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Explaining IT-Based Knowledge Sharing Behavior with IS Continuance Model and Social Factors

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Abstract

Knowledge is an important asset in determining the success and survival of an organization in today's competitive markets. It becomes so important that many advanced Information and Communication Technologies (ICT) and Information Systems (IS) have been developed and employed by organizations specifically for Knowledge Management (KM). However, KM is not just a technical issue. Human is one of the important elements in KM. Human and technology must cooperate well so that KM can be facilitated. Therefore, how to motivate employees to share their knowledge becomes one of the most important KM issues. This paper aims to: (1) extend IS continuance model to study the behavior of using KMS to share knowledge within an organization and (2) integrate social factors in the model to study their relative importance to the use of KMS to share knowledge. It studied the impacts of perceived usefulness, satisfaction, social factors and task interdependence on the behavior of using KMS to share knowledge within an organization. Literature review and survey were conducted to provide supportive results. In the data analysis, the four factors were found to be significantly related to the behavior being studied and explained a significant proportion of the variance.

Keywords: Organizational knowledge management, Knowledge management systems, knowledge sharing, IS continuance, Social factors

1. Introduction

In the twenty-first century, knowledge has become the key to differentiate organizations from their competitors and maintain competitive advantage. Knowledge Management Systems (KMS) have been developed and employed by organizations to facilitate KM within an organization. Organizations have to ensure that KMS invested are fully utilized so that they can benefit most and manage knowledge effectively. Besides, knowledge is embedded in individuals' mind. Organizational members should be willing to contribute their knowledge and response to others' knowledge so that organizational knowledge can be preserved and new knowledge can be created and make available for qualified members within the organization and future use with the help of KMS. Otherwise, important knowledge, e.g. customer profile, certain behaviors and mental maps, may be lost or changed when a knowledge worker leaves the organization (Fiol et al. 1985). Therefore, many organizations are concerned about how to motivate organizational members to contribute knowledge to KMS (Malhotra 2001; King et al. 2002).

Although factors affecting the behavior of knowledge sharing in an IT-enabled working environment have been investigated and studied (e.g. (Constant et al. 1994; Wasko et al. 2000; Ardichvili et al. 2003; Politis 2003), most of them were qualitative studies. This

reduces the predictive power, authenticity and generalizability of the theories. Besides, most of the studies focus on social factors, e.g. ownership of knowledge, free riding, social exchange theory, self-interest and trust, etc. Existing knowledge in IS field was seldom applied to study the issue. As what organizations concern is the sharing of knowledge through KMS so that individual knowledge can be captured for developing organizational knowledge, social factors may be necessary but insufficient to explain or predict individual behavior of using KMS to share knowledge. Existing wisdom may be useful for studying knowledge sharing within an organization. Therefore, suitable existing IS model should be proposed for studying the use of KMS to share knowledge and studied with social factors in order to confirm its external validity and explore the relative importance of social factors. Significant factors found and questionnaire items developed in this study can be used as indicators to check whether KM resources have been effectively allocated and assess the robustness of organizational context for effective use of KMS and knowledge sharing. These can provide useful information and guidance to organizations on how to allocate their KM efforts and help them find out their inherent weaknesses in providing a supportive KM environment.

This paper aims to: (1) extend IS continuance model to study the behavior of using KMS to share knowledge within an organization and (2) integrate social factors in the model to study their relative importance to the use of KMS to share knowledge. More specifically, it aims to study the impacts of perceived usefulness, satisfaction, social factors and task interdependence on the actual behavior of using KMS to share knowledge.

2. Literature Review

2.1 Knowledge

In IS literature, difference between information and knowledge is identified. Knowledge is information processed in the mind of individuals (Alavi et al. 2001). Besides, a distinction has been made between two types of knowledge: tacit knowledge and explicit knowledge (Nonaka 1994). Different types of knowledge has been studied separately in previous empirical research relating to knowledge sharing (Lee 2000; Bock et al. 2005). In these studies, as tacit knowledge is hard to be formalized and can only be learnt through apprenticeship and experience according to its definition, implicit knowledge which is defined as knowledge that can be expressed in verbal, symbolic or written form, but not yet expressed was studied as well as explicit knowledge. In this study, as the focus is not the influence of different types of knowledge, no distinction was made. Therefore, knowledge in this context refers to information that has been processed in your mind, which includes both the experience and understanding of the people in the organization and the information artifacts, such as document and reports, available within the organization and in the world outside (Marwick 2001).

2.2 Knowledge Management Systems (KMS)

KMS refers to Information and Communication Technologies (ICT) and Information Systems (IS) that are implemented by an organization to facilitate knowledge management (e.g. creation, transfer, storage, retrieval and application of organizational knowledge (Alavi et al. 2001)). Examples are document and content management

systems, artificial intelligence technologies, collaborative electronic media (electronic mail, World Wide Web and other collaborative systems), expert networks, customer relationship management systems, groupware and e-learning systems, etc.

2.3 Knowledge Sharing

Knowledge sharing should embed the notion of “willingness to share” and “voluntary to make information available to others” (Jarvenpaa et al. 2000). Motivational disposition is an element of knowledge transfer (Gupta et al. 2000; Alavi et al. 2001) and critical in determining the success of organizational efforts to get knowledge transferred (Huber 2001). The willingness to share knowledge refers to motivational disposition of the source unit (i.e. sender of knowledge) (Alavi et al. 2001). Knowledge sharing can only be facilitated and encouraged (Bock et al. 2005). Knowledge is personalized information (Alavi et al. 2001). Even though people are forced to share their knowledge, they may just share part or none of their valuable knowledge if they are not willing to do so. A participant in a preliminary study mentioned, “I use the KMS because it is part of the project requirement according to the company guideline. However, as I knew, people will not share ALL (their knowledge) since some knowledge is (regarded as) their “key” asset in the company.” As it is impossible to know all about the types and depth of knowledge each employee acquired in advance, it becomes more difficult to assure the quantity and quality of knowledge being transferred if willingness to share knowledge does not occurred. Besides, knowledge should be interpreted in terms of potential for action or immediate link with performance in order to be distinguished from information. Human beings play the central role in knowledge creation (Malhotra 2001). Knowledge sharing must involve human interaction so that KM processes can be facilitated and more new knowledge can be created (Malhotra 2001). In this study, knowledge sharing is defined to be implied with the embedded notion of “willingness to share” and a “voluntary act of making your knowledge available” to other organizational members at large so that they can interpret the data accordingly, (re-)construct the knowledge and use it to actualize their knowledge to facilitate their work or decision making.

2.4 Expectation-Confirmation Theory

Because of globalization and advanced technology development, most of organizations have already adopted some kinds of KMS or ICT to facilitate communication and knowledge sharing among organizational members to get rid of time and space boundaries and thus more and more people have experience of using these technologies at work. Therefore, instead of initial adoption or acceptance of KMS, our focus should change to continued use of KMS especially in knowledge sharing activities to match the need of current reality. IS continuance model is a theoretical model that has been developed to study system use at the post-adoptive stage.

IS continuance model is developed based on expectation-confirmation theory (ECT) (Oliver 1980) to study IS continuance at the individual level and has been validated empirically (Bhattacharjee 2001; Lin et al. 2004). ECT has been widely used to study consumer satisfaction, post-purchase behavior and service marketing (Bhattacharjee 2001). It suggests that a consumer makes a post-purchase comparison between pre-purchase expectation and the performance received to determine the extent to which expectation is confirmed. Both the confirmation level and the expectation will then affect satisfaction which is the primary determinant of repurchase intention. By

adapting the ECT with well-developed Technology Acceptance Model which proposes perceived usefulness and perceived ease of use as salient determinants of IS acceptance behavior (Davis et al. 1989), a post-acceptance model of IS continuance (Bhattacharjee 2001) was developed. Consistent with the ECT, satisfaction is determined by expectation and confirmation. However, instead of measuring ex ante expectation, ex post expectation (i.e. perceived usefulness) is measured as expectation may change with time and ex post expectation will be more closely related to the decision of confirmation level. Moreover, perceived usefulness is consistently found to be a significant predictor of IS use (Taylor et al. 1995; Gefen et al. 2003). Therefore, in the IS continuance model, IS continuance intention is determined by perceived usefulness and satisfaction. As perceived usefulness and satisfaction have been consistently found to be significantly related to post-adoption behavior of using IS, they are believed to be two important direct determinants of post-adoption behavior of using KMS to share knowledge within an organization.

2.5 Social Factors

Based on structuration theory and institutional theory, social or organizational contexts play an important role in shaping ICT-related practices of organizational members (Lamb et al. 2003). Organizational members are social actors, instead of atomic individuals, whose everyday interactions are infused with ICT use (Lamb et al. 2003). Because of increasing complexity of task and division of work, organizational members play different roles and are working together formally or informally to produce goods and services within their organizations. As organizational members are embedded in a network of relationship that mobilizes information exchange and the use of KMS, only relying on individualistic cognitive and cognitive social psychology model but leaving environmental context may be inadequate to explain the use of ICT in a real working context. Within an organizational environment, organizational members articulate the preferences of a collection of actors as well as individual preference in deciding the use of ICT. However, it was found that previous studies relating to ICT use within organizations tended to attenuate the importance of “social context, especially people’s relationships with those who have requested information or whom they are trying to persuade with information gathered and packaged through the use of ICT” (Lamb et al. 2003).

It was found that the use of ICT by organizational members can be characterized by four dimensions: the networks of relationships that link organizational affiliations, the network of relationships that call for the exchange of information and the use of ICT, interactions consist of packages of information, resources and media of exchange that organization members mobilize to engage with members of affiliated parties and intention to construct identities and ascribing profiles of organizational members as individual and collective entities (Lamb et al. 2003). Social factors which has been identified and empirically found to be significantly related to IS usage and knowledge sharing within an organization include: subjective norm and task interdependence.

Subjective Norm (SN): Theory of Reasoned Action (Fishbein et al. 1975) and Triandis Model from social psychology has been widely used as a model for studying behavioral intentions and/or behavior. They both posited that behavioral intention as a direct

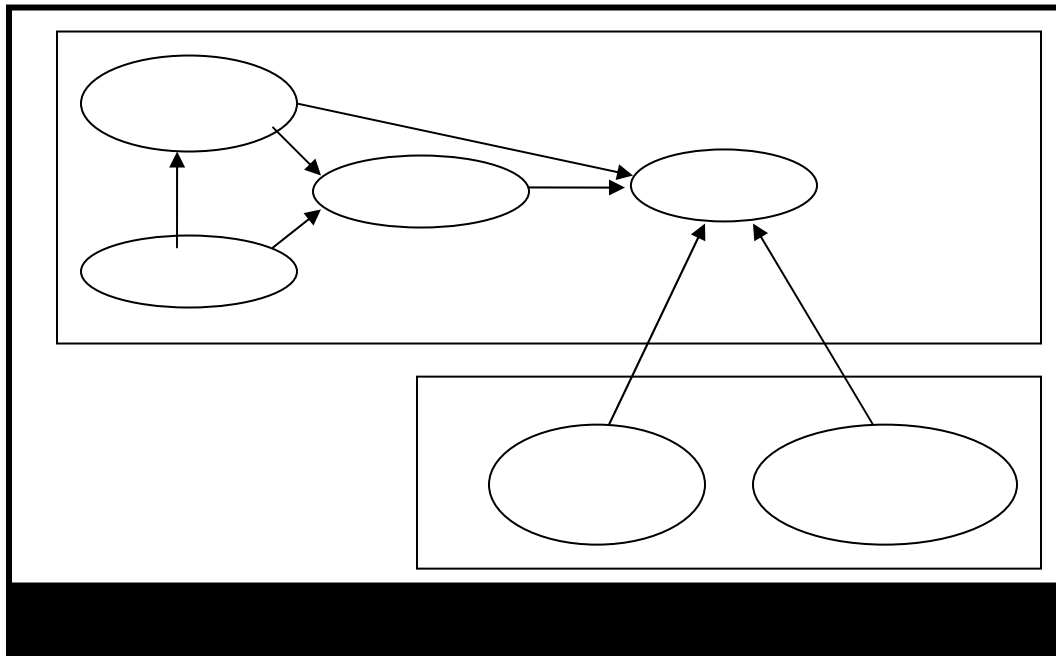
antecedent of behavior is determined partly by subjective norm. It is a factor relating to organizational structure or context. Its value is determined by the normative beliefs of affiliated parties within an organization regarding an individual use of KMS to share knowledge and an individual motivation to comply their beliefs. The normative beliefs can be viewed as technical and institutional pressures exerted by an organizational environment which have found to be an institutional characteristic that mobilize the use of ICT (Lamb et al. 2003) while the willingness to act in conformity to beliefs of referents may be due to the motivational process of intending to establish or maintain a satisfying self-defining relationship with another party (i.e. identification) which is recognized as one of the mechanism that underlies social influence (Kelman 1958).

Task Interdependence (TI): A culture of teamwork is prominent in facilitating the development of knowledge within an organization (Moffett et al. 2003). It is believed that organizations with the best technology infrastructure are not necessarily the best at knowledge sharing. Knowledge flow can be facilitated by taking advantage of technologies provided that a collaborative culture exists within an organization. Knowledge is context-specific. Effective KM solutions must address the work processes and the interdependent needs of knowledge workers in order to effectively influence individual behavior with the help of technology (Massey et al. 2002). For example, Nortel, a leading equipment manufacturer in the telecommunications industry, successfully reengineered its front-end new product development process because of its systematic focus on work process and the underlying needs of knowledge workers.

Moreover, within an organization, the use of KMS is not completely mandatory. Individuals can select from a set of resources chosen by the management. However, they rarely have the opportunity to choose the KMS they use (Lamb et al. 2003). The use of ICT is usually stabilized, regulated or institutionalized (Lamb et al. 2003). The need to cooperate, fulfill multiple roles and complete tasks will be an important consideration in the decision making of using networked technologies over time based on the effect of task-technology fit, institutional factor or rational self-interest of reciprocal benefits from knowledge sharing (Jarvenpaa et al. 2000; Massey et al. 2002; Lamb et al. 2003). Therefore, task interdependence should be controlled in order to assure the reliability of other predictor-criterion relationships identified.

3. Research Model

Figure 1 shows the research model. As this is a cross-sectional study, instead of studying intention to continue to use and post-adoptive usage at the same time, this study focuses only on post-adoptive usage of KMS to share knowledge in order to prevent retrospective problems, maintain logical flows and provide more meaningful and accurate results.



3.1 Perceived Usefulness (PU)

Perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her performance”. In both TAM (Davis 1989) and IS continuance model (Bhattacharjee 2001), it is hypothesized to be significantly related to intention to use. It has been empirically found to be significantly related to actual usage (Davis et al. 1989) and intention to use/adopt technology (Taylor et al. 1995; Venkatesh et al. 2000; Bhattacharjee 2001; Gefen et al. 2003; Venkatesh et al. 2003; Lin et al. 2004). Besides, it is a cognitive response of attitude. According to Triandis Model (Triandis 1980), perceived consequence as a cognitive component of attitude will affect behavioral intention which in turn affects behavior. Significant relationship between perceived consequence and utilization of IS has been found (Thompson et al. 1991; Cheung et al. 2000). Moreover, it is analogous to relative advantage (Moore et al. 1991; Rogers 2003) which is defined as “the degree to which using an innovation as being better than using its precursor” and has been frequently found to be positively related to information technology adoption and usage (Tornatzky et al. 1982). Therefore, the corollary to Hypothesis 1 and 2 should be:

H1: Perceived usefulness has a significant effect on the behavior of using KMS to share knowledge.

In the IS continuance model, ex post perceived usefulness is expected to be positively associated with satisfaction with IS use. Their relationship has also been consistently found in previous research. Therefore, the corollary to Hypothesis 2 should be:

H2: Perceived usefulness has a significant effect on the satisfaction of using KMS to share knowledge.

3.2 Confirmation (CF)

Confirmation measures the discrepancy between expectation and actual performance. According to ECT (Oliver 1980), confirmation affects satisfaction. According to the post-acceptance model of IS continuance (Bhattacharjee 2001), confirmation of IS benefit is also positively associated with perceived usefulness as the perception may be adjusted as a result of the experience gained. Significant relationships between confirmation and satisfaction and between confirmation and perceived usefulness have been empirically confirmed in existing research relating to system usage (e.g. (Bhattacharjee 2001; Lin et al. 2004)). Therefore, the corollary of Hypothesis 3 and 4 should be:

H3: Confirmation has a significant relationship with satisfaction.

H4: Confirmation has a significant relationship with perceived usefulness.

3.3 Satisfaction (S)

Satisfaction is referred to the feelings of outright satisfaction, regret, happiness and general feelings by an individual about the decision to perform a particular act (Oliver 1980). It is measured by items which are emotional or affective in content. In ECT (Oliver 1980), consumer satisfaction has been postulated to be the primary determinant of repurchase intention. Besides, satisfaction has been recognized as one of the major components that constitute IS success and modeled as an antecedent of system use (DeLone et al. 1992). Moreover, according to Triandis Model (Triandis 1980), affective component of attitude will affect behavioral intention which in turn affects behavior. Therefore, the corollary to Hypothesis 5 should be:

H5: Satisfaction has a significant effect on the behavior of using KMS to share knowledge.

3.4 Subjective Norm (SN)

Subjective norm refers to “the individual’s internalization of the reference group’s subjective culture and specific interpersonal agreements that individual has made with others in specific social situations” depending on their personality (Triandis 1980). There is correspondence between individual norms, roles and values and group’s subjective culture. However, they are not identical. People on an organization may think that it is useful to use the KMS to share knowledge, but an individual may still think it is useless according to his/her negative experience or personality. It is similar to the concept of subjective norm of TRA and TPB (Ajzen 1991). Significant relationship between subjective norm and system usage has been found in IS research (Taylor et al. 1995; Cheung et al. 2000). Therefore, the corollary to Hypothesis 6 should be:

H6: Subjective norm has a significant effect on the behavior of using KMS to share knowledge.

Each item of subjective norm was obtained by multiplying “normative belief” (NB) of each referent with “motivation to comply” (MC) with the corresponding referent (Cheung et al. 2000). In this study, social influences from colleagues, immediate

supervisor and the top management were studied as they were determined as important referents who will affect a person from performing a behavior within an organizational context in previous studies (Costigan et al. 1998; Cheung et al. 2000). The items of subjective norm may not load on the same underlying construct (Lewis et al. 2003). A change in social factor construct may mainly due to the change of social influences of one or two referents that are relatively important. Besides, social influence from different referents have been viewed as beliefs of subjective norm and measured separately as predictors of overall subjective norm (Fishbein et al. 1975; Taylor et al. 1995). Therefore, it is meaningful to study the relative importance (i.e. weights) among social influences, and thus items of social factors should be modeled as formative indicators.

3.5 Task Interdependence (TI)

Task Interdependence refers to interdependent information needs between individuals in a network created by the nature of the work. It is a structural factor that has been empirically studied and found to be significantly related to the use of KMS within an organization. Task interdependence has empirically found to be the second most important determinant to the use of collective electronic media for information sharing among factors identified in an organizational study (Jarvenpaa et al. 2000). It measures the interactions, connections, ties, structural links and interdependent information or knowledge needs between individuals in a network created by the nature of the work. A person whose tasks are highly dependent on collaboration or the efforts of other people is believed to have higher motivation of sharing through collaborative technologies (Jarvenpaa et al. 2000). Besides, although the relative influence of task interdependence may vary over time with increasing experience, task interdependence as an institutional factor is expected to be an important determinant of the actual behavior and intention to continue to use KMS. Therefore, the corollary of Hypothesis 7 should be:

H7: Task interdependence has a significant effect on the behavior of using KMS to share knowledge.

4. Measurement Development

In order to develop better measures, literature review was conducted and constructs were carefully defined to specify the domain of the constructs and ensure content and face validity (Churchill, 1979; Moore, 1991). Reliable and valid instruments for measuring confirmation, perceived usefulness, satisfaction, normative beliefs and motivation to comply of social factors, facilitating conditions, task interdependence and behavior constructs were adopted from existing literature, i.e. Bhattacharjee 2001, Moore and Benbasat 1991, Spreng 1993, Cheung, Chang et al 2000 and Jarvenpaa and Staples 2001. They were carefully reworded in order to be applied to the specific context of using KMS to share knowledge within an organization. Each construct was operationalized by at least three indicators (Bollen 1989) which were measured on a seven-point likert scale ranging from (1) strongly agree to (7) strongly disagree.

Research relies on participants to provide information about their thoughts, feelings and actions in the form of verbal self-reports may be biased by tendencies to furnish socially desirable responses and to deny holding socially undesirable attitudes or performing socially undesirable behaviors (Beck et al. 1991). Social desirability refers to “the need for social approval and acceptance and the belief that it can be attained by

means of culturally acceptable and appropriate behaviors” (Crowne et al. 1964). As an attempt to control for this bias, the Marlowe-Crowne Social Desirability Scale was included in the survey to measure this variable directly and assess its potential effect to user response data. Persons who endorse socially desirable items and reject socially undesirable ones are said to be demonstrating a social-desirability response set. Ten items were adopted. Respondents were asked to decide whether each statement is true or false as it pertains to them personally. Four items are keyed true (i.e. acceptable but probably untrue statement) and six false (i.e. true but undesirable statement), making an acquiescence interpretation highly improbable (Crowne et al. 1964). Pilot test was performed to collect opinions and find out errors concerning the questionnaire items and the survey design.

5. Data Collection

The subjects were master students in information systems and electronic commerce of a Hong Kong institution. Data collection was conducted in week 2 of semester A. Four core courses which most of the master students have to attend were selected to distribute the survey. Hard copy surveys were distributed at the end of each lecture or tutorial section. Students were informed that participation is voluntary. They could choose to complete the survey at once, do and return it later to a specified collection place or fill it online through website stated on the questionnaire. 331 questionnaires were distributed with 139 respondents. Among the respondents, 15 of them completed the survey online. Response rate is 42%. Two records were found to be problematic as respondents did not specify a KMS they have used to share knowledge within their organization and most of their responses were “neither agree nor disagree”. Besides, some records with too many missing values were dropped from the data set (e.g. missing two values of a three-item construct). The effective sample size for data analysis was 135. Remaining missing values were imputed by LISREL (Toit et al. 2001).

6. Data Analysis

Some modifications were made to the data set with PRELIS before performing model fit analysis in order to provide reliable results. Remaining missing values were imputed (Toit et al. 2001) which is a sophisticated procedures for replacing individual missing values with likely values (Rigdon 1998).

6.1 Measurement Model

Confirmatory factor analysis using structural equation modeling (SEQ) was conducted with the help of LISREL (Hair et al. 1998). As all observed variables are ordinal, the matrix of polychoric correlations was analyzed with the WLS method, using the correct weight matrix (Joreskog et al. 1996). Asymptotic covariance matrix and the polychoric and polyserial matrix were obtained for performing model fit analysis with PRELIS.

In assessing the measurement model, the acceptance level for path loading was 0.70. To assess internal consistency for a given block of indicators (Chin 1998), the acceptance level of composite reliability (ρ) (Werts et al. 1974) was set at 0.70 (Hair et al. 1998) and that of average variance extracted (AVE or σ) (Fornell et al. 1981) was set at 0.50 (Chin 1998). To evaluate the discriminant validity, AVE of each latent variable

should be greater than the square of the correlations between it and other latent variables (Chin 1998).

All reflective indicators except TI1 had factor loadings above 0.70 ranging from 0.77 to 0.98 significant at 0.01 level. Factor loading of TI1 is 0.65 significant at 0.01 level. According to Chin (Chin 1998), factor loading of 0.50 or 0.60 can still be accepted when there are additional indicators in the block for comparison basis. The values of composite reliability were found to be between 0.88 and 0.94 and those of AVE were found to be between 0.69 and 0.83. Therefore, reliability and convergent validity of the measurement model were supported. The discriminant validity was also verified as AVE of each latent variable was greater than the square of the correlations between it and other latent variables.

6.2 Social Desirability Bias

To assess the effects of social desirability bias, the method bias was modeled as a latent construct which is measured by social desirability scale score with no measurement error and allows all other items to load on it (Podsakoff et al. 2003). No significant correlations were found between social desirability scale score and any items at 0.05 level except PU2, PU3 and CF3 whose correlations with social desirability were -0.20, -0.22 and -0.21 respectively. Therefore, the effect of common method bias due to social desirability on the result of this study should be insignificant.

6.3 Structural Model

Because of the limitation of sample size, plsgraph (Chin 2001) was used to perform the analysis for the structural model. It is a component-based structural equation modeling technique. It has the minimal requirements on measurement scales, sample size and residual distributions (Chin 1998; Chin et al. 1999). It can also be used to suggest the existence of any relationships and propositions as well as performing theoretical confirmatory analysis.

Indicators were standardized to avoid computational errors (Chin et al. 2003). A bootstrap procedure (500 resamples) was performed to examine the stability of estimates (Chin et al. 2003) and develop robust confidence intervals (Chin 1998).

The seven hypotheses were tested collectively. A moderate R-square of 0.51 was obtained in explaining the variance of behavior. All independent variables to behavior (i.e. PU, S, SN and TI) were found to be significantly related to the behavior of using KMS to share knowledge at 0.05 level. Hypothesis 1, 5, 6 and 7 were supported. Among the four variables, SN was found to be the most important with a path of 0.30 followed by PU (0.25), TI (0.24) and S (0.17). For SN, social influence from the immediate supervisor was found to be the most important with weight of 0.64 and factor loading 0.96 followed by that from the top management (0.32, 0.86) and colleagues (0.15, 0.76).

Regarding another dependent latent variable, i.e. Satisfaction, R-square of 0.24 was obtained. CF was found to be significantly related to S and PU at 0.01 level with path loadings 0.35 and 0.69 respectively. Hypothesis 3 and 4 were supported. However, PU was found to be insignificantly related with S. Hypothesis 2 was not supported. This may be due to different task environment and information systems being studied. In previous research, subjects being studied were usually personal users of online services (Bhattacharjee 2001; Lin et al. 2005). They made their own decisions on whether they

should continue to use the IS based on their personal needs. Therefore, an information system that is found to be useful will lead to personal satisfaction or positive affect. However, within an organization, the adoption of KMS is a company decision which is made based on benefits to the organization at large. Employees may be forced to use KMS or use it for the purpose of communication and task completion. Even though a KMS is perceived to be useful, they may simply use it as tools and may not have strong moods or emotions, neither positive nor negative, with it. This explanation was consistent with the result that PU and Satisfaction were found to be the second most important factor and the least important factor to behavior respectively. Besides, using KMS may even lead to dissatisfaction or negative affect. For example, the use of KMS may create extra work to employees. They may be required to input information and knowledge systematically into KMS so that knowledge can be properly retained and shared with different organizational members and for future use. Therefore, even though an employee perceives that a KMS is useful, it is not necessarily contribute to positive affective attitude or emotional feelings.

6.4 Assessing the Extended Research Model using the Original IS Continuance Model

The extended research model was found to be significantly better than the original IS continuance model in explaining the behavior of using KMS to share knowledge within an organization. Although the original IS continuance explained a significant proportion of the variance in employees' behavior, i.e. R-square of 0.37, it was still less than that obtained by the extended research model by 0.14. In order to explore the impact of social factors on the behavior of using KMS to share knowledge, effect size f^2 and q^2 were calculated and checked to Cohen's conventions (Cohen 1988; Chin 1998). f^2 measures the changes in R-square while q^2 measures the changes in predictive relevance Q^2 . f^2 of 0.29 was obtained indicating social factors have a medium effect on the structural model. In calculating q^2 , blindfold analyses with varying omission distances (i.e. 19, 59 and 109) were performed. The results were similar. The cross-validated redundancy Q^2 went from 0.33 to 0.32 when social factors were included implying a q^2 of 0.24 reflecting a medium impact consistently.

7. Conclusions

This study successfully extended IS continuance model to study the behavior of using KMS to share knowledge within an organization and showed the significance of social factors (i.e. subjective norm and task interdependence) to the behavior. Although perceived usefulness was not found to be significantly related to satisfaction, its significance with continuance use remained unchanged. Besides, with the inclusion of social factors, the degree of variance explained with the behavior of using KMS to share knowledge continually within an organization was significantly improved. Although perceived usefulness, affective attitude and social factors have been included in studying different IS use, their relative importance are expected to vary across behaviors and IS being studied. The case is the same as TPB that predictors are assumed to be sufficient to account for actions, but not all necessary in any given applications (Madden et al. 1992; Taylor et al. 1995). Influence of social factors has been found to be little or even insignificant in prior studies of IS use relating to word processing system (Davis 1989), individual task oriented systems (e.g. database application, portfolio analyzer and

accounting system (Venkatesh et al. 2003). The influence was larger and even become the most significant predictor when the IS context being studied involved the need for group or collaborative activities, e.g. the use of personal computer by knowledge workers in a multinational organization (Thompson et al. 1991), the use of computer facilities by students who had to work in teams (Taylor et al. 1995) and intention to share knowledge with organizational members (Bock et al. 2005). The result of this study confirmed that social factors were essential in determining the behavior relating to KMS use especially on knowledge sharing and the use of collaborative technologies.

There are a few limitations in the study which should be taken into account when interpreting the results and drawing implications, e.g. small sample size and non-random sampling. Respondents were people with high education and knowledge in information systems. Even though they are the ones whose knowledge is more important to organizations and KMS are usually adopted to empower them in their work, biases may exist and skew the results. Besides, as the participation in this survey was voluntary, it is possible that some respondents may have disposition towards KM or to use KMS. Moreover, 70% of the respondents were male. Addition analysis was done to examine sampling errors and provide for reference. All indicators were found to be within normal limits with skewness between +1 and -1 ranging from 0.68 to -0.10 and kurtosis between +2 and -2 ranging from 0.62 to -0.60 (Boomsma 1987). Independent sample t-test using SPSS was performed to assess whether there is gender difference for each responding item and used in the model analysis. No significant difference was found between male and female groups for each item at 0.05 level except PU2 and NB1. Therefore, sampling errors may be minimal and the results are still valid. Besides, although using indicators developed in existing research can increase the validity of measurement, the indicators may not fully reflect the IS context being studied. Indicators adopted for measuring perceived usefulness were focused on work performance. However, for participation in KMS-related activities, tangible returns may only be a part of consequences perceived by the users. For some knowledge workers, perceived usefulness of using KMS to share knowledge may also include maintaining ongoing relationship with others, obtaining sense of self-worth (Bock et al. 2005), individual knowledge increment through interaction and opportunity to help others (Wasko et al. 2000; Ardichvili et al. 2003), etc. Therefore, further research will be needed to study the KM issue in this study in more details and this study can be viewed as an exploratory study to be based.

The results of this study can help inform the management within an organization in their effort to promote the use of KMS to share knowledge. As the impact of social factors (e.g. social influence from immediate supervisor and the top management and task interdependence) were found to be significant, management plays an important role in motivating organizational members to share knowledge and use the KMS. They should demonstrate their support and emphasis and carefully evaluate and reengineer its business processes and strategies in order to promote the utilization of KMS and knowledge sharing so that knowledge assets can be successfully capitalized. Besides, when organizations decide to adopt new KMS, they should pay attention to their institutional context in order to apply KMS appropriately. Moreover, as behavior of using KMS to share knowledge is relatively constant, they should try to figure out strategies to motivate organizational members while planning to adopt or implement KMS in order to develop their habit. As perceived usefulness remained as an important factor to behavior even

when social factors were controlled, organizations should also pay efforts in communicating the positive impacts of the use of KMS to share knowledge within an organization to organizational members.

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