An Exploratory Examination of Knowledge Sharing Behaviors: Voluntary vs. Solicited

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Abstract

Knowledge sharing (KS) has been a central concern in knowledge management (KM) practice and research. However, KS has remained largely a simplistic concept. In this study, we differentiate between solicited KS and voluntary KS, and attempt to examine the role of both types of actual sharing behaviors in relation to: task structure, culture, and knowledge process at work unit level. We found that task structure and knowledge practices facilitate only solicited sharing behaviors, but not voluntary sharing behaviors. In addition, the results indicate that feeling of solidarity and knowledge tools are significantly related to voluntary sharing behaviors. Our results provide preliminary evidence of significant relationship between environmental antecedents and two different forms of KS.

1. Introduction

In recent years, the importance of knowledge management (KM) has been widely recognized, as the foundations of industrialized economies shifted from natural resources to intellectual assets. The importance of KM is not restricted to knowledge-intensive firms in the high-tech industries. As demonstrated by Zack [45], even companies in very old traditional industries, such as cement, can greatly benefit from KM. In the research community, great advances have been achieved through conceptual and theoretical developments [2, 15, 30], as well as empirical studies on KM [6, 35, 44]. While much attention has been directed to the enabling role of IT and knowledge management systems [2], a major focus of research is the organizational enablers of successful KM, which includes factors such as KM strategies [26] and the role of culture and structures [23, 44].

A common concern for researchers interested in the organizational dimension of KM is knowledge sharing (KS), and this has received intensive attention in recent years. Researchers have studied KS effectiveness in knowledge networks [25], relationships between KS motivation and organizational forms [32], the role of social capital in KS [44], the influence of KS on individual performance [38], and barriers to KS in organizations [37]. A comprehensive model of intention formation in KS was proposed and tested by Bock et al. [6]. Such intensive attention to KS from researchers is understandable, since it is a critical link in the KM value chain: knowledge acquisition, storage, dissemination, and application. Without effective KS, this value chain will break down.

Built upon the existing research on the subject, this study attempts to enhance our understanding of KS through a new and expanded conceptualization of KS that has not been discussed and examined in previous studies. This expanded KS conceptualization is based on the differentiation between two different forms of KS: solicited and voluntary knowledge sharing behaviors.

1.1 Different Forms of Knowledge Sharing Behaviors

What exactly constitutes KS? While KS has been the focus of intensive research in recent years, the concept itself has remained surprisingly simplistic among researchers. Davenport and Prusak [15], for example, regard KS to have occurred in organizations whenever people ask for knowledge from others to solve their problems. If so, KS starts with the act of "requesting" and consummates with the act of "fulfilling" (i.e. agreeing to provide what is requested). In an empirical study of KS among "strangers" (distant employees of large global companies) by Constant, Sproull, and Kiesler [10], KS behaviors are characterized on the basis of the "request" and "respond" cycle. Dixon [16] pointed out that explicit and tacit knowledge requires different processes of sharing, but no attempt has been made by him or other researchers to explore different forms of KS. In most cases, the term KS is regarded as self explanatory and it is assumed that there is just one form of KS [e.g. 11, 42].

Is the "requesting" and "fulfilling" cycle the only possible way for KS to occur? What happens when people *give* potentially useful information or knowledge to others without first being asked? In fact, many people, including the researchers of the

current study, do this on a routine basis. There is no doubt that, whenever we voluntarily *give* knowledge to others without first receiving a request, KS occurs since the recipients now "share" the knowledge with us. In other words, "giving" knowledge is not restricted to responding to requests, it also includes giving without first receiving a request, i.e., voluntary giving. In this study, we differentiate between two forms of KS: solicited KS and voluntary KS. *Solicited KS refers to the sending and receiving of requests for knowledge, as well as the subsequent fulfillment of these requests. Voluntary KS, on the other hand, refers to the sending and receiving of knowledge without any prior solicitation.*

The requesting and fulfilling aspects of KS is recognized by KS researchers, but what prompted the giving has not been clearly delineated. In empirical KS studies with individual knowledge workers as respondents, the questionnaire typically includes 2 separate items for requesting and giving. In the study by Teigland and Wasko [38], for example, respondents were asked if they "were contacted by someone within the company for specific technical information," which can be characterized as a part of "solicited" KS. Respondents were then asked if they "gave out some specific technical information to someone in the company." This giving, however, is not always in response to a previous request, since the giver may have given out the technical information without first being contacted. In other words, this may involve either solicited (responding to requests) or purely voluntary KS.

This lack of attention to voluntary KS is also reflected in other researches. In a recent case study, Garud and Kumaraswamy [19] reported "vicious and virtuous" KM practices in a large IT service firm. One of the virtuous practices is the cultivation of an "asking culture" in the firm to encourage employees to seek out technical advice from colleagues. This corresponds to the "request" phase of the solicited KS and may not involve voluntary KS.

Research on KS has made great strides in recent years. However, further advances may be hampered if only part of the KS phenomena is studied. For example, it would be difficult to develop a complete understanding of its antecedents and outcomes if voluntary KS is not included in our inquiries. The environmental antecedents to KS such as culture, structures, and technology [3, 23], may be different depending on whether the KS is solicited or voluntary which, in turn, would have significant implications for KM practice in organizations. This motivates our research question for this study: *do the environmental antecedents have the same effect on solicited and voluntary sharing behaviors?* If not, we may need to consider different KM policies for solicited and voluntary KS. In this study, we plan to take an initial step in understanding the differentiated roles of solicited and voluntary KS in KM.

The remainder of this paper is organized as follows. We will first present the research model which identifies the environmental antecedents to the 2 forms of KS behaviors. This is followed by a list of hypotheses based on the research model. In the subsequent sections, we describe research method, measurement of research variables, and study results. Next, discussions and limitations will be presented. Finally, the contribution of our findings and possible future studies are discussed.

2. Research Model and Hypotheses

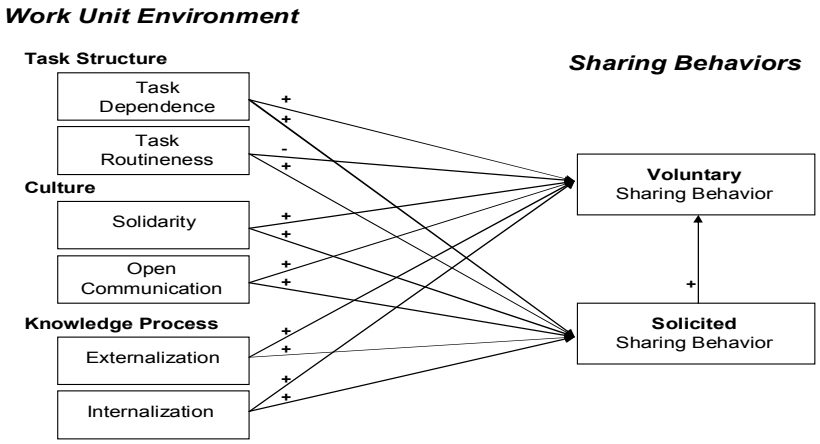

Figure 1: Research Model and Hypotheses

The research model, as depicted in Figure 1, consists of a number of research constructs related to work unit environments and sharing behaviors. The overarching theoretical basis for this model is social exchange theory [9, 29] and information processing perspective [18]. According to social exchange theory [29], social reciprocity is required to effectively collaborate with other colleagues. Further, researchers [e.g. 3, 23] have shown that cultural values are significantly related to effective knowledge transfer within an organization. On the other hand, to cope with uncertainty, an organization may either attempt to reduce uncertainty or enhance its ability for dealing with uncertainty by increasing its information processing capacity [18]. The information processing requirements are influenced by task characteristics [13]. In addition, the previous studies have illustrated that KM processes greatly influence the effectiveness of organizational knowledge transfer [2, 23]. Accordingly, we have included task structure, culture, and knowledge process as the antecedents in our research model.

2.1 Sharing Behaviors

A frequent theme in existing literatures on KS is its focus on perceptions, motivations, and intentions related to KS [6, 11, 25, 37, 38]. Osterloh and Frey [32], for example, analyzed the relationships between KS motivation, both intrinsic and extrinsic, and organizational forms. A recent study by Bock et al. [6] examined the roles of extrinsic motivators, social-psychological forces, and organizational climate in behavioral intention formation in KS. While these studies have provided valuable insights into motivations toward KS, actual KS behaviors need to be studied in order to develop a more complete understanding of its role in KM. In the study by Teigland and Wasko [38], KS frequency was measured and was found to significantly influence creativity and performance. In this study, we will also use frequency-based measures for both forms of KS behaviors.

2.2 Research Hypotheses

A number of studies identified and examined antecedents to effective KM. These include IT, organizational structure, culture, and technology [3, 23, 44]. In this study, we focus our attention on three types of environmental variables at work unit level: task structure, culture, and knowledge process. Our research model, as shown in Figure 1, consists of seven hypotheses. First, we examine the influence of task structure.

Task dependence refers to the extent to which a work unit needs information and support from others to accomplish its work [40]. Task dependence is closely related to levels of information exchange [36]. When the units hold high degree of task dependence, their members are more likely to accomplish their tasks or achieve the desired performance by sharing materials, information, or expertise with other colleagues [12]. Thus, members in such units are expected to engage in extensive interaction:

H1a: Degree of work unit task dependence is positively associated with the intensity of their voluntary sharing behaviors.

H1a: Degree of work unit task dependence is positively associated with the intensity of their solicited sharing behaviors.

In work units where tasks are comparatively routine, members are able to efficiently organize their activities [31] and to process knowledge in a formalized and written form [34]. Researchers have demonstrated a positive relationship between task rountineness and the amount of information processing [13]. On the other hand, previous studies have found that lower task routineness is related to more pro-social behaviors [33], such as voluntary KS. Thus, task routineness can be expected to promote solicited sharing activities in work unit, whereas it may discourage voluntary sharing activities:

H2a: Degree of work unit task routineness is negatively associated with the intensity of their voluntary sharing behaviors.

H2b: Degree of work unit task routineness is positively associated with the intensity of their solicited sharing behaviors.

Researchers [e.g. 6, 19] have explored the relationship between organizational culture and KS. Constant et al. [10] discussed how organizational culture sustains useful information exchange. These previous studies suggest that organizational culture may be important for KS in general. However, researchers have yet to address the theoretical and empirical links between culture and the 2 different forms of KS. Solidarity refers to a measure of a unit's ability "to pursue shared objectives quickly and effectively, regardless of social ties" [22: p. 134]. Solidarity is built upon shared experiences among members within the same unit who pursue common tasks or goals. A strong shared norm of behaviors (i.e., solidarity) is expected to encourage cooperation, reciprocity, and sharing within work units [1]. Thus,

H3a: Degree of work unit solidarity is positively associated with the intensity of their voluntary sharing behaviors.

H3b: Degree of work unit solidarity is positively associated with the intensity of their solicited

sharing behaviors.

In a recent KM case study conducted at Infosys Technologies, a large IT service firm, Garud and Kumaraswamy [19] reported that encouraging social networks among employees contributed to increased knowledge exchange. Further, previous studies on culture have highlighted its roles in promoting inquiry, dialogue, and collaboration [21]. In sharing activities, one party is clearly asking, and the other, giving, and this can be conceptualized as social exchange [5, 9]. This social exchange is necessary when one actively engages in learning and attempts to work with others in the organization in a collaborative relationship, which is supported by *open communication* [21]. Thus,

H4a: Degree of work unit open communication is positively associated with the intensity of their voluntary sharing behaviors.

H4b: Degree of work unit open communication is positively associated with the intensity of their solicited sharing behaviors.

Among the four types of the knowledge creation process [30], *externalization* refers to the process of transforming tacit knowledge into documented forms that others can understand. *Externalization* makes personal knowledge more agreeable and understandable to others [35] *Externalization* is an essential process to knowledge articulation [35]. On the other hand, researchers [e.g. 27] suggested that the key to achieve effective knowledge transfer involve "unlocking" individual tacit knowledge. Through the *internalization* process [30], explicit knowledge may be embodied in action and practice, and thus individuals are able to absorb it and turn it into tacit knowledge. Face-to-face communication and learning by doing are examples of *internalization* processes by which individuals acquire knowledge. Both *externalization* and *internalization* are fundamental processes of sharing activities between individuals. Thus,

H5a: In an organization work unit, the extent of its reliance on externalization is positively associated with the intensity of their voluntary sharing behaviors.

H5b: In an organization work unit, the extent of its reliance on externalization is positively associated with the intensity of their solicited sharing behaviors.

H6a: In an organization work unit, the extent of its reliance on internalization is positively associated with the intensity of their voluntary sharing behaviors.

H6b: In an organization work unit, the extent of its reliance on internalization is positively associated with the intensity of their solicited sharing behaviors.

Knowledge sharing occurs routinely among members of a network, who work together and need to interact with each other [25]. Solicited sharing, if conducted by members of the network over an extended period, will give rise to collaborative linkages that involve sustained, focused, and relatively intense interactions [4], which provides members access to resources that would otherwise be unavailable [24]. As partners in such intense interactions have great incentive and opportunity to share information [1, 24], voluntary sharing can be expected to occur more often among them. Thus,

H7: The intensity of solicited sharing behaviors is positively associated with that of voluntary sharing behaviors.

3. Research Methodology

To empirically test the proposed research model, the survey method was used. We developed the items in the questionnaire by adopting or adapting previously validated instruments. A pilot test was undertaken with 12 experienced knowledge workers, which resulted in the refinement of the questionnaire. The refined questionnaire was issued to MBA students enrolled in a major southern university's cohort-based program for working professionals, and a total of 149 useable responses have been collected.

3.1 Sample Characteristics

At the beginning of the questionnaire, we provide a definition of knowledge. A definition of "work unit" is also given, and the respondent is asked to indicate the name of the unit he/she belongs to, and also briefly describe its activities. In addition, the questionnaire also asks for basic demographic information from the respondents. The age of respondents ranged from 23 to 56 with an average of 39.58 (S.D. = 9.75). Consequently, knowledge workers of virtually all ages were represented in our sample. The presence of both genders in our sample also appears to be consistent with what one might expect in a population of knowledge workers: 64.2% percent male and 35.8% female. The mean number of years a respondent had spent with his/her present unit was 6.18 (S.D. = 6.17). Thus, we can be reasonably sure that they assessed the conditions in their units with a relatively high degree of accuracy. The average size of work units was 24.5 people (S.D. = 38.39). About one third (30.9 %) of the respondents classified themselves as managers, and the remainder consisted of engineers, analysts,

specialists, and a variety of other knowledge workers. The types of industry include IT and consulting (27.7 %), financial service (11.2 %), manufacturing (19.6 %), and others (41.5 %). These sample characteristics provide strong indications that the respondents are reasonably representative of the population of experienced knowledge workers.

3.2 Measuring Voluntary Sharing Behaviors

Consistent with how knowledge sharing was measured in previous studies [38], we measure the intensity of actual sharing behaviors by asking the subjects to indicate the frequencies of their sharing behaviors through a 7-point scale – 1: Very Infrequently, 4: Moderate Frequency (few times per month), 7: Very Frequently (many times daily). In gauging the intensity of KM tool usage, Sabherwal and Becerra-Fernandez [35] utilized this type of frequency measure. Teng and Calhoun [39], in their study on the impact of organizational computing on operational and managerial decision making, also asked respondents to report frequency of computing usage. This type of intensity measure has been used by IS researchers for many years in the study of system success [41].

Although knowledge is clearly defined in the questionnaire, most subjects in the pilot study were not certain if they had shared information or knowledge. Discussion with the subjects revealed that the "information" they were sharing is sufficiently important ("know-what") and maybe classified as knowledge. The researchers realized that, if only knowledge is mentioned in the questionnaire items, a significant portion of the knowledge sharing activities may not be captured since many subjects have an overly strict interpretation of knowledge. Thus, it was decided to pair information and knowledge (called "Info/Know") in the questionnaire items. Similar situations and solutions have been reported in previous empirical KS studies. In the study by Teigland and Wasko [38] on knowledge integration among advanced knowledge workers (consultants), the term "technical information" was used in lieu of "knowledge" in measuring frequencies of sharing behaviors. We used theses 4 items to measure the intensity of voluntary sharing behaviors:

- You voluntarily gave specific Info/Know to someone in your unit.
- Someone in your unit voluntarily gave specific Info/Know to you.
- You voluntarily gave specific Info/Know to someone in other units.
- Someone in other units voluntarily gave specific Info/Know to you.

These 4 items are intended to provide a comprehensive measure of voluntary sharing behaviors. Notice that we captured these sharing behaviors in both directions: giving and receiving.

3.3 Measuring Solicited Sharing Behaviors

As discussed earlier, solicited KS involves a 2-phase cycle: "requesting" and "fulfilling." In the first phase, the knowledge worker has a need for certain knowledge and issues a request to his/her colleagues. We may assume that such requests are generally issued with certain expectation for positive response; otherwise, the requester would normally not bother to request [9]. We have 4 items similar to those used for voluntary sharing. However, in order for the sharing to eventually consummate, a request for info/know must be followed by a second phase, i.e., fulfillment. Thus, we also asked the subjects to estimate the percentages that their requests are fulfilled:

- You received a request for specific Info/Know from someone in your unit.
- On average, I fulfilled about __ % of these requests.
- You requested for specific Info/Know from someone in your unit.
- On average, approximately __ % of my requests was fulfilled.
- You received a request for specific Info/Know from someone in other units.
- On average, I fulfilled about __ % of these requests.
- You requested for specific Info/Know from someone in other units.
- On average, approximately __ % of my requests was fulfilled.

As indicated above, we measure the intensity of requests with the 7-point frequency scale. During the pilot test, we tried to measure the fulfillment also by using the same 7-point frequency scale. Somehow our subjects found this to be very difficult to respond. However, they all are able to estimate the percentage of requests that are eventually fulfilled, and this estimated percentage is included in the final questionnaire as above. To assess the intensity of solicited KS, we multiply the reported request intensity by the percentage of subsequent fulfillment of the requests. For example, if a subject reported a request intensity of 6, and indicated that 85% of his/her requests eventually get fulfilled, then the intensity of solicited KS for this subject is 5.1 = 6 * 0.85. This scale provides a complete measure of solicited KS, since it captures both of its phases: request and fulfill.

3.4 Measurement of Environment Variables

For the work unit environmental variables, we used the scales, which were developed and validated by Daft and Macintosh [14], for *task routineness*. In addition, we developed an item to measure the degree

Table 1: Research Instruments

Task Dependence 1: strongly disagree 7: strongly agree	**Dependence between units means the flow and exchange of materials, information, or expertise in order to achieve the desired output or performance. Please indicate the extent of your agreement by circling a number:**	
	TD	The work in my unit is relatively independent from other units. (reverse-coded)
Task Routineness 1: to a very little extent 7: to a very great extent	TR1	Normal work activities in our jobs are guided by standard directives, rules and procedures.
	TR2	In carrying out our work, there is an understandable sequence of steps that can be followed.
	TR3	Established materials (professional books, directives, manuals, statutes) cover our work.
	TR4	In our type of work, people actually rely on established practices and procedures.
Solidarity 1: strongly disagree 7: strongly agree	SO1	Our work unit takes strong action to address poor performance.
	SO2	Members of our work unit share the same business objectives.
	SO3	Our collective will to win is high.
Open Communication 1: strongly disagree 7: strongly agree	OC1	There is open communication in my work unit.
	OC2	Everyone in my work unit has a chance to express his or her opinion.
	OC3	Our work unit maintains a high level of idea exchange.
Externalization 1 = very infrequently 4 = moderate frequency (few times per month) 7 = very frequently (many times daily)	**Please indicate how frequently each of the following tools is used by you to manage knowledge in your work unit:**	
	EX1	Expert Systems
	EX2	Groupware and collaboration tools
	EX3	Expertise "Yellow Page" (computerized directory for locating experts having specific knowledge)
Internalization 1 = to a very little extent 7 = to a very great extent	**Please indicate the extent that each of the following practices is used to manage knowledge in your work unit**	
	IN1	On-the-job-training.
	IN2	Learning by doing (learning new skills informally on the job).
	IN3	Learning by observation (learning new skills by observing others).

Table 2: Descriptive and Correlations (N = 149)

	Means	S.D.	ICR	Correlation and AVE							
				1	2	3	4	5	6	7	8
1. Voluntary Sharing Behaviors	4.81	1.11	0.88	**0.80**							
2. Solicited Sharing Behaviors	3.98	1.18	0.86	0.52	**0.77**						
3. Task Dependence	5.37	1.80	1.00	0.10	0.28	**1.00**					
4. Task Routineness	5.00	0.97	0.84	0.17	0.22	0.04	**0.75**				
5. Solidarity	5.08	1.03	0.84	0.33	0.28	-0.04	0.23	**0.79**			
6. Open Communication	5.49	1.08	0.92	0.12	0.30	0.05	0.12	0.49	**0.89**		
7. Externalization	2.49	1.53	0.78	0.35	0.23	0.14	0.15	0.08	0.06	**0.74**	
8. Internalization	5.21	0.94	0.77	0.30	0.30	-0.07	0.06	0.24	0.34	0.03	**0.73**

Note: Boldface numbers on the diagonal are the square roots of the AVE values.

of *task dependence*, based upon the definition given by Thompson [40]. While three items adapted from the previous studies of Goffee and Jones [22] were used to measure the level of *solidarity*, the items for *open communication* were adapted from Gibson and Vermeulen [21]. Finally, we used the items of *externalization* and *internalization*, which were developed and validated by Sabherwal and Becerra-Fernandez [35]. The origin and items for environmental variables can be found in Table 1.

Table 2 reports the descriptive statistics and correlations for independent and dependent variables. Both mean and standard deviation of voluntary KS (Mean = 4.81, S.D. = 1.11) were higher than those of solicited KS (Mean = 3.98, S.D. = 1.18). The results of the intensity of fulfillments showed that a large portion of their requests were fulfilled (Mean = 81.6 %, S.D. = 21.32). However, a significant portion of the requests (almost 20%) were not fulfilled, which will render the KS process incomplete.

3.5 Model Assessment

Given the size of the sample, we tested the research model using the partial least square (PLS) method with PLS Graph 3.0 [8]. Before testing the various hypotheses, we first examined the reliability and validity of the scales. The internal composite reliability (ICR) values are reported in Table 2. If ICR values are less than 0.70, the items may be unrelated, or measuring more than one construct. As seen in the

table, all ICR values are above 0.70 (range from 0.77 to 0.92), and thus deemed acceptable [18]. To ascertain the discriminant and convergent validity, we require the average variance extracted (AVE) to exceed 0.50, or the square root of AVE to be greater than the correlation between a construct and any other construct [7]. As can be seen in Table 2, the square root of the AVEs (on the diagonal) is indeed greater than the corresponding correlations. We have also carried out a confirmatory factor analysis (CFA) [20] for environmental antecedents. The results, as indicated in Table 3, reveal that all the constructs are clearly delineated.

Table 3: Factor Analysis for Environmental Variables

	Components					
	1	**2**	**3**	**4**	**5**	**6**
TD	**1.000**	0.052	-0.026	0.048	0.141	-0.063
TR1	0.140	**0.701**	0.116	0.084	0.192	0.131
TR2	0.038	**0.784**	0.271	0.120	0.140	-0.069
TR3	-0.007	**0.744**	0.178	0.064	0.039	0.079
TR4	-0.005	**0.808**	0.122	0.046	0.144	-0.040
SO1	-0.104	0.116	**0.788**	0.352	0.025	0.069
SO2	-0.040	0.178	**0.838**	0.430	-0.025	0.283
SO3	0.082	0.258	**0.793**	0.432	0.213	0.228
OC1	0.045	0.105	0.485	**0.915**	0.063	0.260
OC2	0.009	0.094	0.382	**0.891**	-0.041	0.218
OC3	0.074	0.078	0.483	**0.880**	-0.009	0.419
EX1	-0.011	0.203	0.098	-0.042	**0.806**	-0.142
EX2	0.216	0.085	0.042	0.064	**0.790**	0.117
EX3	0.126	0.093	0.055	-0.010	**0.693**	0.061
IN1	-0.096	0.148	0.193	0.221	0.047	**0.752**
IN2	-0.009	-0.094	0.089	0.217	-0.133	**0.760**
IN3	-0.037	0.010	0.265	0.307	0.115	**0.722**

3.6 Hypotheses Testing

Results of the PLS analysis, including all R^2 and path coefficients values, are reported in Table 4 and also indicated in Figure 2.

The results show that task dependence is positively associated with the intensity of solicited sharing behaviors, confirming H1b (b = 0.25, t = 3.31, $p < 0.01$). However, there was no relationship between task dependence and voluntary sharing behaviors, thus no support for H1a (b = -0.06, t = 0.81). Similar to task dependence, task routineness is positively associated with solicited sharing behaviors, confirming H2b (b = 0.14, t = 2.05, $p < 0.05$). H2a was not supported (b = 0.00, t = 0.01), suggesting that there was no relationship between task routineness and voluntary sharing behaviors. As expected, solidarity is significantly related to voluntary sharing behaviors and we found support for H3a (b = 0.21, t = 2.51, $p < 0.01$). There was no significant relationship between solidarity and solicited sharing behaviors, and there is no support for H3b (b = 0.10, t = 1.00). We found that more open communication leads to higher intensity of solicited sharing behaviors, and there is a support for H4b (b = 0.15, t = 1.93, $p < 0.05$). On the other hand, there was no significant relationship with voluntary sharing behaviors (b = -0.13, t = 1.56).

Table 4: Results of PLS analysis

		Voluntary Sharing Behavior	***Solicited Sharing Behavior***
	R^2	**0.42**	**0.30**
H1 a b	Task Dependency		
	Path Coefficient	-0.06	**0.25****
	t value	0.81	**3.31**
H2 a b	Task Routineness		
	Path Coefficient	0.00	**0.14***
	t value	0.01	**2.05**
H3 a b	Solidarity		
	Path Coefficient	**0.21****	0.10
	t value	**2.51**	1.00
H4 a b	Open Communication		
	Path Coefficient	-0.13	**0.15***
	t value	1.56	**1.93**
H5 a b	Externalization		
	Path Coefficient	**0.25****	**0.20****
	t value	**3.81**	**3.15**
H6 a b	Internalization		
	Path Coefficient	0.11	**0.22****
	t value	1.35	**2.72**
H7	Solicited KS		
	Path Coefficient	**0.45****	
	t value	**6.02**	

As hypothesized, externalization is significantly related to both voluntary and solicited sharing behaviors, confirming H5a (b = 0.25, t = 3.81, $p < 0.01$) and H5b (b = 0.20, t = 3.15, $p < 0.01$). The results show that internalization is positively associated with solicited sharing behaviors, supporting for H6b (b = 0.22, t = 2.72, $p < 0.01$). Internalization, however, was not related to voluntary sharing behaviors (b = 0.11, t = 1.35), and H6a is not supported. Finally, people who engage in solicited sharing are also likely to initiate voluntary sharing, and we have evidence to support H7 (b = 0.45, t = 6.02, $p < 0.01$).

4. Discussions and Limitations

We have proposed a set of seven hypotheses to examine the relationship between environmental antecedents and two different forms of sharing

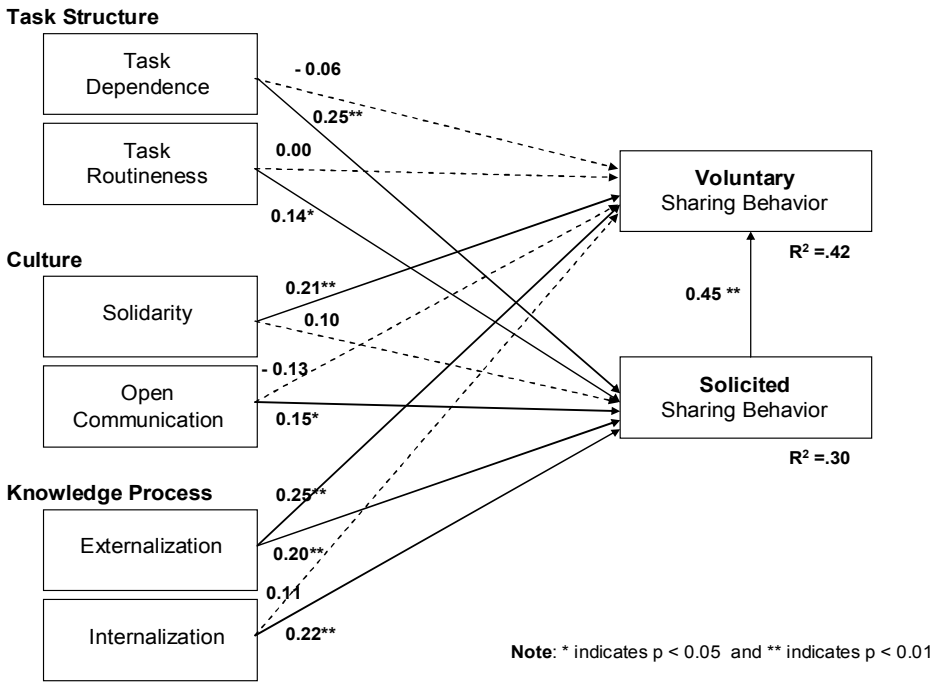

Figure 2: Testing the research model and hypotheses

behaviors: voluntary and solicited KS.

As hypothesized, task structure (i.e. task dependence and task routineness) has significant influence on solicited KS (H1b and H2b supported), but not voluntary KS (H1a and H2a not supported). Solicited KS is an important part of normal job activities, and we can thus expect it to be related to task structure. However, our findings suggest that task structure alone may not be sufficient in motivating people to voluntarily help others. Such motivation strongly depends on solidarity and collaborative spirit that permeate a work unit culture.

We found that solidarity significantly influences voluntary KS intensity (H3a supported), but not solicited KS (H3b not supported). This finding is consistent with the previous studies (Kelly and Jones, 2001), showing that feeling of solidarity promotes members proactively engaging in information processing activities. On the other hand, the contribution of solidarity to solicited KS (see Table 1; correlation coefficient = 0.28, $p < 0.01$) is diminished when we also consider the influence of task structure and knowledge process, both having significant relationships to solicited KS. Our results showed that open communication is significantly related to solicited KS (H4b supported). Interestingly, open communication is not related to voluntary KS (H4a not supported). The results imply that building learning culture, which encourages collaboration and team learning, is critical in fostering knowledge exchange between colleagues. In particular, in order to encourage people to proactively exchange ideas, cultivating trust among members is necessary.

As hypothesized, externalization is significantly related to both solicited and voluntary KS (H5a and H5b supported). This means that knowledge tools and technology for expressing ideas are essential to facilitate both forms of KS. However, internalization has significant influence on solicited KS (H6b supported), but not voluntary KS (H2a not supported). Our finding suggests that internalization is necessary in supporting the basic form of KS in the work unit, but may not be a significant force in bringing about voluntary sharing behavior, which is a much more proactive form of knowledge sharing. Voluntary KS involves taking initiatives that could not occur without strong rewards and incentives [43], which is more a function of culture than process.

4.1 Limitations

We have obtained interesting and insightful results on two different forms of knowledge sharing. Our analysis, however, is based on cross sectional

survey design and we need to exercise caution in making causal inferences. This is a first step toward understanding the roles of solicited and voluntary sharing behaviors in knowledge management. In the current study, we have obtained preliminary evidence that voluntary and solicited sharing behaviors are associated with individual perception of environmental variables. Certain individual-referenced variables, such as helping and sharing, are functionally similar at the individual and team levels [26], as such behaviors always involve multiple participants. Nevertheless, the results are limited by measurements at the individual level, and complete generalization to the organization and work unit levels require further inquiries. In addition, in this exploratory study, our results depend upon the response of a single subject representing a single work unit. Although our results are limited by the extent that each respondent can accurately assess his/her work unit, due to the limited size of the work unit (average = 24.5) and the fact that a knowledge worker typically spend most of his/her work time in the unit rather than the larger organization, we can be reasonably assured of the reliability of their assessment. Nevertheless, future studies may incorporate measures drawn from multiple respondents of a unit. Further, our study have revealed interesting patterns of the relationships between work unit environments and sharing behaviors. These findings provide a good foundation for further inquiry. Future study may incorporate the different media types of achieving the request and respond cycle – e.g. using face-to-face, email, or repository.

5. Contributions and Future Studies

Our results have yielded a wealth of findings and insights. Knowledge sharing has been a major theme in recent KM studies [6, 44], but previous studies have not identified different forms of KS. To our knowledge, we are the first to differentiate between solicited and voluntary knowledge sharing.

Our results have significant implications for KM research. By differentiating solicited and voluntary sharing, this study has uncovered the unique role of voluntary sharing in KM that has rarely been discussed or examined before. While our findings from this study provide significant contribution to KM research, further inquiries into voluntary sharing are needed. For example, future studies may look at the differences in motivation for solicited and voluntary sharing behaviors. Also, other facilitator and outcome variables may be considered to develop a more complete understanding on the role of voluntary sharing in KM.

The study, though preliminary in nature, does have interesting and potentially substantive implications for KM practice. First, as discussed earlier, KS has been commonly regarded as a singular concept. With the realization that voluntary sharing is a more proactive form of KS, KM practitioners may find it beneficial to monitor different forms of KS. Second, managers should not only understand the significant role of voluntary sharing, but also be aware of the role of solicited sharing. Organizations should stimulate and sustain both solicited and voluntary knowledge sharing within and across key work units. Finally, KM practitioners should pay specific attention to cultivating a culture that builds trust among employees and recognizes them for taking initiatives. In general, organizations should not devote all attentions to the hardware/software technologies for KM [26]. There should be more emphasis on extensive interactions among knowledge workers, which would provide more opportunities for them to help each other, possibly through voluntary KS. Through these various initiatives, an organization would increase the intensity of voluntary sharing behaviors among its knowledge workers, which, in turn, should enhance the organization's ability to innovate and compete.

6. References

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