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Proposing a KMS Success Model for Healthcare

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Abstract

Knowledge Management Systems (KMS) have been employed by organizations to facilitate knowledge sharing. However, previous studies have found that the implementation of KMS is often unsuccessful due to the reluctance of employees to use these systems to share knowledge. This study is intended to examine the factors potentially influencing knowledge sharing which may also affect the success of knowledge management systems (KMS), and to explore the relationships between these factors. The focus of this study is the success of KMS in healthcare, since there is little research in this area. The research model is proposed as an improvement to the existing KMS Success Model by considering some external factors that may influence knowledge sharing. A better understanding of the factors that motivate knowledge sharing would encourage more use of KMS and would provide better development of KMS in healthcare. Further empirical research will be conducted to test and validate the model.

Keywords

Knowledge management systems, healthcare, knowledge sharing, success model.

INTRODUCTION

Knowledge management (KM) has been a topic of interest for both healthcare practitioners and scholars which stems from the very substantial investments in information technology (IT) in healthcare organizations during recent years. The increase in medical knowledge, which has to be constantly updated and shared (Heathfield and Louw, 1999), has resulted in an information explosion. In order to address this considerable problem, several studies have focused on incorporating KM in healthcare (Dwivedi et al., 2005; Koumpouros et al., 2006; Wickramasinghe et al., 2007). The majority of KM initiatives involve the implementation of knowledge management systems (KMS), which are defined by Alavi and Leidner (2001) as a class of information systems to support KM processes of creation, storage, diffusion, and application of knowledge. Although healthcare organizations have started to invest in knowledge management initiatives, there exists very little research, particularly in the form of empirical data to guide the healthcare stakeholders in the successful implementation of KM (Dwivedi et al., 2005). Merely implementing information technologies does not guarantee the success of the KM systems. There have been a large number of reported cases of KM initiative failure due to the reluctance of employees to use the systems (Barth, 2000; Kankanhalli et al., 2005; O'Dell and Grayson, 1998). The lesson that healthcare organizations should learn from this failure is that a KM system is more than just an IT-based solution; organizational and socio-cultural issues must be included in assessing the success of KM. Motivated by this concern, we are interested in exploring the factors that may be significant to ensuring KM success in healthcare organizations by looking specifically at the factors that motivate people to use the system to share and retrieve knowledge. A KMS success model is proposed which is later to be tested using empirical data to provide insights into successful KM for healthcare organizations. We present a brief background of the study followed by the proposed model and hypotheses.

THEORETICAL BACKGROUND

Knowledge Sharing and KMS in Healthcare

Healthcare organizations are a special type of organization, highly professionalized with individuals having specialized knowledge and working in mono-disciplinary communities of practice (Nicolini et al., 2007). Healthcare medical knowledge is highly fragmented and distributed in nature; data are held in a number of locations and managed by a variety of people, and the industry is suffering from the over abundance of this knowledge (Nicolini et al., 2007). To illustrate this situation, Davenport and Glaser (2002) give the real-life

example of Dr. Bob Goldszer who must memorize 10,000 different diseases and syndromes, 3,000 medications, 1,100 laboratory tests, and many of the 400,000 articles added each year to the biomedical literature. As a result, doctors no longer can memorize the vast amounts of scientific knowledge (Heathfield and Louw, 1999). This has led to a number of reported medical errors (Davenport and Glaser, 2002). Healthcare organizations are drowning in information overload and yet starving for knowledge (Kanter, 1999). These challenges make healthcare organizations turn to knowledge management as a saviour (Wickramasinghe et al., 2007). To enhance the communication within these practices and to facilitate the process of collaboration, transfer and dissemination of knowledge in healthcare, healthcare organizations have adopted and implemented KM technologies such as portal for nurses (Hsia et al., 2006), telemedicine with KM capabilities (Paul, 2006), the intranet/internet (Koumpouros et al., 2006) and decision support systems with KM (Bose, 2003).

Yet, how effective are these technologies in promoting knowledge sharing? There have been stories of failure of KM initiatives due to the reluctance of employees to use the systems. Orlikowski (1993), in his study on implementation of Lotus Notes, found that the use of tools such as email, and group support systems such as Lotus Notes, cannot motivate people to share knowledge. Barth (2000), in his *KM Horror Stories,* described how a scientist in Pillsbury Co. of Minneapolis proposed a forum in which everyone could contribute knowledge about all aspects of batter and related products. The IT department built the system, seeded it with a few thought-provoking questions, and invited participation via e-mail by all relevant parties. After waiting for six months, the scientist found that not a single user had signed on. The application was deemed a failure and shut down. O'Dell and Grayson (1998) mentioned how dozens of companies had created internal electronic directories and databases, announced they were available, and waited for people to use them. Nothing happened. Employees did not use the system because the culture of sharing was not present and there were no incentives to reward them for sharing their knowledge. According to Nicolini et al. (2007), in his review of managing KM in health, knowledge sharing is hard to realize in the medical profession due to strong professional boundaries. These examples are sufficient to show that the success of KMS entails more than simply imposing KMS as a solution. Therefore, to be successful in KMS implementation, the factors that influence KMS use need first to be understood.

KMS Success Models

The reason that KMS is not used is the reluctance of employees to contribute to the system. In our study, we will look specifically into factors that can influence employees' motivation to share knowledge, because if employees are not motivated to share knowledge, it is unlikely that they will use KMS systems. Unless the employees are willing to contribute to these systems, KMS cannot be successful and the transfer of knowledge will not happen. Researchers examined many variables believed to affect an individual's knowledge sharing behaviour. Several studies have adopted social psychological approaches in their attempts to understand the behaviour of knowledge contributors (Bock et al., 2005; He and Wei, 2009; He et al., 2009; Kankanhalli et al., 2005; Ryu et al., 2003), while other studies focused on organizational issues such as culture (Alavi et al., 2005; Park et al., 2004;) and leadership (Kulkarni et al., 2007) as determinants of KMS success. As KMS is another class of information systems, we use DeLone and McLean's (1992) Information Systems (IS) Success model (DeLone and McLean, 1992) (hereafter referred to as the "D&M IS Success Model") as a theoretical basis, since this model has gained strong theoretical and empirical support, and has been widely accepted by most IS researchers in the study of information systems success. All the variables in the D&M IS Success Model (system quality, information quality, IS use (replaced with perceived usefulness), and user satisfaction) have been rigorously tested and validated by researchers.

To provide a more comprehensive model, we propose to extend the D&M IS Success Model model to include organizational factors that are critical to the success of KM, such as culture and leadership, as well as social factors that motivate knowledge sharing, such as incentives. As knowledge sharing involves social process, the influence of peers, leaders, superiors and subordinates can impact people's use of KMS. Huber (2001) suggests that there is considerable ignorance in the literature concerning the impact of social norm, i.e. subjective norm on knowledge sharing. As a result, there is a need for further research to explore this area. Thus, the proposed model includes the subjective norm as one of the factors influencing knowledge sharing. Security has been the least identified success factor in the literature and yet it is critical to knowledge contributors (Jennex and Olfman, 2003). Knowledge is an asset and losing it to other organizations means losing competitive advantage. Ensuring the right individuals retrieve the knowledge, protecting knowledge against theft of intellectual property and ensuring it is applied appropriately are the concerns of the knowledge contributors when sharing knowledge. Therefore, the perception that knowledge is protected is critical prior to contributing to KMS and, consequently, we believe that perceived security should be considered as a factor influencing knowledge sharing.

Several prior KMS success models were developed based on the D&M IS Success Model. For example, Jennex and Olfman (2003) assessed the success of KMS by extending the D&M IS Success Model to include technological resources for system quality and knowledge strategy/process for knowledge/information quality

variables. This model was tested in an engineering organization. Wu and Wang (2006) developed their KMS success model as an extension of the D&M IS Success Model and this was empirically tested in firms in Taiwan. Halawi et al. (2007) proposed a KMS success model by adopting the generic framework of the D&M IS Success Model. Kulkarni et al. (2007) proposed an extension of the D&M IS Success Model to include organizational support: *leadership*, *incentives*, *co-worker* and *supervisor*. This model was tested and validated in a university in the United States. Of all the above models, the KMS Success model by Kulkarni et al. (2007) seems to cover most of the issues proposed in our study. As such, this study proposes that Kulkarni et al.'s (2007) KMS Success Model be adopted, though with several modifications. First, *KMS Use* is adopted instead of *Knowledge Use*. That is, the success is determined by the extent of the KMS use for knowledge sharing and retrieval. A new variable, C*ulture of Sharing,* is added to replace *Co-worker* and *Supervisor*. *Co-worker* and *Supervisor* refer to the interactions of employees with co-workers and immediate supervisors in their day-to-day work, and thus their influence on attitudes towards knowledge sharing. Through daily interactions, employees share ideas and insights naturally. According to Schein (1985), if the team of employees (co-workers and supervisors) share values, beliefs, and practices, these are considered as culture. Therefore, *Culture of Sharing* is more appropriate as a construct for this study. Finally, *subjective norm* and *perceived security* are added to better fit the healthcare context. *Subjective norm* is included as this construct has been tested and validated in the healthcare environment with findings which show the positive correlation of the impact of subjective norm on physicians' knowledge sharing behaviour (Ryu et al., 2003). *Perceived Security* is included as knowledge in healthcare organizations is very specialized and must be highly protected. Knowledge applied incorrectly by unauthorized knowledge users may lead to incorrect decision making and thus impact the quality of healthcare delivery.

THE RESEARCH MODEL AND HYPOTHESES

Based on the discussions above, a KMS Success Model is proposed in Figure 1. This model is called KMSH Success Model (Knowledge Management Systems for Healthcare (KMSH) Success Model).

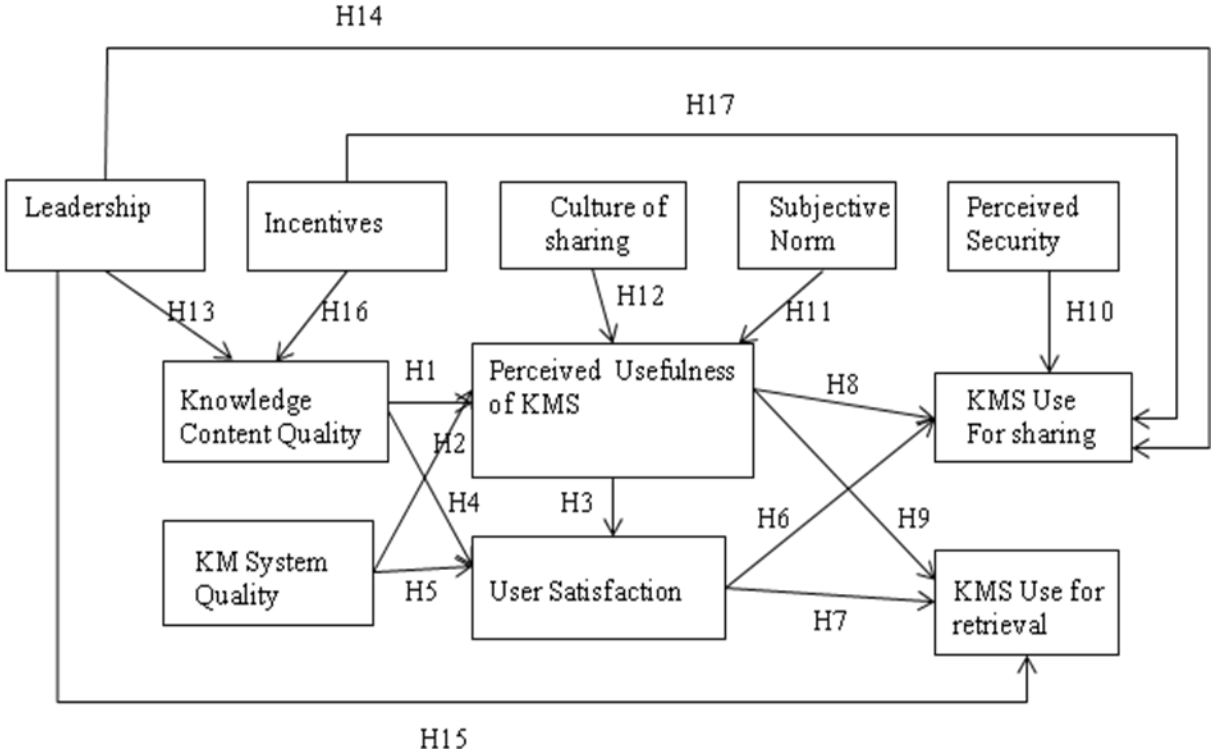

Figure 3 : KMSH Success Model

KMS Use

Note that Knowledge Use in Kulkarni et al.'s (2007) KMS Success Model has been replaced with KMS Use as our choice for the dependent variable. Use has been proposed as an information systems (IS) success measure in numerous studies (Doll and Torkzadeh, 1998; Straub et al., 1995). Of interest to our research is the extent of use of KMS for knowledge sharing among healthcare workers. The process of *knowledge sharing* through KMS involves people contributing knowledge to KMS (sharing) and people seeking knowledge (retrieval) from KMS for reuse. Therefore, success of KMS requires the willingness of knowledge contributors to share knowledge and the desire of knowledge seekers to reuse the codified knowledge (Kankanhalli et al., 2005). KMS success is

measured by examining these two behaviours: (1) contributions to KMS for sharing; (2) accessing KMS for retrieving. Therefore, we propose that when determining KMS Success, two types of use can be recognised, firstly, *KMS use for sharing* (i.e. where a worker actively contributes knowledge to the knowledge-base), and secondly, *KMS use for retrieval* (simply the reuse of existing knowledge). We suggest that these two types of behaviour might be independent of each other and may be influenced by different variables; we have, therefore, separated these two variables in our model.

Knowledge Content Quality

One of the pitfalls of the KMS implemented in healthcare is lack of endorsement on knowledge content quality (Koumpouros et al., 2006). As a consequence, the knowledge produced is of inconsistent quality and difficult to understand and therefore, it can impact the success of KMS. Medical professionals have a broad range of knowledge needs and produce a great amount of knowledge; without high quality and updated knowledge, doctors cannot practice high quality medicine (Heathfield and Louw, 1999). Knowledge such as biomedical knowledge and evidence-based medicine (EBM), which covers many aspects of diagnosis, treatment, and prescribing, are examples of quality knowledge which is essential to healthcare professionals (deLusignan and Robinson, 2007). Therefore, capturing the high quality content of knowledge is critical to the success of KMS in healthcare. The relationship between Knowledge Content Quality and KMS Use is mediated via Perceived Usefulness. Perceived usefulness is defined by Davis (1989, p. 320) as "the degree to which a person believes that using a particular system would enhance his or her job performance". The significance of this relationship is supported by Seddon (1997) in his refinement of the D&M IS Success Model, though this finding is not consistent with that of Kulkarni, et al. (2007), who found that the effect of Knowledge Content Quality on Perceived Usefulness of Knowledge Sharing was not statistically significant. We argue that due to the nature of healthcare, which requires high quality of knowledge content, employees may find sharing and using high quality knowledge will enhance their job performance. Therefore, we offer the following hypothesis:

Hypothesis 1: Higher level of Knowledge Content Quality leads to higher level of Perceived Usefulness.

KM System Quality

As with most information systems, the use of KMS is also influenced by the system quality. *KM System Quality* in our model is a measure of how well the KM systems support and enhance the activities of knowledge sharing and knowledge retrieval. One of the factors that impede the use of a system in healthcare is the quality of the system. If the system provided is not stable, not user-friendly, difficult to use, not reliable and accessible, it is unlikely that the employees (especially workers who are 'technophobic') will use it. They would rather pick up the phone or walk to their peers' desks to talk. When the system is of low quality, they will find the system is not useful and this will lead to its failure. Prior studies have proven the significance of system quality in influencing the KMS Use via Perceived Usefulness (Seddon ,1997; Wu and Wang, 2006). Although Kulkarni et al. (2007) found that KM System Quality does not significantly affect Perceived Usefulness, the finding on the effect of KM System Quality on Perceived Usefulness in the healthcare context may be different. As healthcare workers tend to experience time pressures, they may find value in sharing and using knowledge via KMS (Perceived Usefulness of KMS) if the KMS system reduces the extra effort and time required to share (find or contribute) and use knowledge. Thus, the quality of the system is posited to influence the attitude towards usefulness of KMS, leading to the second hypothesis:

Hypothesis 2: Higher level of KM System Quality leads to higher level of Perceived Usefulness.

User Satisfaction

User satisfaction is one of the most frequently measured aspects of IS success, and has been proven to significantly impact IS success (DeLone and McLean, 1992; Doll and Torkzadeh, 1998; Igbaria and Tan, 1997). This variable is also applicable in the KM context in relation to determining the use of KMS. *User Satisfaction* in our model is measured on user satisfaction with the sharing and retrieval capabilities of the KM system, the adequacy and quality of knowledge needed, and user satisfaction that the system can enhance job performance. Prior studies demonstrated that *User Satisfaction* has positive relationship with KMS Use, being determined by *Perceived Usefulness, Knowledge Content Quality and KM System Quality* (Kulkarni et al., 2007; Wu and Wang, 2006). In line with these studies, we propose that *Perceived Usefulness, Knowledge Content Quality and KM System Quality* together determine *User Satisfaction*. Therefore, the following hypotheses are proposed:

Hypothesis 3: Higher level of Perceived Usefulness leads to higher level of User Satisfaction.

Hypothesis 4: Higher level of Knowledge Content Quality leads to higher level of User Satisfaction.

Hypothesis 5: Higher level of KM System Quality leads to higher level of User Satisfaction.

The significance of User Satisfaction in relation to IS has been demonstrated in previous studies (Igbaria and Tan, 1997; Seddon, 1997). This finding has also been proven to be significant in the KMS context by Wu and Wang (2006) who found that user satisfaction gives positive impact to KMS use. Kulkarni et al. (2007) found that user satisfaction with KM initiatives significantly affects knowledge use. When the employees are satisfied that the system meets their needs, they feel more inclined to use KMS for knowledge sharing and are more encouraged to retrieve knowledge for reuse. Therefore, we propose that User Satisfaction has direct impact on KMS use for knowledge sharing and retrieval. This has led to the following hypotheses:

Hypothesis 6: Higher level of User Satisfaction leads to higher level of KMS Use for Sharing.

Hypothesis 7: Higher level of User Satisfaction leads to higher level of KMS Use for Retrieval.

Perceived Usefulness

A considerable number of studies in the past have extensively elaborated perceived usefulness as having direct impact on usage (Adams et al., 1992; Davis et al., 1989) although Kulkarni et al. (2007) found no significant relationship between Perceived Usefulness and Knowledge Use. We argue that perceived usefulness might have a strong impact in the healthcare environment. Unless healthcare workers find the system is useful and can bring benefit to them, KMS will not be used. This is particularly true for healthcare workers who face time pressures; they might find using the system is an additional task, which would make them reluctant to use the system unless they felt that doing so could enhance job performance (perceived usefulness). These arguments lead to the following hypotheses:

Hypothesis 8: Higher level of Perceived Usefulness leads to higher level of KMS Use for Sharing.

Hypothesis 9: Higher level of Perceived Usefulness leads to higher level of KMS Use for Retrieval.

Perceived Security

The term *perceived security* is used as a construct which refers to the degree to which use of the KMS is perceived as providing secure protection of shared knowledge. However, in this study, our focus is not to measure security, but to highlight the fact that it is critical for healthcare workers to perceive that the systems they use are secure in terms of protecting their shared knowledge prior to using the systems. Lindsey (2002) has used protection as one of the variables to measure the effectiveness of KMS as this variable signifies the importance knowledge has with regard to the organization's competitive advantage. Security is not only about the system, but also covers the policies implemented by organizations to ensure the protection of knowledge, such as the Intellectual Property Act (IPA). If such policies are in place to mitigate the threat of misuse, healthcare workers will feel more secure in contributing knowledge to KMS. This may increase the tendency to share knowledge. Perceived Security, the extent to which one believes that using a particular system is secure, is used as a variable in the study on determinants of e-commerce and online purchasing (Salisbury et al., 2001; Suh and Han, 2003; Yenisey et al., 2005). We believe this is also applicable to the KMS context as knowledge contributors are concerned that the knowledge transferred will go to the intended party and will not be misused by unauthorized knowledge users. When retrieving knowledge, employees may not be concerned much about security as knowledge is retrieved whenever it is needed. Therefore, we hypothesize that

Hypothesis 10: Higher level of Perceived Security leads to higher level of knowledge sharing via KMS.

Subjective Norm

A social psychology approach is useful in predicting people's behaviour in social settings (Ryu et al., 2003). As healthcare workers are professional groups with the tendency to operate within mono-disciplinary communities which create social and cognitive boundaries (Nicolini et al., 2007), this approach is useful in predicting healthcare workers' behaviours in using KMS. The existing theory of social psychology, such as the theory of planned behavior (TPB) (Azjen, 1991), suggests that attitudes and subjective norm shape a person's intention to perform a behaviour. *Subjective norm* describes the social influence that may affect a person's intention to use a KMS (Xu and Quaddus, 2005). In healthcare context, s*ubjective norm* is defined as the degree to which a healthcare worker perceives that his/her superior or co-worker believes he or she should contribute or seek knowledge via KMS. The more the healthcare workers believe that knowledge sharing is socially expected workplace behaviour, the more they would be willing to share. In an ethnographic study, conducted over two years, of general practices in England, Gabbay and May (2004) found that doctors tend to rely on their own and colleagues' experience, the opinions of their leaders and interactions with each other even though they may have unprecedented access to the latest research findings. They would rather walk to the desk of a colleague to obtain information. This shows that peers play a critical role in influencing the behaviour of doctors. Subjective norm has received considerable empirical support as an important antecedent to behavioural intention (Taylor and

Todd, 1995). Similarly, Xu and Quaddus (2005) found that social norm, i.e. influence from peers, leaders, respected people, superiors, subordinates, does have an impact on people's acceptance and use of KMS. Ryu et al. (2003) have empirically tested and validated subjective norm as having the strongest effect on physicians' behavioural intention to share knowledge.

Subjective norm has a direct impact on use if use is mandatory, indirect if voluntary (Venkatesh and Davis, 2000). In healthcare organizations where their employees are under work pressure, knowledge sharing is expected to be voluntary. It is difficult to enforce knowledge sharing in an environment where people feel pressured and are thus less motivated to engage in knowledge sharing activities. If the employees themselves see the benefits of knowledge sharing, they will come round to the idea of using it. In the present context, if a superior or co-worker suggests that a particular system might be useful, a person may come to believe that it actually is useful, and in turn form an intention to use it. This is different in a situation where the KMS use is organizationally mandated; if a superior or co-worker believes that an individual should use the system, he/she might use the system regardless whether the system is useful or not. Since knowledge sharing in our study is voluntary, we propose that subjective norm has an indirect effect on employees' KMS use via Perceived Usefulness.

Hypothesis 11: Higher level of Subjective Norm will lead to higher level of Perceived Usefulness.

Culture of Sharing

Another critical element for successful KMS is the presence of a sharing culture. In their literature review, Alavi et al. (2005) posit that a major cultural shift would be required to change their employees' attitudes and behaviour so that they willingly and consistently share their knowledge and insights. They argue that organizations whose cultures do not value and support information sharing will face difficulties in integrating KMS. According to Davenport and Prusak (1998), a knowledge friendly organizational culture has been identified as one of the most important conditions for the success of KM initiatives in organizations. Ruppel and Harrington (2001) indicated that employee acceptance of or resistance to knowledge-sharing is a management and corporate culture issue rather than a technology issue. While having KMS is important to facilitate knowledge sharing, it does not guarantee that everyone will be willing to share, unless the culture of sharing already exists. Schein (1985) defined culture as the shared values, beliefs and practices of people. Alavi et al. (2005) emphasized that 'good' cultural values, such as knowledge-friendly culture, openness, and trust, will lead to positive KM behaviours. This is supported by Park et al. (2004) who have found a significant positive correlation between the successful implementation of KM technology and culture. In healthcare organizations, with strong professional boundaries where individuals have their own unique expertise, sharing knowledge may result in their retaining less proprietary knowledge, and thus their increased replaceability. However, if the employees see that sharing is practised and becomes the norm in the organization, they will find using KMS will enhance their job performance, and thus, the chances of KMS being used are higher. Therefore, we hypothesize

Hypothesis 12: Higher level of Culture of Sharing leads to higher level of Perceived Usefulness.

Leadership

The term 'leader' refers to anyone from the Chief Executive Officer (CEO) and board of directors to the unofficial opinion leader (DeTienne et al., 2004). Leaders at all levels (supervisors, managers, and executives) can act as role models in using a KM system, and thus encourage others to do the same. If the senior management merely provides 'lip service', without they themselves using the system, it opens a credibility gap with respect to employee belief and trust in KMS, thus making it far more likely that KMS will fail. While leaders across all levels of the organization have important roles to play, the commitment from the highest levels of management, especially the CEO, is critical because it is at these levels that the rules and the norms with respect to knowledge exchange and reuse are established. It is a norm that employees tend to follow management's directions. Researchers from prior studies posit that lack of commitment of top leadership to sharing organizational knowledge and the absence of role models who exhibit the desired behaviour can impede knowledge sharing in healthcare (Davenport et al., 1998; King et al., 2002; Kulkarni et al., 2007). In a survey of 431 U.S. and European organizations, more than 67 per cent of respondents admitted that leaders can overcome resistance to knowledge sharing (Ruggles, 1998). The higher up in the organization these role models are, the better. In the context of healthcare, Booth (2001) mentioned that an organization needs a 'chief knowledge officer' to be responsible for managing knowledge and to ensure that employees are involved in KM initiatives. Since leaders have the power to influence KM activities among their followers, they also can set an example in promoting the high quality of shared knowledge and its reuse. Ultimately, without effective leaders who model appropriate behaviours, employees will not be motivated to use KMS to share and to retrieve knowledge. Based on the above discussions, we offer the following hypotheses:

Hypothesis 13: Higher level of Leadership leads to higher level of Knowledge Content Quality.

Hypothesis 14: Higher level of Leadership leads to higher level of KMS Use for Sharing.

Hypothesis 15: Higher level of Leadership leads to higher level of KMS Use for Retrieval.

Incentives

While elements of culture and leadership are critical for knowledge sharing, incentives must not be overlooked. Research has found that unless there is some type of positive incentive system, employees will be less likely to put forth efforts to share knowledge (Hansen et al., 1999). Orlikowski (1993), for example, found that the failure of the use of Lotus Notes was because of lack of incentives. Barth (2000) also mentioned that incentives was one of the reasons employees did not participate in the forum created for them to share knowledge about the products in Pillsbury Co. of Minneapolis. Markus (2001) makes several interesting observations about the use of incentives as a way to recognize the efforts of knowledge contributors, who are frequently expected to produce high quality knowledge content. He observed that providing rewards and incentives and including support for KM as part of performance assessment will positively influence the desired behaviour of knowledge contributors, particularly when they are pressed for time or competing with each other on the basis of performance. In healthcare, where the quality of knowledge content cannot be compromised, the rewards should stimulate more contribution of knowledge sharing with high quality of knowledge content. Incentives can be given to contributors who contribute high quality knowledge as well as those who use KMS more for sharing knowledge. Incentives have been found to have a strong impact on knowledge contribution via KMS (Vitari et al., 2007). In terms of promoting KMS use for retrieval, incentives are not likely to impact as people will likely retrieve the knowledge only if they find it useful to them. Hence, we contend that the Incentives factor is an antecedent of Knowledge Content Quality as well as KMS Use for Sharing.

Hypothesis 16: Higher level of Incentives leads to higher level of Knowledge Content Quality.

Hypothesis 17: Higher level of Incentives leads to higher level of KMS Use for Sharing.

RESEARCH METHOD

To test the proposed research model, we adopted the survey method for data collection. The survey information will be collected at one point in time and therefore, it can be classified as a cross-sectional study. We are conducting two types of survey: a descriptive survey and the main survey. The initial descriptive survey will be conducted to find out the extent of use of KMS in healthcare organizations. The unit of analysis is an organization. The main survey, which has the healthcare worker as the unit of analysis, will be conducted to test our proposed research model. Data will be collected via questionnaire, because it is more economical and efficient than other methods of data collection. The questionnaires will be administered via mail as well as online. All constructs and measures are constructed using previously validated instruments with minor modifications based on the healthcare context.

CONCLUSION

The primary objective of this paper is to highlight the factors that may affect the KMS Success in Healthcare by developing a model adapted from Kulkarni et al. (2007) which integrates some social and organizational factors. The emphasis on organizational and social factors might indicate that technology alone is not sufficient for KMS to be successful. In summary, it is assumed that the variables used in the KMS Success Model of Kulkarni et al. (2007) are useful for determining the KMS Success model in the context of healthcare together with the additional variables, *culture of sharing*, *subjective norm* and *perceived security*. The expected contributions of the study are twofold. The study would explore the relationships of various factors that may affect the knowledge sharing behaviour of professional groups towards contributing to the success of KMS in healthcare. Thus, it may be helpful for harnessing knowledge management activities in organizations, particularly healthcare. Further, this study will validate a KMS Success Model which may add new understanding of the essential role of knowledge sharing behaviour in determining the knowledge management success. Finally, it is hoped that the findings of the study will provide some insight into the relative importance of the various factors which influence the success of KMS projects in healthcare, which will be of value to practitioners who are developing new systems as well as healthcare stakeholders when planning for KM initiatives. One limitation of this study is that we do not employ all the factors that enable KM in other industries, because we find that those factors are not as critically important as the ones adopted in this study. Those factors can be further tested in future research.

REFERENCES

Adams, D. A., Nelson, R. R., and Todd, P. (1992). "Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication," *MIS Quarterly* (16:2), June, pp 227-247.

Alavi, M., and Leidner, D. E. (2001). "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," *MIS Quarterly* (25:1), March, pp 107-136.

Alavi, M., T. Kayworth, and Leidner, D. (2005). "An Empirical Examination of the Influence of Organizational Culture on Knowledge Management Practices," Journal *of Management Information Systems* (22:3), pp 191 - 224.

Ajzen, I. (1991). "The theory of planned behavior," *Organizational Behavior and Human Decision Processes* (50:2), December, pp 179-211.

Barth, S. (2000). "KM Horror Stories," *Knowledge Management Magazine*, October, pp 37-40.

Bock, G.W., Zmud, R.W., Kim, Y.G., and Lee, J.N. (2005). "Behavioral intention formation in knowledge sharing: Examining the role of extrinsic motivators, social-psychological forces, and organizational climate," *MIS Quarterly* (29:1), March, pp 87-111.

Booth, A. (2001). "Managing knowledge for clinical excellence: ten building blocks," *Journal of Clinical Excellence* (3), pp 187-194.

Bose, R. (2003). "Knowledge management-enabled health care management systems: capabilities, infrastructure, and decision-support," *Expert Systems with Applications* (24:1), pp 59-71.

Davenport, T. H., and Glaser, J. (2002). "Just-in-Time Delivery Comes to Knowledge Management," *Harvard Business Review,* July, pp 107-111.

Davenport, T. H. ,and Prusak, L. (1998). "Working Knowledge: How Organizations Manage What They Know," *Ubiquity* (1:24).

Davenport, T. H., De Long, D.W., and Beers, M.C. (1998). "Successful Knowledge Management Projects," *Sloan Management Review* (39:3), pp 43-57.

Davis, F. D. (1989). "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology," *MIS Quarterly* (13:3), September, pp 319-340.

Davis, F. D., Bagozzi, R. P., and Warshaw, P.R. (1989). "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science* (35:8), August, pp 982-1003.

DeLone, W., and McLean, E.R. (1992). "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), pp 60-95.

de Lusignan, S., and Robinson, J. (2007). "Clinical Knowledge Management: A Model for Primary Care," *Health Informatic Series*, New York, Springer.

DeTienne K. B, Dyer G. D., Hoopes C., and Harris S. (2004). "Towards a model of effective knowledge management and directions for future research: culture, leadership and CKOs," *Journal of Leadership and Organizational Studies* (10:4), pp 26 –43.

Doll, W. J., and G. Torkzadeh (1998). "Developing a multidimensional measure of system-use in an organizational context," *Information and Management* (33:4), pp 171-185.

Dwivedi, A. N., Bali, R. K., and Naguib, R.N.G. (2005). "Implications for Healthcare Knowledge Management Systems: a case study," *Proceedings of the 2005 IEEE Engineering in Medicine and Biology 27th Annual Conference*, September, pp 5668-5671.

Gabbay, J., and May, A.I (2004). "Evidence based guidelines or collectively constructed "mindlines?" Ethnographic study of knowledge management in primary care," *British Medical Journal* (329:1013), October, pp 1-5.

Halawi, L.A., McCarthy, R.V., and Aronson, J.E. (2007). "An empirical investigation of knowledge management systems' success," *Journal of Computer Information Systems* (48), pp 121-135.

Hansen, M. T., Nohria, N., and Tierney, T. (1999). "What's your strategy for managing knowledge?" *Harvard Business Review* (77), March, pp 106-116.

Heathfield, H., and Louw, G. (1999). "New challenges for clinical informatics: KM tools," *Health Informatics Journal* (5:2), pp 6-13.

He, W., and Wei, K-K. (2009). "What drives continued knowledge sharing? An investigation of knowledge-contribution and seeking beliefs", *Decision Support System* (46), pp 826-838.

He, W., Qiao, Q., and Wei, K-K. (2009). "Social relationship and its role in knowledge management systems usage," *Information & Management* (46), pp 175-180.

Hsia T., Lin, L.-M., Wu, J.H., and Tsai, H-Tl. (2006). "A Framework for Designing Nursing Knowledge Management Systems," *Interdisciplinary Journal of Information, Knowledge, and Management* (1), pp 13-22.

Huber, G.P. (2001), "Transfer of knowledge in knowledge management systems: unexplored issues and suggested studies," *European Journal of Information Systems* (10:2), pp 7209.

Igbaria, M., and Tan, M. (1997). "The consequences of information technology acceptance on subsequent individual performance," *Information & Management* (32:3), pp 113-121.

Jennex, M. E., and Olfman, L. L. (2003). "A Knowledge Management Success Model: An Extension of DeLone and Mc Lean's IS Success Model," *Ninth Americas Conference on Information Systems,* pp 2529-2539.

Kankanhalli, A., Tan, B. C. Y., and Wei, K. (2005). "Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation," *MIS Quarterly* (29:1), March, pp 113-143.

Kanter, J. (1999). "Knowledge management, practically speaking," *Information Systems Management* (16:4), pp 7-15.

King, W. R., Marks, V. P., and McCoy, S. (2002). "The Most Important Issues in Knowledge Management," *Communications of ACM* (45:9), September, pp 93-97.

Koumpouros, Y., Nicolosi, G.L., and Martinez-Selles, M. (2006). "Critical success factors for establishing a multidisciplinary health community knowledge management system using internet-based ICTs: the cardiology paradigm," *Int. J. Healthcare Technology and Management* (7:3), pp 283-302.

Kulkarni, U. R., Ravindran, S., and Freeze, R. (2007). "A Knowledge Management Success Model: Theoretical Development and Empirical Validation," *Journal of Management Information Systems* (23:3), pp 309-347.

Lindsey, K. (2002) "Measuring knowledge management effectiveness: A task-contingent organizational capabilities perspective," *Proceedings of the 8th Americas Conference on Information Systems,* pp 2086-2090.

Markus, M.L. (2001). "Toward a theory of knowledge reuse: Types of knowledge reuse situations and factors in reuse success," *Journal of Management Information Systems* (18:1), pp 57-93.

Nicolini, D., Powell, N, Conville, P., and Martinez-Solano, L. (2007). "Managing knowledge in the healthcare sector. A review," *International Journal of Management Reviews* (10:3), pp 245-263.

O'Dell, C., and Grayson, C. J. (1998). "If Only We Knew What We Know: identification and transfer of internal best practices," *California Management Review* (40), pp 154-174.

Orlikowski, W. J. (1993). "Learning from notes: organizational issues in groupware implementation," *The Information Society Journal* (9), pp 237-250.

Park, H., Ribier V., and Schulte, W.D. (2004). "Critical attributes of organizational culture that promote knowledge management technology implementation success," Journal of Knowledge Management (8:3), pp 106-117.

Paul, D. L. (2006). "Collaborative Activities in Virtual Settings: A Knowledge Management Perspective of Telemedicine," *Journal of Management Information Systems* (22:4), pp 143-176.

Ruggles, R. (1998). "The state of the notion: Knowledge management in practice," *California Management Review* (40:3), pp 80-89.

Ruppel, C. P., and Harrington, S.J. (2001). "Sharing Knowledge Through Intranets: A Study of Organizational Culture and Intranet Implementation," *IEEE Transactions on Professional Communication* (44:1), pp 37-52.

Ryu, S., Ho, S.H., and Han, I. (2003). "Knowledge sharing behavior of physicians in hospitals," *Expert Systems with Applications* (25:1), pp 113-122.

Salisbury, D. W., Pearson R.A., Pearson, A.W., and Miller, D.W. (2001). "Perceived Security and World Wide Web Purchase Intention," *Industrial Management and Data Systems* (101:4), pp 165-176.

Schein, E. (1985), "Organizational Culture and Leadership", *Jossey-Bass*, San Francisco, CA.

Seddon, P. B. (1997). "A Respecification and Extension of the DeLone and McLean Model of IS Success," *Information Systems Research* (8:3), September, pp 240-253.

Straub, D., Limayem, M., and Karahanna-Evaristo, E. (1995). "Measuring System Usage: Implications for IS Theory Testing," *Management Science* (41:8), pp 1328-1342.

Suh, B., and Han, I. (2003). "The Impact of Customer Trust and Perception of Security Control on the Acceptance of Electronic Commerce," *International Journal of Electronic Commerce* (7:3), pp: 135-161.

Taylor, S., and Todd, P. A. (1995). "Understanding Information Technology Usage: A Test of Competing Models," *Information Systems Research* (6:2), June, pp 144-176.

Venkatesh, V., and Davis, F.D. (2000). "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (46:2), February, pp 186-204.

Vitari, C., Moro, J., Ravarini, A., and Bourdon, I. (2007). "Improving KMS Acceptance: The Role of Organizational and Individuals' Influence*," International Journal of Knowledge Management* **(**3:2), pp 68-90.

Wickramasinghe, N., Bali, R. K., and Geisler, E. (2007). "The major barriers and facilitators for the adoption and implementation of knowledge management in healthcare operations," *International Journal of Electronic Healthcare* (3:3), pp 367-381.

Wu, J. H., and Wang, Y.M. (2006). "Measuring KMS success: A respecification of the DeLone and McLean's model," *Information and Management* (43), pp 728-739.

Xu, J., and Quaddus, M. (2005). "Exploring the perceptions of knowledge management systems," *Journal of Management Development* (24:4), pp 320-334.

Yenisey, M. M., Ozok, A. A., and Salvendy, G. (2005). "Perceived security determinants in e-commerce among Turkish university students," *Behaviour and Information Technology* (24:4), July, pp 259-274.

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