

Title	A Study on Knowledge Sharing Mechanism among Enterprise Research and Development Personnel
Author(s)	Zhang, Shuhua; Sun, Lili
Citation	
Issue Date	2007-11
Type	Conference Paper
Text version	publisher
URL	http://hdl.handle.net/10119/4143
Rights	
Description	The original publication is available at JAIST Press http://www.jaist.ac.jp/library/jaist-press/index.html , Proceedings of KSS'2007 : The Eighth International Symposium on Knowledge and Systems Sciences : November 5-7, 2007, [Ishikawa High-Tech Conference Center, Nomi, Ishikawa, JAPAN], Organized by: Japan Advanced Institute of Science and Technology

A Study on Knowledge Sharing Mechanism among Enterprise Research and Development Personnel

Shuhua Zhang † Lili Sun ‡

†School of Management
Shenyang Normal University, Shenyang, Liaoning, China P.R.110034
‡School of Educational Science
Shenyang Normal University, Shenyang, Liaoning, China P.R.110034
Zhangshuhua2000@126.com

Abstract

How to promote knowledge sharing is the core of knowledge management to create value for the organization. The paper explored knowledge sharing mechanism among enterprise research and development personnel from three level factors: individual, group and organization factors. Data collected from research and development teams or personnel of technology department among 19 enterprises in Shenyang with random sampling method. The findings are as follows: knowledge sharing desire makes a partial mediating effect between P-O fit and knowledge sharing behavior; knowledge sharing desire has an absolute mediating effect between trust in the higher-ups and knowledge sharing behavior; knowledge sharing desire has a partial mediating effect between expectation reward and knowledge sharing behavior; it has an absolute mediating effect between expectation relation and knowledge sharing behavior. In conclusion, understanding factors of knowledge sharing within organizational personnel and exploring knowledge sharing mechanism are of great significance for enhancing organizational knowledge management level and building organization competitive advantages.

Keywords: Knowledge Sharing, P—O Fit, Interpersonal Trust, Sharing Desire, Expectation of Result

1 Introduction

The core of knowledge management lies in how to promote knowledge sharing to create value for the organization (Liebowitz, 2001). Understanding factors of knowledge sharing within

organizational personnel and exploring knowledge sharing mechanism are of great significance for enhancing organizational knowledge management level and building organization competitive advantages.

2 Documents

Presently the study on factors of knowledge sharing can be mainly summarized into three aspects: individual level factors, group level factors and organizational level factors.

2.1 Individual level factors

2.1.1 Knowledge sharing behavior

Knowledge sharing behavior is the root of knowledge management. Jincheng Wang (2001) thought knowledge sharing is as follows: having a face to face communication with others on job problems, making field demonstration during the work, and publishing files about job problems, storing knowledge into the organizational database after the concretion, making an open speech, and having interaction with personnel in the same trade. Sheng Wu (2003) believed, knowledge sharing is that organizational personnel and inner—outer groups exchange and discuss their knowledge each other through all kinds of channels within or across organizations, the intention is to enlarge the utility value of knowledge and the performance of creating knowledge.

2.1.2 Sharing desire

Predicting whether individuals can engage in a certain behavior, we must know his behavior intention (Fishbein & Ajzen, 1975). Most schol-

ars explore cognitive factors from individual aspects on the basis of TPB, which is based on ration, they think persons' cognition of sharing makes an effect on sharing behavior, but the effect plays an indirect role through the mediating effect of sharing. Hence, the core variables of predicting sharing behavior is sharing desire, that is, the subjective probability of individuals wanting to share with others (Ajzen, 1991;2002),the theory is proved by many studies (Jarvenpa & Staples, 2001;Bock et al., 2002, 2005;Shengzhuan Wu,2003).

2.1.3 Expectation of result

Fishbein & Ajzen (1975) believed individuals engaging in some behavior can be influenced by the possible result and the evaluation of the result. People usually can't give up their knowledge to others without expectation (Davenport & Prusak, 1998).The sharing motivation in this study is mainly expectation of result, it includes two aspects: expectation reward and expectation relation.

2.2 Group level factors

2.2.1 Interpersonal trust

Interpersonal trust is an important social resource; it can promote cooperation and harmonize interaction (Mayer, Davis & Schoorman, 1995; McAllister, 1995). Davenport & Prusak (1998) thought that if there is lack of trust in the organization, none of knowledge market can effectively function. Nonaka, Toyama & Konno (2000) pointed out that only organization members are full of trust and promise, thus can inspire the knowledge sharing desire and behav-

ior among them. At the same time, trust must begin from the higher-ups, the trust in the company usually penetrate from up to bottom, if the higher-ups set themselves an example to others, thus can build an example for the later (Davenport & Prusak, 1998) .Thus it can be seen, the degree of members trusting in the higher-ups is also an important force of affecting knowledge sharing, which is not to be ignored.

2.3 Organization level factors

2.3.1 P-O fit

Cable & DeRue (2002) indicated that the perception of P-O fit is strongly related to organizational identification, organizational support of the perception, and citizenship behavior, stay decision-making, furthermore they deduced that personnel without sharing organizational values may have very low organizational identification, and unwillingly make extra-role contributions. Chatman (1989) also pointed out that the fit of individuals and organizational values can enhance personnel' extra-role behaviors.

In the support of the above documents, this study constructed knowledge sharing model on the basis of TPB (Figure 1), the model shows: individual knowledge sharing behavior is influenced by individual, group and organization factors, all the impacts are carried out through the mediating effect of personnel sharing desire. Hereby, we make some assumptions as follows:

Hypothesis1: the variables of individual expectation of result, interpersonal trust and P—O fit influence personnel knowledge sharing.

Hypothesis2: the above variables affect sharing behavior through the mediating effect of sharing desire.

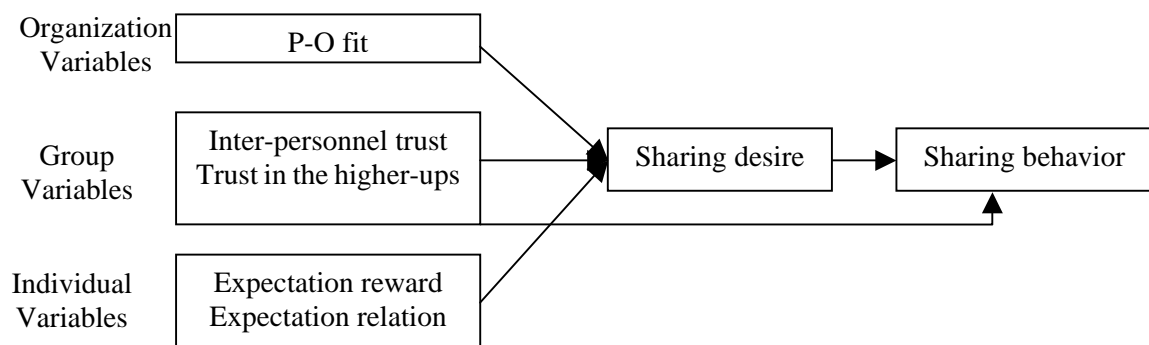


Figure 1. Knowledge sharing mechanism model

3 Study Methods

3.1 Subjects

The study sampled 19 enterprises in Shenyang with random sampling method, the subjects are research and development teams or personnel of technology department, 450 questionnaires were distributed, 325 effective questionnaires were collected, and the efficient rate is 72.22%.

3.2 Study instruments

Knowledge Sharing Behavior Questionnaire adopts that of Wenyan Wang (2002) measuring knowledge sharing behavior (a reliability coefficient : 0.8778), Knowledge Sharing Desire Questionnaire uses that of Ajzen (2002) (a reliability coefficient : 0.8142), Expectation of Result Questionnaire adopts the questionnaire that Shengzhuan Wu (2003) emended that of Bock & Kim (2002) (a reliability coefficient : 0.8345, 0.9061), Inter-Personnel Trust uses the questionnaire that? measured inter-personnel trust (a reliability coefficient : 0.7699), Trust in the Higher-Ups adopts the questionnaire that Farth (1998) measured the four projects of trust (a reliability coefficient : 0.8400). P-O fit Questionnaire uses that of Cable & Judge (1996) (a reliability coefficient : 0.8348).

3.3 Data management and analysis

All collected data are input into the computer, and are made statistics analysis using SPSS 11.5 Statistics package.

4 Results and Discussion

4.1 The factors of knowledge sharing behavior

From the figures 1 to 4 we can find out that, P-O fit, trust in the higher-ups, and expectation of result (expectation reward and expectation relation) are the main factors of knowledge sharing behavior. To promote knowledge management developing smoothly in organizations, they must make a comprehensive analysis from all aspects to adopt corresponding management strategies when organizations carry out knowledge management.

4.2 The mediating effect analysis of knowledge sharing desire

The study discussed the mediating effect of knowledge sharing desire to organization, group and individual variables and result variables on the basis of the Ajzen's theory.

4.2.1 Organization aspect:

Table1 The results of three-step intervening regression analysis among p-o matching、knowledge sharing desire and knowledge sharing behavior

Variables	Knowledge sharing desire		Knowledge sharing behavior		Knowledge sharing Behavior		
	The first step	The second step	The first step	The second step	The first step	The second step	The third step
Demographic Variables							
Sex	-.069	-.043	-.013	.008	-.013	.004	.014
Age	.010	.022	-.105	-.108	-.105	-.098	-.103
Culture Degree	.061	.043	.172	.154**	.172**	.161	.151
Work Tenure	-.053	-.074	.214	.229*	.214 *	.200	.218
Company	-.036	-.034	.229	.084	.073 *	.075	.083
Character							
P-O Matching		.388***				.238***	.145*
Sharing Desire				.297***			.240***
F	.870	47.492***	1.954	26.211***	1.954	16.463***	14.792***
R ²	.016	.165	.035	.122	.035	.092	.140
△R ²	.016	.149***	.035	.087***	.035	.056***	.048***

*** p<0.001 ** p<0.01 * P<0.05

The results indicate that P-O fit makes for knowledge sharing behavior, thus confirmed the deduction of Cable (2002) and further confirmed the partial mediating effect of knowledge sharing desire between P-O fit and knowledge sharing behavior. Combining the P-O fit theory with TBP, when individual values are in accord with organizational values, individuals agree more with

organization behaviors, their behavior intentions meet the requires of the organization much more, thereby produce strong sharing knowledge desire even sharing behavior.

4.2.2 Group aspect:

Table2 The result of three-step intervening regression analysis among inter-personnel trust、knowledge sharing desire and knowledge sharing behavior

Variables	Knowledge sharing desire		Knowledge sharing behavior		Knowledge sharing Behavior		
	The first step	The second step	The first step	The second step	The first step	The second step	The third step
Demographic Variables							
Sex	-.069	-.029	-.013	-.008	-.013	-.011	.002
Age	.010	.053	-.105	-.108	-.105	-.044	-.117
Culture Degree	.061	.078	.172**	.154**	.172 *	.171*	.163**
Work Tenure	-.053	-.058	.214	.229	.214	.135	.243
Company	-.036	-.064	.073	.084	.073	.025	.093
Character							
Trust in the Higher Ups		.150*				.149**	.057
Inter-Personnel Trust		.390***				.020	-.068
Sharing Desire				.297***			.292***
F	.870	26.086 ***	1.954	26.211***	1.954	3.087*	21.246***
R ²	.016	.178	.035	.122	.035	.057	.127
△R ²	.016	.162***	.035	.087***	.035	.022 *	.070***

*** p<0.001 ** p<0.01 * P<0.05

The results indicate that knowledge sharing desire has an absolute mediating effect between trust in the higher-ups and knowledge sharing behavior, and confirmed trust in the higher-ups can influence knowledge sharing behavior of organization members through knowledge sharing desire. However, the results also show that

knowledge sharing desire has no mediating effect between inter-personnel trust and knowledge sharing behavior.

4.2.3 Individual aspect:

Table3 The result of three-step intervening regression analysis among expectation reward、 sharing desire and sharing behavior

Variables	Knowledge sharing desire		Knowledge sharing behavior		Knowledge sharing Behavior		
	The first step	The second step	The first step	The second step	The first step	The second step	The third step
	Demographic Variables						
Sex	-.069	-.045	-.013	-.008	-.013	.001	.011
Age	.010	.096	-.105	-.108	-.105	-.051	-.071
Culture Degree	.061	.062	.172**	.154**	.172 **	.176**	.163**
Work Tenure	-.053	-.100	.214	.229	.214	.161	.182
Company	-.036	-.016	.073	.084	.073	.118*	.122*
Character							
Expectation		.217**				.442***	.397***
Reward							
Sharing Desire				.297***			.209***
F	.870	16.330 ***	1.954	26.211***	1.954	26.620***	13.147***
R ²	.016	.124	.035	.122	.035	.197	.235
△R ²	.016	.108***	.035	.087***	.035	.161 ***	.038***

*** p<0.001 ** p<0.01 * P<0.05

Table4 The result of three-step intervening regression analysis among expectation relation、 sharing desire and sharing behavior

Variables	Knowledge sharing desire		Knowledge sharing behavior		Knowledge sharing behavior		
	The first step	The second step	The first step	The second step	The first step	The second step	The third step
	Demographic Variables						
Sex	-.069	-.046	-.013	-.008	-.013	.000	.013
Age	.010	.091	-.105	-.108	-.105	-.061	-.086
Culture Degree	.061	.060	.172**	.154**	.172 **	.172**	.155**
Work Tenure	-.053	-.083	.214	.229	.214	.197	.220
Company	-.036	-.039	.073	.084	.073	.072*	.083
Character							
Expectation		.280***				.154*	.077
Relation							
Sharing Desire				.297***			.276***
F	.870	21.836 ***	1.954	26.211***	1.954	6.388***	20.982***
R ²	.016	.091	.035	.122	.035	.058	.127
△R ²	.016	.075***	.035	.087***	.035	.023 *	.069***

*** p<0.001 ** p<0.01 * P<0.05

The results indicate that knowledge sharing desire has a partial mediating effect between expectation reward and knowledge sharing behavior; it has an absolute mediating effect between expectation relation and knowledge sharing behavior.

5 Conclusions

Knowledge sharing desire makes a partial mediating effect between P-O fit and knowledge

sharing behavior.

Knowledge sharing desire has an absolute mediating effect between trust in the higher-ups and knowledge sharing behavior

Knowledge sharing desire has a partial mediating effect between expectation reward and knowledge sharing behavior; it has an absolute mediating effect between expectation relation and knowledge sharing behavior

References

- [1]. Senge, Peter. Sharing Knowledge, *Executive Excellence*, 15 (6):11-12, 1998.
- [2]. Nonaka, I. Takeuchi, H. The Knowledge-creating Company, *Oxford University Press Inc*, 1995.
- [3]. Liebowitz, J. Knowledge Management and Its Link to Artificial Intelligence. *Expert Systems with Applications*, 20:1-6, 2001.
- [4]. Jincheng Wang. Study of Sharing Mechanism in R&D Institution, unpublished Master's thesis, *Public Administration Institute of Chengchi University*, 2001.
- [5]. Sheng Wu. **Exploring Knowledge Sharing Behavior of IS Personnel with Theory of Planned Behavior**. Master's thesis. National Central University, Tianwan, 2003.
- [6]. Fishbein, M. & Ajzen, I. *Belief, Attitude, Intention, and Behavior: an Introduction to Theory and Research*. MA: Addison-Wesley, 1975.
- [7]. Ajzen, I. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*: 179-211, 1991.
- [8]. Ajzen, I. Constructing a TPB Questionnaire: Conceptual and Methodological Considerations, 2002.
- [9]. Bock, G.W. & Kim, Y.G. Breaking the Myths of Rewards: an Exploratory Study of Attitudes about Knowledge Sharing. *Information Resources Management Journal*: 14-21, 2002.
- [10]. Jarvenpa, S.L. & Staples, D.S. The Use for Collaborative Electronic Media for Information Sharing: an Exploratory Study of Determinants. *Journal of Strategic Information Systems*, 9:129-154, 2000.
- [11]. Kelley, H. Thibaut, J.W. *Interpersonal relations: A theory of interdependence*, New York, Wiley, 1978.
- [12]. Constant, D. Kiesler & Sproull, L. What's Mine Is Ours or Is It? A Study of Attitudes about Information Sharing. *Information Systems Research*, 5(4):400-421, 1994.
- [13]. Hall, H. Input-friendliness: Motivating Knowledge Sharing across Intranets. *Journal of Information Science*, 27(3):139-146, 2001.
- [14]. Thibaut, John W. and Harold H. Kelley. *The Social Psychology of Groups*. New York: John Wiley & Sons, 1959.
- [15]. Gefen, D. & Ridings, C. M. Implementation Team Responsiveness and User Evaluation of Customer Relationship Management: a Quasi-Experimental Design Study of Social Exchange Theory. *Journal of Management Information Systems*, 19(1):47-69, 2002.
- [16]. Mayer, R.C, Davis, J. H. & Schllrman, F. D. "An Integration Model of Organizational Trust", *Academy of Management Review*, 20(3):709-734, 1995.
- [17]. McAllister, D. J. "Affect-and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations," *Academy of Management Journal*, 38(1):24-59, 1995.
- [18]. Politis J.D. "The Effect of Managerial Power and Relational Trust on the Skills and Traits of Knowledge Acquisition: Evidence from the United Arab Emirates," *Electronic Journal of Knowledge Management*, 1(2):147-158, 2003.
- [19]. Yimin Wang. Study of IS Personnel's Knowledge Sharing Behavior. Master's thesis. National Sun Yat-sen University, Tianwan, 2004.
- [20]. Cable D M, DeRue D S. The Convergent and Discriminant Validity of Subjective Fit Perception. *Journal of Applied Psychology*, 87(5):875~884, 2002.
- [21]. Xingguo Zhang, Baihua Xu. A New Progress in Study of P-O Fit. *Psychology Science*, 28 (4) : 1004-1006, 2005.
- [22]. De Long, D. & Fahey, L. Diagnosing Cultural Barriers to Knowledge Management. *Academy of Management Executive*. 14(4):113-127, 2000.
- [23]. Al-Hawamdeh, Suliman. Formulating a Communication Strategy for Effective Knowledge Sharing. *Journal of Information Science*. 30(1):2-22, 2004.
- [24]. Chih-Chien Wang. The Influence of Ethical

- and Self-Interest Concerns on Knowledge Sharing Intentions among Managers: an Empirical Study. *International Journal of Management*, 21(3):370-381, 2004.
- [25]. Govindarajan, V. & Gupta, A. K.. An Analysis of the Emerging Global Arena. *European Management Journal*. 18, 3: 274-284, 2000.
- [26]. Zhiping Yang, Wei Wang, Dongsheng Wang, Min Song(translated) , Kan Shi(revised). Job Evaluation—Scale for Organizational Diagnosis and Research. *China Light Industry Press*, Beijing, 2004.
- [27]. Lee, J.N.& Kim, Y. G. Effect of Partnership Quality on IS Outsourcing Success: Conceptual Framework and Empirical Validation. *Journal of Management Information Systems*, 15(4):29-61, 1999.
- [28]. Chowdhury, S. The Role of Affect-and Cognition-Based Trust in Complex Knowledge Sharing. *Journal of Managerial Issues*, 17(3):310-326, 2005.