

FACTORS AFFECTING KNOWLEDGE SHARING BEHAVIOR: A CONTENT ANALYSIS OF EMPIRICAL FINDINGS

Yu-Chung Hung¹, Ya-Hsueh Chuang²

Department of Accounting and Information Technology, National Chung Cheng University
168 University Rd., Min-Hsiung, Chiayi 621, Taiwan, R.O.C.

+886-5-2720411

¹actych@ccu.edu.tw, ²cyh806@gmail.com

Abstract: In the knowledge-based era, knowledge is the foundation of a firm's competitive edge. In practice, knowledge sharing is the core and the most difficult activity of knowledge management. Through a review of literatures on knowledge sharing, ten factors affecting knowledge sharing behaviors were identified based on the study of Kankanhalli et al. (2005). Content analysis was then applied to 16 journal articles that examined the behaviors of knowledge contribution. Correspondingly, this study aimed to combine various results to find out critical factors affecting knowledge sharing. The paper concludes that trust, pro-sharing norms, identification, and reciprocity are primary factors in a majority of articles.

INTRODUCTION

In the knowledge-based era, knowledge is the most precious asset and the foundation of a firm's competitive edge (Bock et al., 2005). It originates individual's intelligence but exists in the routines, procedures, systems, software, practice and norms of the organization, which are difficult to imitate (Davenport and Prusak, 1998). The flow of knowledge depends on knowledge sharing behaviors of the employees. However, sharing one's knowledge with others does not conform to human's nature. People are afraid that they will lose knowledge power in the organization if they share knowledge with others (Davenport, 1997). Therefore, in the execution of knowledge management activities, knowledge sharing is identified as the most difficult one (Ruggles, 1998).

Knowledge sharing has become the core of management practice since knowledge management became a tool of managers in 1990s. What drives knowledge sharing intention of employees? What is the role of organizational climate? Does personality have influence on knowledge sharing behavior? Prior studies focused mostly on knowledge sharing in the organizations or virtual communities such as blogs and forums. Even though many factors affecting knowledge sharing have been reported in academic journal with many case studies, however, few studies summarized and analyzed their results systematically. Thus, we are unable to draw the whole picture of factors affecting knowledge sharing. The objective of this study is to provide an integrative review of empirical literature on factors affecting knowledge contribution in order to contribute to the development of knowledge sharing. This study applied content analysis to published journals and combined various results to find out critical factors affecting knowledge sharing. The results can give companies an insight into the nature of knowledge contribution and help companies to more correctly and efficiently induce employees to share their knowledge.

PRIOR RESEARCH

Most prior studies are based on theories to find out factors affecting knowledge sharing. According to the theory of reasoned action (TRA) proposed by Ajzen and Fishbein(1980), beliefs and evaluations would affect individual's attitudes while normative beliefs and motivation to comply would affect subjective norms. Next, attitudes and subjective norms would affect individual's intention, and intention has influence on behavior in sequence. Based on the TRA, Bock et al. (2005) find that attitudes toward and subjective norms with regard to knowledge sharing as well as organizational climate affect individuals' intentions to share knowledge. In addition, they find that reciprocal relationships would affect individual's attitudes toward knowledge sharing while both sense of self-worth and organizational climate would affect subjective norms. As for anticipated extrinsic rewards, they play a negative role on attitudes toward knowledge sharing.

In order to enhance the predictability of the TRA, Ajzen (1985, 1989) revises the framework of the TRA, which is named the theory of planned behavior (TPB). Ajzen (1985, 1989) finds that many constraints in real life would hinder the formation of intention and behavior, so he adds a new dimension, perceived behavioral control, to enhance the predictability of the TRA. Based on the TPB, Ryu et al. (2003) find that the TPB model is superior to the TRA in explaining physicians' intention to share knowledge. Their research results also show that perceived behavioral control has influence on physicians' intention to share knowledge.

In addition to the TRA and TPB, social exchange theory predicts knowledge sharing behavior from a cost-benefit framework. Social exchange is similar to economic exchange, and they both assume that exchange occurs when the benefit individual gains is greater than cost. The difference is that social exchange investigates intangible costs and intangible benefits. Therefore, it can not

definitely identify rights or obligations (Blau, 1964). Chang et al. (2008) adopt a cost-benefit framework to predict the users' contribution behavior on blogs and forums. Their research results show that users' intention toward knowledge sharing is affected by extrinsic benefits (reputation and reciprocity), intrinsic benefits (enjoy helping and self-efficacy), and costs (convenience and interaction).

Social capital theory is also often used to explain knowledge sharing behavior in the organization. Social capital refers to the resources rooted within the networks of human relationships (Nahapiet and Ghoshal, 1998). Social capital theory posits that social capital provides a necessary condition for the occurrence of knowledge exchange. Nahapiet and Ghoshal (1998) point out that trust, norms, and identification are three key factors that can define the context for knowledge sharing.

Chow and Chan (2008) integrate social capital theory with TRA to examine knowledge sharing behavior in the organization. Surveying 190 managers from Hong Kong firms, Chow and Chan (2008) find that a social network and shared goals facilitate individual's decision to share knowledge significantly, and directly foster the perceived social pressure of the organization. As for social trust, it has no direct effect on the attitude and subjective norm of knowledge sharing.

Kankanhalli et al. (2005) employ social exchange theory to identify cost and benefit factors affecting electronic knowledge repository (EKR) usage, and social capital theory to account for the moderating influence of contextual factors. Kankanhalli et al. (2005) divide benefits of knowledge contributors into extrinsic benefits (organizational reward, image, and reciprocity) and intrinsic benefits (knowledge self-efficacy and enjoyment in helping others). Codification effort and loss of knowledge power are costs of knowledge contributors. Their research results show that knowledge self-efficacy and enjoyment in helping others affect EKR usage by knowledge contributors significantly while contextual factors (trust, pro-sharing norms, and identification) moderate the impact of codification effort, reciprocity, and organizational reward on EKR usage. It reflects the fact that extrinsic benefits are moderated by contextual factors whereas intrinsic benefits have direct impacts on EKR usage of knowledge contributors.

Synthesis of prior research reveals that motivational factors on knowledge contribution reflect three levels of driving force (Bock et al., 2005). The three levels of driving force are individual benefits, group benefits, and organizational benefits respectively. Individual benefits mean self-interest and individual gains (Constant et al., 1994; Wasko and Faraj, 2000). Group benefits mean reciprocal relationships with others (Constant et al., 1994; Kalman, 1999; Wasko and Faraj, 2000). As for organizational benefit, it refers to organizational gains and commitment (Kalman, 1999).

Aforementioned literatures all address factors impacting knowledge contribution in the organizations or virtual communities. However, these factors are divergent, and some are even overlapping. In addition, the theories used to explain knowledge sharing behavior are diverse. Therefore, according to the framework proposed by Kankanhalli et al. (2005), this study aimed to combine various results to find out critical factors affecting knowledge sharing in order to have a more comprehensive understanding about the development of knowledge sharing. This study summarized four dimensions (cost, extrinsic benefits, intrinsic benefits, and contextual factors) and a total of 10 factors according to the framework proposed by Kankanhalli et al. (2005). These four dimensions and 10 factors are listed in Table 1.

1. Cost (1) Loss of knowledge power (2) Codification effort	2. Extrinsic benefits (1) Organizational reward (2) Image (3) Reciprocity
3. Intrinsic benefits (1) Knowledge self-efficacy (2) Enjoyment in helping others	4. Contextual factors (1) Trust (2) Pro-sharing norms (3) Identification

Table 1: Dimension of factors affecting knowledge sharing

RESEARCH METHODOLOGY

This study searched for knowledge-sharing-related academic articles published between 2000 and 2009 in top 5 journals of management information system (MIS) field through EBSCOhost database. The identification of top 5 journals of MIS field was according to Ferratt et al. (2007) published in *Communication of the Association for Information Systems (CAIS)*. These journals were *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *Decision Support Systems*, and *Information & Management* in sequence. The papers were chosen through EBSCOhost database by searching for abstracts that contained either the keywords "knowledge sharing," "knowledge contribution," "information sharing," or "information exchange." After eliminating unrelated articles, this study yielded 16 articles on knowledge sharing. Next, this study used content analysis to analyze the 16 articles based on the framework proposed by Kankanhalli et al. (2005). Content analysis is a highly flexible research method that has been extensively applied in information system (IS) studies (White and Marsh, 2006). By using it, this study could

summarize and analyze factors affecting knowledge sharing systematically.

RESEARCH RESULTS AND DISCUSSION

Distribution of Articles by Year

The distribution of articles published by year is shown in Table 2. According to Table 2, the number of articles increased substantially since 2005. It appeared that the issue of knowledge sharing emerged in MIS field recently.

Publication Year	Number of Articles
2001	1
2005	4
2006	3
2007	3
2008	2
2009	3

Table 2: Distribution of articles by year

Distribution of Articles by Journals

Table 3 shows distribution of articles by journals. According to Table 3, most articles related to knowledge sharing were concentrated in *Decision Support Systems* and *Information & Management*. *Information Systems Research* had only one relevant article.

journal	Number of Articles	Percentage
MIS Quarterly	3	18.75%
Information Systems Research	1	6.25%
Journal of Management Information Systems	2	12.5%
Decision Support Systems	6	37.5%
Information & Management	4	25%

Table 3: Distribution of articles by journals

Distribution of Articles by Factors Affecting Knowledge Sharing

Based on the framework proposed by Kankanhalli et al. (2005), this study summarized four dimensions and adopted content analysis to understand the distribution in relevant literatures. Distribution of articles by factors affecting knowledge sharing is shown in Table 4. Twelve of the sixteen papers (75%) indicated that trust was a significant factor affecting knowledge contribution. Reciprocity, pro-sharing norms, and identification had the second largest percentage (9 articles, 56%) of the articles. The least mentioned factors were loss of knowledge power and codification effort with only 1 (6%) and 2 (13%) articles respectively. The ten factors affecting knowledge contribution are discussed by ranking as follows.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	No	%
1. Cost																		
1.1 Loss of knowledge power																v	1	6
1.2 Codification effort											v					v	2	13
2. Extrinsic benefits																		
2.1 Organizational reward		v			v		v			v	v					v	6	38
2.2 Image	v				v	v					v	v	v			v	7	44
2.3 Reciprocity	v	v	v		v				v		v	v	v			v	9	56
3. Intrinsic benefits																		
3.1 knowledge self-efficacy	v	v		v	v							v				v	6	38

3.2 Enjoyment in helping others	v			v							v	v	v			v	6	38	
4. Contextual factors																			
4.1 Trust	v	v			v	v			v	v		v	v	v	v	v	12	75	
4.2 Pro-sharing norms		v			v	v					v	v	v	v	v	v	9	56	
4.3 Identification			v	v		v						v	v	v	v	v	9	56	

Table 4: Distribution of articles by factors affecting knowledge sharing

Trust

Kankanhalli et al. (2005) treat trust as a contextual factor and posit that the degree of trust has an impact on collaborative efficiency in the organization. Bock et al. (2005) document that the fairness of the organization is built on the trust among members in the organization. A trusting and equal climate can facilitate knowledge sharing (Chiu et al., 2006; Chow and Chan, 2008; He and Wei, 2009; Hooff and Huysman, 2009; Hsu and Lin, 2008; Panteli and Sockalingam, 2005; Shin et al., 2007). In addition to the trust within the organization, Inter-organization trust also facilitates knowledge sharing behavior. Li and Lin (2006) examine information sharing behavior in supply chain management and find that trust in supply chain partner enhances the quality and quantity of information sharing. Therefore, trust is regarded as one of the important contextual factors affecting knowledge contribution in prior research.

Reciprocity

Reciprocity is regarded as a benefit that individuals gain from social exchange (Blau, 1964). For knowledge contributors, reciprocal relationship means that they can improve relationships with others via their contributions and they expect future help from others (Kankanhalli et al., 2005). Therefore, anticipated reciprocal relationship can facilitate knowledge sharing, and it is identified as an important factor affecting knowledge contribution (Bock et al., 2005; Chiu et al., 2006; He and Wei, 2009; Hsu and Lin, 2008; Kulkarni et al., 2007; Ma and Agarwal, 2007; Shin et al., 2007; Wasko and Faraj, 2005).

Pro-sharing Norms

A norm means a degree of consensus in the social system that individuals are involved (Coleman, 1990). Norms can moderate human's behavior in accordance with the expectations of the group or community (Kankanhalli et al., 2005). Pro-sharing norms represent norms that facilitate knowledge sharing. Starbuck (1992) documents that norms of teamwork enhance the climate of knowledge sharing, therefore, Pro-sharing norms is regarded as an important contextual factor affecting knowledge contribution (Bock et al., 2005; Chow and Chan, 2008; He and Wei, 2009; Hooff and Huysman, 2009; Hsu and Lin, 2008; Jarvenpaa and Staples, 2001; Kulkarni et al., 2007; Shin et al., 2007).

Identification

Identification is an identity based on the interests when individual's interests merge with organization's interests (Johnson et al., 1999). When identification is strong, the cost of sharing knowledge may not be a concern because the concern of organizational outcomes may dominate the behavior of knowledge sharing. Therefore, identification is viewed as an important contextual factor affecting knowledge contribution (Chiu et al., 2006; Chow and Chan, 2008; Hooff and Huysman, 2009; Hsu and Lin, 2008; Jarvenpaa and Staples, 2001; Kankanhalli et al., 2005; Ma and Agarwal, 2007; Panteli and Sockalingam, 2005; Shin et al., 2007).

Image

From the viewpoint of social exchange theory, the advancement of image is treated as an extrinsic benefit when people engage in knowledge sharing. Image is a valuable asset for individuals to achieve or maintain their status in the organization (Jones et al., 1997). Therefore, the enhancement of reputation is a crucial factor for people to engage in knowledge sharing (He and Wei, 2009; Hsu and Lin, 2008; Kankanhalli et al., 2005; Kulkarni et al., 2007; Panteli and Sockalingam, 2005; Shin et al., 2007; Wasko and Faraj, 2005).

Organizational Reward

Knowledge sharing occurs when employees perceive that incentive of knowledge contribution exceeds costs required for knowledge sharing (Kelly and Thibaut, 1978). Thus, if there are appropriate rewards or incentive mechanisms such as bonus or career advancement, employees will be motivated to share their knowledge (Bock et al., 2005; He and Wei, 2009; Jones et al., 2006; Kankanhalli et al., 2005; Kulkarni et al., 2007; Wang et al., 2009).

Knowledge Self-efficacy

Sharing expertise useful to the organization is an opportunity to enhance sense of self-worth. When knowledge self-efficacy increases, people gain confidence in terms of what they can do (Constant et al., 1994). When people think that their expertise can improve work efficiency and increase productivity, they will be more inclined to share knowledge with others (Bock et al., 2005, Jarvenpaa and Staples, 2001; Kankanhalli et al., 2005; Kulkarni et al., 2007; Shin et al., 2007; Wasko and Faraj, 2005).

Enjoyment in Helping Others

The benefit of enjoying helping others is originated from the concept of altruism (Kankanhalli et al., 2005). People gain satisfaction and joy when they help others (Wasko and Faraj, 2000). Such fulfillment arises from their intrinsic enjoyment in helping others (Constant et al., 1994). Thus, enjoying helping others is positively related to knowledge sharing (He and Wei, 2009; Hsu and Lin, 2008; Jarvenpaa and Staples, 2001; Shin et al., 2007; Wasko and Faraj, 2005).

Codification Effort

It takes time and effort to transfer tacit knowledge into explicit knowledge which is understandable for others. Such effort is codification effort of knowledge contributor. Kankanhalli et al. (2005) demonstrate that the time required for coding knowledge is an opportunity cost. When the codification process is complex, people will be more unwilling to contribute their knowledge (He and Wei, 2009).

Loss of Knowledge Power

When knowledge contributors share their unique knowledge with others, they will retain less proprietary knowledge. Kankanhalli et al. (2005) posit that people are afraid that they will lose power position in the organization if they contribute unique knowledge to others. Thus, loss of power due to knowledge contribution is a barrier to knowledge sharing (Davenport and Prusak, 1998).

Distribution of Articles by Theories

This study summarized the theories used in these 16 knowledge-sharing-related articles. Distribution of articles by theories is shown in Table 5. Table 5 showed that research based on the social capital theory, social exchange theory, and other social psychology theories were prevalent. Only one article was based on the theory of planned behavior. It implied that most of knowledge-sharing research focused on networks of human relationships.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	No	%
1. Theory of reasoned action		v									v		v	v			4	25
2. Theory of planned behavior											v						1	6
3. Social exchange theory	v			v	v				v							v	5	31
4. Social capital theory	v								v			v		v	v	v	6	38
5. Other social psychology theories			v			v	v	v		v							5	31

Table 5: Distribution of articles by theories

CONCLUSION

In the knowledge-based era, how to motivate employees to share their knowledge is the most difficult activity of knowledge management. Therefore, factors affecting knowledge sharing are exclusively important. This study applied content analysis to provide an integrative review of MIS literature on factors affecting knowledge sharing. The results of this study offer useful implications to companies implementing knowledge management and to correctly and efficiently induce employees to share their knowledge.

The limitation of this study is that research samples are aimed at *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *Decision Support Systems*, and *Information & Management*. Although these top 5 journals in MIS field represent major research in MIS, some academic articles about knowledge sharing scatter in other fields such as *Management Science*, *Academy of Management Review*, and *Organization Science*. Therefore, it is suggested that future research can focus on knowledge-sharing-related articles in other fields to present the factors affecting knowledge contribution more comprehensively.

REFERENCES

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognition to behavior*. Heidelberg: Springer.
- Ajzen, I. (1989). Attitude structure and behavior. In A. R. Pratkanis, S. J. Breckler & A. G. Greenwald (Eds.), *Attitude structure and function*, Lawrence Erlbaum Associates (pp. 241-274). Hillsdale, NJ.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: John Wiley & Sons Inc.
- Bock, G.-W., Zmud, R. W., Kim, Y.-G., & Lee, J.-N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, 29(1), 87-111.
- Chang, C.-C., Chiu, H.-C., Keng, N., & Chou, S.-Y. (2008). A study on the knowledge sharing behavior on blogs and forums. *Journal of e-Business*, 10(4), 885-908.
- Chiu, C.-M., Hsu, M.-H., & Wang, E. T. G. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, 42(3), 1872-1888.
- Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management*, 45(7), 458-465.
- Coleman, J. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.
- Constant, D., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitude about information sharing. *Information Systems Research*, 5(4), 400-422.
- Davenport, T. H. (1997). Some principles of knowledge management. Unpublished Working Paper.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*: Harvard Business School Press.
- Ferratt, T. W., Gorman, M. F., Kanet, J. J., & Salisbury, W. D. (2007). Is journal quality assessment using the author affiliation index. *Communications of the Association for Information Systems*, 19, 710-724.
- He, W., & Wei, K.-K. (2009). What drives continued knowledge sharing? An investigation of knowledge-contribution and -seeking beliefs. *Decision Support Systems*, 46(4), 826-838.
- Hooff, B. v. d., & Huysman, M. (2009). Managing knowledge sharing: Emergent and engineering approaches. *Information & Management*, 46(1), 1-8.
- Hsu, C.-L., & Lin, J. C.-C. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge

- sharing motivation. *Information & Management*, 45(1), 65-74.
- Jarvenpaa, S. L., & Staples, D. S. (2001). Exploring perceptions of organizational ownership of information and expertise. *Journal of Management Information Systems*, 18(1), 151-183.
- Johnson, W. L., Johnson, A. M., & Heimberg, F. (1999). A primary and second order component analysis of the organizational identification questionnaire. *Educational and Psychological Measurement*, 59(1), 159-170.
- Jones, C., Hesterly, W. S., & Borgatti, S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, 22(4), 911-945.
- Jones, M. C., Cline, M., & Ryan, S. (2006). Exploring knowledge sharing in ERP implementation: an organizational culture framework. *Decision Support Systems*, 41(2), 411-434.
- Kalman, M. E. (1999). The effects of organizational commitment and expected outcomes on the motivation to share discretionary information in a collaborative database: Communication dilemmas and other serious games. Unpublished Ph.D. Dissertation. University of Southern California.
- Kankanhalli, A., Tan, B. C. Y., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: An empirical investigation. *Mis Quarterly*, 29(1), 113-143.
- Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. New York: Wiley.
- Kulkarni, U. R., Ravindran, S., & Freeze, R. (2007). A knowledge management success model: Theoretical development and empirical validation. *Journal of Management Information Systems*, 23(3), 309-347.
- Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision Support Systems*, 42(3), 1641-1656.
- Ma, M., & Agarwal, R. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities. *Information Systems Research*, 18(1), 42-67.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and organizational advantage. *Academy of Management Review*, 23(2), 242-266.
- Panteli, N., & Sockalingam, S. (2005). Trust and conflict within virtual inter-organizational alliances: a framework for facilitating knowledge sharing. *Decision Support Systems*, 39(4), 599-617.
- Ruggles, R. (1998). The state of notion: Knowledge management in practice. *California Management Review*, 40, 80-89.
- Ryu, S., Ho, S. H., & Han, I. (2003). Knowledge sharing behavior of physicians in hospitals. *Expert Systems with Applications* 25, 113-122.
- Shin, S. K., Ishman, M., & Sanders, G. L. (2007). An empirical investigation of socio-cultural factors of information sharing in China. *Information & Management*, 44(2), 165-174.
- Starbuck, W. H. (1992). Learning by knowledge-intensive firms. *Journal of Management Studies*, 29(6), 713-740.
- Wang, J., Gwebu, K., Shanker, M., & Troutt, M. D. (2009). An application of agent-based simulation to knowledge sharing. *Decision Support Systems*, 46(2), 532-541.
- Wasko, M. M., & Faraj, S. (2000). It is what one does: Why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*, 9, 155-173.
- Wasko, M. M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1), 35-57.

White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. *Library Trends*, 55(1), 22-45.