KMS adoption: the effects of information quality

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Abstract

Purpose – By expanding the technology acceptance model, this paper aims to provide a research model for examining the impact of information quality and task technology fit on the adoption of KMS.

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

Findings – Based on the study, it is suitable to use a technology acceptance model to study adoption of KMS and explore how two external variables, information quality and task technology fit, affect the intention to adopt. Additionally, information quality has a directly significant effect on ease of use that users perceive and usefulness where fit between task and KMS is high.

Research limitations/implications – A mass mailing of a somewhat lengthy, blind survey to busy managers produces a somewhat low response rate. Thus, the generalized nature of the findings is somewhat in question, making replication of the study in Taiwan important.

Practical implications – The study distinguishes the design of information systems and knowledge management systems. For adoption of KMS, managers must pay more attention to the quality of information provided, and the contextual features of the knowledge involved.

Originality/value – The value of this paper is in demonstrating the role of information quality with KMS, and providing further insight into the co-relationship of information quality, usefulness, and fit between task and KMS, leading to more effective strategies for KMS adoption.

Keywords Knowledge management systems, Information systems, Communication technologies

Paper type Research paper

1. Introduction

In the post-capitalist society (Drucker, 1993), the basic economic resources are no longer capital, land, or labor, but instead, knowledge (Hwang *et al.*, 2008). Given the rising importance in considering knowledge as a key organizational asset, interest in knowledge management systems (KMSs) is increasing at a rapid pace (Feng *et al.*, 2004; Lai, 2008; Nevo and Chan, 2007). Firms today must equip themselves for adoption of KMS and confront the challenges posed by such activities effectively.

KMS is an IT-based system developed to support and to enhance knowledge management (KM). Typical KMS includes DBMS, intranet, groupware, search engines etc. In practice, such applications are usually embedded in different business processes, e.g. SCM, CRM, competitive intelligence monitoring, and operational management, which results in various KMSs. These applications are expected to enhance flexibility and adaptability, and subsequently a firm's long-term competitiveness and survival (Khalifa *et al.*, 2008). Thus, many companies are building KMSs to create knowledge,

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organize it, and make it available whenever and wherever it is needed (O'Brien and Marakas, 2006; Tseng, 2008).

While several KMS success factors have been developed in other studies (Halawi *et al.*, 2008; Ong and Lai, 2007), most focus on information quality. Basically, information quality refers to the quality of data provided by information systems (IS). The data need fully to record the events happening in business operation processes. Yet, KMS outputs have to refine these data and also consider any contextual problems that users are facing (Nonaka and Konno, 1998; Wu and Wang, 2006). It means that knowledge provided to a given processor for a certain task at a certain time may be information or data for another task or at a different time (Holsapple, 2003). Therefore, a good KMS must not only consider the problems of system design, but also the quality of outputs that a system provides and the fit between user tasks and KMS.

Although KMS has been studied widely over several years, there is not much literature available on adoption of KMS (Jun and Mohammed, 2007). The technology acceptance model (TAM), which is widely accepted as a framework for understanding users' IT acceptance processes, can serve as a sound basis for investigation of KMS adoption. Despite its successful reputation, the role of external variables in KMS has not been well explored. This study examines information quality as a variable that affects the acceptance of KMS and further explores the influences of fitness between user tasks and KMS regarding usefulness. The research model and hypothesized relationships are empirically tested by a regression analysis approach using SPSS 15. This study aims to provide an extended model that is capable of understanding the determinants of KMS adoption. The results of the study should be useful to practitioners when formulating appropriate strategies to increase the success rate for adopting KMS in their companies.

2. Literature review and hypotheses development

2.1 Knowledge management system (KMS)

While there are many different approaches to KM, their purposes are the same: to more effectively facilitate the organization's effort in managing both tacit and explicit knowledge. To add value to KM there is need for KMS, which is a type of IS that supports and enhances KM processes of creation, storage, retrieval, diffusion, and application of knowledge (Lin and Huang, 2008; Quaddus and Xu, 2005; Vitari *et al.*, 2007). Alavi and Leidner (2001) point out that the role of a KMS is to:

- help in user assimilation of information;
- provide access to the sources of knowledge rather than the knowledge itself;
- gather, store, and transfer knowledge;
- provide link among sources of knowledge to create a wider breadth and depth of knowledge flows;
- provide effective search and retrieval mechanisms for locating relevant information; and
- enhance intellectual capital by supporting the development of individual and organizational competencies.

These implications highlight a number of issues that distinguish KMS from other systems, such as MIS and data warehouses, and help to define the relevant dimensions for KMS.

Realizing the importance of knowledge as an organizational asset that enables sustainable competitive advantage, many firms are developing KMSs designed especially to facilitate the sharing and the integration of knowledge, thus making a distinction between data and information (Bolloju *et al.*, 2002). Hoards of information are of little value; only that information which is actively processed in the mind of an individual through a process of reflection, enlightenment, or learning can be useful, and KMS facilitates an individual doing that. Systems designed to support knowledge in organizations may not appear radically different from other forms of IS, but will be geared toward enabling users to assign meaning to information and capture some of their knowledge in information and/or data (Alavi and Leidner, 2001).

Chait (1999) suggests that KMSs includes the key elements of organizational knowledge capital, including information about staff, customers, methodologies, and practices, which are crucial for effective management to achieve success and sustain competitive advantage (Lai and Chu, 2002). Despite the potential benefits of an effective KMS, companies have implemented KMS only to find that the system is not used or does not contribute value to the companies (Hansen and Von, 2001). It is often suggested that such failures are caused by an over-reliance on IT (Grant and Qureshi, 2006). However, the challenges of implementing KMS do not merely depend on management's technological abilities, but on how well systems meet the needs of users and organization (Whitfield, 2008), it means that the information and functions provided by a KMS should be fitted with user's needs for his or her jobs (Lin and Huang, 2008; Wing and Chua, 2005). This shows that the quality of the content and output of KMSs have a higher effect on the system adoption (Wu and Wang, 2006; King and Marks, 2008). Therefore, understanding and creating conditions under which KMS will be adopted and embraced by individual employees remain a high priority, as many companies have made large investments in KMS (Poston and Speier, 2005).

2.2 Technology acceptance model (TAM)

Among the different research models developed in the attempt to understand user acceptance of technologies, TAM has come to be one of the most widely used models for IT adoption (King and He, 2006; Venkatesh and Bala, 2008). In a critical review of TAM, Legris *et al.* (2003) conducted a meta-analysis and argued that TAM consistently explains about 40 percent of the variance in computer use and has been a useful theoretical model. TAM is supported by abundant empirical studies and has been successfully applied in the acceptance of diverse technologies, such as personal computers (Hamner and Qazi, 2009), mobile devices (Kuo and Yen, 2009; Shin, 2007), web sites (Kim *et al.*, 2008; Shin, 2008), and ERP (Bueno and Salmeron, 2008).

Davis (1989) introduced TAM as an adaptation of the theory of reasoned action (TRA) and proposed TAM to explain potential user behavioral intention (BI) to use a technological innovation. TAM posits that individuals' BI to use an IT is determined by two beliefs: perceived usefulness (PU), defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context" (Davis *et al.*, 1989, p. 985) and perceived ease of use (PEOU), defined as "the degree to which the prospective user expects the target system to be free of effort". PU looks at assessment of the extrinsic characteristics of IT, that is, task-oriented outcomes or how IT assist users achieve task-related objectives, such as task efficiency and effectiveness; PEOU examines the intrinsic characteristics of IT, such as ease of use, flexibility, and clarity of the IT interface (Jun and Mohammed, 2007). Both PU and PEOU exhibit significant influence on BI; the former has a stronger effect on promoting the use of IT (Davis *et al.*, 1989). Moreover, TAM shows that PEOU has a direct influence on PU. The easier a system is to use, the less effort will be required to accomplish certain tasks. TAM also theorizes that the effect of external variables, such as system features and environmental variables, on BI will be mediated by PU and PEOU.

Many empirical studies have generally supported the TAM hypotheses, i.e. PU and PEOU have significantly positive effects on BI (Aggelidis and Chatzoglou, 2009; Hernandez *et al.*, 2008; Jung *et al.*, 2009) and PEOU can strengthen PU (Bueno and Salmeron, 2008; Hamner and Qazi, 2009; Mao and Palvia, 2008). A user who perceives a higher usefulness of KMS will be more willing to adopt it (Hernandez *et al.*, 2008; Money and Turner, 2005). Ease of use would be primary factor to strengthen the acceptance of KMS (Hernandez *et al.*, 2008; Money and Turner, 2005). Additionally, a KMS with high ease of use encourages an increased sense of its usefulness (Hernandez *et al.*, 2008; Lai, 2008; Vitari *et al.*, 2007). Consequently, we hypothesize that (see Figure 1):

H1. PEOU will positively affect PU of KMS.

H2. PU will positively affect user intention to adopt KMS.

H3. PEOU will positively affect user intention to adopt KMS.

2.3 Information quality

Due to the fact that organizational databases reside in the larger context of IS, an integrated platform is necessary to help align information in order to transfer it into useful knowledge for other departments or functions (Michnik and Lo, 2009). Therefore, the quality of information has become a critical concern for decision makers (Halawi *et al.*, 2008; Ong and Lai, 2007; Wu and Wang, 2006) because information might be inappropriately interpreted by people who do not understand its full complexities or implications (Damodaran and Olphert, 2000).

The notion of information quality (IQ) was first proposed by DeLone and McLean (1992), who argued that IQ is a significant construct needed to build successful IS. IQ represents the user's perception of the output quality generated by an IS and includes

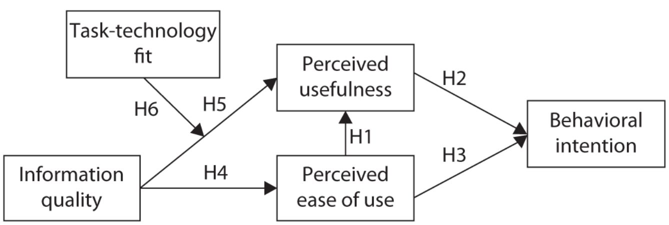


Figure 1.
Research model

such issues as accuracy, precision, currency, reliability, completeness, conciseness, relevance, understandability, meaningfulness, timeliness, comparability, and format (DeLone and McLean, 1992). Later, Wu and Wang (2006) proposed a KMS success model, which was modified by DeLone and McLean's (2003) updated model, and argue that IQ has a greater influence on perceived IS benefits. They identified IQ as consisting of content quality, and context and linkage quality. The first is similar to that of a traditional information system environment, while the other one is made up of special KMS characteristics. Halawi *et al.* (2008) then developed knowledge quality, which consists of ten items, which include timeliness, understandability, relevance, accuracy and so on.

As one of the KM goals in an organization is to provide rapid access to quality knowledge (Shin, 2004), timeliness and relevance become essential for information to be useful because information provided after a pivotal decision is merely history. If information is not relevant enough to individuals for needed decision-making or their current task needs, individuals will not use it. In order to maximize the extent to which the context attached to transferred knowledge is understood, information must be easy to read and comprehend (Lee *et al.*, 2002; Ong and Lai, 2007). Incomprehensible information for users is neither reliable nor relevant. Further, the meaningfulness of information is critical to IQ. Individuals are not committed to share and update their information when they don't see any value in it to themselves (Nevo and Chan, 2007). Therefore, the content of IQ should be measured as timeliness, relevance, understandability, and meaningfulness (Beverly *et al.*, 2002; DeLone and McLean, 1992; Lee *et al.*, 2002; Michnik and Lo, 2009; Wu and Wang, 2006).

Prior studies have argued that IQ has a positive impact on PEOU and PU (Ahn *et al.*, 2007; Chang *et al.*, 2005; Lin, 2007). Lin argues that IQ is a valuable predictor of perceived ease of use and usefulness. Chang *et al.* finds that IQ has a significant relationship to PEOU and PU for the internet tax-filing system. Ahn *et al.* also indicate that IQ has a positive influence on user perception of ease of use and usefulness in the context of online retailing. For a KMS then, it is important to highlight the role of IQ and satisfy the needs of users to accomplish their jobs. If a high quality of information is provided by KMS, it will offer the best decision to user jobs in time and reduce the complexity that users need to suffer for huge data processing. Additionally, if KMS provides high quality information, it will be regarded as useful because that knowledge helps users in making decisions and improving their productivity. Thus, the following hypotheses are proposed:

H4. Information quality will positively affect PEOU of KMS.

H5. Information quality will positively affect PU of KMS.

2.4 Task technology fit

The concept of fit has been explored widely in organization and strategy literature and covers much of the descriptive and prescriptive research in this area. Different definitions of fit in three distinct approaches to structural contingency theory have been identified: fit as congruence, fit as interaction, and fit as internal consistency (Drazin and Van de Ven, 1985). These ideas were further extended to identify six perspectives on fit: fit as moderation, as mediation, as matching, as gestalts, as profile deviation, and as covariation (Venkatraman, 1989). These perspectives vary in their degree of specificity of the theoretical relationship between variables, in the number of variables, in the fit relationships, and in whether the concept of fit is anchored to a particular criterion variable (Zigurs and Buckland, 1998).

According to the task technology fit (TTF) model, systems will help improve users' performances when the technology is "a good fit with the tasks it supports". In this study, the conceptual argument developed here is how effectively a KMS can be associated with users' tasks. This concept is similar to the foregoing perspective of "fit as matching" which can be found in TTF (Goodhue and Thompson, 1995). Goodhue and Thompson suggest that TTF is defined as the degree to which the capabilities of the technology match the demands of the task. TTF posits that IT will be used if, and only if, the functions available to the user support (fit) the activities of that user (Dishaw and Strong, 1999; Goodhue, 1995). If users perceive that the technology adequately fits the required task, then a positive evaluation is rendered (Susan and Howard, 2006). Rational users will choose the technology that enables them to complete their tasks with the greatest net benefit. IT that does not offer a sufficient advantage will not be used (Diane *et al.*, 2006). In this study, TTF is the degree to which KMS can provide useful knowledge to assist users in completing their jobs. The degree of TTF is high when users capture the right knowledge with sufficient context from KMS to accomplish their tasks. Thus, the higher the degree of fittness, the better will be the job performance that may result.

In KMS, the distinction between knowledge and information depends on its context with users (Nonaka and Konno, 1998; Wu and Wang, 2006). For instance, one's knowledge can be another's information; knowledge to one given person for a certain task at a certain time may be only information or data for another task or a different time (Holsapple, 2003). The above-mentioned explanation implies an important concept that usefulness of a KMS is contextual-dependent. A user might consider the quality of information appropriate for one task, but not sufficient for another task (Bizer and Cyganiak, 2008). Even though the provided knowledge has high quality, the recipient would not admit the knowledge if they believe it has no relationship or "relevance to practical affairs" (Lee *et al.*, 2007). Hence, it is possible for TTF to moderate the relationship between IQ and PU. When a user perceives the degree of TTF to be high, there may be a stronger relationship between IQ and PU. A high TTF ensures that the right knowledge with sufficient context is captured and available for the user at the right time. Thus, the following hypothesis is formulated:

H6. Task-technology fit will moderate the relationship between IQ and PU.

3. Research methodology

3.1 Sample and data collection

The population for this study consisted of IT managers in Taiwanese companies. The IT managers were chosen as informants in 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 MIS doctoral students and three MIS professors conducted the first round of pre-testing to ensure that both content and wording of the questionnaire were problem free. During the second round of pre-testing, a revised questionnaire was pre-tested by 50 EMBA students from NTUST to validate that the sentence structure of the questions was clear and understandable.

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

3.2 Measure development

Table I lists the constructs definition of instruments and the related references. To ensure content validity, items selected from the constructs were mainly adapted from previous researches and modified for use in a KMS context. All questionnaire items used a five-point Likert- type scale that varied from “strongly disagree” (1) to “strongly agree” (5). The Appendix presets all the surveyed items. The scales of PU, PEOU, and BI in TAM were measured using three items for each element that was adapted from previous researches (Davis, 1989; Dishaw and Strong, 1999; Elena *et al.*, 2006; Mao and Palvia, 2008; Venkatesh and Bala, 2008). There are four items to preset the meaning of IQ (Beverly *et al.*, 2002; DeLone and McLean, 1992; Lee *et al.*, 2002; Michnik and Lo, 2009; Wu and Wang, 2006). TTF was measured using five items described by Klopping and McKinney (2004) and Susan and Howard (2006).

3.3 Statistical analysis

Several statistical procedures were adopted to examine the hypotheses. First, factor analysis and Cronbach’s α were used to evaluate the degree of validity and reliability. Second, correlation analysis was conducted to understand the relationships between the variables and provide explanations for results from the regression analysis. Third, regression analysis was used to test the hypotheses. Furthermore, to reduce the problem of multicollinearity, the analysis centered PEOU, IQ and TTF while testing the moderating effects proposed by *H6* (Aiken and West, 1991).

Constructs	Definition	References
Perceived usefulness (PU)	The extent to which a person believes that using a KMS will enhance his or her job performance	Mao and Palvia (2008); Venkatesh and Bala (2008)
Perceived ease of use (PEOU)	The extent to which a person believes that using a KMS will be free of effort	Elena *et al.* (2006); Venkatesh and Bala (2008)
Behavioral intentions (BI)	The strength of one’s willingness to adopt a KMS	Davis (1989); Dishaw and Strong (1999)
Information quality (IQ)	The quality of the information provided by KMS. That measure includes such dimensions as understandability, timeliness, relevance, and meaningfulness	Beverly *et al.*(2002); DeLone and McLean (1992); Lee *et al.* (2002); Michnik and Lo (2009); Wu and Wang (2006)
Task technology fit (TTF)	The extent to which a KMS meets the information needs of the user’s task	Klopping and McKinney (2004); Susan and Howard (2006)

Table I.
Formal definitions of the constructs

4. Data analysis and results

4.1 Sample characteristics

A total of 151 usable questionnaires were returned for a response rate of 30.2 percent after deleting 16 questionable cases. The respondents are all IT managers, and 68.2 percent have been working in the IT field over seven years. Approximately, 40.4 percent of the participants were in information technology circles, manufacturing circles (25.8 percent), finance circles (17.2 percent). The remainder included wholesaling, service, and other circles. The number of employee for most 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 II lists the respondent characteristics, including industry type, gender, work experience, and number of employees.

4.2 Measure validity and reliability

Factor analysis and Cronbach's α were used to assess the psychometric proprieties of the scales (Kaiser, 1974; Hair *et al.*, 1998). The items were tested for validity, using principal components analysis and varimax rotation. A cutoff for statistical significance of the factor loadings of 0.5 was used, because loadings of 0.5 or greater are considered practically significant (Hair *et al.*, 1998). Each item loaded distinctively on one factor, and the highest factor loading was separated from its next nearest loading by at least 0.2. Table III includes the information related to the constructs of the study, including factor loading, eigen value, explanation of variance, and cumulative variance. Based on the result of the factor analysis, the items loaded

Demographic variable	Sample composition (n = 151)	
	n	Percent
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	1.3
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
501-1000 people	24	15.8
1,000 people or above	91	60.3

Table II.
Demographic characteristics

Items	Factor 1	2	3	4	5	Eigen value	Variance explained (%)	Cumulative variance (%)
TTF03	*0.827*		0.106	0.132	0.246			
TTF05	*0.810*		0.229	0.115				
TTF01	*0.807*	0.139			0.139	3.454	19.19	19.19
TTF02	*0.742*		0.142	0.203	0.273			
TTF04	*0.647*		0.262	0.373	0.198			
IQ01		*0.856*						
IQ03	0.104	*0.815*		0.295				
IQ02		*0.810*	0.114	0.113		2.876	15.98	35.17
IQ04		*0.802*			0.116			
PU02	0.170	0.128	*0.867*	0.241				
PU03	0.159		*0.852*	0.246	0.216	2.843	15.80	50.97
PU01	0.222		*0.834*	0.262	0.141			
UI01	0.112	0.150	0.320	*0.764*	0.243			
UI02	0.256	0.210	0.284	*0.762*	0.277	2.319	12.88	63.85
UI03	0.269	0.141	0.424	*0.727*	0.195			
PE01	0.203	0.140		0.153	*0.848*			
PE02	0.348		0.248	0.191	*0.692*	2.118	11.77	75.62
PE03	0.234		0.253	0.259	*0.672*			

Table III.
Validity of the questions

highly on the right constructs and had low loadings on the other constructs, indicating high convergent and discriminant validity. Factor analysis yielded five components and accounted for 75.62 percent of the total variance. These five components corresponded to the five constructs, namely, task technology fit, information quality, perceived usefulness, behavioral intention, and perceived ease of use. All questions had at least good loadings on their intended constructs.

Means, standard deviation, intercorrelations, and internal reliability are among the variables presented in Table IV. Internal consistency reliability to test unidimensionality was assessed by Cronbach's α. Its values ranged from 0.79 to 0.92, which were above the acceptable threshold of 0.70 suggested by Nunnally and Bernstein (1994). According to Table IV, BI was positively related to PU ($r = 0.675$, $p < 0.01$), and PEOU ($r = 0.596$, $p < 0.01$). Participants who reported higher levels of

Construct	Descriptive statistics Mean	SD	Correlations ($n = 151$) PU	PEOU	BI	IQ	TTF
PU	3.9316	0.56479	(0.92)				
PEOU	3.6380	0.52626	0.477	(0.79)			
BI	3.8720	0.53867	0.675	0.596	(0.89)		
IQ	4.0613	0.48215	0.244	0.237	0.347	(0.86)	
TTF	3.4225	0.56263	0.455	0.582	0.518	0.211	(0.88)

Notes: Numbers in parentheses are the Cronbach's α of the scales; PU = perceived usefulness; PEOU = perceived ease of use; BI = behavioral intention; IQ = information quality; TTF = Task technology fit

Table IV.
Means, standard deviations and correlations

intention to adopt KMS were also more likely to have higher PU and PEOU. Furthermore, participant agreement on PU positively related to PEOU ($r = 0.477$, $p < 0.01$) and IQ ($r = 0.244$, $p < 0.01$). On the basis of the correlation coefficients, we found that the participants who reported higher levels of agreement on PU were those who also reported higher levels of PEOU and IQ. In addition, no pair of measures had correlations exceeding the 0.9 level (Hair *et al.*, 1998) implying that no multicollinearity exists among the various constructs. The results of the tests for reliability, convergent validity, and discriminant validity provide evidence of the internal and external validity of the scales used in this study.

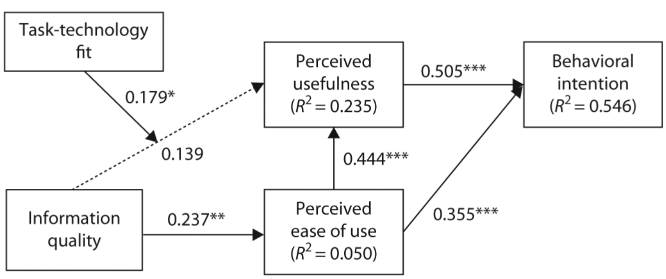
4.3 Hypotheses tests

Table V summarizes the results of the regression analyses and Figure 2 shows the standardized regression coefficients, *p*-value, and coefficients of determination (R^2) of variables. The results of the regression analyses of the TAM model (M1, M3) show that PU ($\beta = 0.505$, $p < 0.001$) and PEOU ($\beta = 0.355$, $p < 0.001$) positively affect BI, and PEOU ($\beta = 0.444$, $p < 0.001$) positively influences PU, providing support for *H1*, *H2*

Table V. Results of regression analyses

	BI	PEOU	PU	PU
Variables	M1	M2	M3	M4
Main effect				
Perceived usefulness (PU)	0.505***			
Perceived ease of use (PEOU)	0.355***		0.444***	0.291**
Information quality (IQ)		0.237**	0.139	0.165*
Moderator				
Task technology fit (TTF)				0.207*
Interaction				
IQ*TTF				0.179*
Adjusted R^2	0.546***	0.05**	0.235***	0.298***
F-value	91.324***	8.857**	24.086***	16.895***

Notes: Standardized coefficients of regression analyses are reported here; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Notes: *: *p*-value < 0.05; **: *p*-value < 0.01; ***: *p*-value < 0.001. Dotted line indicates that the path relationship is not significant

Figure 2. Results of model

and *H3*. These findings indicate that the TAM model can serve as a foundation for research of KMS user acceptance.

Based on these results, we further tested effects of IQ and TTF from TAM. The analytical results also support *H4*. As shown in M2, there was a positive and significant relationship between IQ ($\beta = 0.237, p < 0.01$) toward PEOU. M3 tested the direct effects of PEOU and IQ on PU. The analytical results show that PEOU positively influences PU. However, there was insufficient evidence to support *H5*, as IQ ($\beta = 0.139, p = 0.061$) was not significantly related to PU. Moreover, the regression result for *H6* was summarized in M4, providing support for *H6* ($\beta = 0.179, p < 0.05$). This result shows that there was a moderating effect of TTF on the relationship between IQ and PU.

5. Discussions

Previous research has successfully applied TAM in the context of general IS (Bueno and Salmeron, 2008; Hamner and Qazi, 2009; Lin, 2007). The findings of this study strongly support the appropriateness of using TAM to understand the factors that contribute to the adoption of KMS, which is a new e-capability of enterprises. From the results, there are significant effects from PU and PEOU toward intention to adopt KMS and a firm relationship between PEOU and PU. It is similar to the study of Money and Turner (2005). Obviously, to enhance user's intention to adopt KMS, there should be a primary focus on perceived ease of use and usefulness. People are willing to adopt a KMS to accomplish their tasks or projects if they find it will provide a friendly interface and increase their productivity.

In general, the purpose of IS implementation is to enhance work performance or operational management achievement, and KMS does that. Because the purpose of KMS is not only to improve productivity or job performance, but also accumulate working experiences and save time to solve the same problems when they appear again. Further, IS itself should be well designed to ensure its acceptance. Users are more likely to use a KMS that can offer a friendly interface. If users find the KMS is difficult to use, they will tend to consider that the KMS as not useful and be unwilling to use it. In TAM, there would be an emphasis on the operation of KMS that is free of effort and a benefit of KMS that is helpful for work. Therefore, for KMS to be successful, managers have to focus on designing both useful and easy- to-application of the systems.

DeLone and McLean (1992) argue that IQ is important in building successful IS. This study introduces IQ as a potential variable to use to further understand the success of KMS adoption. Basically, the purpose of KM is to acquire relevant and understandable information and assist managers in making timely and informed decisions. Therefore, timeliness, relevance, understandability, and meaningfulness of information are critical concerns with KMS (Halawi *et al.*, 2008; Ong and Lai, 2007; Wu and Wang, 2006). If the information or knowledge provided by KMS is not provided in time, not easy to read, or unavailable at a time that is suitable for its use, the success rate of IS adoption will be significantly reduced when managers want to implement a KMS into their companies. Consequently, user perception of ease of use and usefulness is resoundingly influenced by these characteristics.

In the study, IQ was found to have a significant effect on PEOU instead of PU. That finding is different from the findings of Ahn *et al.* (2007) and Chang *et al.* (2005). This inconsistency can probably be the type of IS in this study. For general IS, the consequences that users might anticipate are those IS can provide high data/information quality to fulfill their routine job. Oppositely, for KMS users, they may not only require highly information quality, but also ensure that this information/knowledge can be captured and available at the right time to accomplish their specific tasks. The effect that IQ produced on PEOU supports H4 if information retrieved from KMS is easy to read, meaningful, and sufficiently timely. The higher quality of information provided by KMS has led to better outcomes and reduced the complexity that users need to suffer for huge data processing with appropriate interfaces, which in turn enhances the perceived usefulness of KMS.

However, IQ had no significantly positive effect on PU. Although previous studies have proven that IQ will positively affect a user's perception of usefulness (Lai and Yang, 2008; Saeed and Abdinnour-Helm, 2008), there is insufficient evidence to support *H5*. This finding led us consider the reasons from the intrinsic of KM. The distinction between knowledge and information depends on its context with users (Nonaka and Konno, 1998; Wu and Wang, 2006). Information is everywhere; it can overwhelm an organization by its sheer volume. But knowledge is embedded in context and it always depends on user need. Therefore, one's knowledge could be another's information or data.

Departments often follow different processes, use different tools, and have totally different demands for information and knowledge. Accordingly, we suppositioned that information systems that support KM processes would also inherit similar properties. In other words, the application and practice of KMS would be restricted to a specific context that is task dependent. KMS is not a general type of IS (i.e. MIS), but is instead task oriented. Different tasks should be supported by different types of KMS, so users can perceive it as useful for their jobs.

After adding TTF as a moderator, the relationship between IQ and PU became significantly. In other words, the insignificant effect from IQ to PU would be caused when a KMS is not clearly designed for tasks that users do. Even though the output is highly qualified, users won't think the KMS is useful for their jobs either. Therefore, IQ can reduce the feeling of degree of difficulty which users perceive when they try to adopt a KMS, but it cannot produce a significant effect toward PU as the KMS is irrelevant to their tasks.

Previous studies have shown that the quality of the information provided by systems has an obvious influence on IS success, and so does this study. We found that there was a significant moderating effect of TTF on the relationship between IQ and PU, which similar to the finding of Venkatesh and Davis (2000). The shape of this IQ × TTF interaction was investigated further in Figure 3, indicating that when TTF was relatively high, IQ was positively related to PU. In contrast, when TTF was relatively low, the relationship became insignificant.

There is low usefulness perceived by a KMS user when the quality of information is not good enough. But, if fitness between the task and the assignments of a KMS is high, the usefulness perceived by users will strengthen, even if the IQ is low (from 3.79 to 3.85). Oppositely, increasing the quality of information has different effects on user perception of usefulness caused by the fitness between tasks and KMS (from 3.81 to 4.21). Users will perceive a KMS is useful if it can provide high IQ and TTF. That is, if the fitness between user tasks and KMS is high, the effect of IQ on user perception of

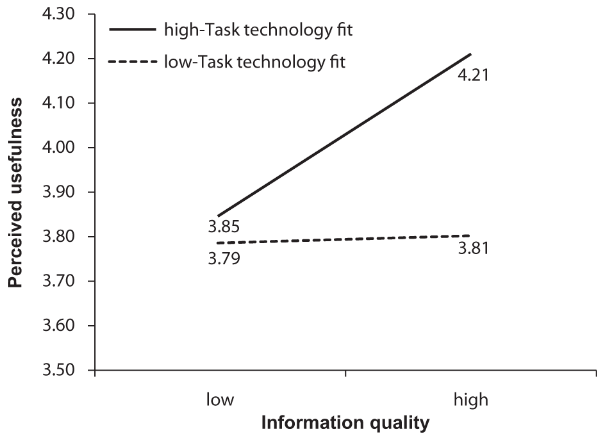


Figure 3.
The moderating effect of TTF on IQ and PU

usefulness will be more significant. For users, a well-built KMS has to help capture the right information with sufficient content to accomplish their tasks and improve their job performance. If users perceive the KMS does not benefit their jobs, they will perceive the system is useless regardless of IQ. Consequently, it is important to be concerned with the purpose of KMS and design it contextually to fit the requirements of tasks that users need to achieve.

6. Conclusions and limitation

KMS is emerging as a powerful source of competitive advantage, and plays an important role in managing an organization's knowledge. Therefore, how to improve the success rate for adopting a well-built KMS become more important. This study utilizes the well-known technology acceptance model as its theoretical framework. Critical external variables, information quality, and task-technology fit, are proposed as significant contributors to the adoption of KMS. From the results, a friendly interface of KMS is a basic requirement, and it will indeed improve system usefulness and adoption.

Managers must pay more attention toward improving the quality of information that is provided and adopt the right KMS for users to help them conquer the challenges they meet. And, it is important for KMS to effectively facilitate users to absorb new knowledge (Alavi and Leidner, 2001; Garry and Bruce, 2003; Lien *et al.*, 2007). From our results, to achieve such capability two presuppositions should be required. First, KMS is not a general IS, but a system based on the specific needs for the target groups. The data in the database of KMS needs to be collected for user-specific requirements of their jobs. Second, to enhance the effects of knowledge absorption, it is necessary to consider the design of interfaces and functionalities for KMS. Developing a well-designed and friendly interface to present information in an appropriate way can help users to comprehend it more easily and effectively.

Therefore, there are two implications for KMS practitioners. First, the quality of information is critical for the usefulness that KMS should be. But the relation is not significant in this study. It implies that the influence would be made by the relation from perceived ease of use toward perceived usefulness based on the TAM model. So, managers should pay attention to improve the quality of information, which can indirectly enhance the usefulness of KMS. Moreover, it is also a crucial point for KMS designers to develop need-centric interfaces and functions to present the right information more clearly and effectively, which in turn helps its users' perceived usefulness. Second, KMS would be a task-centric information system for a targeted group of users. Because even though information provided by a KMS is highly qualified, users will not perceive directly the KMS is usefulness if they think the information from KMS has no relevance to their tasks.

Consider about the limitation of this study, for a mass mailing of a somewhat lengthy and blind survey to busy managers, the response rate was believed to be low. Due to the low response rate, the generalized nature of these findings is somewhat in question, and thus it is important that the study be replicated in Taiwan.

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Appendix

Perceived usefulness

PU1. Using KMS can improve my working performance.

PU2. Using KMS can increase my job productivity.

PU3. I can find KMS useful in my job.

Perceived ease of use

PEOU1. My interaction with KMS can be clear and understandable.

PEOU2. I can find KMS to be flexible to interact with.

PEOU3. I can find KMS easy to use.

Behavioral intention to use

BI1. I will use KMS rather than manual methods to complete my job.

BI2. My intention is to use KMS enable me to accomplish my tasks more quickly.

BI3. My intention is to use KMS enable me to enhance my effectiveness on jobs.

Information quality

IQ1. The content representation provided by KMS is logical and understandable.

IQ2. The knowledge or information provided by KMS is available at a time suitable for its use.

IQ3. The knowledge or information provided by KMS is important and helpful for my work.

IQ4. The knowledge or information provided by KMS is meaningful.

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.

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