pp. 557-74.

Thomas, K.W. and Velthouse, B.A. (1990), "Cognitive elements of empowerment: an 'interpretive' model of intrinsic task motivation", *Academy of Management Review*, Vol. 15 No. 4, pp. 666-81.

Wang, S. and Noe, R.A. (2010), "Knowledge sharing: a review and directions for future research", *Human Resource Management Review*, Vol. 20 No. 2, pp. 115-31.

Wasko, M.M. and Faraj, S. (2005), "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice", *MIS Quarterly*, Vol. 29 No. 1, pp. 35-57.

Wu, J.-H. and Wang, Y.-M. (2006), "Measuring KMS success: a respecification of the Delone and Mclean's model", *Information & Management*, Vol. 43 No. 6, pp. 728-39.

Yoon, H.-Y. (2005), "Characteristics of team-based organization introduced to academic libraries in South Korea", *The Journal of Academic Librarianship*, Vol. 31 No. 4, pp. 358-65.

Zhang, J. and Faerman, S. (2007), "Distributed leadership in the development of a knowledge-sharing system", *European Journal of Information Systems*, Vol. 16 No. 4, pp. 479-93.

Further reading

Shih, H.-P. (2008), "Continued use of a Chinese online portal: an empirical study", *Behaviour and Information Technology*, Vol. 27 No. 3, pp. 201-9.

Appendix 1

Empowering leadership

EL1	Managers respect employees' opinion
EL2	Managers are willing to provide opportunities for employees to use their own judgment in their work
EL3	Managers are willing to empower employees to do their work
EL4	Managers tend to sufficiently trust employees in their work

Compatibility

CP1	KMS would be compatible with all aspects of my work
CP2	I think that KMS would fit well with the way I like to work
CP3	KMS would fit into my work style

Task technology fit

TTF1	I can get the data that is current enough from KMS to meet my jobs
TTF2	The data from KMS is up to date enough for my purposes
TTF3	The data maintained by KMS is pretty much what I need to carry out my tasks
TTF4	KMS contains critical data that would be very useful to me in my job
TTF5	KMS maintains data at an appropriate level of detail for my group's tasks

Usage

US1	I daily use KMS to accomplish my work
US2	I frequently use KMS to accomplish my work
US3	The functionalities of KMS enable my colleagues and I to carry out our work favorably
US4	I use KMS to solve many problems in my work

Appendix 2
Abbreviation index

Average Variance Extracted (AVE)
Confirmatory Factor Analysis (CFA)
Comparative Fit Index (CFI)
Goodness-of-Fit Index (GFI)
Knowledge Management System (KMS)
Information System (IS)
Information Technology (IT)
Non-Normed Fit Index (NNFI)
Root Mean Square Error of Approximation (RMSEA)
Task-Technology Fit (TTF).

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