Predictors of employees' perceptions of knowledge sharing cultures

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Abstract
This study investigated whether organizational factors such as employees' perceptions of management's support for knowledge sharing, their perceptions of the organization's social interaction culture, the organization's size, and the organization's available knowledge sharing technology, as well as whether individual factors such as age, gender, and organizational tenure had a significant impact on employees' perceptions of a knowledge sharing culture. New measures to assess employees' perceptions of management's support for knowledge sharing, their perceptions of the organization's social interaction culture, and the perceived knowledge sharing culture were developed. We found that perceptions of management's support for knowledge sharing, and perceptions of a positive social interaction culture were both significant predictors of a perceived knowledge sharing culture. In addition, gender was a significant moderator: female participants required a more positive social interaction culture before they would perceive a knowledge sharing culture as positive as that perceived by their male counterparts.

Predictors of employees' perceptions of knowledge sharing cultures

Knowledge sharing has been identified as a positive force in creating innovative organizations, but the organizational and individual factors that promote or discourage knowledge sharing among colleagues are poorly understood. Although firms that seek to increase knowledge sharing among their employees often invest in a variety of new technologies, there may be more significant predictors of knowledge sharing than the mere availability of technology. The current study evaluates whether organizational factors such as employees' perceptions of management's support for knowledge sharing, their perceptions of the organization's social interaction culture, the organization's size, and the organization's available knowledge sharing technology, as well as whether individual factors such as age, gender, and organizational tenure had a significant impact on employees' perceptions of a knowledge sharing culture.

Knowledge sharing in organizations

Knowledge sharing is a set of behaviors that involve the exchange of information or assistance to others. It is separate from information sharing, which typically involves management making information about the organization (e.g. financial statements) available to employees at every level. Whereas knowledge sharing contains an element of reciprocity, information sharing can be unidirectional and unrequested.

Knowledge sharing can be compared to organizational citizenship behavior (OCB) or prosocial organizational behavior. According to Brief and Motowidlo (1986), prosocial organizational behaviors are positive social acts carried out to produce and maintain the well-being and integrity of others. Prosocial behaviors include acts such as helping, sharing, donating, cooperating, and volunteering. Like knowledge sharing, these behaviors can be directed towards an individual or to the organization as a whole. However, knowledge sharing is not necessarily synonymous with these two constructs. For an action to be considered to be organizational citizenship behavior, it must be performed both spontaneously and voluntarily. In contrast, although knowledge sharing must be voluntary (Kelloway and Barling, 1999), it is not necessarily spontaneous. In fact, knowledge sharing is quite often the subject of managerial exhortations and organizational reward structures, while organizational citizenship behavior is largely unrewarded extra-role behavior. Knowledge sharing provides intangible and uncertain rewards, is not always noticed by influential others, and may involve more significant effort or sacrifice.

Perceptions of management's support for knowledge sharing

Kelloway and Barling (1999) have suggested that transformational leadership may be a potential predictor of knowledge use in organizations. In addition, leadership commitment to knowledge sharing has also been identified by Martiny (1998) as a key consideration. According to her survey, uncertainty about leadership commitment to knowledge sharing was the key challenge. This support, of course, must be encouraging rather than coercive; employees can receive suggestions on what and how much to share with their colleagues, but the final decision is always up to them. In fact,

> ... when lower level workers are ordered to "share" information with those higher up the corporate ladder, a cutthroat information culture of meddling micromanagement can result (Davenport, 1994).

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Employees may form judgments about management's support for knowledge sharing by looking for appropriate symbols. If a culture is "the system of such publicly and collectively accepted meanings operating for a given group at a given time" then symbols, which are "objects, acts, relationships ... that evoke actions and impel [people] to action" play an important role in an organizational culture's development and evolution (Nonaka and Takeuchi, 1995; Pettigrew, 1979). The presence of knowledge sharing technology may be such a symbol. If management spends a significant amount of resources on either purchasing or developing and implementing such technology, employees could interpret this as a signal of management's support for this ideal, and act accordingly. However, as Martinsons (1993) acknowledges, if employees perceive that management is not very committed to implementing this new technology, then the initiative to promote a strong knowledge sharing culture is not likely to be successful. Perceptions about management's support for knowledge sharing are potentially necessary for the creation and maintenance of a positive knowledge sharing culture in an organization.

Perceptions about a positive social interaction culture

In an organization with a positive social interaction culture, both management and employees socialize and interact frequently with each other, with little regard for their organizational status. Kelloway and Barling (2000) suggest the importance of social interaction with respect to knowledge use. Benefits of a positive social interaction culture, with respect to knowledge sharing, include employees who are more knowledgeable about their colleagues' potential for being knowledge sources, as well as employees who trust more colleagues, and who trust them more completely, and who are willing to share knowledge with them as a result.

Some companies have recognized the value of social interaction, and are beginning to provide complimentary food and drink in an attempt to have their employees interact more frequently (Flaherty, 2000). Complimentary popcorn and tea not only increase morale and the likelihood of unpaid overtime; they also increase face-to-face contact in an informal atmosphere, where employees are more likely to ask each other questions and offer assistance. When people who work together talk to each other, the subject of their conversation invariably returns to what they have most in common;

their work. The inevitable non-work related conversations are not a waste of time: they serve to increase trust.

Martiny (1998) explains that "the sharing of knowledge at HP consulting was informal and serendipitous – based on personal networks or accidental encounters at meetings". Prusak (1999) concurs that informal, personal communication is important:

> Many aspects of knowledge are not systematic – a lot of knowledge gets generated and transferred while having a cup of coffee with a colleague in the hallway ... (after noticing this), some Japanese companies have instituted "talk rooms" where workers are expected to spend time each week, talking to colleagues about their work.

Such impromptu encounters may not only reinforce perceptions about management's support for knowledge sharing, (if employees see their senior managers sharing knowledge freely), but they also reduce status differentials and other barriers to communication.

Although reduced status distinctions between employees may encourage social interaction, which may increase knowledge sharing, a decrease in knowledge sharing may also be used to reinforce status distinctions. Upper management may reserve access to certain information to other managers – which means that employees who are "out of the loop" have their lower status reinforced by their hampered ability to contribute relevant new ideas. As Nonaka (1991) explains:

> When information differentials exist, members of an organization can no longer interact on equal terms, which hinders the search for different interpretations of new knowledge.

Affinity groups are developed along these principles, and according to Kelloway and Barling (2000), they can play an important role in promoting knowledge use in organizations. An integral component of affinity groups is that each group's members have the same position or job title in the organization. This encourages all members to share their ideas, and the groups' participants must demonstrate either personal or expert power for their ideas and concerns to be heard (Orr, 1996; Van Aken *et al.*, 1994). Employees will not share knowledge among all group members if the groups are constrained by hierarchies or perceived power imbalances – people are inhibited by their superiors. In fact, hierarchical organizations are not likely to fully engage the skills and knowledge of all employees (Vallas, 1998).

Perceptions about a positive social interaction culture may be particularly important with respect to the creation of a positive knowledge sharing culture, depending on the nature of the knowledge to be shared. According to Constant *et al.* (1994), employees may be more likely to share tangible information if there are prosocial attitudes and norms of informational ownership, while the sharing of intangible information may be contingent on friendships and personal relationships.

Technology

Many organizations that are striving to increase knowledge sharing among their employees create or acquire a database or "knowledge repository" where employees contribute their expertise electronically to the organization in a way that can be accessed by other employees (Ruggles, 1998). These knowledge sharing technologies offer a number of advantages. Communication can be nearly instantaneous, even across a wide geographical separation. Most technologies are non-intrusive, that is they can be accessed at the convenience of either party, and they may be well-suited for shy or very busy workers who prefer to avoid face-to-face interaction, especially with people they do not know well. The introduction of knowledge sharing technology may also provide a highly visible symbol of management's support for knowledge sharing.

Some strategists consider new technology to be the best way to promote knowledge sharing; "information technology budgets continue to escalate ... (and) IT professionals are increasingly assuming knowledge titles ..." (Fahey and Prusak, 1998, p. 273). As Davenport (1994) notes,

> ... many managers still believe that once the right technology is in place, the appropriate information-sharing behavior will inevitably follow.

In fact, many organizations' knowledge sharing initiatives are led by the information services division and consist exclusively of the acquisition of new information software (Davenport *et al.*, 1992). This may be because purchasing and installing a new information management system is relatively easy for an organization to accomplish; cultural changes are not so simple.

Although technological fixes remain popular with some managers, information systems' ability to promote knowledge sharing is not universally applauded. As Fahey and Prusak (1998) note,

> IT is a wonderful facilitator of data and information transmission and distribution [but] it can never substitute for the rich

interactivity, communication, and learning that is inherent in dialogue. Knowledge is primarily a function and consequence of the meeting an interaction of minds" (Fahey and Prusak, 1998, p. 273).

Davies and Roche (1999) explain that "in information use, as elsewhere, expediency prevails. Accessibility predominates over quality of information as a criterion for use." If it is faster for an employee to gather relevant, reliable, and recent information with a few phone calls than by consulting a database or Intranet, then he or she may use the information that is available from his or her social network, instead of from the available technology.

In essence, most knowledge simply cannot be stored on a computer – even if it houses the most sophisticated expert system available – due to the complexity of the information involved and the time and expense required to input it. In contrast, this knowledge can be quickly and cheaply gleaned in a conversation with the actual expert. When knowledge is separated from its appropriate context, it loses much of its richness and value (Nonaka and Konno, 1998).

Even if it is highly functional, few new technologies will be used by employees who have not received appropriate training and guidance from management. In a professional services firm cited by Davenport (1994), management introduced some new technology to encourage employees to share their knowledge. Unfortunately, employees had no incentives to use the new system; in fact, they were afraid of giving away their expertise to colleagues who would use this knowledge to get promoted instead of them. In this case, the technology became irrelevant to the knowledge sharing exchange.

As Ruggles (1998, p. 88) points out, "if technology solves your problem, yours was not a knowledge problem". That is not to say that technology is not useful in facilitating knowledge sharing. There are a number of ways that new technology can be used in conjunction with existing tools. As executives at IBM have recognized, an information map or catalogue that shows enquirers who to contact and what other information is available is very useful (Davenport, 1994). According to Prusak (1999),

> Companies are [introducing] things like electronic "yellow pages," directories or maps of knowledge-holders across the company so people can make connections.

Technology, in this case, is effective because it is an enabler, not a driver (Martinsons, 1993; Martiny, 1998).

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Demographics

Although they have not received much attention from the literature, certain demographic variables may also influence whether an employee will choose to share their knowledge. Employees with shorter organizational tenure are more likely to share information according to Shermerhorn (1977), even though organizational tenure is not associated with organizational citizenship behavior (Organ and Ryan, 1995). Gender was also not found to be a significant predictor of organizational citizenship behavior (Organ and Ryan, 1995), but given gender's influence on communication styles, it is not unreasonable to wonder if it would also affect knowledge sharing. An organization's size may also be related to its knowledge sharing culture, if employees in smaller organizations are more likely to rely on each other and to interact with each other socially. Employees' ages and career stage may also affect their knowledge sharing behaviors through the size and utility of their social networks; experienced employees may simply be more able to share their knowledge because they know more of the right people in the organization.

The current study

Knowledge sharing cultures vary within and between organizations. The preceding review of the literature suggests a number of factors that may either promote or discourage a positive knowledge sharing culture. This study investigates whether these factors are significant predictors of positive knowledge sharing cultures. It is expected that the dominant dimensions will be, as outlined above, organizational factors such as perceptions of management's support for knowledge sharing, perceptions about a positive social interaction culture, and the presence of technology that can facilitate knowledge sharing. In this study, a number of hypotheses are tested.

Perceptions of management's support for knowledge sharing
H1. Individuals who see management as being committed to knowledge sharing will perceive a more positive knowledge sharing culture.

Perceptions about a positive social interaction culture
H2. Individuals who perceive a positive social interaction culture will be more likely to perceive a positive knowledge sharing culture.

Technology
H3. The presence of knowledge sharing technology in an organization will increase employees' perceptions of a positive knowledge sharing culture.

Gender
H4. Female employees will perceive their organization's knowledge sharing culture differently than will their male counterparts.

Methodology

Respondents and procedure

A total of 231 survey packages were distributed. A total of 84 survey packages were distributed to MBA or MPA students at four Canadian universities in two provinces, 121 survey packages were distributed to undergraduate students in who were participating in continuing and distance studies; and 26 packages were sent to individuals who were not students. Each survey package that was mailed (151) through Canada Post contained an introductory letter, a five-page survey, a random draw entrance card, and two business reply-paid envelopes. Survey packages that were sent to candidates who had access to campus mail were supplied with two ordinary self-addressed envelopes instead.

The two reply envelopes were supplied so that participants could enter in a random draw without attaching identifying information to their returned survey. Although individuals who received surveys could have conceivably entered the draw without completing the survey, more surveys than entrance cards were received (126 surveys compared to 107 lottery entrance cards).

In total, 126 individuals responded, for a response rate of 54.5 per cent. Of those who indicated their gender, 71 were female and 55 were male. Of those who indicated their ages, the average age was 29. The youngest respondent was 19 and the oldest respondent was 58. The average size of the respondents' organizations was 4,092; the smallest organization had four people and the largest organization had 110,000 people. The average length of time that a participant had been at their present job was 5.4 years. The shortest tenure was 6 months, and the longest tenure was 34 years. In total, participants were in a total of 99 different occupations and 69 different industries. The most common industries were government (16), education (10), manufacturing (9), finance (7), as well as computer (5) and research (5).

Measures

A number of new scales were developed for this study. To assess perceptions about the social interaction culture, four items were included to measure whether the participants perceive their organizations to be inimical to social interaction, or conducive to spontaneous meetings with new people. For example, a typical item would be "In my organization, who you talk to is determined by what your job title is".

To assess the respondents' perceptions about their organization's management's support forwards knowledge sharing in their organizations, six items were included. A sample item is "My manager would like me to share more information with other people in the organization".

Respondents were also asked to identify technologies that they had access to that could help to facilitate knowledge sharing. Respondents had six options, including software that was designed to encourage information exchange.

To assess the participants' perceptions of the knowledge sharing culture in their organizations, five items were included. A sample item is "People with expert knowledge are willing to help others in this organization". Except for the items that dealt specifically with technology, all items were rated by respondents on a seven-point Likert-type scale, anchored by 1 = no, I disagree and 7 = yes, I agree.

Results

As outlined above, four scales were developed for this study. The scale that measured the participants' perceptions of the knowledge sharing culture of their organizations had a Cronbach's alpha of 0.85. The scale that measured the participants' perceptions of the social interaction culture of their organizations had a Cronbach's alpha of 0.74. The scale that measured the participants' perception of their managers' support for knowledge sharing had a Cronbach's alpha of 0.79. The scale that measured the presence in participants' organizations of technology that can facilitate knowledge sharing had a Cronbach's alpha of 0.72.

Regressions

Table I shows the means, standard deviations, and correlations between all scales. Results of the regression analyses predicting knowledge sharing are shown in Table II. We see that participants' perceptions of their organizations'

knowledge sharing cultures were significantly predicted by their perceptions of their organizations' social interaction culture, and by their perceptions of their management's support for knowledge sharing.

Moderators

Interactions were determined by first standardizing the predictors and computing cross products. A two stage hierarchical regression was then run, with the simple predictors in the first step and the interaction on the second step. Gender emerged as a significant moderator; the change in R-squared for an interaction between gender and social interaction culture was significant ($p < 0.01$) and accounted for 32.4 per cent of criterion variance. We see how women who perceived a positive social interaction culture also perceived a more positive knowledge sharing culture than did their counterparts who did not report a positive social interaction culture. Men who perceived a positive social interaction culture were also more likely to perceive a positive social interaction culture than their counterparts with less positive social interaction cultures, but the effect is not as pronounced as it is for the female participants.

Discussion

Perceptions about management's support for knowledge sharing and a perceived positive social interaction culture were both significant predictors of a positive knowledge sharing culture, while technology was not. Gender moderated the effects of a positive social interaction culture on the knowledge sharing culture.

Perceptions of management's support for knowledge sharing

According to the findings of the regression against the knowledge sharing scale, hypothesis one, (that perceptions about management's support for knowledge sharing is a significant predictor of perceptions about a positive knowledge sharing culture, was supported). It appears that employees are interested in acting in accordance with management direction. Further research can assess whether managers can best encourage their employees to share knowledge with each other by acting as a role model, by rewarding desired behavior, or with charismatic persuasion.

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Social interaction culture

According to the findings of the regression against the knowledge sharing scale, hypothesis two (that perceptions about a positive social interaction culture are a significant predictor of a positive knowledge sharing culture) was supported. These findings suggest that an organizational environment that is conducive to social interaction is also conducive to knowledge sharing.

Although it is not possible to infer causality, it is possible that knowledge sharing is encouraged by increased social interaction, rather than employees who are predisposed to be sociable are also predisposed to share knowledge. This could be because people are more likely to seek or offer knowledge when they are aware that a colleague possesses it. Social interaction makes employees more likely to learn and to remember what knowledge their colleagues possess and need. Because employees are more likely to share knowledge with their friends, social interaction may be conducive to knowledge sharing because it increases the likelihood of an employee making friends with colleagues.

Technology

Hypothesis three (that the presence of knowledge sharing technology in an organization will predict a positive knowledge sharing culture) was not supported.

It is possible that this study used an inadequate measure of the presence of technology (despite the high Cronbach's alpha). The findings may have been different if the measure had taken into account employees' training, use, degree of use, or attitudes towards this technology, or if it had asked about a different type of technology.

The technologies involved may yet be crucial for knowledge sharing to take place. Employees may use knowledge sharing technology to communicate with colleagues they already know. In the absence of technology, they would continue to share knowledge with these people (e.g. with phone calls or by meeting in person instead of through an e-mail discussion group), but the technology may make these exchanges easier and more frequent.

It was interesting to note that although the technology did not appear to be significantly conducive to the prediction of a positive knowledge sharing culture, it was also not a significant inhibitor. That is, the technology did not create an environment so cold and impersonal or so rushed and harried that employees resisted the creation of a knowledge sharing culture. Furthermore, the existence of this technology in the organization may be interpreted by employees as a symbol of management's support for knowledge sharing, which is a significant predictor, as discussed above.

Clearly, future research is necessary to determine if the presence of knowledge sharing technology does not have any impact on the creation of knowledge sharing cultures in all circumstances (e.g. in very large or geographically dispersed organizations), and if it is all knowledge sharing technology that has no impact (e.g. if email discussion groups among colleagues have a more positive impact than a centralized database). Also, the role of technology may vary among organizations, depending on their industry.

Gender

Hypothesis four, (that female employees will perceive their organization's knowledge sharing culture differently than their male counterparts will) was supported.

Gender interacted with the perceived social interaction culture with respect to the knowledge sharing culture. That is, women who reported a positive social interaction culture were also much more likely to also

Table I
Descriptive statistics and correlational matrix

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Knowledge sharing	4.87	1.15	–							
2. Social interaction culture	5.20	1.28	0.61***	–						
3. Management's support for knowledge sharing	4.02	1.17	0.56***	0.45***	–					
4. Available technology	2.88	1.73	0.08	– 0.02	0.09	–				
5. Gender	0.57	0.50	– 0.01	– 0.08	– 0.04	– 0.31**	–			
6. Age	29.05	9.01	– 0.22*	– 0.20*	– 0.18	– 0.06	0.05	–		
7. Organizational size	4,092	13,948	– 0.22*	– 0.18	– 0.07	0.24*	– 0.14	0.05	–	
8. Tenure	5.40	5.85	– 0.06	– 0.03	– 0.05	– 0.13	– 0.01	0.78***	– 0.01	–

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

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Table II
Knowledge sharing: regression results

Predictor variable	*R*-squared values	Betas	*F*-values
Age	0.01	0.05	0.40
Gender	0.00	− 0.09	1.21
Social interaction culture	0.37	0.33	3.86**
Management's commitment	0.31	0.47	5.61***
Organization size	0.05	− 0.17	2.37*
Technology	0.01	0.61	0.54
Organizational tenure	0.00	− 0.06	0.53
Total	0.59		15.34***

Notes: *$p < 0.05$; **$p < 0.001$; ***$p < 0.0001$

perceive a highly positive knowledge sharing culture in their organizations. Female employees may have been conditioned to be helpful, but given their, frequently less advantaged, positions in many organizations, they may be hesitant to share with colleagues if they believe that they will be sharing away their power. A positive social interaction culture may allow female employees to forge the trust among colleagues that allows knowledge sharing to take place.

The diversity of the work environment may also be an issue. For example, a male engineer who works with other male engineers may have different knowledge sharing experiences than a female engineer who works with male engineers. If knowledge sharing is most likely to occur among friends, and employees are most likely to become friends with similar others (e.g. of the same gender), then employees of a minority gender may be less likely to share knowledge freely.

Potential limitations

Because this study relies on participants' self-reports, a future study should use another method to try to replicate these results. Although the response rate of this study was acceptable, the sample size was small. Future studies should use larger sample sizes. Many of the scales used in this study were developed specifically for this project; further work in this area could help strengthen the construct validity of these measures. In addition to enhancing the psychometric properties of the constructs, future research could consider incorporating different variables in the research model.

This study focused on organizational variables that predict a knowledge sharing culture. There may also be other variables that are particular to each interaction, that predict a knowledge sharing culture. Variables for future research include trust, status differentials, and reward structures. In their comments, participants identified

still other potential variables for future study: the importance of the nature of the knowledge to be shared, the importance of recognition in the knowledge sharing transaction, and the potential impact of non-technological methods of knowledge sharing (such as staff meetings, as well as verbal or written reports or memos).

Although one of the strengths of this study is that it was conducted across 126 different organizations, (and therefore should be fairly generalisable), it would be interesting to determine if there are separate knowledge sharing cultures in different occupations. For example, are teachers more likely to share knowledge than stockbrokers? How is this influenced by an employee's commitment to their occupation or profession?

Conclusions

This study confirms the hypotheses that perceptions about a positive social interaction culture and management's support for knowledge sharing can predict a positive knowledge sharing culture. Organizations now have more information with which to formulate their knowledge management strategy. An organization that seeks to increase knowledge sharing among its employees may well prefer to forego implementing an expensive new knowledge sharing software in favor of hosting more social events for employees, and having managers find more ways to demonstrate their support for having employees share their knowledge.

This study provides many starting points for future research. The impact of gender on knowledge sharing in organizations has thus far not received much attention from academics who study knowledge sharing. This study, which showed that women are more sensitive to the social interaction culture when assessing an organization's knowledge sharing culture has opened the door to further research in this area.

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