

In-role and extra-role knowledge sharing: A self-determination perspective

(Target to MISQ)

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Abstract

Knowledge sharing (KS) is critical for modern organizations and has attracted much attention from academicians in MIS community. Based on the literature on knowledge sharing in MIS area and organizational citizenship behavior in organizational behavior area, we propose two types of knowledge sharing existing in organizations, namely, in-role and extra-role KS. This study aims to identify the two types of knowledge sharing and investigate their antecedents and consequences through the view of self-determination theory (SDT). Extrinsic rewards, introjected rewards, intrinsic rewards, expected reciprocity, and self efficacy are hypothesized to predict the two types of knowledge sharing in different ways. In turn, the two sharing behaviors are expected to affect the individual, group and organization performance. Two studies will be conducted to identify the existence of the two types of knowledge sharing and test the hypotheses proposed, respectively.

Keywords: In-role knowledge sharing, extra-role knowledge sharing, organizational citizenship behavior, self-determination theory

1. Introduction

Knowledge is believed to be one of the most important resource for creating core competitive advantages of an organization (Liu and Lai 2010). To leverage this resource, knowledge management systems (KMS) have been applied to organizations and were made to benefit them (He and Wei 2009). More importantly, whether employees are willing to perform knowledge sharing (KS) which refers to members' sharing task-relevant ideas, information, and suggestions with each other (Faraj and Sproull 2000; Srivastava et al. 2006) is critical. Researchers have devoted to examining factors that increase organizational members' knowledge sharing. However, one literature review in this area found some inconsistent research findings (Wang and Noe 2010). For example, some researchers could not find the effect of extrinsic rewards on the attitude or intention towards knowledge sharing (Kwok and Gao 2005; Lin 2007a; Lin 2007b) while others found significant but negative effect (Brock et al. 2005; Brock and Kim 2002). In some studies, self efficacy showed positive effect on the attitudes (Cabrera and Cabrera 2005) and behavior of knowledge sharing (Chen and Hung 2010) while such an effect could not be found in the context of electronic networks (Wasko and Faraj 2005).

The above inconsistent research findings indicate that the KS in different research may have different nature. Different types of knowledge sharing show different patterns in terms of their antecedents and that may cause the inconsistencies in the literature. In order to resolve the problem, knowledge sharing needs to be further classified and investigated. In supply chain research, two types of information sharing among organization partners were identified (Du et al. 2012). One type is based on pre-specified agreements, called template-based information sharing. The other type refers to the information sharing whenever needed to help partners, called proactive information sharing. Similarly, studies in organizational behavior also identified two types of individual behavior: in-role behavior that is based on the role requirement and extra-role beyond the role requirement when needed (Organ 1988). Based on the literature review, two types of knowledge sharing, in-role and extra-role KS, were proposed.

In-role KS is defined as the knowledge sharing required or expected by the organization. It guarantees the necessary knowledge to be shared for the in-role performance in organization. Extra-role KS refers to the knowledge sharing beyond the organization's requirements. The extra behavior of knowledge sharing may generate extra valuable knowledge, which provides more intangible resources in the organization. This study aims to explore the existence of the proposed two types of knowledge sharing and investigate their antecedents and consequence as well.

Extrinsic and intrinsic rewards have been widely investigated as the antecedents of KS in previous literature (Brock et al. 2005; Brock and Kim 2002; Constant 1994; He and Wei 2009; Kankanhalli et al. 2005; Kulkarni et al. 2006; Kwok and Gao 2005; Lin 2007a; Lin 2007b; Wasko and Faraj 2005), which is well-explained by self-determination theory (SDT). This study also applies SDT to construct the nomological network of the two proposed new concepts of KS. SDT argues people's inherent growth tendencies and their innate motivations is more effective than extrinsic drives in determining their behavior (Deci and Ryan 2002). Extrinsic rewards, introjected rewards, intrinsic rewards, expected reciprocity, and self efficacy are hypothesized to influence the two proposed knowledge sharing behaviors in different patterns. Both KS are expected to influence the performance on three levels: individual, group and organizational.

This study contributes the knowledge sharing research by the differentiation of in-role and extra-role KS. The new taxonomy can help to explain some inconsistent research findings in previous literature. By investigating the antecedents and consequences, the new conceptualization will also help us understand more about knowledge sharing behavior and provide some insights for its implementation in KMS.

In the following sections, we will review the literature of KS, OCB and SDT. A nomological network of the two proposed types of KS was built based on SDT. Two studies will be performed to test the classification and proposed model. The first small-scale study aims to identify the existence of the two proposed types of KS. The second large-scale study will collect multi-level data to test the relationship

hypotheses proposed in the model.

2. Literature review

2.1 knowledge sharing

From the information systems (IS) perspective, knowledge sharing in organizations is believed to be affected by the match between organizational structures and information systems (IS) structures (Lee and Leifer 1992). Some other researchers believed that knowledge management system (KMS) plays an important role in the knowledge integration in virtual teams (Alavi and Tiwana 2002). Information and communication technology infrastructure was found to influence the structural social capital and then the knowledge sharing in organizations (van den Hooff and Huysman 2009).

Researchers have found that information stewardship attitude of employees (i.e., treatment of information as a corporate, rather than personally owned, resource) positively affect the extent of knowledge sharing in organizations (Kolekofski Jr. and Heminger 2003). Ardichvili, Page, & Wentling (2003) also believe that when knowledge is viewed as a public good belonging to one whole organization, it flows much more easily.

In addition to the attitudinal factors, the motivational factors are more widely investigated. Four mechanisms in encouraging knowledge sharing in organizations have been suggested (Bartol and Srivastava 2002). The first mechanism, extrinsic rewards (rewards coming from the external sources) has been investigated by many studies. Extrinsic rewards from organization as found positively related to the frequency of knowledge contribution made to KMSs (Kankanhalli et al. 2005). Higher level of incentives to KS were believed to be effective in another study (Kulkarni et al. 2006). However, some researchers failed to find the effect of extrinsic rewards on the attitude or intention towards knowledge sharing as expected (Kwok and Gao 2005; Lin 2007a; Lin 2007b). More counter-intuitively, some researchers even found negative effect of extrinsic rewards on the intention or attitude to share knowledge in their studies (Bock et al. 2005; Bock and Kim 2002).

The second and third rewards mechanism suggested by Bartol & Srivastava (2002) are related to personal interactions. It is found that pro-social attitude and norms of organizational ownership have effect on tangible knowledge sharing (Constant 1994). Trust and expected reciprocity have also been investigated by researchers. Ardichvili, Page, & Wentling (2003) suggested various types of trust, ranging from knowledge-based to institution-based, to be developed in organizations to remove the barriers to knowledge sharing. However, trust was shown to be insignificant in the study by Chow & Chan (2008). In their study, social network and shared goals significantly influence knowledge sharing while the social trust failed to show direct effect on the attitude and subjective norms of knowledge sharing.

Anticipated reciprocal relationship was considered as an intrinsic motivator and found significantly affects the attitude of knowledge sharing and then the knowledge sharing behavior in organizations (Bock & Kim 2002). However, the research findings cannot be generalized to virtual communities in which researchers failed to find the significant effect of reciprocity. For example, norm of reciprocity was found to have positive relationship with quantity while no relationship with the quality of knowledge sharing in virtual communities (Chiu et al. 2006). Wasko & Faraj (2005) found reciprocity negatively related to volume of contribution of knowledge in electronic networks and no relationship between reciprocity and the helpfulness of contribution. Chen and Hung (2010) did not find the proposed relationship between norm of reciprocity and contributing knowledge in virtual communities. The reason may be that most of the virtual communities are set for people's entertainment or relaxing. They participate in those communities mainly for fun rather than benefit.

Intrinsic rewards, the fourth one suggested by Bartol & Srivastava (2002) have also received much attention of KS researchers. Intrinsic rewards should be limited in the rewards intrinsic with one individual related to the behavior itself. For example, self-expressive needs of people determines their sharing of expertise (Constant 1994). Enjoyment in helping others that is defined as the perception of pleasure obtained from helping others through knowledge contribution was significantly impact on the knowledge contributors' IS usage (Kankanhalli et al. 2005). It is considered as an

intrinsic rewards and showed moderately significant effect on the knowledge sharing in electronic networks (Wasko and Faraj 2005). The user satisfaction, pleasure gained from contributing to KMS, makes the employees more likely to contribute knowledge in the systems (He and Wei 2009). Foss et al. (2009) suggested providing more autonomy to increase the intrinsic motivation of the employees and encourage them to share knowledge in organizations.

In addition, some other rewards have also been investigated. For example, sense of self-worth has been found affect knowledge sharing attitudes and then intention to share knowledge (Bock et al. 2005). Self efficacy (defined as “the judgment an individual makes about his or her ability to execute a particular behavior” (Bandura 1997)) encourages positive attitudes toward knowledge sharing (Cabrera and Cabrera 2005). Self efficacy later was found to have significant effect on both knowledge contributing and collecting behavior in virtual community (Chen and Hung 2010). Recognition was also considered as effective intrinsic rewards to motivate employees in knowledge-sharing activities (O' Dell and Grayson 1998). Social embeddedness was also believed to motivate knowledge sharing (van den Hooff and Huysman 2009). Although the authors classified these factors into intrinsic rewards, we believed they are not the rewards intrinsic with the KS behavior itself and their categorizations need to be reexamined.

In addition to the antecedents of knowledge sharing, researchers also examined the consequences of knowledge sharing. On the organizational level, researchers have found KS among organizational partners have positive effects on the success of their cooperative outsourcing projects (Lee 2001). On the group level, it is also found that individual knowledge sharing can increase group performance. For example, Henry (1995) found sharing task-relevant information by individual will lead to significantly increased group performance, especially group judgment accuracy. Bunderson & Sutcliffe (2002) confirmed the mediating effect of information sharing on the relationship between functional diversity and unit performance. Lee et al. (2010) found that team members' willingness of information sharing will affect team knowledge sharing, which in turn, significantly predicted team performance. Choi et

al. (2010) also confirmed that knowledge sharing through information technology and transactive memory systems enhances team performance.

Taxonomies of knowledge sharing can also be found in the above literatures. Knowledge has been identified with explicit and implicit types which were investigated by (Brock et al. 2005; Constant 1994; Lee 2001). Some studies classified knowledge sharing into contributing and collecting knowledge based on the direction (Chen and Hung 2010; Foss et al. 2009; He and Wei 2009). Some studies investigated the quality and quantity of knowledge sharing (Chiu et al. 2006; Wasko and Faraj 2005). However, the research of KS needs a new taxonomy based on the organizational behavior perspective, which will help to explain the inconsistent research findings in the literature, such as the effect of extrinsic rewards or self efficacy. This study proposes a new conceptualization of knowledge sharing with in-role and extra-role KS. Their antecedents will be examined and compared, of which the research findings are expected to explain some of the inconsistent research findings in previous studies.

2.2 In-role and extra-role behavior

In 1964, Katz raised the distinction between extra-role and in-role behaviors (Katz 1964). There were also many studies to investigate these two behaviors. For example, O'Reilly and Chatman (1986) performed a factor analysis with self-report data to measure in-role performance. Researchers also tried to discover the dimensions of Extra-role behavior, also called organizational citizenship behavior (OCB), to thoroughly assess it (Organ 1988; Smith et al. 1983). Williams & Anderson (1991) empirically distinguished extra-role behaviors from in-role activities using supervisor-report data. They also confirmed in-role behavior positively affects the extra-role behavior.

In-role and extra-role behavior do exist in organizations. Sharing more knowledge than required is believed as one type extra-role behavior. It is really necessary to further examine the difference between the in-role and extra-role behavior regarding knowledge sharing. This study aims to identify the two types of knowledge sharing and investigate their determinants through self-determination

theory.

2.3 Self-determination theory

Self determinant theory (SDT) has been continuously refined and applied in the past 30 years or so. Its basic idea does not change: it is people's inherent growth tendencies and their innate motivations that determine their behavior (Deci and Ryan 2002). Many a studies in this line focus on the cognitive evaluation theory (CET) which argues that the extrinsic rewards will reduce the intrinsic interest/motivation in a task (Deci 1971; Deci and Ryan 1985). Extrinsic rewards pertain to external rewards or outcomes that can be distinguished from the activity itself (Deci & Ryan 1985) whereas the intrinsic rewards refers to the pleasure and inherent satisfaction derived from a specific activity (Vallerand 1997).

Later, Deci and Ryan (1985) suggested a more fine-grained motivation taxonomy to further understand the relationship between motivations and behavior. Four more motivations were defined and together with the original two, they form a spectrum from the highest to the lowest self-determined motivations: intrinsic motivation, integrated motivation, identified motivation, introjected motivation, extrinsic motivation, and amotivation. However, we believe that the classification is a little too overelaborated to be identified easily in knowledge sharing context. Therefore, in this study, we only focus on the motivation driven by intrinsic, introjected, and extrinsic rewards. Introjected motivation is the internalization of the external regulations (self-regulated yet not intrinsically motivated) and introjected rewards are defined as the external rewards that has been internalized or imaged by individuals. The competent impression one individual gives others, good reputation/image, and praise/recognition gained from others are all included in this concept.

In the self-determination process, three main intrinsic needs were identified, competence, relatedness, and autonomy (Deci and Ryan 2000). It is believed that these primary factors advance motivation and development. People have the needs to experience capability with, care for and be related to others, and actively participate in determining their own behavior. Competency refers to seek to control the outcome and experience mastery (White 1959). Relatedness refers to the universal want to

interact, be connected to, and experience caring for others (Baumeister and Leary 1995). Autonomy refers to the universal urge to be causal agents of one's own life and act in harmony with one's integrated self.

In the past 30 years, many studies applied SDT to examine individual behavior as it was refined, including knowledge sharing (Foss et al. 2009; Welschen et al. 2012). However, some inconsistent research findings, such as the extrinsic rewards and self efficacy on knowledge sharing, suggest the application should be reexamined with the new conceptualization of in-role and extra role knowledge sharing. Actually, some researchers believed that rewards in SDT may not always account for the role as expected when the research context varies (Vallerand et al. 2008). Therefore, it is necessary to examine their effects on different types of knowledge sharing.

3. Research model and hypothesis

3.1 In-role and extra-role KS

In this study, in-role KS refers to the knowledge sharing that is bound by organization regulations or job descriptions to ensure the effectiveness of organization. Employees are generally expected to follow certain conventions to share knowledge, for example, having regular meetings, reporting progresses, training new employees or other activities based on different roles in the organization.

Extra-role KS, on the other hands, is beyond of these requirements and expectations. It refers to the knowledge sharing that is not directly or explicitly recognized by formal reward system, but in the aggregation of promoting the effective functioning of the organization. Examples are like employees' willingness to share new knowledge to enhance job performance or helping colleagues out by sharing more knowledge. The extra-role KS obviously exceeds the expectations of typical activities in an organization and it can further benefit the organization in addition to the in-role part. Therefore, we propose:

H1: In-role KS and extra-role KS are independent constructs.

In order to understand more about these two types of knowledge sharing, a research model is developed based on self-determinant theory and previous literatures, with both antecedents and consequences of KS. However, not all the antecedents are

hypothesized to influence both of the two types knowledge sharing. In fact, we believed that they show different patterns regarding the self-determined behavior.

3.2 The antecedents of knowledge sharing

Cognitive evaluation theory (CET) argues that extrinsic rewards may reduce the intrinsic interest/motivation in a task. When people are provided extrinsic rewards, their intrinsic interest/motivation may be negatively affected (Deci et al. 1999). Extrinsic rewards (usually monetary incentives) are believed effective in facilitating private activity while it dilutes image reward effect for public activity (Ariely et al. 2009). Experiments done in India and replicated in Massachusetts Institute of Technology and University of Chicago indicated that the extrinsic rewards would provide stress that may overwhelm its motivating effect when jobs involve in cognitive activities or are in public (Ariely 2008).

Knowledge sharing involves cognitive skills and each time at least two parties are involved in. The public activity may generate some social pressure on the one who shares, especially for in-role KS. Therefore, extrinsic rewards may play a negative effect on in-role KS. It implies a constraint rather than a motivator to the employees – they may not get the rewards if they don't share knowledge as expected. The rewards somehow negatively affect the employees' intrinsic needs, perceived competence and autonomy (Deci et al. 1999; Houliort et al. 2002), and thus negatively affect the knowledge sharing behavior.

Extra-role KS, on the contrary, is a volunteer behavior in which no coerciveness can be perceived by the employees. Without any official and public regulation, people can share knowledge as they will and also feel no pressure when they do not share. Moreover, extra-role KS is the knowledge sharing which is not directly or explicitly recognized by formal reward system. Therefore, we believe extrinsic rewards may have no effect (negative or positive) on extra-role KS. Therefore, we hypothesize:

H2a: Extrinsic rewards have a negative effect on in-role KS.

H2b: Extrinsic rewards have no effect on extra-role KS.

Self-determination theory suggested that people can be motivated by the introjection of maintaining and enhancing sense of worth in their social groups

(Koestner and Losier 2002). People have needs to be accepted or recognized. They want their competence to be perceived by both themselves and others. Therefore, employees may have the tendency to show others his/her compliance to the organization expectation regarding knowledge sharing in order to exhibit his/her competence to others and maintain the feelings of worth (Foss et al. 2009). Reputation was found to have positive relationship with KS in electronic networks (Wasko & Faraj 2005). In addition to the in-role KS, people may share more than required or expected to get more acceptance or show more competence. Status characteristic theory suggests one's contribution to group goal helps to gain his/her status (Feldman 2001). Extra-role KS shows one's competence, facilitates the group achievements and gains status for the individual. Therefore, we hypothesize:

H3a: Introjected reward has a positive effect on in-role KS.

H3b: Introjected reward has a positive effect on extra-role KS.

Self-determination theory emphasizes on the effect of intrinsic motivation over extrinsic one. It is believed that people are self-determined and the intrinsic rewards would be more effective to affect their behavior (Deci 1971; Deci and Ryan 1985). Many studies on knowledge sharing investigated the effect of intrinsic rewards from different aspects and cause some confusion. In this study, in order to differentiate it from the introjected rewards and eliminate social elements, intrinsic rewards is defined as the pleasure, satisfaction, challenge, and special experience from knowledge sharing itself. It is believed to influence both in-role and extra-role KS.

Regarding in-role KS, the more pleasure people get from the behavior, the more they want to perform it, even when it is required by the organization. For example, researchers have found the significant effect of intrinsic rewards on the knowledge contributing to a KMS which one organization expects/requires the employees to use (He and Wei 2009; Kankanhalli et al. 2005).

Regarding extra-role KS, intrinsic rewards is a more important drive. The totally voluntary behavior is believed to be driven by the rewards inherent to the behavior itself. Researchers have found enjoyment in helping others has significant effect on the knowledge sharing in electronic networks (Wasko and Faraj 2005). In a study of

blog use (which is also a voluntary behavior), it is believed important to increase individuals' intrinsic motivations, including their enjoyment, fun, curiosity, and exploration when promoting blog use (Hsu & Lin 2008). Therefore, we believe intrinsic rewards also have effect on extra-role KS. Based on the analysis, we hypothesize:

H4a: Intrinsic rewards have a positive effect on in-role KS.

H4b: Intrinsic rewards have a positive effect on extra-role KS.

People are social creatures and born with the social needs of being related with each others. Relatedness is believed to be one of the intrinsic needs of human being in self-determination theory (Deci and Ryan 2002). When people have interaction with each other, they expect reciprocity. In organizational context, expected reciprocity is found to play a role in the enhancement of knowledge sharing (Chiu et al. 2006). On one hand, expected reciprocity may encourage in-role KS. On the other hand, they may also have expected reciprocity when performing extra-role KS -- they help others and at the same time hope they can receive the help from others someday. Therefore, we hypothesize:

H5a: Expected reciprocity has a positive effect on in-role KS.

H5b: Expected reciprocity has a positive effect on extra-role KS.

Self determination theory indicates competence is one of the basic intrinsic needs of individual (Deci and Ryan 2000). The perceived competence, called self efficacy is believed to motivate people's performance of one behavior (Bandura 1997). Self efficacy is closely related to goal setting theory which emphasizes on the motivational effect of specific, challenging and publically-set goals (Locke 1968). Self efficacy can be increased when a specific and challenging goal is set publically. Among the two types of knowledge sharing, the in-role one is specific and in public. Therefore, it is believed that self efficacy plays an important role in the behavior of in-role KS. However, the "goal" for extra-role KS is vague without any public requirements or regulations. Everything is based on voluntariness. They may share more just for good even if they have low confidence. It is believed that self efficacy has no significant effect on extra-role KS. Therefore, we hypothesize:

H6a: Self efficacy has a positive effect on in-role KS.

H6b: Self efficacy has no effect on extra-role KS.

3.3 The consequence of KS

It is believed that KS can improve individual performance. The process of sharing knowledge to others is also one of recalling and resorting the knowledge for each individual. The accumulated and reinforced knowledge will help the individual to build his/her own knowledge system, which helps his/her work and eventually, improves his/her individual performance. No matter in-role or extra-role KS, they both have the same effect. Therefore, we hypothesize:

H7a: In-role KS has a positive effect on individual performance.

H7b: Extra-role KS has a positive effect on individual performance.

Researchers have also found that individual KS can increase group performance (Bunderson and Sutcliffe 2002; Choi et al. 2010; Henry 1995; Lee et al. 2010). On one hand, the more knowledge shared by each individual, the more useful knowledge resource a group can obtain. This will directly increase the group performance, especially in decision making or knowledge-based tasks. On the other hand, more KS accompanies more communications among group members, which helps to build trust, avoid or resolute possible conflicts among them, and then increases the group performance. In addition, both in-role and extra-role KS can contribute to the group performance through these two ways. Therefore, we hypothesize:

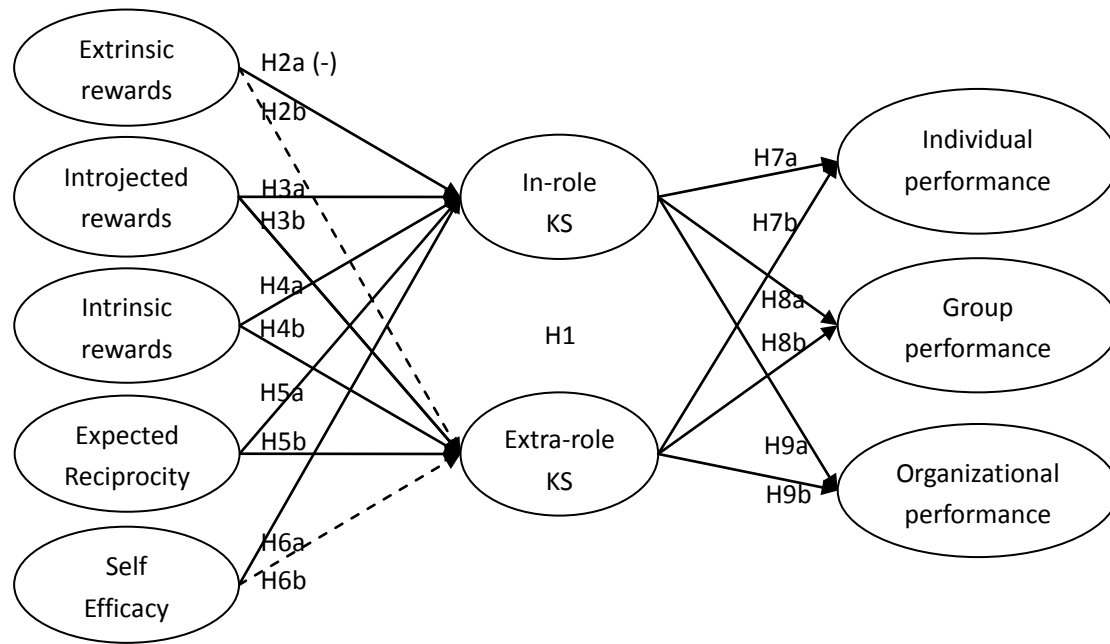
H8a: In-role KS has a positive effect on group performance.

H8b: Extra-role KS has a positive effect on group performance.

Researchers have found KS among organizational partners have positive effects on the success of their cooperative outsourcing projects (Lee 2001), which indicates the more knowledge one organization possesses, the higher performance they will achieve. We believe the knowledge shared by each individual within the organization, no matter from in-role or extra-role, can also contribute to the resource of the entire organization and have the same effect. Therefore, we hypothesize:

H9a: In-role KS has a positive effect on organizational performance.

H9b: Extra-role KS has a positive effect on organizational performance.



The arrow with dot line indicates there is no relationship between the two variables.

Figure 1. Comparing two types of knowledge sharing

4. Methodology

4.1 Data collection for two studies

This study aims to identify two types of knowledge sharing and examine their antecedents and consequences. Two studies are to be conducted in this research. The first small-scale one aims to identify in-role and extra-role KS and develop their measurements. EMBA students from Taiwan are recruited to a survey and souvenirs are provided as incentives. The data collected in Study 1 can also be used to confirm the measurements of other constructs in the model and preliminarily verify the relationships between them. Factor analysis and regression are the major data analysis method in this study.

The second study is the main study with a large-scale sampling from the employees in several Chinese organizations. Data from three levels (individual, group and organizational level) will be collected. The data of the two types of knowledge sharing and their antecedents will be collected on individual level and analyzed by structure equation modeling (SEM). CFA will be performed to test the measurement model. The validity (including the content, convergent, and discriminant validity) and reliability will be assessed. For the structural equation model, the model-fit-indices

including Chi-square, CFI, NNFI, RMSEA, and SRMR will be assessed. If the model fits well, the coefficients along with their significance level are used to confirm the hypotheses. The data of group and organizational performance will be collected in higher levels. H8 and H9 with the relationship between two types of KS and group and organization performance will be tested by Hierarchical Linear Modeling (HLM).

4.2 Measure Development

The measures in this study were developed based on previous studies. All the measures were composed of multi-statements. Respondents were asked to indicate their opinions by making a choice from 1 (“strongly disagree”) to 7 (“strongly agree”) for each statement. In addition to the two types of knowledge sharing, all the other measurements are directly adapted from the existing literature.

New measures for in-role and extra-role KS were developed particularly for this study since there were no existing measures to adopt. The measures for template-based and proactive information sharing (Du et al. 2012) were referred to. The context was changed from partners among supply chains to employees within organizations. The measures of OCB (Smith et al. 1983; van den Hooff and Huysman 2009) were examined to modify the wording. Finally, four items that address the knowledge sharing based on role requirement, regulation, organization expectation and, and avoiding problems are developed for in-role KS. The readiness and willingness to share knowledge beyond required, the eagerness to share new knowledge, and the voluntariness to share knowledge to enhance job performance were used to measure extra-role KS.

The questionnaire was pre-tested by five business professors. Based on their comments, the questionnaire was modified, particularly the wording, the grammar, and the structure. The questionnaire was first developed in English and then translated into traditional and simplified Chinese for data collection.

5. Expected contribution

There are several expected contributions in this research:

First, the researching findings may help to explain the inconsistent research findings in previous studies on knowledge sharing. For example, the confirmation of

the negative effect of extrinsic rewards only on in-role KS will provide on possible reason why some researchers found no (Kwok and Gao 2005; Lin 2007a; Lin 2007b) while others found negative effect (Brock et al. 2005; Brock and Kim 2002) of extrinsic rewards. Similarly, the confirmation of the effect of self-efficacy only on in-role KS may help to explain the inconsistent research findings of (Cabrera and Cabrera 2005; Chen and Hung 2010) and (Wasko and Faraj 2005).

Second, the conceptualization of the new taxonomy sheds lights on an unexplored research area in knowledge sharing. In the past decades, many studies on knowledge sharing have been conducted and the knowledge in this area is “seemingly saturated”. The identification of in-role and extra-role KS opens a new area for researchers to explore. Further investigations in the future are needed.

Third, the application of organizational behavior and psychology theories in this research continues to validate the theory development in MIS community. Organizational citizenship behavior (OCB), self-determination theory, self-efficacy theory and goal-setting theory are involved in the hypothesis development.

Forth, this study also clarifies the classification of rewards and resolves some confusions in MIS literature. By introducing introjected rewards, the rewards from external resources but internalized or imaged by individual, such as sense of worth, recognition, or reputation/image, were reclassified from either extrinsic or intrinsic rewards.

Finally, the study will provide more research findings on knowledge sharing behavior as well as the insights of knowledge management issues, such as the implementation of KMS in organizations. In the future, the relationship between KMS and the two types of knowledge sharing needs further investigation.

6. Current progress

Now we have finished the first study and aims to apply the RGC grant of Hong Kong Government for the conduction of the second large-scale study.

6.1 The preliminary results of Study 1

Copies of invitation letter containing survey description were sent to 200 EMBA students, mostly from Taiwan. Questionnaire was attached to the emails. The

respondents were asked to fill up one questionnaire and invite one of their colleagues to participate in the survey, if possible. After two rounds of reminder, 86 questionnaires were filled up and sent back. After excluding two incomplete ones, 84 valid questionnaires were used for data analysis.

Among the corresponding respondents, 56 were male and 28 were female. They were all above first-line managers. Exploratory factor analysis (EFA) was run with principal component analysis and Varimax rotation using SPSS 15.0. All the factors that we intended to generate were exacted and the items loaded higher to their own target factors than to others.

The items of knowledge sharing loaded to two different factors as expected. One with the items related to role expectation of knowledge sharing were named “in-role KS”. The other was identified as “extra-role KS” with the items on sharing knowledge beyond the expectation/requirement. Thus, the first hypothesis is confirmed.

Then, the validity of the measurement model was further assessed. The content validity had been verified by an interview of some senior managers. Convergent and discriminant validity were assessed by examining the average variance extracted (AVE) of each variable and comparing it with the shared variance between them. The AVEs of all the variables are higher than the required threshold, 0.5, indicating strong convergent validity of the measures. In addition, they are all higher than the shared variances with other variables. Therefore, the discriminant validity of the measures is established. The reliability of the measures was assessed by Cronbach’s alpha and composite reliability. All the values are higher than 0.7, indicating the measures are reliable.

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