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# **Breaking the Myths of Rewards: An Exploratory Study of Attitudes about Knowledge Sharing**

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## **Abstract**

Many CEOs and managers understand the importance of knowledge sharing among their employees and are eager to introduce the knowledge management paradigm in their organizations. However, little is known about the determinants of the individual's knowledge sharing behavior. The purpose of this study was to develop an understanding of the factors affecting the individual's knowledge sharing behavior in the organizational context. The research model includes various constructs based on social exchange theory, self-efficacy, and theory of reasoned action. Research results from the field survey of 467 employees of four large, public organizations show that expected associations and contribution are the major determinants of the individual's attitude toward knowledge sharing. Expected rewards, believed by many as the most important motivating factor for knowledge sharing, were not significantly related to the attitude toward knowledge sharing. As expected, positive attitude toward knowledge sharing was found to lead to positive intention to share knowledge and, finally, to actual knowledge sharing behaviors.

**Keywords:** Knowledge Sharing, Rewards, Social Exchange, Self-efficacy, Theory of Reasoned Action, Fishbein and Ajzen, Triandis, Attitude, Intention, Behavior

## **1. Introduction**

As the 21<sup>st</sup> century unfolds, many people regard the strategic management of knowledge resources as one of the key factors for sustainable competitive advantages.

In particular, knowledge sharing is perceived to be the most essential process for knowledge management. In a survey of the 260 CEOs and directors in European multinational organizations, 94% of the respondents answered that people should share what they know with others in the organization (Financial Times, 1999).

However, as Davenport (1997) argues, sharing knowledge is often unnatural. People will not share their knowledge as they think their knowledge is valuable and important. Hoarding knowledge and looking suspiciously upon knowledge from others are the natural tendency. In addition, this natural tendency is difficult to change. In a study of 431 U.S. and European organizations, conducted in 1997 by the Ernst & Young Center for Business Innovation, the biggest difficulty in knowledge management was "changing people's behavior" (Ruggles, 1998).

Therefore, rather than just encouraging or mandating knowledge sharing, fostering the motivation to share knowledge must precede. The purpose of this research was to develop an understanding of the factors that support or constrain the individual's knowledge sharing behavior in the organizations, and how they eventually influence the knowledge sharing behaviors. We proposed expected rewards, expected associations, and expected contribution as the major determinants of the individual's knowledge sharing attitudes, and this attitude as a determinant of their intention to share knowledge. Then, we suggested the knowledge sharing intention as an immediate predictor of the knowledge sharing behavior. "The Theory of Reasoned Action (Fishbein and Ajzen, 1975)" was adopted as the theoretical basis to

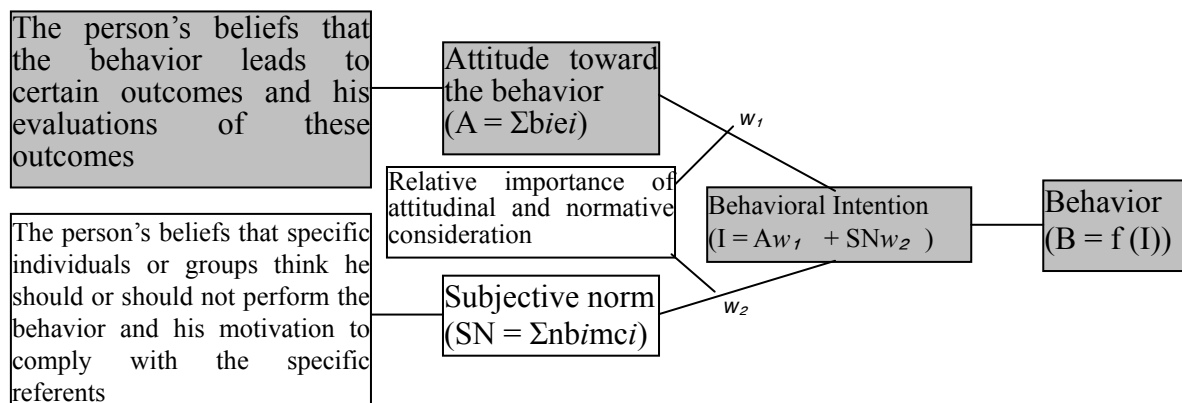
explain how these determinants affect the knowledge sharing behavior.

## 2. Theoretical Background: Theory of Reasoned Action

Theory of Reasoned Action assumes that human beings are usually quite rational and make systematic use of information available to them. For this reason, this approach is referred as a ‘Theory of Reasoned Action (TRA)’ (Fishbein & Ajzen, 1975).

According to TRA, a person’s performance of a specified behavior is determined by his behavioral intention (I) to perform the behavior ( $B = f(I)$ ). Next, intention is jointly determined by the person’s attitude (A) and subjective norm (SN) concerning the behavior in question with relative weights typically estimated by the regression coefficients ( $BI = Aw_1 + SNw_2$ ). And then, a person’s attitude toward a behavior is determined by his salient beliefs (bi) about the consequences of performing the behavior multiplied by the evaluation (ei) of those consequences ( $A = \sum biei$ ). Finally, an individual’s subjective norm (SN) is determined by a multiplicative function of his normative beliefs (nbi) and motivation to comply (mci) ( $SN = \sum nbimci$ ).

[Figure 1] Theory of Reasoned Action



TRA is a widely accepted model in social psychology to explain virtually any human behavior (Fishbein & Ajzen, 1980). A particularly helpful aspect of TRA is that it assumes all other factors influence behavior only indirectly by influencing attitude, subjective norms, or their relative weights (Davis, et al., 1989). Based on this explanatory power, TRA can be a useful model for explaining the knowledge sharing behavior in organizations, as Davis et al. presented the technology acceptance model (TAM) by adapting TRA to explain the individual’s computer usage behavior.

In this study, we focus only on the salient beliefs which affect the knowledge sharing attitude, because we assume that the knowledge sharing behavior is motivated and executed mainly at the individual level - shaded boxes in Figure 1 represent the scope of this study. The role of social factors may also need to be studied in the future.

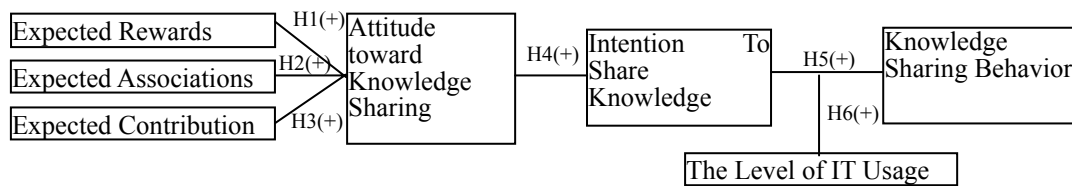
## 3. Research Model and Hypotheses

With the advent of the knowledge management paradigm, researchers examined many variables believed to affect the individual’s knowledge sharing behavior. Some of them were used in the information sharing research such as incentive systems and culture, and others such as top management and senior leadership have been emphasized in the knowledge

sharing research (O'Reilly, et al., 1987; Desantis & Gallupe, 1987; Butler, 1995; Nelson & Coopriider, 1996; Majchrzak, et al., 2000).

Despite such attempts, few researchers empirically tested such factors in the knowledge-sharing context on a solid theoretical foundation. In this study, we propose three factors —expected rewards, expected associations, and expected contribution —identified in social psychology theories as the salient beliefs for knowledge sharing attitude. Based on TRA, the suggested research model for this study is presented in Figure 2.

[Figure 2] Research Model



### 3.1 Economic Exchange Theory

Knowledge sharing is a kind of social interaction among people. Two principal theories which explain the social interaction of people are economic exchange theory and social exchange theory. According to the economic exchange theory, individuals will behave by rational self-interest. Thus, knowledge sharing will occur when its rewards exceed its costs (Kelley and Thibaut, 1978; Constant, et al., 1994). That is why many researchers have emphasized incentive systems for successful knowledge management. Hence, *expected rewards* imply that, if employees believe they will receive extrinsic benefits such as monetary rewards, promotion, or educational opportunity from their knowledge sharing, they would develop a more positive attitude toward knowledge sharing.

H1: Expected rewards will have a positive effect on the individual's attitude toward knowledge sharing.

### 3.2 Social Exchange Theory

While economic exchange theory concerns extrinsic benefits, social exchange theory concerns intrinsic rewards (Blau, 1967). Social exchange differs from economic exchange in that social exchange entails unspecified obligations. In contrast to economic commodities, the benefits involved in social exchange do not have an exact price in terms of a single quantitative medium of exchange, and the nature of the return cannot be bargained about. This is why only social exchange tends to engender feelings of personal obligation, gratitude, and trust.

For example, the initial offer of knowledge to a newcomer in an organization entails a friendly relationship, and the individual who has received the help feels an obligation to reciprocate. If the newcomers reciprocate properly, they will prove themselves trustworthy and exchange relations will be established (Gouldner, 1960; Blau, 1967). Thus, not only extrinsic benefits but also intrinsic benefits from social association should be considered as a key determinant of knowledge sharing.

*Expected associations* assume that if employees believe they could improve relationships with other employees by offering their knowledge, they would develop a more positive attitude toward knowledge sharing.

H2: Expected associations will have a positive effect on the individual's attitude toward

knowledge sharing.

### ***3.3 Social Cognitive Theory***

A person's attitude and behavior are influenced by the self-produced factors as well as by the external agent's stimuli. Among the types of knowledge that employees can derive from self-reflection, none is more central than the employees' judgment of their capabilities to deal effectively with different environmental realities (Stajkovic & Luthans, 1998). Bandura (1975) called this capability as 'self-efficacy.' Self-efficacy is defined as 'people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances (Bandura, 1986).'

Based on the self-efficacy percept, we propose that the individual's judgment of his capabilities to contribute to the organizational performance is going to be a major factor affecting knowledge sharing, as a purely self-motivational source. *Expected contribution* refers to the idea that if employees believe they could make contributions to the organization's performance, they would develop a more positive attitude toward knowledge sharing.

H3: Expected contribution will have a positive effect on the attitude toward knowledge sharing.

### ***3.4 Theory of Reasoned Action***

The hypothesis 4 and 5 examine the relationship between attitude and intention, and the relationship between intention and behavior in the knowledge-sharing context. These relationships have been supported by TRA in other behavioral contexts.

H4: Attitude toward knowledge sharing will have a positive effect on the individual's intention to share knowledge.

H5: Intention to share knowledge will have a positive effect on the individual's knowledge sharing behavior.

The last hypothesis refers to the individual's usage of information technology. Fishbein and Ajzen (1980) argued that several external variables could have an affect when an intention was realized to perform a behavior. Since information technology is considered as an important enabler in knowledge management (Davenport, 1997; Ruggles, 1998, O'Dell & Grayson, 1998), we examine how the individual's level of IT usage affects the knowledge sharing behavior.

H6: The level of Information technology usage of the individual will have a positive effect on the individual's knowledge sharing behavior.

## **4. Research Methodology**

To test the proposed hypotheses, we developed measurements for each variable and performed a pretest. Then, the main survey was conducted.

### ***4.1 Measurement Development***

The questionnaire used is shown in Appendix 1. Items for all independent variables – expected rewards, expected associations, and expected contribution - were newly developed based on the relevant theories and prior studies. Items to measure attitude toward knowledge sharing and behavioral intention were modified from the Fishbein and Ajzen's (1980)

previous works to make them relevant to the knowledge-sharing context. Items for knowledge sharing behaviors and the level of IT usage were adapted from the previous MIS studies.

[Table 1] Definitions and References

Constructs	Definitions	References	Items
Expected Rewards	The degree to which one believes that one can have extrinsic incentives due to one's knowledge sharing	Jauch, 1970; Gomez-Mejia, et al., 1990; Konig, Jr., 1993; Malhotra & Galletta, 1999	4
Expected Associations	The degree to which one believes one can improve mutual relationship through one's knowledge sharing	Deluga, 1998; Sparrowe & Linden, 1997; Seers et al., 1995; Major, et al., 1995; Parkhe, 1993	5
Expected Contribution	The degree to which one believes that one can improve the organization's performance through one's knowledge sharing	Stajkovic & Luthans, 1998; Gardner & Pierce, 1998; Schaubroeck & Merritt, 1997; Gecas et al., 1989;	5
Attitude toward knowledge sharing	The degree of one's positive feelings about sharing one's knowledge	Fishbein & Ajzen, 1975; 1980; Robinson & Shaver, 1973; Price & Mueller, 1986	6
Behavioral intention to share knowledge	The degree to which one believes that one will engage in a knowledge sharing act	Fishbein & Ajzen, 1980; Feldman & March, 1981; Constant et al., 1994; Dennis, 1996;	5
Knowledge Sharing Behavior	The degree to which one actually shares one's knowledge	Fisher, et al., 1997; Davis, 1989; Manis & Meltzer, 1978; Heide & Miner, 1992	7
Level of IT Usage	The degree of one's frequency of using IT such as BBS and email	Malhotra & Galletta, 1999; Robey 1979; Taylor & Todd 1995; Thompson et al., 1991	4

Before conducting the main survey, we performed a pretest. We tested the internal consistency and discriminant validity of the measurement instrument with 61 responses from 13 organizations in 7 industries. The Cronbach's  $\alpha$  value ranged from .71 (for expected rewards) to .95 (for expected contribution). Two out of the thirty six items were dropped from the expected rewards and attitude toward knowledge sharing, respectively, due to the low level of internal consistency.

#### 4.2 Data Collection for the Main Survey

The sample consisted of 467 employees in 75 departments of the four large public organizations in Korea. The brief description on each organization is shown in Table 2.

[Table 2] Company Profile

Name	Business Domain	Established	% of gov'n't share	# of employees*	Revenue
A	Produce & distribute natural gas	1983	50.2%	2,396	\$3.6 mil.
B	Provide district heating	1985	46.1%	792	\$2.8 mil.
C	Operate the subway	1994	N/A	518	N/A
D	Process & distribute the farm products, Provide banking service	1961	Owned by the farmer	1,620	Nonprofit org.

\* Year 1999

The data were gathered by means of a questionnaire in October and November of 1999. Overall, of the 900 questionnaires that were distributed, 861 questionnaires were received and 467 were usable. Detailed descriptive statistics of the respondents' characteristics are shown in Table 3. The unit of analysis for this study was the individual.

[Table 3] Profile of Respondents

Measure	Items	Frequency	Percent	Measure	Items	Frequency	Percent
Gender	Male	413	92.6%	Gender	Female	33	7.4%
Age	21~29	109	25.7%	Work Experience (year)	0~3	76	17.5%
	30~34	182	42.9%		3~6	203	46.6%
	35~39	73	17.2%		6~9	54	12.5%
	Over 40	60	14.2%		9~	102	23.4%
Position	Employee	97	21.7%	Work Training (# of times)	1~2	106	28.0%
	Chief employee	222	49.8%		3~4	138	36.4%
	Manager	95	21.3%		5~6	78	20.6%
	Director	32	7.2%		Over 7	57	15.0%
Education	High school	37	6.5%	Work Training (# of days)	1~10	88	25.4%
	College (2 years)	50	8.7%		11~20	125	36.0%
	University (4 years)	326	56.9%		21~30	63	18.1%
	Graduate school	24	4.2%		31~	71	20.5%
	Etc.	7	1.2%				

#### 4.3 Measurement Assessment

Content validity refers to the representativeness and comprehensiveness of the items used to create a scale. It is assessed by examining the process by which scale items are generated (Straub, 1989). In this research, definitions of expected rewards, expected associations, and expected contribution were initially proposed based on reviews of the economic and social exchange theories and self-efficacy theory. And previous research in IS and other disciplines was comprehensively reviewed to develop the measurement items. Definitions of attitude, intention, and behavior are based on the Fishbein and Ajzen's TRA, which is widely accepted in social psychology.

Construct validity looks at the extent to which a scale measures a theoretical variable of interest. There are, however, many different aspects of construct validity that have been proposed in the psychometric literature (Bagozzi, et al., 1991). In this study, we followed the Straub's (1989) process of validating instruments in MIS research to test construct validity in terms of convergent and discriminant validity.

To test construct validity, item analysis and factor analysis with varimax rotation was performed. For convergent validity, we evaluated the item-to-total correlation that is the correlation of each item to the sum of the remaining items. Discriminant validity was checked by using the factor loading values. Three items (one item in attitude toward knowledge sharing, one item in knowledge sharing behavior, and one item in level of IT usage) with item-to-total correlation of lower than 0.5 were dropped. No items were dropped due to factor analysis. Internal consistency for all constructs was investigated using the Cronbach's alpha values. The results of measurement assessment are shown in Table 4 and Table 5.

[Table 4] The Results of Measurement assessment

Measure	Item	Mean	S.D.	Cronbach $\alpha$
Expected Rewards	3	2.255	0.878	.8276
Expected Associations	5	3.573	0.781	.9335
Expected Contribution	5	3.510	0.736	.8924
Attitude to Knowledge Sharing	4	3.934	0.705	.8737
Intention to Share Knowledge	5	3.846	0.633	.8886
Knowledge Sharing Behavior	6	2.894	0.661	.8214
Level of IT Usage	3	3.158	0.895	.7609

[Table 5] Rotated Component Matrix

Items	Component						
	1	2	3	4	5	6	7
Expected Rewards 1	.828						
Expected Rewards 2	.900						
Expected Rewards 3	.799						
Expected Associations 1		.820					
Expected Associations 2		.844					
Expected Associations 3		.825					
Expected Associations 4		.800					
Expected Associations 5		.745					
Expected Contribution 1			.589				
Expected Contribution 2			.743				
Expected Contribution 3			.824				
Expected Contribution 4			.802				
Expected Contribution 5			.783				
Attitude 1				.666			
Attitude 2				.763			
Attitude 3				.829			
Attitude 4				.779			
Intention 1					.734		
Intention 2					.778		
Intention 3					.826		
Intention 4					.811		
Intention 5					.775		
Behavior 1						.719	
Behavior 2						.693	
Behavior 3						.698	
Behavior 4						.797	
Behavior 5						.712	
Behavior 6						.653	
Level of IT Usage 1							.809
Level of IT Usage 2							.851
Level of IT Usage 3							.786
Eigenvalues	1.499	9.054	2.498	1.700	3.607	2.069	1.283
% of variance explained	4.835	29.208	8.059	5.485	11.637	6.674	4.140
Cumulative %	65.898	29.208	48.904	61.063	40.845	55.579	70.038

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

A rotation converged in 6 iterations.

Attitude 1~4: Attitude toward knowledge sharing; Intention 1~5: Intention to share knowledge; Behavior 1~6:



### 5. Results of Hypothesis Testing

In this study, we aimed to find the salient beliefs affecting an individual’s knowledge sharing attitude, and to apply the Fishbein and Ajzen’s model in the knowledge-sharing context to understand how these factors affect the knowledge sharing behavior. In addition, we tried to explicate the role of IT as an enabler of knowledge sharing behaviors. The hypothesized relationships depicted in Figure 2 were tested using regression analysis. Table 6 presents a summary of the hypothesis tests.

[Table 6] Hypothesis Test Results

Equation	R <sup>2</sup>	ΔR <sup>2</sup>	β	Hypothesis test results
Attitude toward knowledge sharing (A) A=ER+EA+EC+errors ER EA EC	.304***		-.124** .382*** .237***	H1: not supported H2: supported H3: supported
Intention to share knowledge (I) I=A+errors	.323***		.568***	H4: supported
Knowledge Sharing Behavior (B) B=I+errors	.014*		.118*	H5: supported
Knowledge Sharing Behavior B=I+IT+I×IT+errors I IT I*IT	.054	.000	.094 .168 .039	H6: not supported

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, †p<0.1

ER: Expected Rewards; EA: Expected Associations; EC: Expected Contribution; IT: The Level of IT Usage

Hypotheses 1 to 3 examine the links between the employee’s beliefs about expected rewards, associations, and contribution, and the attitude toward knowledge sharing. While expected associations (*beta* = .382, *t*-value = 7.542, *p* < .001) and contribution (*beta* = .237, *t*-value = 4.706, *p* < .001) were positively related to the attitude as expected, expected rewards (*beta* = -.124, *t*-value = -3.127, *p* < .01) was negatively related to the attitude. Therefore, hypothesis 1 was not supported, and hypotheses 2 and 3 were supported.

Hypotheses 4 and 5 examine the Fishbein and Ajzen’s model in the knowledge-sharing context. Attitude toward knowledge sharing (*beta* = .568, *t*-value = 14.995, *p* < .001) has a significant influence on behavioral intention. Thirty-two percent of the variance of behavioral intention to share knowledge is explained by the attitude toward knowledge sharing. Also, an individual’s actual knowledge sharing behavior is highly correlated with the behavioral intention to share knowledge. The positive influences of attitude on intention and intention on behavior are confirmed in the knowledge-sharing context, too.

For the last hypothesis, we investigated the moderating effect of an individual’s level of IT usage on knowledge sharing behavior. We found that the individual’s level of IT usage does not show a significant moderating effect on the knowledge sharing behavior (*R*<sup>2</sup> Change = .000, *F*-value Change = .016, *p* = .900). Thus, hypothesis 6 was not supported.

### 6. Discussion of Results

One of the most interesting findings of this study is about the expected rewards variable. Many researchers as well as practitioners have emphasized the importance of rewards in knowledge sharing. From a theoretical perspective, economic exchange theory also suggests that a person behaves after calculating the expected rewards and costs incurred by his or her behavior. However, contrary to many researchers' expectation, this research shows that the attitude toward knowledge sharing is negatively related to the expected rewards. That is, expected rewards discourage the formation of a positive attitude toward knowledge sharing.

We may find a reasonable explanation for this negative relationship in the pay-performance research. Even though the assumption that people will do a better job if they are promised some sort of rewards is still pervasive, a number of studies on pay-performance have shown that there is no relationship, or even a negative relationship between rewards and performance (Kohn, 1993). Kohn provided six reasons why rewards failed, many of which are applicable in the knowledge-sharing context, too.

First of all, he insisted that rewards have a punitive effect because they are manipulative like outright punishment. Further, not receiving a reward that one had expected to receive is indistinguishable from being punished. Secondly, rewards break off relations. For each person who wins, there are many others who feel they have lost. When employees compete for a limited number of incentives, they will very likely begin to see each other as competitors to their own success. Next, managers often use incentive systems as a substitute for giving workers what they need to do a good job —providing useful feedback, social support, and the room for self-determination. Finally, rewards, like punishment, may actually undermine intrinsic motivation. The more they experience being controlled, the more they tend to lose interest in what they are doing. Furthermore, the recipient of the reward assumes, "If they have to bribe me to do it, it must be something I wouldn't want to do." So, the larger the incentive they are offered, the more negatively they view the activity for which the bonus was received.

The next explanation is related to the organizational citizenship behavior (OCB) literature. *OCB* can be defined as "willingness of persons to contribute efforts to the cooperative system" by Barnard (1938). Almost 30 years after Barnard, Kats and Kahn (1966; 1978) suggested that reward systems might inhibit cooperation (Organ & Konovsky, 1989), because critical voluntary behaviors that are not specified by job descriptions are largely a function of identification and internalization rather than instrumental involvement (O'Reilly & Chatman, 1986). According to Constant et al. (1994), experienced workers learned that they should share their knowledge which was acquired from their work and training. Therefore, they may have a negative attitude toward receiving extrinsic benefits in return for knowledge sharing behavior which they perceive as normal business activity.

Do rewards play no role for knowledge sharing? Why do many researchers and practitioners emphasize the role of rewards in knowledge sharing? To answer this question, let us borrow the Triandis' (1980) model. Triandis proposed a theory that incorporated many of the same concepts and constructs of Fishbein and Ajzen, but also modified and redefined them (Thompson et al., 1991). He acknowledged that even when intentions were high, behavior might not occur if certain conditions of a particular situation, for example accessibility, made the behavior impossible.

We expected that rewards could be a facilitating condition for knowledge sharing just like accessibility. Many practitioners mentioned that rewards played an important role in the initiation stage of knowledge management. From the theoretical point of view, Kelman (1958) argues that rewards succeed at securing only one thing: temporary compliance. Once the rewards run out, people revert to their old behavior (Kohn, 1993). In technical terms, the marginal utility of increasing amounts of extrinsic benefits eventually diminishes (Blau,

1967). This means that reward may be a trigger for knowledge sharing, but they are not a fundamental force for forming a person's attitude.

We also suggested that the level of IT usage of an individual would have a moderating effect on the knowledge sharing behavior, because IT was described as an enabler for knowledge sharing in much of the available literature (Davenport, 1997). We expected people who had intention to share their knowledge and used IT frequently would actually share their knowledge more frequently through BBS, email and etc. However, the moderating effect of the individual's level of IT usage was not significant. It may be necessary to measure the construct of IT usage with more diverse types of IS for knowledge sharing, because sharing of explicit knowledge is done mostly through intranets and formal knowledge repositories in many organizations.

## **7. Implications and Future Research**

The result of this study suggests that the reward system for knowledge management may need to be reexamined. Incentives (what are called "extrinsic motivators") do not seem to alter the attitude that underlies our knowledge sharing behavior. They do not create an enduring commitment to any action. Rather, incentives merely – and temporarily – change what we do (Kohn, 1993). It is no more than a trigger or facilitating condition. When it comes to producing lasting changes in attitude, however, rewards, like punishment, are strikingly ineffective (Kohn, 1993). The role of individual's level of IT usage falls to the same conclusion.

However, since social benefits have no exact price, the marginal utility function does not apply to the expected associations and contribution. Therefore, the frequent rendering of OCB like knowledge sharing would seem to mainly foster a sense of social exchange relationship. Employees who think knowledge sharing would increase the scope and depth of associations among organizational members tend to have a positive attitude toward knowledge sharing. Their positive attitudes toward knowledge sharing are formed by the expectations of reciprocation on knowledge sharing. Moreover, employees who believe in their ability to contribute to improvements of organizational performance have a positive attitude toward knowledge sharing. Therefore, we should pay more attention to enhancing the positive mood state for social associations which precedes knowledge sharing behaviors and should provide useful feedback to improve the individual's self-efficacy instead of designing an elaborate evaluation and incentive system.

Even though this research has drawn intellectually and practically meaningful implications, there are a few limitations. First of all, the use of self-report scales to measure the study variables involves the possibility of the common method bias for some of the results obtained. In order to pursue further investigation of the conceptual model, it would be appropriate to develop more direct and objective measures for knowledge sharing behavior.

Secondly, data of this study was collected from the firms in the public sector of Korea. The results might not be generalizable due to the organizational characteristics unique to the public organizations of Korea. In order to generalize the results from this study, we need to collect data from various industries and countries.

Finally, because we considered knowledge sharing as a very individualistic behavior, we focused only on the salient beliefs which affected the attitude toward knowledge sharing. However, according to Fishbein and Ajzen, behavioral intention is determined by social factors as well as by the attitude. Therefore, social factors need to be considered in the future research to increase the explanatory power of the research model.

For further research, it will be interesting to compare the Fishbein and Ajzen's model with the

Triandis' model. In terms of the facilitating conditions, explanatory power of the Triandis' model seems to be stronger than the Fishbein and Ajzen's model. However, Fishbein and Ajzen's model is simpler and more widely accepted. To provide a more accurate explanation on knowledge sharing behavior based on the Fishbein and Ajzen's model, a longitudinal approach also needs to be taken.

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## Appendix 1. Questionnaire

### *Knowledge Sharing Behavior*

How frequently do you share the following knowledge with your organizational members?

	Very Rarely	Rarely	Moderately	Frequently	Very Frequently
1) Manuals, Methodologies, Models	( )	( )	( )	( )	( )
2) Best Practices	( )	( )	( )	( )	( )
3) Knowledge from mass media	( )	( )	( )	( )	( )
4) Know-Where, Know-Whom	( )	( )	( )	( )	( )
5) Experience, Know-How	( )	( )	( )	( )	( )
6) Expertise from Education & Training	( )	( )	( )	( )	( )

### *The Level of IT Usage*

How frequently do you use the following information technology to share your knowledge?

	Very Rarely	Rarely	Moderately	Frequently	Very Frequently
1) BBS	( )	( )	( )	( )	( )
2) E-Mail	( )	( )	( )	( )	( )
3) Home Page	( )	( )	( )	( )	( )

### *Intention to Share Knowledge* [five-point Likert type scale]

1. I will share my knowledge with more organizational members.
2. I will always provide my knowledge at the request of other organizational members.
3. I intend to share my knowledge with other organizational members more frequently

in the future.

4. I try to share my knowledge with other organizational members in an effective way.
5. I will open my knowledge to anyone in the organization if it is helpful to the organization.

### ***The Individual's Beliefs***

#### *Expected Rewards* [five-point Likert type scale]

1. I expect to receive monetary rewards in return for my knowledge sharing.
2. I expect to receive additional points for promotion in return for my knowledge sharing.
3. I expect to receive an honor such as educational opportunity in return for my knowledge sharing.

#### *Expected Associations* [five-point Likert type scale]

1. My knowledge sharing would strengthen the tie between me and existing members in the organization.
2. My knowledge sharing would get me well acquainted with new members in the organization.
3. My knowledge sharing would expand the scope of my associations with other members in the organization.
4. My knowledge sharing would draw smooth cooperation from able members in the future.
5. My knowledge sharing would make strong relationships with members who have common interests in the organization.

#### *Expected Contribution* [five-point Likert type scale]

1. My knowledge sharing would help other members in the organization to solve problems.
2. My knowledge sharing would create new business opportunities for the organization.
3. My knowledge sharing would improve work processes in the organization.
4. My knowledge sharing would increase the productivity in the organization.
5. My knowledge sharing would help the organization to achieve its performance objectives.

#### *Attitude toward Knowledge Sharing* [five-point Likert type scale]

1. My knowledge sharing with other organizational members is good.
2. My knowledge sharing with other organizational members is pleasant.
3. My knowledge sharing with other organizational members is valuable.
4. My knowledge sharing with other organizational members is wise.