

Influential Individual Factors of Knowledge Sharing Behavior in Hong Kong Construction Teams

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Abstract

This exploratory study employs social exchange theory to investigate individual factors that affect people's knowledge sharing behaviour in Hong Kong construction teams. This study supports the view that knowledge is embedded in individual mind, highly personal and context based. Thus people may be reluctant to share knowledge due to potential costs involved. Given that knowledge sharing is social exchange behaviour, people may be motivated to share knowledge if they perceive that benefits obtained from knowledge sharing are more valuable than the associated costs. So individual factors are analyzed from the perspectives of cost factors and benefit factors. This exploratory study is carried out with a qualitative approach. Semi-structured interviews are conducted with professionals from a large local construction company. The transcripts of interviews are analyzed using the content analysis technique. The results show that people share their knowledge for both intrinsic benefits (e.g. enjoyment, knowledge self-efficacy) and extrinsic benefits (e.g. monetary rewards, knowledge feedback). Perceived costs involved in knowledge sharing include time cost and losing face.

Keywords: knowledge sharing, social exchange theory, benefits, costs, construction team, Hong Kong

1. Introduction

In our modern society with knowledge economy, knowledge has been recognized as an important resource of organizations for competitive advantage (Nonaka, 1994; Spender, 1996). Many organizations have formulated knowledge management strategy aiming to manage and leverage collective knowledge in order to maintain sustainable competitiveness (Alavi and Leidner, 2001). Knowledge management in construction industry also receives significant attention from researchers because the construction industry is a knowledge intensive industry. The service product (e.g. buildings) significantly relies on specialized expert knowledge and problem solving know-how (Egbu and Robinson, 2005). As one essential and important participant in construction industry, construction companies (or ‘contractors’) involve in knowledge activities as well. Construction of facilities requires input of large amount of professional knowledge and technical expertise.

Many studies indicate that encouraging knowledge sharing among employees can effectively leverage knowledge and lead to creation of new ideas (Davenport and Prusak, 1998; Ipe, 2003; Nonaka, 1994). Current study adopts the view that knowledge is embedded in individual mind, highly personal, context based, and difficult to be communicated. As a result, people may not be willing to share their knowledge due to potential costs involved, such as codification effort and loss of knowledge power (Gray, 2001; Huang et al., 2008; Kankanhalli et al., 2005). However, social exchange theory suggests that social behavior is exchange and people may be motivated to perform the behavior if they perceive that the benefits they will receive from performing the behavior exceed costs. This study uses the social exchange theory to study the cost and benefit factors that would discourage or motivate people to perform knowledge sharing behavior. More specifically, the target is focused on individuals in construction teams internally organized by contractor companies. Construction industry operates around projects. A project (also called construction project) is commissioned by a client and executed by multi-disciplinary organizations, e.g. consultant, constructors; each part of the construction project (e.g. design of the facility, construction of the facility) carried out by each participant company is also a project from the perspective of the participant company (Kamara et al., 2005, p. 105). So the ‘construction team’ in this study refers to the project team internally organized by a contractor company to implement and manage the construction works on site. Fast track is a notable characteristic on construction site. It is believed that team members sharing knowledge together would help to formulate effective methods to do work and solve problem quickly. A construction team usually dissolves for other projects once the current project is completed. Important knowledge identified and learned by team members through knowledge sharing in current project team can be transferred and applied in other projects (Ma et al., 2008). This process helps to avoid effort on reinventing the wheel.

Many researches have been found studying factors influencing people’s knowledge sharing behavior from different perspectives. For instance, Riege (2005) conceptually discusses various barriers for employees to share knowledge. Ardichvili et al. (2003) and Wasko and Faraj (2000) use qualitative method to investigate the motivations and barriers to engage in knowledge sharing in electronic communities of

practice (CoP). Cabrera et al. (2006) and Bock et al. (2005) use quantitative method to empirically examine factors affecting people's knowledge sharing behavior from perspective of individual, organizational climate and technology. In construction area, Ma et al. (2008) investigate influential factors of knowledge sharing in project teams of China construction companies. The factors are identified from a perspective of nature of knowledge (explicit and tacit knowledge) and the team environment (e.g. environment of trusting and justice). It is observed that there is a lack of study on individual factors affecting people to participate in knowledge sharing behavior in Hong Kong construction teams. Hence, this paper explores why people choose to share or not to share knowledge with teammates in construction teams.

An exploratory qualitative study is designed to evaluate the potential factors identified from literature review as well as to explore any additional factors that would affect people's knowledge sharing behavior in construction teams. Social exchange theory is employed to identify costs and benefits factors. Semi-structured interviews are conducted with seven professionals from a large local construction company currently involving in projects. Content analysis technique is used to analyze the interview transcripts. The findings from the exploratory study are discussed and compared with insights from relevant literature.

2. Theoretical background

2.1 Knowledge

Knowledge can be defined from different perspectives. One perspective is 'knowledge as object' based on a positivist view of knowledge (Baskerville and Dulipovici, 2006; Wasko and Faraj, 2005). This perspective believes that knowledge can exist regardless of people who know it and regardless of the context where knowledge is created. Knowledge can be separated from human mind and exist independently (Wasko and Faraj, 2005). Typical definition of knowledge from this perspective is 'justified true belief' suggested by Plato (Nonaka and Takeuchi, 1995). Based on this perspective, knowledge management strategies adopted by organizations aim to codify and convert personal knowledge into structured organizational assets, which is stored in organizations' knowledge repositories (e.g. documents, electronic database). The structured organizational knowledge can be accessed and transferred to other people in the organization.

Another perspective is 'knowledge embedded in individuals'. Being contrary to former perspective, this perspective argues that knowledge only resides in human mind and knowledge is inseparable from people who know it (Wasko and Faraj, 2005). This perspective recognizes that knowledge is highly tacit and context based. Knowledge is rooted in an individual's action and experience, and it is difficult to be communicated. People can only externalize their knowledge into explicit form (e.g. article, speech) to be accessed by others. The explicated knowledge is regarded as information in this study. According to Kakabadse et al. (2003), information is a form of message. Information standing alone is less useful until someone applies it in a specific situation and internalizes it into knowledge with his/her personal elements

(e.g. belief, interpretation and judgment). Knowledge embedded in individual perspective requires knowledge management strategies focusing on human resources management (Wasko and Faraj, 2005). People are encouraged to interact with each other. Through individual interactions, people may obtain useful information that he/she can apply in situations and gain new knowledge (Koskinen et al., 2003).

A third perspective of ‘knowledge embedded in community’ defines knowledge as the social practice of knowing (Wasko and Faraj, 2005). This view suggests that knowledge is developed in the context of a community and exists in the form of routines, shared languages, etc (Wasko and Faraj, 2005). According to this view, organizations formulate communication of practice (CoP) strategies to encourage knowledge sharing among a group of people. CoP promotes sharing of experiences and story telling among people who have similar background and interests.

This study takes the stand point that knowledge is embedded in individual. Accordingly, people have the control over the knowledge they owned. People can choose to share or not to share their knowledge with others. Social exchange theory suggests that people may exchange their knowledge for returns and the returns can either be tangible or intangible (e.g. status, confidence).

2.2 Knowledge sharing

Because knowledge is embedded in people’s mind, individuals usually seek knowledge and advice from team members rather than searching in knowledge repositories (e.g. database, manuals) in project environment (Koskinen et al., 2003). Alternatively, people turn to knowledge repositories when team members direct them to a specific point (Koskinen et al., 2003). According to Hendriks (1999), knowledge sharing involves at least two parties, one possessing knowledge and the other one seeking knowledge. Hendriks (1999) argues that knowledge sharing is different but related to information sharing. This study holds the view that knowledge is rooted in human mind and is difficult to be shared. In order to share knowledge with others, the one who possesses knowledge need to firstly externalize or codify his/her personal knowledge into information (or called explicit knowledge) in a specific form (e.g. speech, acts, sketch or writing). People who seek knowledge then take the action of internalization, such as learning by doing, interpreting the codified knowledge on existing knowledge base, etc. Thus, Ipe’s (2003) definition of knowledge sharing is adapted and used in this study: knowledge sharing is the behavior that people convert his/her knowledge into a form which is accessed, used and absorbed by other individuals. This study explores factors influencing knowledge sharing behavior from the perspective of knowledge contributor.

2.3 Social exchange theory

Social exchange theory (SET) is one of the most influential conceptual bases for understanding workplace behavior (Cropanzano and Mitchell, 2005). SET was developed in late 1950s with key proponents of Homans. Homans (1961) suggests “social behavior as exchange” and exchange between people is based

on the principles of costs and benefits. This implies that people involve in exchange with the purpose of maximizing benefits and minimizing costs. People may evaluate the potential benefits and costs before they perform a behavior. If the costs associated with the behavior exceed the rewards, people possibly choose to terminate the behavior.

As social behavior is an exchange, Cropanzano & Mitchell (2005) suggests that resources are involved in the social exchange process. The resources can be regarded as the currency of social exchange. There are two main forms of resources, i.e. economic and socioeconomic outcomes (Cropanzano and Mitchell, 2005). Economic outcomes are usually associated to financial needs and tend to be tangible. Socioeconomic outcomes are related to one's social and esteem needs, which is intangible. In the exchange process, resources given away during social exchange or negative outcomes of exchange can be seen as costs. Resources received as a result of social exchange or positive outcomes of exchange can be seen as benefits (Kankanhalli et al., 2005).

Knowledge sharing is considered to be a form of social exchange (Bock et al., 2005). Previous researchers have applied SET to study people's knowledge sharing behaviors, e.g. Kankanhalli (2005), Bock and Kim (2002), and Lin (2007). This research also adopts a cost-benefit analysis based on SET to identify individual factors affecting individual knowledge sharing behavior in construction teams.

3. Research method

3.1 Research setting

This exploratory study is conducted by qualitative method. Semi-structured interviews are conducted with seven professionals from a large local construction company, who are currently involved in construction projects. The respondents include an assistant project manager, a site agent, an engineer, two quantity surveyors, a product manager, a safety manager and a safety officer. Based on literature review, an interview guide is designed with open-questions to assist the interviews. All the seven interviews are recorded with respondents' permissions.

3.2 Data analysis

Transcripts are taken down for all interview records. Content analysis method is chosen to analyze the text data. Content analysis is a research technique using a set of specific procedures to make replicable and valid inferences from text (Krippendorff, 2004; Weber, 1990). The central process of content analysis is coding, which categorizes words of the text into content categories that can be manageable (Weber, 1990). A coding strategy is formulated based on Gillham (2000), Holsti (1969), Miles (1994), and Strauss (1998). Main procedures in the coding strategy include:

- 1) Researcher inductively codes all the transcripts to develop a list of categories with descriptions;

- 2) Researcher prepares coding manual and invites an independent coder to deductively code sample transcript;
- 3) Researcher checks the inter-coder reliability and makes necessary revision to the list of categories and coding manual until the inter-coder reliability is accepted. The revision process is based on researcher's negotiation with the independent coder;
- 4) Independent coder deductively codes all the transcripts based on revised list of categories and coding manual;
- 5) Researcher checks the final inter-coder reliability and makes further modification based on negotiation if necessary until the final inter-coder reliability is accepted;
- 6) Coding results are transferred to analysis grids.

In this study, the number of respondents who report corresponding category is counted. The categories reported by only one respondent are disregarded to avoid the case of occasional incident. Since one purpose of this study is explore as many factors influencing knowledge sharing behavior as possible, categories reported by more than one respondent are regarded as valid.

4. Findings

4.1 The perceived costs of sharing knowledge

Two main perceived costs are identified from this exploratory study. *Time cost* is reported to be associated with knowledge sharing activities by most respondents. For instance, respondent 1 reports that some people consider knowledge sharing (e.g. give a presentation) as extra work and costs extra time, thus they are not willing to share knowledge with others. Since time spent in sharing knowledge can be considered as opportunity cost (Kankanhalli et al., 2005), people may not be willing to share knowledge if they perceive they can obtain more benefits by using the time to do other things. *Losing face* is another perceived cost identified. Respondents report that they may feel shame to share some bad experience (e.g. mistakes they made), or they feel embarrassed or being dishonored when others think what they share is useless or the quality is low. Sometimes they may choose not to share knowledge in order to save face: *'you don't know how other people will consider after you speak out. Maybe you think you are successful but others may think you are stupid...'* [Respondent 1]. People's fear of losing face becomes a barrier for them to share knowledge with others.

4.2 The perceived benefits of knowledge sharing

- Extrinsic benefits

This study discovers that some individuals share knowledge with others to generate extrinsic benefits. Several respondents report that people may get *organizational reward* (i.e. money, promotion) by sharing knowledge with teammates. For example, respondent 5 describes an incentive policy of the company. If the project is completed without any injury, each one in the construction team would be rewarded with one thousand dollars. This policy, to certain extent, encourages people to share ideas and discuss with each others to find the most safe and suitable way to carry out work in order to achieve zero-injury in the project. Similarly, respondent 7 notes that knowledge sharing within construction team helps to improve work efficiency and quality, and reduce re-do work. As a result, *'boss may think well done, and will increase your salary or promote you'* [Respondent 7]. Another identified extrinsic benefit is *knowledge feedback*. It is noted by six respondents that they can obtain knowledge feedback from other's response when they share knowledge with others. The feedback includes others' pointing out mistakes, and others' comments, suggestions, experience, etc. Knowledge feedback helps people to refine their thinking and develop new insights. One typical manifestation is made as *'if what you shared can be challenged by others, for example you may have neglected something in the past, which is found by others, this is quite good. You may think your previous experience is correct all the time, but actually it has some defects. Then you can find out those defects through other's challenge and get to know that it is better to do in another way'* [Respondent 6].

In addition, several respondents perceive that sharing knowledge with others can reduce their own workload. Respondent 1 states that *'I tell him/her my experience of how to do and how he/she should do...this will save my time'*. Respondent 4 says *'When more people know how to do the task, more people share the workload'*. This result may imply that in the context of construction project, teamwork is emphasized. No one can handle all the tasks. It may be worthless to hoard knowledge because normally the performance appraisal is based on the overall project achievement instead of individual achievement. In other studies, researchers find that people may not be willing to share knowledge if they perceive that they will lose knowledge power. As an example, Huang et al (2008) find that loss of knowledge power has a negative effect on the attitude towards knowledge sharing. This situation happens most in circumstances where individual performance is assessed in the appraisal strategy. In construction project environment, people need to share knowledge and work cooperatively in order to complete projects successfully.

- Intrinsic benefits

Four respondents report that they can get enjoyment from sharing knowledge with others. Enjoyment is described as people's feeling of happiness from knowledge sharing. Respondent 1 believes that the knowledge sharing experience itself makes people feel pleasure: *'you tell your experience and your*

opinions, and share them with others...sharing makes people happy, many people discuss together... [Respondent 1]. Respondent 2 feels happy because sharing knowledge with others makes him feel more professional. Another point reported by respondent 4 and 7 is that people enjoy sharing knowledge because the knowledge they shared can help others to solve work related problems: *'I helped them to solve the problems, maybe reducing the time in searching materials, reducing time in setting up, then I feel happy'* [Respondent 7]. Besides, respondents report that people share knowledge with others because they can achieve knowledge self-efficacy. The concept of self-efficacy comes from Bandura (1986), which is defined as 'people's judgments of their capabilities to organize and execute course of action required to attain designated types of performance'. Knowledge self-efficacy refers to people's confidence in their capabilities of using knowledge to solve work related problems, improve work efficiency or helping others in work. For instance, Respondent 2 states *'If he/she asks me questions about law, I reply quickly on how he/she should do so that he/she does not need to search, which improves his/her work efficiency and (helps) him/her to solve problems'*; Respondent 5 notes *'knowledge sharing can make project process run more smoothly'*. Thus, perceived knowledge self-efficacy can drive people to share knowledge with others in construction project team.

In a project-based working environment, people who work together on a project may never know each other. Knowledge sharing provides opportunities for people to interact with each other and develop interpersonal relationship. This study observes that sometimes people share knowledge with others in order to enhance their personal relationship with others, e.g., *'sharing experience has a loop effect on personal relationship, and let people have common topics to communicate'* [Respondent 3].

Two respondents also report that their confidence is increased if what they shared is recognized by others. According to Bock et al (2005), others' responses provide evidence for people to judge whether his/her thinking and behavior is correct or not. If others' responses are in line with his/her anticipation, he/she may get a kind of reflected appraisal which contributes to the formation of self-worth (Bock et al., 2005). This idea is supported by this study where one comment is stated as *'you will feel good when people agree with what you talk about. People understand what you talk about, and you will build up your confidence'* [Respondent 5].

5. Discussion and conclusion

This exploratory study identified people's perceived benefits and costs associated with knowledge sharing behavior in construction teams. It is found that time cost is one barrier for people to share knowledge with others. In the study carried out by Kankanhalli et al. (2005), it is also mentioned that expense of time and effort in explicating and codifying knowledge may discourage people to share their knowledge. Sometimes, people choose to not share knowledge because they are afraid of losing face. This finding is consistent with prior research in knowledge sharing behavior. In the context of knowledge sharing in electronic communities of practice, Ardichvili et al. (2003) discover that people may fear that the knowledge they shared is not important, not entirely accurate, or not relevant to a specific discussion.

Huang et al. (2008) also observe that people have a low intention to share knowledge if they are afraid of sharing wrong or incorrect knowledge in order to 'save face'.

Both extrinsic benefits and intrinsic benefits of knowledge sharing are identified in this study. The benefits are in line with Wasko and Faraj (2000), who argue that people share knowledge to generate both tangible and intangible returns. Identified extrinsic benefits from this exploratory study include organizational reward, knowledge feedback, and reduced workload. Organizational reward has been addressed by many researchers, but some researchers claim that organizational rewards do not impose positive influence on knowledge sharing (Bock and Kim, 2002; Bock et al., 2005; Kwok and Gao, 2005). In this study, respondents report that incentives are rewarded based on team performance instead of individual performance. Thus, individuals are encouraged to share knowledge with others in order to improve the team performance. The benefit of knowledge feedback is a kind of reciprocity return in knowledge sharing. By sharing knowledge with others, knowledge contributor could learn new things as well from other's response and comments. The finding is consistent with Wasko's (2000) view that answering others' questions helps to refine their own thinking, learn new things and keep current on new innovations.

Intrinsic benefits mainly concerns individual's inherent satisfaction and esteem needs. This exploratory study finds that people share knowledge with others may gain intrinsic benefits of enjoyment, knowledge self-efficacy, enhanced relationship with others and increased confidence. Enjoyment as a benefit from knowledge sharing has been reported by others researchers. For example, Wasko and Faraj (2000) find that enjoyment is perceived to be an intangible return by people to share knowledge in electronic community of practice. This study also confirms Kankanhalli et al.'s (2005) observation that perceived knowledge self-efficacy increases people's intention to share knowledge. People in construction team are more likely to share knowledge with others if they perceived that they build confidence in their capability to solve work-related problems or improve work efficiency by sharing their knowledge. People also regard knowledge sharing as opportunities to build up personal relationship with teammates in construction team. Bock and Kim (2002) and Lin (2007) hold similar view that sometimes people intend to share knowledge with hope of strengthening social ties with others and expand the scope of association. In addition, this study observes that people can increase their self-confidence when their shared knowledge is recognized by others. Other's recognition leads to an increase of one's self-satisfaction and respect.

There are a number of implications from this study. Firstly, organizations can provide incentives to promote knowledge sharing among employees. Appraisal for reward should be based on collective performance instead of individual performance. Incentive strategy based on individual performance may lead to personal knowledge hoarding because people may try to protect their individual knowledge power in work place. Secondly, organizations should emphasize teamwork spirit. In project environment, no individual owns knowledge for all tasks or has the ability to handle all work. Team spirit moves people to contribute their effort, support other team members and care the collective performance of the team.

Besides, organizations can organize various activities (e.g. workshops, meetings) for people to interact with others, share ideas and collect feedbacks.

This study serves as an exploratory study, thus limited interviews are conducted and only one construction company is focused. The results only provide a limited extent of insights to the knowledge sharing behavior in Hong Kong construction teams. However, this exploratory study provides a basis for future explanatory study. The extent of significance of those identified factors shall be examined and measured in future empirical survey.

References

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1), 107.

Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7(1), 64.

Bandura, A. (1986). *Social foundations of thought and action : a social cognitive theory*. Englewood Cliffs, N.J. :: Prentice-Hall.

Baskerville, R., & Dulipovici, A. (2006). The theoretical foundations of knowledge management. *Knowledge Management Research & Practice*, 4(2), 83.

Bock, G. W., & Kim, Y. G. (2002). Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing. *Information Resources Management Journal*, 15(2), 14.

Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: examine the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, 29(1), 87-111.

Cabrera, A., Collins, W. C., & Salgado, J. F. (2006). Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management*, 17(2), 245.

Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management*, 31(6), 874.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge : how organizations manage what they know*. Boston, Mass :: Harvard Business School Press.

- Egbu, C. O., & Robinson, H. S. (2005). Construction as a knowledge-based industry In C. J. Anumba, C. Egbu & P. Carrillo (Eds.), Knowledge management in construction. Oxford ; Malden, MA :: Blackwell Pub. .
- Gillham, B. (2000). Case study research methods. London :: Continuum.
- Gray, P. H. (2001). The impact of knowledge repositories on power and control in the workplace. *Information Technology & People*, 14(4), 368.
- Hendriks, P. (1999). Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and Process Management*, 6(2), 91.
- Holsti, O. R. (1969). Content analysis for the social sciences and humanities. Reading, Mass. :: Addison-Wesley.
- Homans, G. C. (1961). Social behavior : its elementary forms. London :: Routledge & Kegan Paul.
- Huang, Q., Davison, R. M., & Gu, J. (2008). Impact of personal and cultural factors on knowledge sharing in China. *Asia Pacific Journal of Management*, 25(3), 451.
- Ipe, M. (2003). Knowledge Sharing on Organizations: A Conceptual Framework. *Human Resource Development Review*, 2(4), 337.
- Kakabadse, N. K., Kakabadse, A., & Kouzmin, A. (2003). Reviewing the knowledge management literature: Towards a taxonomy. *Journal of Knowledge Management*, 7(4), 75.
- Kamara, J. M., Anumba, C. J., & Carrillo, P. M. (2005). Cross-project knowledge management. In C. J. Anumba, C. O. Egbu & P. Carrillo (Eds.), Knowledge management in construction Oxford ; Malden, MA :: Blackwell Pub.
- Kankanhalli, A., Tan, B. C. Y., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: an empirical investigation *MIS Quarterly*, 29(1), 113.
- Koskinen, K. U., Pihlanto, P., & Vanharanta, H. (2003). Tacit knowledge acquisition and sharing in a project work context. *International Journal of Project Management*, 21(4), 281.
- Krippendorff, K. (2004). Content analysis : an introduction to its methodology (2nd ed. ed.). Thousand Oaks :: Sage.

- Kwok, S. H., & Gao, S. (2005). Attitude towards knowledge sharing behavior. *The Journal of Computer Information Systems*, 46(2), 45.
- Lin, H.-F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2), 135-149.
- Ma, Z. Z., Qi, L. Y., & Wang, K. Y. (2008). Knowledge sharing in Chinese construction project teams and its affecting factors: An empirical study. *Chinese Management Studies*, 2 (2), 97 - 108.
- Miles, M. B. (1994). *Qualitative data analysis : an expanded sourcebook* (2nd ed. ed.). Thousand Oaks, Calif. :: Sage.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company : how Japanese companies create the dynamics of innovation*. New York :: Oxford University Press.
- Riege, A. (2005). Three-dozen knowledge-sharing barriers managers must consider. *Journal of Knowledge Management*, 9(3), 18.
- Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17, 45.
- Strauss, A. L. (1998). *Basics of qualitative research : techniques and procedures for developing grounded theory* (2nd ed. ed.). Thousand Oaks :: Sage Publications.
- Wasko, M. M., & Faraj, S. (2000). "It is what one does": why people participate and help others in electronic communities of practice. *The Journal of Strategic Information Systems*, 9(2-3), 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.
- Weber, R. P. (1990). *Basic content analysis* (2nd ed. ed.). Newbury Park, Calif. :: Sage Publications.