

Predictors of Knowledge Sharing in Organizations

M.Sc. Thesis for:

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Abstract

This study develops scales to assess how social interaction climate, perceived management commitment to knowledge sharing, and the presence of technology that can facilitate knowledge sharing, are correlated with knowledge sharing in organizations. Of these measures, knowledge sharing was significantly predicted by social interaction climate, and perceived management commitment to knowledge sharing. Technology was not a significant predictor. This study also used a series of vignettes to determine situational variables in knowledge sharing exchanges. Trust, reward structures, and organizational status differentials were all significant predictors of knowledge sharing in organizations.

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“Competition is healthy when describing sports, and it was appropriate for an economic climate where resources were plentiful” (Amidon, 1998, p.41). Now, as organizations focus on leveraging human capital in the face of tightening labour markets, employees are being implored to disseminate their knowledge throughout their firms, thereby abandoning traditional competitive morays. Traditional means of getting ahead in an organization, for example by hoarding information and by preventing colleagues from succeeding, are becoming less acceptable.

In an attempt to harness the knowledge of its employees, many organizations are introducing new technology. Workers are told to use corporate Intranets, data warehouses or knowledge repositories, decision support tools, and groupware (Ruggles, 1998). Unfortunately, employees are not necessarily obeying such managerial directives. As Martiny (1998) explains, “typically, there are individuals in every organization who want to share and communicate knowledge, and those who prefer to keep their knowledge a private asset” (p.71).

Knowledge sharing has been identified as a positive force in creating innovative organizations, but the factors that promote or discourage knowledge sharing among colleagues are yet to be determined. The proposed research will examine workers in a variety of settings to develop an instrument that can determine if a work environment is conducive to knowledge sharing. Specifically, we propose to evaluate how organizational factors such as perceived management commitment, social interaction climate, and technology, as well as situational factors such as trust, reward structures, and status differentials influence workers’ attitudes

towards knowledge sharing both in terms of the quality and the diffusion of the knowledge to be shared.

Predictors of Knowledge Sharing in Organizations

Knowledge sharing is a set of behaviours that involve the exchange of information or assistance to others. It is separate from information sharing, which typically involves management making information on the organization available to employees. Whereas knowledge sharing contains an element of reciprocity, information sharing can be uni-directional and unrequested.

Knowledge that can be shared can be divided into two dimensions; tacit and explicit. “Tacit knowledge is highly personal... hard to formalize and, therefore, difficult to communicate to others” (Nonaka, 1991, p.98). It refers to internalized skills, mental models, beliefs, and perspectives that are often based on experience. It can be further divided into two dimensions; a technical aspect (i.e how to do things), and a cognitive aspect (i.e. how to think about things) such as the beliefs, values, schema and mental models that are deeply ingrained in us and that we take for granted (Nonaka and Konno, 1998). Because of its complexity, this type of knowledge is most easily shared via inter-personal interaction.

In contrast, explicit knowledge is formal and systematic, so it can be easily communicated and shared. Examples include product specifications, manuals, a scientific

formula, a computer program, or anything that can be expressed in words or numbers (Nonaka, 1991; Nonaka and Konno, 1998). This type of knowledge is less valuable and can be quickly and easily disseminated to a large number of people.

Knowledge sharing can be compared to organizational citizenship behaviour (OCB) or prosocial organizational behaviour. According to Brief and Motowidlo (1986), prosocial organizational behaviours are positive social acts carried out to produce and maintain the well-being and integrity of others. Prosocial behaviours include acts such as helping, sharing, donating, cooperating, and volunteering. Like knowledge sharing, these behaviours can be directed towards an individual or to the organization as a whole. However, knowledge sharing is not necessarily synonymous with these two constructs; there are important differences. For an action to be considered to be organizational citizenship behaviour, it must be performed both spontaneously and voluntarily. In contrast, although knowledge sharing must be voluntary (Kelloway and Barling, 1999), because under coercion it loses the quality that separates it from mere information exchange, it is not necessarily spontaneous. In fact, knowledge sharing is quite often the subject of managerial exhortations and organizational reward structures, while organizational citizenship behaviour is largely unrewarded extra-role behaviour.

Because it involves helping someone else, knowledge sharing could also be compared to altruism. However, in certain contexts, the knowledge that is potentially being shared is so valuable, that offering it has a much more significant impact on colleagues than would other behaviour that is categorized as being altruistic. Knowledge can be the key to an employee's

organizational status, security, remuneration, and potential. As Davenport (1994) explains, “if information is power and money, people won’t share it easily.” In contrast, typical altruistic behaviours such as not spending time on personal phone conversations, arriving early to be ready to work when the shift starts, or helping to organize departmental get-togethers may not really be analogous to knowledge sharing. Whereas these former helping behaviours are indeed useful for the organization, they also provide immediate work-related benefits to the employee, are readily observable by superiors, and require little investment of time or energy. Knowledge sharing, however, provides intangible and uncertain rewards, is not always noticed by influential others, and may involve more effort or sacrifice.

Some items on scales that are designed to assess the altruistic component of OCB could be applied to knowledge sharing behaviours. Examples include, ‘helping others with heavy workloads’, or ‘helping people outside the department when they have problems’ (Wolfe Morrison, 1994, p. 1556). However, they do not specify the type, quantity, or quality of assistance to be provided. The difference between a knowledge sharing behaviour and a knowledge sharing - related organizational citizenship behaviour, may be dependent on the magnitude of the knowledge being shared. Short, easy answers to a colleague’s question that allow them to achieve the minimum requirements of their task may be knowledge sharing OCBs, while teaching a colleague how to do something new or providing them with something that will allow them to perform at a superior level may cross the threshold into standard knowledge sharing.

In each potential knowledge sharing exchange, there are elements that are specific to the organization, as well as elements that are particular to the interaction. The organizational elements that will be discussed in this paper are perceived management commitment to knowledge sharing, social interaction climate, and the presence of technology that can facilitated knowledge sharing. The situational elements that will be discussed include trust that the other party will reciprocate the exchange, the reward structure, as well as the status differentials between the people in the potential exchange.

Perceived Management Commitment to Knowledge Sharing

Transformational leadership was identified by Kelloway and Barling (1999) as a potential predictor of knowledge sharing. 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. As Kelloway and Barling (1999) explain, knowledge sharing must be voluntary. 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).

Perceived management commitment to knowledge sharing may be discerned by employees through symbols, if they are communicated effectively. 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 its development and evolution (Nonaka and Takeuchi, 1995; Pettigrew, 1979). In certain situations, information technology could be such a symbol. If management spends a significant amount of resources on either purchasing or developing and implementing technology designed to facilitate knowledge sharing among employees, this could be interpreted as a signal of their commitment to this ideal. If there is little management commitment to new technology that is being implemented to facilitate knowledge sharing, then the initiative is not likely to be successful (Martinsons, 1993).

Social Interaction Climate

In an organization with a positive social interaction climate, both management and employees socialize and interact frequently with each other, with little regard for their organizational status. Kelloway and Barling (1999) suggest the importance of social interaction with respect to knowledge sharing. Benefits of a positive social interaction climate, 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 of their colleagues, and who trust them more completely, and 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. Non-work related conversations 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 ‘talk rooms’ where workers are expected to spend time each week, talking to colleagues about their work.” Such impromptu encounters may not only reinforce perceived management commitment to knowledge sharing, (if employees see their senior managers sharing knowledge freely), but 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 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 (1999), can play an important role in knowledge sharing 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, Monetta, and Sink, 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).

Social interaction may be a particularly important predictor of knowledge sharing, depending on the nature of the knowledge to be shared. According to Constant, Kiesler, and Sproull (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 companies who are striving to increase knowledge sharing 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).

Some technologies that are designed to facilitate knowledge sharing offer certain benefits. 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 managerial commitment to 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, 1992). This may be because purchasing and installing a new information management system is relatively easy for an organization to accomplish.

The type of industry may also affect whether an organization tries to encourage knowledge sharing by introducing technology. Feldman (1989) suggests that organizations where

there is a concentration of technical expertise develop what he calls ‘the idealization of technology’; “without a strong managerial and marketing orientation, there exists a potential to over-focus on technical problems and to over-emphasize technical solutions (p. 576). As a result, firms in technology-oriented fields may be more inclined to try to address knowledge-sharing gaps by introducing technology.

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” (p.273).

Furthermore, most information 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 information 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).

As Ruggles (1998) points out, “if technology solves your problem, yours was not a knowledge problem” (p.88). 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).

Even if it is highly functional, few new technologies will be used by employees without 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.

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 rely on the information that is available from his or her social network, instead of using the technology.

Alternately, in large or in geographically dispersed organizations, technology may provide the only link available for individuals who need to share knowledge, or it may be the medium with which some employees are most comfortable. A danger is that the technology is not able to communicate the full value of the knowledge. Context, emotions, and attitudes may be lost in the course of the transmission, with the result that the exchange is far less meaningful and useful.

Trust

Trust is important for knowledge sharing because both are predicated on reciprocity and exchange. Individuals will be less likely to volunteer valuable knowledge if they do not expect the gift to be misused or not reciprocated. In fact, access to certain crucial resources, such as political aid, sensitive information, organizational 'gossip' and political intelligence, is contingent on trust (Podolny and Baron, 1997).

Trust can be directed towards managers and towards colleagues, and is required on both sides of the knowledge sharing exchange. Knowledge recipients must be able to trust that the information that they receive is accurate, and knowledge transmitters must be able to trust that the information they provide will be used appropriately (Buckman, 1998).

For trust to exist among colleagues, individuals must believe that their goodwill will be reciprocated, even in the absence of formal controls. Both trust and reciprocity are necessary for the creation of the social networks that are so important to knowledge exchange (Burt, 1992;

Larson, 1992). A trusting environment should be more conducive to knowledge sharing, because as Davenport (1999) notes, without it an organization is forced to create a set of rules to govern each transaction. This increased bureaucracy will slow down transaction times, which will decrease the likelihood that employees will participate in transactions (such as sharing their knowledge or asking for assistance or advice). Even interpersonal knowledge-sharing networks are contingent on interpersonal trust, according to McAllister (1995).

Reputation is an integral component in the establishment of trust between players. As Pentland (1992) explored, the reputation of a knowledge seeker affects the likelihood that they will receive assistance. In fact, “people who ask dumb questions or too many questions will quickly earn a reputation as unworthy of assistance. The loss of face that results from abusing the good will of helpers destroys one’s capacity to seek further help” (p.539). People not only evaluate a knowledge seeker’s reputation (and avoid sharing with those they cannot trust), but they also must manage their own reputation, by not asking too many questions, by not asking stupid questions, and by appearing helpful. It can be a precarious balance.

Trust between management and employees is also important, if employees are expected to share their knowledge. However, as Bond (1999) points out, management’s initiatives to capture their employees’ knowledge has for a long time been used to assert managerial control. This may destroy trust and actually decrease the quality and quantity of shared knowledge. As Bond notes, “Frederick Taylor purposefully set out to wrest control over tasks from the worker and an explicit aim of the approach was to capture the worker’s knowledge, both tacit and

explicit. Even at this stage of management theory it was implicit that knowledge was associated with control.” If employees do not trust their managers, and instead believe that they will be replaced as soon as their formerly unique expertise has become commodified and instantly available to new hires, they will be reluctant to share what they know.

Reward Structure

Kelloway and Barling (1999) have explained that in order for employees to share their knowledge, they must be rewarded for doing so. A collectivist organization will generally provide rewards equally to all members, while an individualist organization will prefer to allocate the rewards equitably (Leung and Bond, 1984). A lack of compensation for appropriate behaviour (knowledge sharing) may be less damaging than rewards for inappropriate (knowledge hoarding) behaviour. Pfeffer (1999) considers too much destructive internal competition to be a serious impediment to the effective functioning of organizations. He observes that “even though companies talk about knowledge sharing, many – indeed most – compensation, evaluation and incentive schemes pit employees against each other. And then people wonder why there isn’t enough learning from each other” (p.31).

A reward system that promoted individualism by focussing on individual achievement had a disastrous outcome at Kidder Peabody. Each trader’s reputation and value to the firm was based on their profit and loss statistics (Marshall et al., 1996). Workers had no incentive to share their strategies with their colleagues or even with their accounting and control divisions.

Although this remuneration policy did attract and retain some high achievers, the rest of the firm did not benefit from their knowledge or experience.

In contrast, some other professions have a strong tradition of sharing knowledge. For example, teachers post lesson plans on the Internet to provide assistance to other teachers (e.g. www.reallyfine.com/educationonline.html). This may be due to the fact that teachers are not evaluated (or rewarded) on the basis of their lesson plans. They may choose to share their lesson plans as a way of demonstrating their professional competence to their peers.

If there are no specific rewards for performance, but there are rewards that are contingent on the performance of the organization, employees may be more willing to share knowledge in order to indirectly contribute to their own success. However, not all incentives need to be monetary. Managers are presently trying to motivate their knowledge workers by appealing to their sense of greed, but it might be more effective to appeal to their values or by giving them recognition and social power (Drucker, 1999).

Status Differentials

Status differentials have already been discussed with regards to how they may inhibit social interaction between organizational members of different status levels. However, when the knowledge sharing is not contingent on a prior personal relationship, status differentials may affect an employee's willingness to share their knowledge.

Especially with no performance-based status distinctions or reward mechanisms, employees may share their knowledge as a way of demonstrating their competence to their colleagues. Lower level employees may share with more senior people, either out of respect, perceived obligation, fear of retribution, or in order to curry favour. However, higher status employees may share with their junior colleagues because they do not feel as though there is any competition between them, or as an act of 'charity' (helping the less able employee). With no readily apparent status differentials that are not due to seniority, employees may be more prone to provide assistance if it is readily visible to other employees.

In a hierarchical organization, in contrast, people may remain civil, but they are also mindful of their 'place' in the organization and adjust their behaviour and interactions accordingly. The organization may be stratified, with most people speaking only to others at 'their level'. A small power distance culture might encourage knowledge sharing between individuals with different statuses, while a large power distance culture might discourage an unfettered exchange of ideas and knowledge.

Contract workers, such as consultants and temporary workers are an interesting case, because as "outsiders" they are often the lowest status employees in the organization. Although they may be knowledgeable, they have such low job security that they may refuse to share their knowledge if they believe it to be the key to keeping their job. Permanent workers (the "insiders") may be reluctant to share knowledge with someone who may not be around long enough to reciprocate, and they may be wary of sharing knowledge with someone who might in

turn share the knowledge with a competitor.

Demographics

Certain demographic variables may also influence whether an employee will choose to share their knowledge. Employees with shorter tenure are more likely to share information according to Shermerhorn (1977), even though tenure was not associated with organizational citizenship behaviour (Organ and Ryan, 1995). Gender was also not found to be a significant predictor of organizational citizenship behaviour (Organ and Ryan, 1995). Organizational size may be related to knowledge sharing, if employees in smaller organizations are more likely to interact with each other socially.

The Current Study

Knowledge sharing behaviours vary within and between organizations. The preceding review of the literature suggests a number of factors that either promote or discourage knowledge sharing behaviours in organizations, or that predispose or preclude an individual from having positive attitudes towards sharing knowledge. This study will investigate which factors are the most significant predictors of knowledge sharing in organizations. It is expected that the dominant dimensions will be, as outlined above, organizational factors such as perceived management commitment to knowledge sharing, social interaction climate, presence of technology that can facilitate knowledge sharing, as well as situational factors such as trust, reward structures, and status differentials.

In this study, a number of hypotheses will be tested.

Perceived management commitment to Knowledge Sharing

H1: Individuals who believe that their management wants them to share knowledge will be more likely to have positive attitudes towards knowledge sharing.

Technology

H2: The presence of technology designed to promote knowledge-sharing, will have an effect

on individuals' attitudes towards sharing knowledge.

Social Interaction Climate

H3: Individuals who participate in a large number of social interactions in their organizations will be more likely to share knowledge than individuals who have few opportunities for social interactions.

Trust

H4: Employees will be more likely to share their knowledge with others whom they can trust will reciprocate the behaviour.

Reward Structure

H5: In situations where employees are rewarded for individual performance, they will be less likely to share their knowledge than if their rewards are based on the performance of their group.

Status Differentials

H6a: Contingent workers with indeterminate status in the organization will be less likely to

share their knowledge than will full time employees.

H6b: Employees will be less inclined to share knowledge with lower status employees.

Organization Size

H7: Employees of larger organizations will be less likely to share knowledge than will be employees of smaller organizations.

METHODOLOGY

Respondents and Procedure

A total of 231 packages were distributed. Eighty-four packages were distributed to MBA or MPA students at four Canadian Universities in two provinces, 121 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. In this study, the unit of analysis was an individual who was currently or very recently employed in an organization. No occupation or industry was excluded in an attempt to study only 'knowledge workers', because as Kelloway and Barling (1999) note, the category is superfluous.

Each package that was mailed (151) through Canada Post contained an introductory letter, a five-page survey (Appendix A), a random draw entrance card, and two business reply-paid envelopes. Packages that were sent to candidates who had access to campus mail were supplied with two ordinary 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 107 lottery entrance cards).

In total, 126 individuals responded, for a response rate of 54.5%. Of those who indicated their gender, 71 were female and 55 were male. Of those who indicated their ages, the average 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 half a year and the longest tenure was 34 years.

In total, participants were in a total of 99 different occupations. The five most common occupations were engineer (13), sales (11), engineering manager (5), manager (5), and programmer (5), but the sample was also diverse enough to include an operational air navigator, a library technician, a geologist, a social worker, and a print copy operator.

These participants were in a total of 69 different industries. The five most common industries were government (16), education (10), manufacturing (9), finance (7), as well as computer (5) and research (5), but the sample also included people in the legal, aerospace, paper, and contract glazing industries.

Measures

Questionnaire Structure

The intention of the first section of the study was to develop scales to measure participants' perceptions of their organizations' management's commitment to knowledge sharing, their perception of the social interaction in their organizations, and the amount of technology that can facilitate knowledge sharing at their firms. These scales were regressed against a measure of the participants' attitudes towards knowledge sharing to determine if this would be significantly affected by these factors.

In the second part of the study, participants were asked to respond to a series of vignettes (inspired by Constant et. al (1994) and Jarvenpaa and Staples (in press)) to determine how situational variables affect their attitudes towards knowledge sharing. Each vignette, aside from a generic introductory vignette, explored the importance of either rewards, status differentials, or trust.

Scales

Four questions were asked in order to identify whether the participants perceive their organizations to be inimical to social interaction, or conducive to spontaneous meetings with new people. This scale was designed to assess the organizational social interaction climate. (Please

see Appendix B for a complete list of the items in each scale, and Appendix A for the complete survey as it was distributed to participants).

Six questions were designed to measure the respondents' perception of the degree of perceived management commitment towards knowledge sharing in their organizations.

Respondents were also asked six questions to assess the amount of technology that they had access to that could help to facilitate knowledge sharing. To assess the participants' perceptions of the extent of knowledge sharing in organizations, five questions were asked.

SECTION B: Vignettes

Twelve vignettes were also presented to the same respondents that answered the survey questions (please see Appendix C for a comprehensive list of the vignettes). They depict two characters, Pat and Jean, in a variety of contexts and situations. The characters' genders are deliberately obscured. Each vignette depicts an individual who is contemplating sharing information with a colleague. Respondents were asked to decide how the individual should respond, as well as to what degree they believe that this response is warranted. Each vignette focussed on three separate situational characteristics in order to determine how trust, status differentials, or reward structures influence the decision to share knowledge.

RESULTS

Part A: Scales

Four scales were developed for this study. The scale that measured the knowledge sharing attitudes of the participants had a Cronbach's alpha score of 0.85. The scale that measured the social interaction climate of the participants' organizations had a Cronbach's alpha score of 0.74. The scale that measured the participants' perception of their managers' support for knowledge sharing had a Cronbach's alpha score of 0.79. The scale that measured the presence in participants' organizations of technology that can facilitate knowledge sharing had a Cronbach's alpha score of 0.72. Each scale was then submitted to a principal components factor analysis, with the results shown in Appendix D.

Regression / Significances

A number of elements were regressed against the knowledge-sharing scale. The elements were: the size of the participants' organizations, the participants' ages, genders, and tenure in their organizations, as well as the three other scales discussed earlier: social interaction climate, managerial commitment to knowledge sharing, and presence of technology that can facilitate knowledge sharing.

Of these elements, both managerial support for knowledge sharing and social interaction

climate were significant predictors of knowledge sharing. Their p-values were both 0.00. The slope of the coefficient of perceived management commitment to knowledge sharing was a fairly large 0.26, and the slope of the coefficient of the social interaction climate was an even larger 0.45. Both the managerial support for knowledge sharing and social interaction climate scale had positive impacts on the knowledge sharing scale. With a p-value of 0.02, the size of the participants' organizations was also significant, even if less so, but its respective slope coefficient was so small, at -0.000012, that we cannot yet conclude that organizational size is in fact a significant predictor of knowledge sharing.

The presence of technology that can facilitate knowledge sharing was not a significant predictor of knowledge sharing; $p > 0.05$. Gender, organizational tenure, and age were also not significant; $p > 0.05$.

Knowledge Sharing: Regression Results

Predictor Variable	R-Squared Values	Beta Values	F-Values
Age	0.01	0.05	0.40
Gender	0.00	-0.09	-1.21
Social Interaction Climate	0.37	0.33	3.86***
Management 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****

Table 5

* 0.05 > p

*** 0.001 > p

**** 0.0001 > p

Interactions and Moderators – An Exploratory Investigation

Interactions were determined by first standardizing the predictors and computing cross products. A two step regression was then run, with the simple predictors in the first step and the interaction on the second step. The change in the R-Squared statistic for an interaction between age and perceived management commitment to knowledge sharing was 2.3% and significant at the 0.05 > p level. The change in the R-Squared statistic for an interaction between age and the presence of technology that can facilitate knowledge sharing was 4.4% and was significant at the 0.05 > p level. The change in the R-Squared statistic for an interaction between gender and

social interaction climate was 32.4% at the $0.001 > p$ level.

To assess the direction of the influence of the age related interactions, the sample was divided into three approximately equal categories: younger workers (aged 19-24, $n=44$), medium aged workers (aged 25-30, $n=41$), and middle-aged workers who were older than the other workers (aged 31-58, $n=36$). Separate regressions were run for each age category, and the coefficients and significances were compared.

Gender interacted with social interaction climate with regards to knowledge sharing. That is, women who reported a positive social interaction climate were also more likely to have positive attitudes towards knowledge sharing in their organizations. Age interacted with perceived management commitment to knowledge sharing with regards to participants' attitudes towards knowledge sharing in their organizations. The youngest workers, aged 19-24, who perceived high management commitment to knowledge sharing in their organizations were unlikely to have positive attitudes towards knowledge sharing, in comparison to their older counterparts.

Moderators were determined by splitting the sample into categories (male / female, and young, medium, older) and running separate regressions. The differences in regression weights were tested according to this formula: $z=(b1-b2)/\sqrt{se1*se1 + se2*se2}$. In this case, $b1$ and $b2$ are the unstandardized regression weights of each variable, and $se1$ and $se2$ are the standard errors of each variable. The resulting z-score is interpreted as significant if it exceeds 1.654 (one

tail) or 1.96 (two tails).

Age moderated the impact of social interaction climate on knowledge sharing. For workers aged 25 to 30, social interaction climate was no longer a significant predictor of knowledge sharing attitudes, although it remained significant for younger and older workers with p-values of 0.00 and 0.03 respectively. The unstandardized slope coefficient for age-moderated social interaction climate was important for the youngest group, at 0.55, and it was also important for the oldest group, at 0.23. This middle group was significantly different from the younger group at a 2-tailed level of significance (2.23) and it was significantly different from the older group at a 1-tailed level of significance (1.71).

Age moderated the impact of organizational tenure on knowledge sharing. For workers aged 25 to 30, organizational tenure was a significant predictor of knowledge sharing attitudes, with a p-value of 0.00 and an unstandardized slope coefficient of -0.22, although it remained insignificant for younger and older workers. This middle group was significantly different from the younger group at a 1-tailed level of significance (1.6541) and it was significantly different from the older group at a 2-tailed level of significance (-2.87).

Vignettes

Each vignette was designed to elucidate a participant's response to a situation where either trust, status differentials, or reward structures were important. To determine if the

responses to the vignettes were significantly different from each other, one-way ANOVAs were conducted within each group. Subsequent paired t-tests revealed that people responded significantly differently to opposite instances of the same issue.

One-way ANOVA Results

Group	df	F
Rewards		
group bonuses / individual bonuses	125	3.56***
group bonuses / no bonuses	125	5.67***
group bonuses / stock options	122	13.20***
individual bonuses / no bonuses	125	2.91*
individual bonuses / stock options	122	11.91***
no bonuses / stock options	122	10.75***
Trust		
never met / friendly & helpful reputation	124	14.65***
never met / unhelpful reputation	124	25.81***
never met / always asking for help	124	14.85***
never met / friends since starting	125	13.90***
unhelpful reputation / always asking for help	125	20.73***
unhelpful reputation / friendly & helpful reputation	125	6.338***
unhelpful reputation / friends since starting work	125	5.58***
friendly & helpful reputation / always asking for help	125	8.60***
friendly & helpful reputation / friends since starting work	125	21.97***
always asking for help / friends since starting work	125	11.93***
Status		

lower status sharer / contract worker	124	8.81***
lower status sharer / higher status sharer	124	7.50***
contract worker / higher status sharer	125	6.99***

Table 6

* 0.05 > p

*** 0.001 > p

Reward Structures

There were four vignettes that dealt with different reward structures. Each vignette had a different mean score. The lowest mean score (4.17) was in response to a situation where the organization awarded bonuses for individuals. The next lowest mean score (5.39) was in response to a situation where the company did not award bonuses to individuals but where everyone participated in a stock option plan. The second highest mean score (5.83) was in response to a situation where the company did not award bonuses for exceptional work. The highest mean score (6.06) was in response to a situation where the company awards bonuses on the basis of a group's performance and the knowledge sharing was between group members. This was the highest mean score in comparison to all the vignettes in the study.

Impact of Reward Structure on Knowledge Sharing

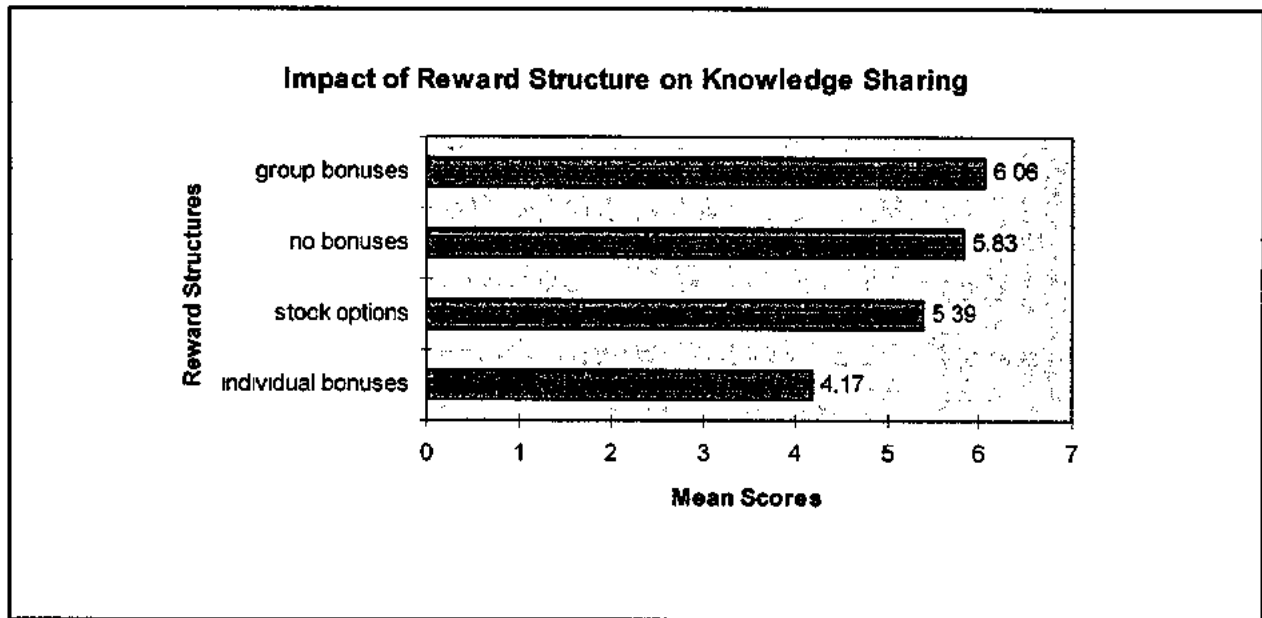


Figure 1

In paired t-tests, the mean of the vignette that described a situation with bonuses for individual performance was significantly different from all other vignettes that described a reward structure (i.e. stock options, no bonuses, bonuses for group performance). Because the vignette that described a situation with bonuses for individual performance had the lowest mean (4.17) of the vignettes that described a reward structure, we may conclude that reward structures that emphasise individual performance discourage people from sharing their knowledge.

The mean of the vignette that describes a situation where there are bonuses based on the performance of the group (and with the highest mean; 6.06) was, according to paired t-tests, significantly different from all other vignettes that described reward structures, except for the one that described a situation with no bonuses at all. This last vignette was also significantly

different from all the other vignettes that dealt with reward structures. From this we may conclude that bonuses based on group performance are more conducive to knowledge sharing than stock options or bonuses for individual performance.

The vignettes that described the two situations with the middle mean scores, (stock options for everyone (5.39) and no bonuses for anyone (5.83)), were significantly different from each other, according to paired t-tests with a p-value of 0.00. A compensation situation where there are no bonuses appears to be more conducive to knowledge sharing than a compensation situation with stock options for all employees.

Based on the vignette means and the paired t-tests, it appears as though the reward structure most conducive to knowledge sharing is bonuses based on group performance, followed by a system with no bonuses for individual performance, followed in turn by a structure that provides stock options for everyone. The reward structure that appears to inhibit knowledge sharing is one that provides bonuses for individual accomplishments.

Trust

There were five situations that dealt with situations where there were varying levels of trust. The lowest mean score (3.74) was in response to a situation where the party who was asking for knowledge had a reputation for never helping anyone. The second lowest mean score (4.38) was in response to a situation where the party who was asking for knowledge had a

reputation for constantly asking for help. The middle mean score (4.62) was in response to a situation where the two parties worked in different departments of the same company and had never met each other. The second highest mean score (5.78) was in response to a situation where the party seeking knowledge was generally regarded to be friendly and helpful. The highest mean score (5.87) was in response to a situation where the two parties were friends.

The vignette that depicted a close friend asking for knowledge was the only one where *not* a single participant indicated (with a 1 on the seven point Likert scale) that they would *not* share the knowledge. All other responses to the other vignettes ranged from a high of seven to a low of one. However, the vignette that depicted the close friends was not significantly different from the vignette that identified the knowledge seeker as friendly and helpful. A friendship appears to provide a modicum of insurance against receiving no knowledge from colleagues, but a reputation for being friendly and helpful seems to provide an equal maximum potential for knowledge sharing.

Impact of Trust on Knowledge Sharing

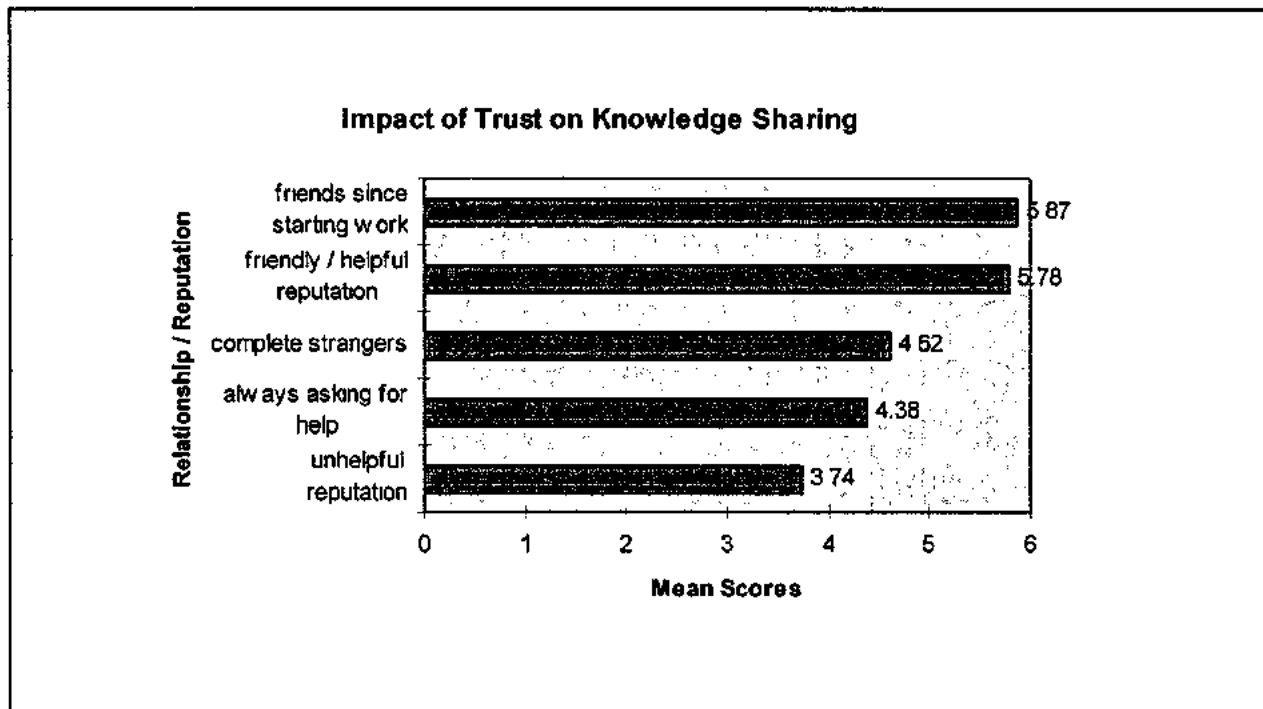


Figure 2

According to paired t-tests, this vignette that depicted the close friends was significantly different from and had a higher mean than the vignette where the two parties did not know each other, the vignette that depicted the knowledge seeker with the reputation for never helping anyone, and the vignette that featured a knowledge seeker who was constantly asking for help.

Interestingly, according to a paired t-test, participants did not react significantly differently to a vignette that depicted a stranger asking for knowledge and a vignette that depicted someone asking for knowledge who had a reputation who was always asking for help.

Status

There were three questions that dealt with situations where the two potential parties in the knowledge sharing transaction had different statuses in the organization. In the situation with the lowest mean score (4.36), the potential knowledge sharer was a contract employee while the other party was a permanent employee. In the situation with the middle mean score (5.24), the sharer was a very senior programmer while the other party was a new entry level employee in another division. In the situation with the highest mean score (5.33), the sharer was a new entry level employee while the other party was a very senior manager in another division.

Impact of Status Differentials on Knowledge Sharing

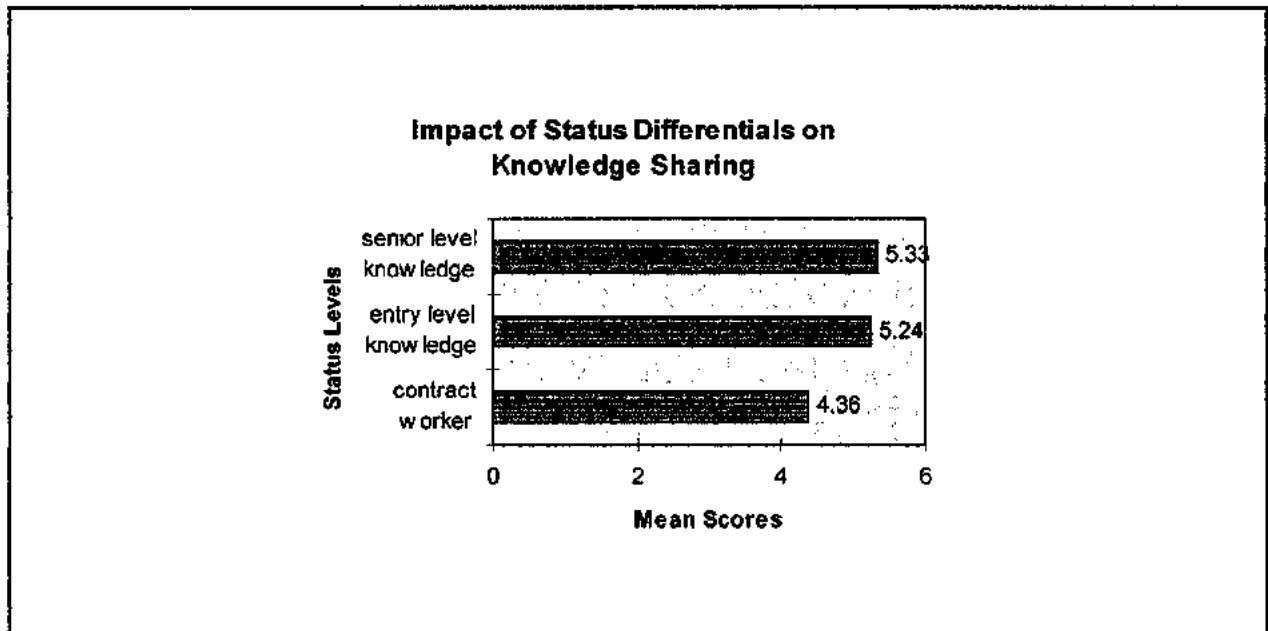


Figure 3

Although there was no significant difference between the knowledge sharing attitudes expressed towards the vignettes with senior and entry-level employees, employees were not as likely to share with a contract worker as they were to share with either a more junior or more senior employee.

DISCUSSION

Overview

Perceived managerial commitment to knowledge sharing and a positive social interaction climate were both predictors of organizational knowledge sharing, while technology was not. Employees were most likely to want to share knowledge when they trusted them, did not see them as an outsider, and did not believe that they would be penalized for sharing with them. Employees in smaller organizations were more likely to share knowledge than were employees in larger organizations.

Managerial Commitment

According to the findings of the regression against the knowledge sharing scale, hypothesis one, that managerial commitment is a significant predictor of knowledge sharing attitudes, was supported. It appears as though employees are interested in acting in accordance with management direction.

These findings were also supported by the comments that participants added to their questionnaires when they filled them out. (Please see Appendix E for a complete list of all participants' comments). Many participants underscored the importance of a manager in not only determining and communicating policies for employees to follow "as long as the company

approves [employees] should be willing to share” but also in fostering a “good group spirit” that would be conducive to knowledge sharing. The ability of management to diminish knowledge sharing activity was also acknowledged by other participants.

Age interacted with perceived management commitment to knowledge sharing with regards to participants’ attitudes towards knowledge sharing in their organizations. Young workers, aged 19-24, who perceived high management commitment to knowledge sharing in their organizations were not more likely to have positive attitudes towards knowledge sharing, in comparison to their older counterparts. This may be due to the nature of these young workers’ jobs. In this sample, the majority of the participants at this age would be University students, working at part time or temporary summer jobs. Not only is it possible that their management has never discussed their commitment to knowledge sharing with these workers, but if they do not intend to keep these jobs permanently, they may not care what their managers would prefer them to do.

Social Interaction Climate

According to the findings of the regression against the knowledge sharing scale, hypothesis two (that social interaction climate is a significant predictor of knowledge sharing attitudes) was supported. These findings suggest that an organizational environment that is conducive to social interaction is also conducive to knowledge sharing, or that an employee who is predisposed to be sociable is also predisposed to share knowledge.

Although it is not possible to infer causality, it is possible that knowledge sharing is encouraged by increased social interaction. This could be because people are more likely to seek or offer knowledge when they are aware that it is possessed by a colleague. 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 those with whom they are friends (according to the paired t-tests of the vignettes), social interaction may be conducive to knowledge sharing because it increases the likelihood of an employee making friends with colleagues.

Gender interacted with social interaction climate with regards to knowledge sharing. That is, women who reported a positive social interaction climate were also more likely to have positive attitudes towards knowledge sharing in their organizations.

If the respondents work in homogenous work environments, then gender may not be an issue for most of the workers. For example, a male engineer who works with other male engineers may have different knowledge sharing attitudes 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 (i.e. of the same gender), then employees of a minority gender may be less likely to share knowledge freely. Such considerations are echoed in the comments of one participant, who explains that “[she] worked for several years at a well-established “old boys club” company with NO company communication / knowledge sharing.” It may be that they shared knowledge with each other, even though they would not with her.

Age was a moderator of the impact of social interaction climate on participants' attitudes towards knowledge sharing. For workers aged 25 to 30, social interaction climate was no longer a significant predictor of knowledge sharing attitudes, although it remained significant for younger and older workers. For this sample, workers in this age group were likely to be MBA or MPA students, in the early stages of their careers. They may be so focussed on advancing in their organization, that they put personal relationships aside when determining with whom to share their knowledge. Or, their education may have influenced them to have stable knowledge sharing attitudes that are not influenced by social relationships. Alternately, because of their industries (predominantly high technology) they may take a positive social interaction climate for granted, and base their decision to share knowledge on other factors.

Interestingly, for this same age group, participants with longer organizational tenure became significantly less likely to have positive attitudes towards knowledge sharing than their younger and older co-participants. It may be that participants in this age group with less tenure have positive attitudes, because they realize they have much to learn about organizational practices, but as they gain more experience, they feel that they have less to gain from knowledge sharing exchanges, and so they adopt less positive knowledge sharing attitudes. This may result in serious consequences for organizations who wish to encourage their most knowledgeable and experienced employees to share their knowledge, however it is encouraging to note that this group does respond to communication about management commitment to knowledge sharing.

Knowledge Sharing Facilitating Technology

According to the findings of the regression against the knowledge sharing scale, hypothesis three (that the presence of technology that can facilitate knowledge sharing is a significant predictor of knowledge sharing attitudes) was not supported.

It is possible that this study used an inadequate measure of the presence of technology (despite the high Cronbach's alpha score). The findings may have been different if the measure had taken into account the level of training or comfort that participants had with this technology, or if it had included a different type of technology.

It may be that employees use knowledge sharing technology to communicate with colleagues with whom they already enjoy a knowledge sharing relationship. In the absence of technology, they would continue to share with these people (e.g. with phone calls or in person instead of in an email discussion group).

It was interesting to note that although the technology did not appear to be significantly conducive to knowledge sharing, 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 did not see value in sharing knowledge with each other.

The comments of one participant underscore the relationship between technology and

managerial commitment. As he or she explains, “A server was set up in a way so that documents could have been easily shared, but employees were instructed not to do this”. In this case, the technology was present, but this factor alone was not sufficient to encourage knowledge sharing. Technology may also be ineffective if employees are unaware of its existence, are not trained on how to use it, or if it is not accessible to all levels of the organization (as various participants noted).

Clearly, future research is necessary to determine if the presence of knowledge sharing technology does not have any impact on knowledge sharing 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).

Reward Structure

According to the findings of the paired t-tests between the vignettes that described various reward structures, hypothesis four (that employees who are rewarded based on individual performance will have less positive knowledge sharing attitudes than employees whose rewards are based on more collective goal achievement) was supported.

These findings may be due to employees acting in self-interest. When the reward system is set up so that financial benefits are allocated to a group’s performance, and an employee is part

of that group, and the performance of the group is determined in part by the knowledge of the group members, each employee has a financial incentive to try to enhance the entire group's performance. In contrast, if each employee needs to compete against each of the others for financial rewards, each employee has a financial incentive to protect any competitive advantage – hence knowledge hoarding.

It was interesting that the responses to the vignette that described a situation with no bonuses were not significantly different from the responses to the vignette that described a situation with stock options for all employees. It may be that the respondents did not associate the value of the stock options with the performance of their group. They may consider stock options to be either too abstract or indistinguishable from yet another benefit. It would be interesting to see if employees would become more likely to share their knowledge if the relationship between the performance of their fellow employees and the stock price of their company was made more clear. Of course, such information, if reiterated by management, could also be interpreted by employees as evidence of managerial commitment towards knowledge sharing in their organization.

Employees also act in their best interest when they become less willing to share their knowledge if they are evaluated on their individual performance. If knowledge is the key to their performance, and they are evaluated in relation to their peers, then the tangible rewards of the bonus (e.g. financial reward and recognition from management and peers) may outweigh the intangible rewards of sharing knowledge (e.g. potentially strengthened relationship with

colleagues, or potentially increased chances of receiving knowledge in the future).

Trust

According to the findings of the paired t-tests between the vignettes that described various reward structures, hypothesis five (that employees who trust that the other will reciprocate the knowledge sharing behaviour will be more likely to share knowledge) was supported.

Employees appear to be trying to maximise their accrued knowledge by carefully selecting the type of person with whom they will share knowledge. Not only do workers try to avoid appearing to be unhelpful (which would result in fewer people sharing knowledge with them), but they want to avoid wasting their resources on someone who will not reciprocate. As a result, employees prefer to exchange knowledge with those they trust, either by reputation or by experience.

There is a sense in certain comments by participants that employees do not want to be taken advantage of by their fellow employees. As one participant explains, “I have a problem with people who expect everything done for them and they get a free ride,” and another elaborates, “unfortunately, you can’t trust everyone [and] you must think of your own protection.”

In contrast, when employees do trust each other, knowledge sharing becomes normal. As

one participant explained, “the workers are like family. Everyone is comfortable with each other and exchange info clearly.”

More research needs to be done to determine whether employees become more likely to trust that their colleagues will reciprocate their knowledge sharing if there is more social interaction. It may be that increased social interaction leads to increased trust, which in turn leads to more knowledge sharing. In addition, a smaller organizational size may be more conducive to increased social interaction, which would lead to increased trust, which may lead to increased knowledge sharing.

Status Differentials

According to the findings of the paired t-tests between the vignettes that described various reward structures, hypothesis six (a) (that contingent workers with indeterminate status in the organization will be less likely to share their knowledge than will full time employees) was supported, and hypothesis six (b) (that employees will be less inclined to share knowledge with lower status employees) was not supported.

These finding suggest that the most important status differential is between insiders and outsiders, rather than between upper echelon elites and entry level serfs. Contingent workers, who have no job security and who may need to justify their value to the organization based on the scarcity or uniqueness of their knowledge, have little incentive to share their knowledge.

They may feel that they are sharing themselves out of a job. The mistrust of contingent workers towards permanent workers appears to be reciprocated; in the words of one participant, “knowledge shouldn't be shared with contract workers until they become permanent.” Further research could explore the specifics of the knowledge hoarding bias with regards to contingent workers.

Although this study did not explore the nature of unsolicited advice as a form of knowledge sharing, the comments of one of the participants explains that there is in certain circumstances a bias against lower level employees. Their advice is apparently not valued and may be interpreted as hostile. As he or she notes, “my company seems to have problems with employees giving opinions to management in that they take this as employees speaking ‘out of turn’.” Further research could elaborate on the actual direction of knowledge sharing – can it be uni-directional or does it require an exchange?

Organizational Size

According to the initial regression, hypothesis seven, that organizational size is a significant predictor of knowledge sharing attitudes, was not supported. Although the effect of organizational size was statistically significant, the impact of the effect was so small that it is not possible to conclude that organizational size is a predictor of knowledge sharing. Further research should be conducted to determine if in fact knowledge sharing is more prevalent in smaller organizations.

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 quite respectable, the sample size was quite 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.

Some potential variables, that may yield interesting results but that were not addressed in this study were identified by participants in their questionnaire comments. These variables, that could be examined in future research, include: 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 attitude norms for different industries. For example, are teachers more likely to share knowledge than stockbrokers?

This study used fairly simple vignettes to test attitudes towards knowledge sharing, so it is not possible to evaluate the impact of one element (e.g. reward structure) against another (e.g. trust). More complex vignettes could easily be developed that could make such comparisons possible.

SUGGESTION FOR FUTURE RESEARCH

Because perceived management commitment to knowledge sharing appears to be such an important predictor of knowledge sharing behaviour, it would be interesting to perform an intervention study to verify this finding. A group in a single organization could be randomly divided into two. Both subgroups would have their initial knowledge sharing attitudes assessed, and then one group would be encouraged by their managers to share their knowledge freely. The control group would not receive this message. After some time had elapsed, both groups would have their knowledge sharing attitudes reassessed. If there was indeed a significant difference, and the more clearly communicated management commitment to knowledge sharing was effective in changing employees' attitudes, then the remaining subgroup would also receive the intervention. Various means of communicating management's commitment to knowledge sharing could also be tested.

SUMMARY AND CONCLUSIONS

This study confirms the hypotheses that a positive social interaction climate and perceived management commitment to knowledge sharing can have positive impacts on knowledge sharing in organizations. Organizations now have more information with which to formulate their knowledge management strategy. An organization who seeks to increase knowledge sharing among its employees may well prefer to forego implementing an expensive new knowledge sharing software in favour of hosting more social events for employees, telling them to share their knowledge, and rewarding employees on the basis of their team's performance.

This study provides many starting points for future research. The impact of gender and age 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 climate when deciding whether or not to share their knowledge, and which showed how knowledge sharing attitudes are determined by different elements for employees at different stages of their working lives, has opened the door to further research in this area.

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Appendix A: Complete Survey

For the first section, please circle the number that corresponds with how much you agree or disagree with the statement.

	No, I disagree				Yes, I agree		
	1	2	3	4	5	6	7
I get to meet a lot of people outside my work group.							
I am rewarded by my manager for sharing information with people in the organization.							
If I helped someone in my organization, they would return the favour.							
Everyone in my work group receives the same compensation.							
Management seems to be serious about getting workers to share information with each other.							
People in this organization share their ideas openly.							
In my organization, who you can talk to depends on what your job title is.							
When my colleague succeeds, we all benefit.							
My manager would like me to share more information with other people in the organization.							
My colleagues are knowledgeable enough to be able to answer my questions.							
If I started sharing information or ideas with other people in the organization, my manager would be really annoyed.							
People in this organization are willing to share knowledge/ideas with others.							
At social events at my company, people really just talk to the people in their own work groups.							

	No, I disagree				Yes, I agree		
	1	2	3	4	5	6	7
My manager doesn't really care if I share information or not.							
Everyone in my work group has the same job title.	1	2	3	4	5	6	7
My manager has told me to share more information with other people in the organization.	1	2	3	4	5	6	7
The best way to keep your job is to make sure you're the only one who knows how to do it.	1	2	3	4	5	6	7
This organization is good at using the knowledge/ideas of employees.	1	2	3	4	5	6	7
I see everyone in my work group on a regular basis.	1	2	3	4	5	6	7
I know that management will make good use of any information that I give them.	1	2	3	4	5	6	7
My company sponsors lots of social activities.	1	2	3	4	5	6	7
I would feel comfortable walking up to anyone in my company and starting a conversation.	1	2	3	4	5	6	7
I feel really isolated at work.	1	2	3	4	5	6	7
My organization has a special knowledge-sharing initiative underway.	1	2	3	4	5	6	7
People in this organization keep their best ideas to themselves.	1	2	3	4	5	6	7
Everyone in the organization get the same perks (office size or decorations, chair, computer monitor size, parking privileges etc.).	1	2	3	4	5	6	7
My organization rewards people on the basis of their individual achievement.	1	2	3	4	5	6	7
People with expert knowledge are willing to help others in this organization.	1	2	3	4	5	6	7

	No, I disagree				Yes, I agree		
	1	2	3	4	5	6	7
I am mainly motivated by my paycheck.							
I compete against my colleagues for recognition.							
My organization has a person or office in charge of knowledge sharing.							
I use my organization's electronic phone book or directory regularly.							

This next section is a series of vignettes. Please read each one and circle the number that corresponds best with how strongly you feel that Pat should share or should not share the new software with Jean. What would you do if you were Pat?

	Don't Share				Share		
	1	2	3	4	5	6	7
Pat and Jean both work at your company. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean are both employees at your company who work in completely different divisions and who have never met each other. Pat just finished developing a wonderful piece of software. Jean heard about it, and has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Jean has a reputation for never helping anyone. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. They are both part of the same work group, and they receive bonuses on the basis of the group's performance. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Pat is a new, entry level employee who just finished developing a wonderful piece of software. Jean, a very senior manager in another division has asked for a copy. Should Pat share with Jean?							

	Don't Share					Share	
	1	2	3	4	5	6	7
Pat and Jean both work at your company. Jean is generally regarded to be friendly and helpful. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Your company's policy is to award bonuses for individuals who do exceptional work. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Pat is a contract worker who would like to join your company, while Jean has been a permanent employee for a long time. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. It is your company policy to <u>not</u> award bonuses for exceptional work. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Jean has a reputation for constantly asking everyone for help. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. They started work at the same time, and have remained friends ever since. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?							
Pat and Jean both work at your company. Pat, a very senior programmer, just finished developing a wonderful piece of software. Jean, a new entry level employee in another division, has asked for a copy. Should Pat share with Jean?							

Pat and Jean both work at your company. Although your company's policy is to not award individual bonuses for exceptional work, they do offer a generous stock options plan that everyone participates in. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Don't Share					Share	
1	2	3	4	5	6	7

In this final section, please answer in the space provided.

Profession: _____

Industry: _____

Gender: _____

Age: _____

Number of years spent with this organization: _____

Approximate number of people in my organization: _____

Approximate number of people in my organization who I would feel comfortable asking for advice or information: _____

Number of people in my immediate work group: _____

My company has (check all that apply):

- an Intranet
- an organizational directory
- an Intranet forum where employees can ask questions and post answers
- email discussion forums where employees can ask questions and post answers
- software that is designed to encourage information exchange
- a server set-up so that documents can be easily shared

Comments (optional): _____

Appendix B: Scale Items

Social Interaction Climate

These questions were rated by respondents on a seven-point Likert type scale, (1 = No, I disagree, 7 = Yes, I agree).

Questions:

- ▶ In my organization, who you talk to is determined by what your job title is.
- ▶ At social events at my company, people mostly just talk to the people in their own work groups.
- ▶ I would feel comfortable walking up to anyone in my company and starting a conversation.
- ▶ I feel really isolated at work (R).

Perceived Management Commitment to Knowledge Sharing

These questions were rated by respondents on a seven-point Likert type scale, (1 = No, I disagree, 7 = Yes, I agree).

Questions:

- ▶ I am rewarded by my manager for sharing information with people in the organization.
- ▶ My manager would like me to share more information with other people in the organization.

- ▶ My manager has told me to share more information with other people in the organization.
- ▶ My manager doesn't really care if I share information or not (R).
- ▶ Management seems to be serious about getting workers to share information with each other.
- ▶ My organization has a special knowledge-sharing initiative underway.

Technology

Participants were asked to indicate whether their organization had any of the following:

Questions:

- ▶ An Intranet.
- ▶ An organizational directory.
- ▶ An Intranet forum where employees can ask questions and post answers.
- ▶ Email discussion forums where employees can ask questions and post answers.
- ▶ Software that is designed to encourage information exchange.
- ▶ A server set-up so that documents can be easily shared.

Knowledge Sharing Scale

These questions were rated by respondents on a seven-point Likert type scale, (1 = No, I disagree, 7 = Yes, I agree).

Questions:

- ▶ People in this organization are willing to share knowledge/ideas with others.
- ▶ This organization is good at using the knowledge/ideas of employees.
- ▶ People in this organization keep their best ideas to themselves (R).
- ▶ People in this organization share their ideas openly.
- ▶ People with expert knowledge are willing to help others in this organization.

Appendix C: Vignettes

Vignettes

Respondents were asked to decide how the individual should respond, as well as to what degree they believe that this response is warranted. This attitude was measured by a seven point Likert scale (1 = No, I disagree, 7 = Yes, I agree).

The importance of trust

Pat and Jean are both employees at your company who work in different divisions and who have never met each other. Pat just finished developing a wonderful piece of software. Jean heard about it, and has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Jean has a reputation for never helping anyone. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Jean has a reputation for constantly asking everyone for help. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. They started work at the same time, and have remained friends ever since. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Jean is generally regarded to be friendly and helpful. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

The importance of status differentials

Pat and Jean both work at your company. Pat is a new, entry level employee who just finished developing a wonderful piece of software. Jean, a very senior manager in another division has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Pat, a very senior programmer, just finished developing a wonderful piece of software. Jean, a new entry level employee in another division, has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Pat is a contract worker who would like to join your company, while Jean has been a permanent employee for a long time. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

The importance of reward structures:

Pat and Jean both work at your company. It is your company policy to not award bonuses for exceptional work. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Your company's policy is to award bonuses for exceptional work. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. Although your company's policy is to not award bonuses for exceptional work, they do offer a generous stock options plan that everyone participates in. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

Pat and Jean both work at your company. They are both part of the same work group, and they receive bonuses on the basis of the group's performance. Pat just finished developing a wonderful piece of software. Jean has asked for a copy. Should Pat share with Jean?

**Appendix D: Factor Analysis Results
for Each Scale (Tables 1a - 4b)**

Knowledge Sharing Factor Analysis Results

Component	Eigenvalues	Percentage of Variance Explained	Cumulative Variance Explained
1	3.16	63.251 %	63.251%
2	0.665	13.305	76.555
3	0.532	10.648	87.204
4	0.392	7.843	95.046
5	0.248	4.954	100.000

Table 1a

Knowledge Sharing Factor Loadings

Item	Factor Loading
People in this organization share their ideas openly.	0.872
This organization is good at using the knowledge / ideas of employees.	0.781
People in this organizations are willing to share knowledge / ideas with others.	0.862
People with expert knowledge are willing to help others in this organization.	0.720
People in this organization keep their best ideas to themselves. (Reverse coded).	0.728

Table 1b

Social Interaction Climate Factor Analysis Results

Component	Eigenvalues	Percentage of Variance Explained	Cumulative Variance Explained
1	1.988	49.700 %	49.700 %
2	0.919	22.964	72.664
3	0.718	17.955	90.618
4	0.375	9.382	100.000

Table 2a

Social Interaction Climate Factor Loadings

Item	Factor Loading
My company sponsors lots of social activities.	0.427
I would feel comfortable walking up to anyone in my company and starting a conversation.	0.868
In my organization, who you can talk to depends on what your job title is. (Reverse coded).	0.653
I feel really isolated at work. (Reverse coded).	0.791

Table 2b

Perceived Management Commitment Factor Analysis Results

Component	Eigenvalues	Percentage of Variance Explained	Cumulative Variance Explained
1	3.006	50.095 %	50.095 %
2	0.827	13.776	63.871
3	0.760	12.670	76.542
4	0.584	9.726	86.267
5	0.444	7.397	93.665
6	0.380	6.335	100.000

Table 3a

Perceived Management Commitment Factor Loadings

Item	Factor Loading
I am rewarded by my manager for sharing information with people in the organization.	0.785
Management seems to be serious about getting workers to share information with each other.	0.762
My manager would like me to share more information with other people in the organization.	0.769
My manager has told me to share more information with other people in the organization.	0.694
My manager doesn't really care if I share information or not. (Reverse coded).	0.618

Table 3b

Technology that can Facilitate Knowledge Sharing Factor Analysis Results

Component	Eigenvalues	Percentage of Variance Explained	Cumulative Variance Explained
1	2.505	41.758 %	41.758 %
2	1.102	18.372	60.130
3	0.832	13.869	73.999
4	0.627	10.445	84.444
5	0.584	9.741	94.184
6	0.349	5.816	100.000

Table 4a

Technology that can Facilitate Knowledge Sharing Factor Loadings

Item	Factor Loading	
	Component 1	Component 2
My company has:		
An Intranet	0.721	-0.323
An organizational directory	0.635	-0.138
An Intranet forum where employees can ask questions and post answers	0.620	0.566
Software that is designed to encourage information exchange	0.637	-0.144
A server set-up so that documents can be easily shared	0.742	-0.384
Email discussion forums where employees can ask questions and post answers	0.494	0.701

Table 4b

Appendix E: Participants' Comments

Server set-up so that documents can be easily shared was attempted but no training, no accountability, no hierarchy

I have a problem with people who expect everything done for them and they get a free ride. In my experience, technical expertise advice has been openly shared.

Poor immediate supervisor and competing departments cause problems outlined

I work in a restaurant. We have no computers or software because its not needed. The workers are like family. Everyone is comfortable with each other and exchange info clearly.

Survey not really applicable to the kind of job I have right now. I should have filled it out based on my work in a corporation. More introductory guidelines would have been helpful as a student filling out the questionnaire.

Internet site not promoted enough and underused despite great functionality.

I work in the field sales office (2 employees) of a large organization; the circumstances seem irrelevant in many of these vignettes

This company has email set up so that people feel comfortable asking for advice or information

We are so small I don't think this really applies. Sharing information is something that has to be done, or we all suffer from one person's mistakes. Also, I'm a student, so this is only a summer job.

Good Luck Catherine!

Since we don't get paid, \$ isn't an issue... it's all about helping the kids more effectively.

We did not have "job titles" to try and keep out hierarchy!

There are 500 people in my building but 1800 in the company. The first two [Intranet and organizational directory] items link all of us.

E-mail is not extensively used, more at the managerial level ie. managers have e-mail capability but not all staff do.

The knowledge-sharing initiative at his company is informal. Their compensation system is partly based on individual achievement, and partly on the success of the company.

Interesting Research -- good luck with your research!

Based on last job.

First part was hard for me since I am the "boss" -- I don't report to management.

My company has a very good knowledge-share infrastructure at work.

I do not know if a high school teacher's opinion is relevant. There are few external rewards either for good teaching or for information sharing. However, with few rewards there is little competition. A good group spirit fostered by a good department head can work wonders.

It's been my experience that those who are not team players don't stick around long. To retaliate against an uncooperative employee by refusing to share info, hurts the team, and makes you look uncooperative as well.

Not yet on-line -- Access to computers is limited to personal use in the educational centre except for offices/staff who have access at this time

Funding cuts have disrupted plans for information system. Downsizing has left morale low -- not much incentive to volunteer time to make such a project work.

My company has a software for processing prescriptions and an electronic bulletin board.

Regular staff meetings

The unchecked may exist, but I am as yet unaware of them.

When answering these questions I based my answers on my most previous work experience where I held a contract research position for 8 months until the research was completed.

Who I would feel comfortable asking for advice or information would depend on the question and the department.

My company seems to have problems with employees giving opinions to management in that they take this as employees speaking "out of turn". There are many times in a shift when there are too many hostesses / servers on for the amount of business, but if you ask to go, it is frowned upon instead of appearing conscientious (i.e. not wanting to get paid to stand around).

Immediate boss is very tight with information both to staff and to head office. Head office loves to share information.

The workplace in question was overseas, and was an international (multinational) organization. The workers were from many different countries. The organization's mandate was to help stabilize peace and security, and thus information sharing, via daily written and verbal reports was critical. The technical level was not highly sophisticated, given infrastructure constraints. My position, relatively low on the level of professional staff may reflect my interest in sharing information more than those higher up in the organization. However, the possession of

information contributing to policy decisions was considered to be valuable.

The organizational directory is not electronic. The Health Care Industry is way behind in electronic information systems.

In some cases with the questionnaire, it was hard for me to make a distinction between my immediate work group and the organization as a whole. Generally, I can't say that I interact as much with my organization as much as my immediate work group. Being more specific on this would have helped. Also, I wasn't sure what the '4' option was: neutral? That is what I assumed. Besides this, I found the questionnaire very user friendly, a good length, and with good straight simple questions. I wish you all the best in your research project!

The second section would have been easier to answer if you knew the purpose of the new software a new competitive product would be treated differently than something developed for in-house use.

Previous to this position, I worked for several years at a well-established "old boys club" company with NO company communication / knowledge sharing

A server was set up in a way so that documents could have been easily shared, but employees were instructed not to do this.

A server system so that documents can be easily shared has almost been implemented Does the shared s/w actually work? The wayaro with all our sharing is the wasted time getting 'bogus' s/w!

My "organization" is very big, but my "division" is about 20 people. I consider this to be my "company/organization".

Pat and Jean wasn't clear as to the repercussions of sharing. As long as the company approves they should be willing to share.

For Pat and Jean "4" was circled most frequently because sharing would be dependent upon a number of items including (recognition software was developed by Pat, if software development was already announced as finished by Pat prior to sharing). Unfortunately, you can't trust everyone or you must think of your own protection.

No electronic means of sharing info -- but monthly sessions for all office employees to share info.

Intranet is coming soon

Recognition is important when deciding whether to share something. Knowledge shouldn't be shared with contract workers until they become permanent.