

The implications of different models of social relations for understanding knowledge sharing

Niels-Ingvar Boer ¹⁾

Peter J. van Baalen ¹⁾

Kuldeep Kumar ²⁾

¹⁾ Department of Information and Decision Management, Erasmus University Rotterdam,
P.O. Box 1738, 3000 DR Rotterdam, The Netherlands
N.I.Boer@fbk.eur.nl / PBaalen@fbk.eur.nl

²⁾ Department of Decision Sciences & Information Systems, Florida International University,
University Park, BA 250, Miami, Florida, 33199, United States
Kumark@fiu.edu

Abstract

This paper explores how different models of social relations can contribute to a better understanding of the dynamics of knowledge sharing within different organizational settings. It is asserted that the dynamics of knowledge sharing is organized according to a mix of four relational models distinguished by the relation models theory (Fiske, 1991). It is described how each of these models (communal sharing, authority ranking, equality matching and market pricing) have their own implications for understanding and supporting the knowledge sharing process. What model of social relations is in use, is influenced by cultural implementation rules, the kind of activity with its division of labor and the characteristics of knowledge being shared and technologies being used. By knowing according to what relational model(s) knowledge is being shared, one can better understand and consequently better facilitate the organizational and technical conditions for sharing knowledge (and vice versa).

1. Introduction

It is generally agreed upon that knowledge sharing is a crucial process within organizational settings, whether these are for example project teams, formal work groups or communities of practice. One might even argue that sharing knowledge is the *raison d'être* of such organizational settings. After all, due to the division of labor and accompanying fragmentation, specialization and distribution of knowledge, it becomes a requisite to integrate and thus share the diversity of complementary knowledge in order to produce complex products and

services. An organizational setting has just been implemented or has emerged since none of the actors involved could produce the collective outcome individually.

Many practitioners and academics assume that since knowledge sharing is so important, people *will* share all the required knowledge. However, many companies and institutions have experienced that the reality is somewhat different. Textbox 1 describes the situation of organizations dealing with repetitive work trying to develop knowledge repositories in order to share their best practices. Textbox 2 addresses the implementation of communities within and between organizations in order to share knowledge among peers. Both examples are commonly encountered in many organizations but also indicate that knowledge sharing is not obvious in practice, whether a codified strategy (e.g. best practices) or a personalized strategy (e.g. communities) has been followed (Hansen, Nohria, & Tierney, 1999).

Hitherto, research has suggested a number of individual factors that may influence this lack of knowledge sharing. One explanation that has received much attention in literature is the epistemological impossibility to articulate all knowledge people have (Baalen, 2002). It is now accepted that we know more than we can tell (Polanyi, 1983). Besides cognitive limits, other individual factors include efficiency rationales, a lack of relevance recognition for sharing knowledge, a lack of 'who-knows-what' and the 'not-invented-here' syndrome. Also several organizational factors have been identified in literature that restrict knowledge sharing. Examples of these factors are: an organizational culture that discourages knowledge sharing; the lack of (billable) time to contribute to both knowledge repositories and community activity; badly

defined objectives for sharing knowledge; and the fact that technologies supposed to facilitate knowledge sharing are not appropriate. A third set of explaining factors is derived from the knowledge being shared. For example its codifiability, equivocality or heterogeneity that influence the knowledge sharing process considerably.

However, as Granovetter (Granovetter, 1982) has argued, neither an undersocialized perspective of individuals acting in isolation nor an oversocialized view of individuals obedient to norms and culture is adequate to explain behavior. Both the under- and oversocialized perspectives of knowledge sharing, as well as the combination of the two, neglect an important additional consideration: the social relationships among actors. This is an important omission because knowledge sharing is a fundamentally social phenomenon. Knowledge sharing involves a relationship between actors that is also embedded in a structure of other social relationships. These ongoing social relationships provide the constraints and opportunities that, in combination with characteristics of individuals, organizations and knowledge, may help explain the dynamics of knowledge sharing in organizations. In this paper an embedded perspective is adopted where individuals are considered to interact and share knowledge within a network of social relations.

Textbox 1 Developing best practices and using groupware technology

In an increasing competitive environment, organizations need to operate as efficiently as possible, especially when they are dealing with repetitive work (e.g., doing similar consultancy assignments, processing insurance claims or developing software). Since these organizations employ people who all have acquired particular knowledge in practice, it seems rational to try to benefit from this knowledge, so that every employee can take advantage of prior experiences of their colleagues. It would be inefficient to let people 'reinvent the wheel' every time. Therefore organizations have tried to set up knowledge repositories that contain best practices and other knowledge that could be of interest for other employees. Rationally most people subscribe the usefulness of such knowledge systems. However, in practice many repositories remained 'empty' since the employees did not contribute to the accumulation of knowledge in the database.

Not only within organizations dealing with repetitive work, but also within globally distributed projects one faces situations where technologies for sharing knowledge are not used as intended. Although groupware technology can support transforming the workflow of a project into a text and make it visible to everyone involved in the project, the database frequently remains rather incomplete due to the unwillingness of the project members to contribute to the project repository (Ciborra & Patriotta, 1996).

Knowledge sharing behavior is generally explained by just one model of social relations. Whereas some people, for example, assume that people share knowledge without expecting anything in return, others argue that people only share knowledge when they are being paid for it or acquire prestige. Also textboxes 1 and 2 indicate that there exist different social principles according to which people do or do not share knowledge. The relation models theory (Fiske, 1991) postulates that human relations may be based largely on combinations of four relational models: communal sharing, authority ranking, equality matching and market pricing. By taking these four relational models into account as mechanisms behind knowledge sharing, rather than just one, it is asserted that the understanding of knowledge sharing might improve. The objective of this paper is to explore how the four models of social relations can contribute to a better understanding of the dynamics of knowledge sharing within different organizational settings.

Textbox 2 Implementing communities

The last two decennia, a whole range of organizations have reorganized themselves into team-based organizations, since there was widespread agreement that multi-disciplinary working was essential in the new competitive environment (Orlikowski, Yates, Okamura, & Fujimoto, 1995). While moving from a functionally based company, where experts were located amongst others with similar backgrounds and interests, to one based on project teams, they found out that much cross-fertilization of ideas within disciplines were lost (Blackler, Crump, & McDonald, 1999). An increasing number of organizations have tried to solve their problem by creating communities as a way of maintaining connections with peers, continuing the abilities of specialists to work at the forefront of their own fields (Wenger, 1998). Appealing historic examples (Orr, 1990; Wenger & Snyder, 2000) probably have contributed to the desire of many organizations to implement similar communities within or between organizational settings. Although communities benefit from cultivation (Wenger & Snyder, 2000), their fundamentally informal and self-organizing nature makes a simple managerial implementation almost impossible (management paradox). And indeed, in practice many organizations are struggling with facilitating communities and the expected advantages for the knowledge sharing process do not always come off.

The rest of the paper is structured as follows. First, it is described how knowledge sharing implies a kind of social relation between people. Then, the four elementary models of social relations are described as brought forward by the relation models theory (Fiske, 1991). It is described how just four relational models can account for the diversity and complexity of social relations. Consequently, the implications of these four models for the knowledge sharing process are explained. The next section describes how the relational models can

be applied at an organizational level and can shape four different infocultures. When people share knowledge according to different relational models, have different interpretations of the same models, or when the rationale of a technology is not consistent with the relational model of its users, social conflicts might occur as is described next. The paper concludes with some summarizing remarks.

2. Knowledge sharing and social relations

In the introduction it has been stated that knowledge sharing is a fundamentally social phenomenon. 'Social behavior is inherently relational in nature: individual behavior assumes social meaning only in the context of human relations. The basic unit of analysis is therefore not individual behavior, but behavior-in-a-relational context (Fiske, 1991)'. In line with the idea of structuration (Giddens, 1984), it can be stated that a relationship between people is established as soon as they share knowledge with one another and that a particular relationship between people consequently influences the way knowledge is being shared. Knowledge can be shared between people interacting face-to-face, or mediated by technology both synchronous and asynchronous. 'It is not necessary that the 'other persons' be present or even exist – nor, if they do exist, that they actually perceive the action or perceive it as it was intended. A social relationship exists when any person acts under the implicit assumption that they are interacting with reference to imputedly shared meanings (Fiske, 1991)'.

The knowledge sharing process has fascinated researchers within a diversity of social disciplines, like philosophy, sociology, cognitive psychology, management science and economics. Within their own domain, each discipline has contributed to the understanding of knowledge sharing by providing different theoretical perspectives and accompanying theories. From this theoretical diversity different approaches for understanding the knowledge sharing process have emerged.

Knowledge sharing behavior is frequently explained as the product of an individual calculus of benefits and costs. People are assumed to strive to optimize or maximize the ratio of expected benefits to costs, risks or effort incurred. In this framework, all knowledge sharing behavior is seen as merely a means to the ultimate goal of long-run realization of individual self-interest. Knowledge is considered as a commodity that is being shared as a function of market prices or utilities. Not only economists (e.g. transaction costs economics (Williamson, 1975)) have taken such assumptions as their core axioms, but also other social scientists have taken them for granted as implicit assumptions.

However, self-interest realization is not the unique nor paramount motive for knowledge sharing behavior. Rather than assuming that humans are by nature (asocial) individualists, the idea that people are fundamentally

social, almost altruistic is another common idea. This can be illustrated by the emergence of communities, which has received an increasing interest recently (Wenger, 1998). The assumption underlying an 'ideal' community is that people freely share knowledge where they can, without keeping a scorecard of their gains and losses. This assumption about knowledge sharing is dominant within most current knowledge sharing initiatives. However, practice shows that the assumptions of this approach are not valid in all organizational settings (see textboxes 1 and 2).

Usually, only one approach of social relations is taken into account for understanding knowledge sharing. Davenport, for example, primarily relates to the first approach while labeling the second as unrealistic: 'Many knowledge initiatives have been based on the utopian assumption that knowledge moves without friction or motivation force, that people will share knowledge with no concern for what they may gain or lose by doing so (Davenport & Prusak, 1998)'. In contrast, within community thinking one primarily relates to the second approach. When adopting the assumptions of one approach, it is quite hard to understand the assumptions underlying the other approach. The phenomenon of an altruistic community is hard to explain within transaction costs thinking and vice versa. Nevertheless, the dynamics of knowledge sharing cannot be understood nor explained either by solely altruistic motives nor by solely motives of self-interest. Additional approaches, relational structures are required in order to understand those parts of knowledge sharing behavior that remains unexplained so far.

3. Different models of social relations

The relation models theory of Fiske (Fiske, 1991; Fiske, 1992) claims that people are fundamentally sociable. They generally organize their social life in terms of their relations with other people. In general people seek to create, sustain, and repair social relationships because the relationships themselves are subjectively imperative, intrinsically satisfying, and significant. The relation models theory integrates the work of the major social theorists and builds on a synthesis of empirical studies across the social sciences, including anthropological fieldwork. From an exhaustive review of the major thinking on relationships in sociology (such as Blau, 1964; Buber, 1987; Durkheim, 1966; Tönnies, 1988; Weber, 1975), social anthropology (such as Malinowski, 1961; Polanyi, 1957; Salins, 1965; Udy, 1959) and social psychology (such as Clark & Mills, 1979; Krech & Crutchfield, 1965; Leary, 1957; Piaget, 1973), Fiske argues for the existence of four fundamental forms of human relationships: communal sharing, authority ranking, equality matching and market pricing. The four social structures are manifestations of elementary mental models (schemata). Fiske's assertion about the pervasiveness and importance of these four

forms of human relationships is not a modest one. He hypothesizes that the four models are *fundamental*, in the sense that they are the lowest or most basic-level “grammar” for social relations. Further, the models are *general*, giving order to most forms of social interaction, thought, and affect. They are *elementary*, in the sense that they are the basic constituents for all higher order social forms. [...] they are *universal*, being the basis for social relations among people in all cultures and the essential foundation for cross-cultural understanding and intercultural engagement ((Fiske, 1991) p.25)’. Table 1 summarizes some of the major postulations of the relation models theory. Each of the relational models is now briefly described.

Communal sharing relationships (CS) are based on a conception of some bounded group of people as equivalent and undifferentiated. In this kind of relationship, the members of a group or dyad treat each other as all the same, focusing on commonalities and disregarding distinct individual identities. People in a CS relationship often think of themselves as sharing some common substance (e.g., family ties), and hence think that it is natural to be relatively kind and altruistic to people of their own kind. Close kinship ties usually involve a major CS component, as does intense love; ethical and national identities and even minimal groups are more attenuated forms of CS. When people are thinking in terms of equivalence relations, they tend to regard the equivalence class to which they themselves belong as better than others, and to favor it.

Authority ranking relationships (AR) are based on a model of asymmetry among people who are linearly ordered along some hierarchical social dimension. People higher in rank have prestige, prerogatives, and privileges that their inferiors lack, but subordinates are often entitled to protection and pastoral care. Authorities often control some aspects of their subordinates’ actions. Relationships between people of different ranks in the military are predominantly governed by this model, as are relations across generations and between genders in many traditional societies. Although, in principle, in any society or situation, people could be ranked in different hierarchies according to innumerable different status-relevant features, in practice, people tend to reduce these factors to a single linear ordering. When people are thinking in terms of such linearly ordered structures, they treat higher ranks as better.

Equality matching relationships (EM) are based on a model of even balance and one-for-one correspondence, as in turn taking, egalitarian distributive justice, in-kind reciprocity, tot-for-tat retaliation, eye-for-an-eye revenge, or compensation by equal replacement. People are primarily concerned about whether an EM relationship is balanced, and keep track of how far out of balance it is. The idea is that each person is entitled to the same amount as each other person in the relationship, and that the direction and magnitude of an imbalance are meaningful. Colleagues who are not intimate often interact on this basis: they know how far from equality

they are, and what they would need to do to even things up. People value equality and strongly prefer having at least as much as their partners in an EM relationship.

Market pricing relationships (MP) are based on a model of proportionality in social relationships and people attend to ratios and rates. People in an MP relationship usually reduce all the relevant features and components under consideration to a singular value or utility metric that allows the comparison of many qualitatively and quantitatively diverse factors. People organize their interactions with reference to ratios of this metric, so that what matters is how a person stands in proportion to others. Proportions are continuous, and can take any value. The most prominent examples of interactions governed by MP are those that are oriented towards prices, wages, commissions, rents, interest rates, tithes, taxes and all other relationships organized in terms of cost-benefit ratios and rational calculations of efficiency or expected utility.

Table 1 Postulations of relation models theory

-
- People are fundamentally sociable; they generally organize their social life in terms of their relations with other people.
 - People use just four relational models (*communal sharing*, *authority ranking*, *equality matching* and *market pricing*) to generate, understand, coordinate and evaluate these social relationships; the four social structures are manifestations of elementary mental models (schemata).
 - These models are autonomous, distinct structures, not dimensions; there is no continuum of intermediate forms.
 - People find each of the models of relationships intrinsically satisfying for its own sake. There is typically an extremely high degree of consensus among interacting actors about what model is, and should be operative.
 - People believe that they should adhere to the models, and insist that others conform to the four models as well.
 - Social conflicts often occur when people are perceived to be profoundly violating the elementary relationships.
 - The residual cases not governed by any of these four models are *asocial interactions*, in which people use other people purely as a means to some ulterior end, or *null interactions*, in which people ignore each other's conceptions, goals and standards entirely.
 - People commonly string the relational models together and nest them hierarchically in various phases of an interaction or in distinct activities of an organization.
 - Relations and operations that are socially significant in one relational structure may not be meaningful in certain others.
 - People in different societies commonly use different models and combinations of models in any given domain or context. Cultural implementation rules (rules that stipulate when each model applies and rules that stipulate how to execute each model) are essential for the realization of any model in practice (domain, degree).
 - The four models do not all work equally well in every domain, and each is dysfunctional for some purposes in some contexts.
-

(Derived from Fiske 1992)

Not all behavior is social in nature. Obviously, any given person has no social relationship at all with most of the people on earth. Furthermore, using the same toilet, drinking at the same coffee machine are not social relationships ipso facto. People sometimes may simply disregard the existence of other people as social partners, acting towards others as if they were merely animate

organisms, or taking no account of them at all. On the other hand, people may have a social relationship without ever encountering each other face to face or even communicating directly (Anderson & O’Gorman, 1983). If there is no truly social relationship, Fiske speaks about *null interaction*, in which people ignore each other’s conceptions, goals and standards entirely. Fiske furthermore distinguishes *asocial interactions*, in which people use other people purely as a means to some ulterior end. In asocial relations one party treats the other as a mere impersonal object, a means to an end, and the other submits out of fear, pain, hunger, or the like. Although the relation models theory does not include these asocial relationships, they play an important role for understanding why people do not share knowledge.

4. Diversity and complexity in social relations

It might seem impossible that just four relational models can explain all complex relationships. However, there are different ways in which diversity based on the four models is established (After all, there are also just four bases in the genetic code of DNA). There are three aspects of the construction of social relationships that result in a limitless variety of surface manifestations of a limited set of relatively simple underlying models.

First, the models are in one sense “empty” principles, which can be realized in behavior only within the context of certain arbitrary cultural rules. Cultural implementation rules are rules that stipulate when each model applies and rules that stipulate how to execute each model. Each of the four elementary models can be realized only in some culture-specific manner. There are no culture-free implementations of the models. Each model leaves open a number of parameters that require some determinant setting. Within CS relationships one has to determine what is shared collectively and what is not (e.g., goods or thoughts). Within AR relationships the important question is whether people are ranked by age, gender, race, inheritance of or succession to office, or various kinds of achieved status. Questions like ‘what counts as equal?’ and ‘what is appropriate delay before reciprocating?’ need to be answered within EM relationships. MP relationships have to determine how prices are set, what counts as an offer of sale or bid to buy and when one can acceptably withdraw from an agreement.

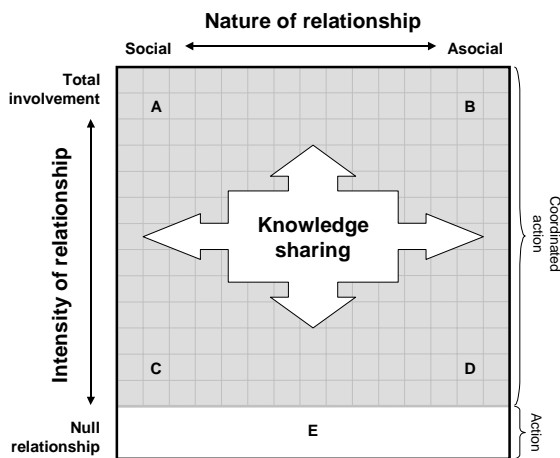


Figure 1 Knowledge sharing determined by the nature and intensity of a relationship

Figure 1 illustrates that the null relationship and the asocial relationship are actually extremes on continua of two variables. The nature of a relationship can vary from social to asocial and the intensity of a relationship can vary from null (ignoring each other) to total involvement. A third variable, although not depicted in the figure, is the formality or strictness with which people observe the standards of whatever model they are using. Figure 1 furthermore indicates that knowledge sharing always implies coordinated action within any kind of relationship; sharing knowledge during an intensive workshop among colleagues could be an example of A; a bank clerk sharing the secret code of the bank vault with the robber while being threatened by his gun could be an example of B; C could refer to a situation where someone has a nice brief chat with a stranger and D could refer to a call center that bothers you with asking stupid questions about a product or service; riding a bike is an example of action that does not involve any relationship nor knowledge sharing. However, note that all these examples could be modeled according to any of the four described relational models.

Furthermore, people in different societies commonly use different models and combinations of models in any given domain or context. Within many western countries the husband-wife relationship, for example, is primarily based on EM, whereas other cultures consider it as normal that the husband dominates his wife (AR). Relations and operations that are socially significant in one relational structure may not be meaningful in certain others. For example, within a CS mindset the idea of private ownership has no meaning at all, whereas within a MP mindset it is hard to understand that people share goods free of charge.

Second, the four models are ordinarily combined in various ways to yield complex structures, which, though analytically reducible to the four fundamental structures, nevertheless may have emergent properties as a combination. It is quite rare to find a relationship that draws on only one relational model. People commonly use a combination of models, out of which people construct complex social relations. For example, colleagues may share office supplies freely with each other (CS), work on a task at which one is an expert and imperiously directs the other (AR), divide equally the amounts of carpooling rides (EM), and transfer a laptop computer from one to the other for a price determined by its utility or exchange value (MP). Thus, each of the models is operating simultaneously at different levels of

a social relationship.

Third, the recursive application of the same model at successive embedded levels results in a limitless potential for elaboration of any one model. This aspect is further discussed in section 6 about infocultures.

Finally, the relational models in use are not static, but might change over time. Several theorists have described dynamic sequences of transition in which the dominant form of interaction changes from one of the relational models to another. The relationship between a given pair of people or among the members of a particular group is assumed to transform from MP to EM to CS, or from AR to CS, although sequences may vary. In a society, however, most writers suggest a sequence in the opposite direction that is some subset of the ordering, CS → AR → EM → MP, usually over historical spans of time (e.g., transition from primitive tribe to capitalistic society).

5. Implications for knowledge sharing

The previous sections have described the four fundamental relational models and how these can establish diverse and complex relationships. Before that, it has been asserted that the dynamics of knowledge sharing can be organized according to these relational models. Since the relation models theory intends to describe the elementary ‘grammar’ of social life in general rather than focusing on the knowledge sharing issue specifically, this section describes how we think that the theory can be specified for knowledge sharing. It is explained how we think that each model conceptualizes knowledge and how each model determines the principles behind knowledge sharing.

Within CS relationships, knowledge is perceived as a common resource, rather than as one’s individual property. Knowledge is not personally marked, since it belongs to the whole group. Knowledge is freely shared among people belonging to the same group or dyad, following the idea ‘what’s mine is yours’. Whereas the CS relationship described by Fiske primarily refers to an

almost pure type of altruism, we suggest an additional type of communal sharing, based on the idea of generalized exchange (Mauss, 1925). The underlying assumption of people sharing knowledge within such a CS relationship is that they expect an unspecified favor from an unspecified group member within an unspecified time span in return (see table 2). By sharing knowledge within the group or dyad one ‘receives’ the potential helpfulness of the group in future. The motivation for sharing knowledge is based on intimacy. Knowledge is shared because one thinks that someone else might need it or because someone asks for it. There are no hidden motives for (not) sharing knowledge. The only reason for not sharing knowledge is when one is not capable of sharing or when the desirability for sharing knowledge is unknown.

In order to share knowledge according to CS principles, a bounded group sharing some common substance (e.g. kinship) is required. It is important to realize that this common substance between people can be based on different *objects* of cohesion and on different *grounds* for cohesion (Lammers, 1964). Although CS is frequently not the dominant structure for sharing knowledge organization-wide (e.g. object is the university), there might exist some subsets within the organization where knowledge is being shared based on CS (e.g. object is department within the university). Furthermore, people might share knowledge with others according to CS since they feel connected with them based on shared ideological objectives (ideal cohesion, e.g. within a political movement), based on shared activities (instrumental cohesion, like between academic staff) or based on solidarity (social cohesion, like fine working environment).

Within AR relationships knowledge is perceived as a means to display rank differences, whether rank is based on e.g. formal power, expertise or age. The higher a person’s rank, the better access to better knowledge. A person higher in rank who shares knowledge with someone lower in rank demonstrates his nobility and largesse and expects to get authority or status in return

Table 2 Models of social relations with their implications for knowledge sharing

	Communal Sharing ¹⁾	Authority Ranking ¹⁾	Equality Matching ¹⁾	Market Pricing ¹⁾
Object of exchange for sharing knowledge	None or nothing specified	Respect, loyalty, authority or pastoral care, loyalty	Similar knowledge	Specified value
Timing of reciprocity	No or unspecified	Non-specific	Implicitly specified in (short) future	Direct or specified in future
Breakdown²⁾	KS with outsiders	Evaporation of power base	Violation of equality	Exploiting the other
Narrative	“We just all try to do what we can, and that’s different for everybody”	“It is not a matter of free will, I have to share my knowledge”	“Now it is my turn to coach the newcomer” “I owe you one”	“As long as they are paying me enough for my expertise, I will share my knowledge”

¹⁾ This relational model occurs both in a dyadic version and in a generalized version.

²⁾ Obviously breakdowns occur within all models when the timing is violated or when the object of exchange is inaccurate.

(see table 2). A subordinate shares knowledge because either he has to or because he wants to chum up with his superior. In both cases the subordinate can expect a kind of 'pastoral care' in return. In this respect knowledge sharing is motivated by power differences. People are less or not willing to share knowledge when it can change their balance of power negatively. 'Negative' knowledge is frequently withheld by window dressing behavior and a knowledge overload may originate from largesse and sweet-talk.

Within EM relationships knowledge is perceived as a means of leveling out knowledge sharing efforts. The principle behind knowledge sharing within an EM relation is based on the exchange of knowledge for similar knowledge (see table 2). Knowledge is being shared because someone else has shared something similar before or because one expects something similar in return. It is the desire for equality that motivates knowledge sharing. In this respect one can morally obliged a person to share something in return by sharing knowledge oneself. People are less or not willing to share knowledge when nothing similar can be shared in return within a reasonable time span.

Within MP relationships knowledge is perceived as a commodity which has a value and can be traded. Knowledge is being shared because one receives a compensation for it (not being similar knowledge or status). People are motivated to share knowledge by achievement. When the perceived compensation is not high enough, people are less or not willing to share knowledge. In appendix 1 the implications of the four relational models for understanding knowledge sharing are summarized.

Let's illustrate the different knowledge sharing principles for professional knowledge workers. Whereas the university is expected to be a place where knowledge is being shared freely, following the rules of CS, the reality demonstrates that the CS mechanism is hardly present within universities. Of course, scientists are very eager to share their knowledge with other people from the academic community, but only when they are being rewarded for it by prestige (AR) or money (MP). So sharing ideas through scientific publications associated with author names is common practice, just like contributing to a lucrative publication. However, unbridledly sharing knowledge with colleagues in the pre-publication phase (CS) is less obvious to occur. In the day-to-day activities of academics, knowledge is commonly shared with colleagues according to EM principles. Only when they acquire valuable knowledge from colleagues, they will share similar knowledge with them (and vice versa). Regularly, academics feel more cohesiveness with the peers who are working on their own research topic than with people from unrelated departments or with the entire university. A similar line of reasoning exists for ambitious professional consultants. Since these knowledge workers frequently feel more connected with the consulting profession and their own career than with the consulting firm they are

working for temporarily, they like to receive intellectual recognition for their own work (AR) more often than a financial reward (MP). In contrast with the academics, consultants are frequently not personally rewarded for their intellectual effort. The intellectual outcome is considered to be 'owned' by the whole organization (CS) and therefore the company name is connected to it rather than the name of the consultant who created it. Some consultancy firms have succeeded to create an intensive ideal cohesiveness, resulting in CS practices of knowledge sharing.

This section ends with some remarks about the null relation and the asocial relation, since they explain, among other things, why knowledge is not being shared. As has been described before, when there is a null relation between people, knowledge can not be shared by definition. In these situations it is interesting to find out why there is not a relation (anymore) between the actors involved and if this is problematic. Also the degree to which the actors are relating for the sake of the relationship itself (social) or are using each other as means to asocial ends determines if and how knowledge is being shared. In the long run, asocial relationships will discourage or even stop knowledge sharing.

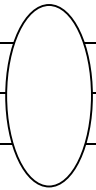
6. Infoculture: recursive application of social relations

Till so far the relational models have been described primarily as the mechanisms behind knowledge sharing between individuals. One can usually generalize such a relationship towards one dominant model of social relations. The relation between a husband and wife, for example, might be primarily based on EM, even when they act according to the other models as well. However, the models can also be used to delineate the knowledge sharing mechanisms within organizational settings. After all, organizational actors are embedded within a network of social relations. When the majority of actors within an organizational setting is sharing knowledge according to one particular relational model, the organizational setting can be typified by that dominant model of social relations. In practice one frequently explains a lack of knowledge sharing by saying that 'there exists a culture that discourage knowledge sharing'. And indeed this 'knowledge-sharing-culture' is of crucial importance, but commonly remains rather abstract. In this respect, the four models can be seen as different completions of an infoculture (Ciborra & Patriotta, 1996) and in this respect specify this rather abstract theoretical notion. Based on a process of institutionalization (Berger & Luckman, 1966) not only relationships and organizational settings can be typified by one dominant relational model, but also a country or even a society. Whereas many Western countries are inclined towards MP thinking, for example, many countries from the Middle East are more based on AR.

Lets now focus on the significance of the relational models at the level of organizational settings. Different organizational settings could be characterized according to different dominant relational models. The assumptions underlying a community of practice, for example, are frequently based on CS. In a similar way one might argue that people in a formal work group interrelate according to AR and that project members their relationships are based on MP. Partly this can be explained by the time scope of the different organizational settings. The more often people interact, the longer the relationship endures, and the greater the number and diversity of domains in which they interact, the less likely they are to use MP and the more likely they are to relate in a CS mode; EM is in between (Fiske, 1991).

However, even though one can make generalizations about the relational model in use in an organizational setting, one always needs to realize that within such an organizational setting people interact according to the other models as well. Table 3 illustrates this by differentiating different relational models at the interaction level within a particular infoculture at the organizational level (ellipse). Although there might be one relational model which is dominant in a particular organizational setting, it is not the organizational setting *per se* that determines according to what relational model knowledge is being shared. For example, even when two collaborating project teams are characterized by MP, their linking pins (individuals of both organizations who embody the collaboration) may share knowledge according to different social mechanisms.

Table 3 Combining relational models at organizational and interaction level

		Infoculture (organizational level)			
		CS	AR	EM	MP
Interaction level	CS				
	AR				
	EM				
	MP				

Although it is possible to use any of the four models to organize any aspect of social relations, some relational models are more obvious to occur in particular situations. For example, work organized along CS lines lacks the long-term productive potential characteristic of division of labor based on differentiated complementarity. Whereas EM is widely used as a means of obtaining supplementary labor at times of peak demand or of tasks that require massed labor, it is never the primary mode of organizing the core group for the entire cycle of production. This is probably because a complete cycle of production can rarely be broken down into tasks that are all the same, and because often there is no great functional advantage in balanced reciprocal exchange of

the same task. Market systems governed by prices can be the most efficient mechanism for organizing large-scale production and exchange. In part this is because MP facilitates division of labor and technical specialization, and in part because of its emergent property of conveying information about utilities and costs, permitting the use of this information to guide allocation decisions. On the other hand, many kinds of public goods cannot be produced and allocated by MP alone. Thus, the four models of human relations are dysfunctional for some purposes in some contexts. Furthermore, they do not work equally well in every domain. Let's take a decision making process as an example. Within CS decision-making is based on seeking consensus, within AR relations on authoritative fiat, within EM relations on one-person one vote and within MP relations on rational cost benefit analysis. When quick decision-making is required, AR is more appropriate than CS, since this last model is cumbersome and time consuming.

6. Conflicts: mismatch of relational models

Hitherto, it has been presumed that individuals, groups or organizations sharing knowledge are operating according to the same relational model without problems and that the technologies supporting knowledge sharing are in line with the relational model of their users. However, in practice the distinctness and the congruence of the relational models are not always assured. Three situations can be distinguished where a mismatch of relational models might result in a social conflict: a) people share knowledge according to the same relational model but disagree about how the model is applied, b) people share knowledge according to different relational models and c) the technology or organizational structure supposed to support knowledge sharing is designed according to a different rationale than the relational model of its users. All three situations are now illustrated.

In the first type of situations social conflicts can occur when the people involved have different interpretations of the same relational model in use. Conflicts are the result of applying different cultural implementation rules. An example of such a social conflict in organizational settings is the disturbed relation between an employee from the IT helpdesk and a needy manager from another department. Both individuals might think that their relation is based on AR. The IT-er has a technical expertise that the manager is lacking and the manager has a formal power that supersedes the influence of the IT-er. Thus, the variable on which the hierarchy is based is different. Both are acting and sharing knowledge as if they are the higher in rank, ending in a social conflict. The result is that both evaluate the others behavior as inappropriate and both experience a lack of understanding. Similar conflicts might occur between young just graduated academics

and grown old senior employees, or between a secretary with many years of experience and her new manager.

A second example deals with a different interpretation of how to balance a mutually approved EM relationship. When one person has shared a significant amount of knowledge with someone else and this person only receives insignificant knowledge in return or significant knowledge with an inappropriate delay, a social conflict might occur. This social conflict can be resolved in several ways. The person can continue to share knowledge with the other, so that the relationship might shift from an EM to an AR model. The person acquires a certain expert status implicitly, due to the developed imbalance of knowledge. Or the person can be inclined not to share any knowledge with that person anymore in future. Additional knowledge needs to be shared in order to resolve the conflicts.

The second type of situations results in more serious social conflicts, since the actors involved share knowledge according to different relational models. If one person shares knowledge with someone else, while implicitly adopting a CS model, he would feel offended when the other is asking money for his contribution (MP). When a person starts to behave as an expert to his colleagues (AR), he can expect opposition of them when they are used to share knowledge according to EM. In these situations people adopt different relational models, whereas in the third type of situations the technology or organizational structure are designed according to different relational models than their users.

This third type of situations can be illustrated by reconsidering the development of knowledge repositories in order to share best practices as described in textbox 1 (A similar argument can be made about the implementation of communities as described in textbox 2). The rationale behind the design of most current knowledge repositories is based on CS. Knowledge is considered to be a pooled resource that is accessible by every one and knowledge is considered to be freely shared with others where possible. When the people involved do actually interrelate according to the model of CS, then there is no problem. However, in situations where there exists a difference between the assumed CS rationale behind the technology and the actual relational model in use, problems might occur. For example, when people relate with one another based on AR, they might have difficulties with using a technology that is based on CS. Since, information is accessible by everybody including one's superiors, they avoid the knowledge system and share their ideas informally through other media. People do not want to be adjudicated on the basis of some informal premature documents they have put in the system. People acting upon EM have other reasons for (not) contributing to knowledge systems. A frequently expressed argument is that 'people do not want to bring more than they get'. Especially employees who have no intention to remain in an organization for a long time, for example, do not value the importance of retaining experiences for future use by their colleagues,

since they won't benefit themselves. People who share knowledge according to MP only contribute to the knowledge repository when they receive an appropriate reward for it. A repository based on CS does not provide such a reward.

Different strategies can be followed to solve these kinds of problems. One can try to change the existing relational model of the user in order to fit the technology to be used, one can try to redesign the existing technology in order to fit the relational model of its user, or a combination of both. The first situation requires a cognitive change of the users which is a time-consuming process, whereas the second situation requires a fundamental reconsideration about the functionalities of the technology. Obviously, in practice it should not be an either or choice, but a combination of both strategies. Several technical adjustments of the knowledge system can be proposed. The problem within an AR relation might be solved by implementing a double layer structure in the knowledge system; only the final content is made accessible by everybody, while the rest is only accessible by colleagues of the project team (Ciborra & Patriotta, 1996). In the EM situation, for example, one could redesign the technology in such a way that people can only consult the knowledge system when they also contribute something. In a MP situation people might be stimulated to contribute to the system by providing financial bonuses. These suggestions for changing the technology should be accompanied by an appropriate change of the relational model (infoculture) of the users.

Just like the rationale of a technology needs to be in line with the relational model of its users, also the rationale of the organizational structure needs to fit the relational model of the way people share knowledge. Within organizations with a dominant MP infoculture, it is very hard or even impossible to implement a CS community of practice. Thus, reward systems, supporting technologies, organizational hierarchies needs to be in line with the relational models in use and vice versa. It is useless to reward people according to MP when they relate to one another based on AR. Many knowledge workers who have achieved a minimum level of income, for example, are more sensitive to intellectual acknowledgement than to additional financial rewards.

7. Research model

This section presents a conceptual research model for investigating knowledge sharing in practice. The vertical relations in figure 2 describe the argument made in this paper; It has been argued that the different models of social relations determine the structure behind knowledge sharing processes and that cultural implementation rules are essential for the realization of any relational model in practice. The horizontal relations are implicitly assumed in this paper, but are important for placing the argument in context. The horizontal relations are now briefly described (for reasons of clarity, many relations

in figure 2 are left out).

In this paper the focus has been on knowledge sharing within organizational settings. (In another paper we describe how different organizational settings can be described as the context within which knowledge is being shared by using an activity theory approach (Boer, Baalen, & Kumar, 2002)) Knowledge sharing should not be investigated as an object in itself, but as a mean to establish organizational activity. In order to produce products or services, a variety of knowledge has to be shared among the actors involved. There exist constant gaps between the available knowledge and the required knowledge, resulting in knowledge tensions. The knowledge tensions result from change somewhere in the organizational activity (in its broadest sense); formulation of a new assignment, new personnel, changing working conditions etcetera. Frequently the knowledge tensions lead to a knowledge sharing effort, whereas in some situations people (implicitly or explicitly) decide not to share knowledge.

Obviously, the relational models behind knowledge sharing are not the only factor for explaining why and how people do or do not share knowledge. For example, the nature of the activity determines the need for knowledge sharing and to some extent the nature of the knowledge. Knowledge (sharing) within a R&D department is different from knowledge (sharing) along an assembly line. Furthermore, the nature of knowledge highly determines how knowledge is being shared, or should be shared. Abstract and uncodified knowledge should be shared differently, for example, than knowledge that is concrete and codified (Boisot, 1995). Conversely, by adopting one particular way of sharing knowledge (e.g., lecturing, workshop, reading), the variety of knowledge that can be shared is limited accordingly. A similar line of reasoning is valid for the technology being used for sharing knowledge. The media richness (Daft & Lengel, 1984) and functionality of a technology determines the kind of knowledge that can be shared and vice versa.

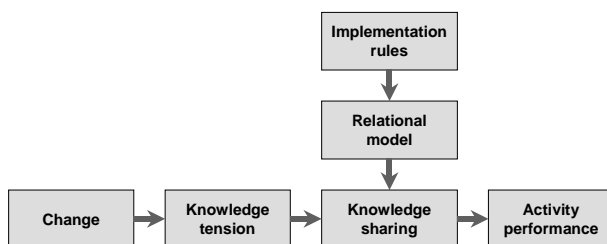


Figure 2 Conceptual model of knowledge sharing

However, this kind of research is available excessively as has been mentioned in the introduction, whereas the relational dimension behind knowledge sharing is crucial and frequently overlooked. Of special interest is the link between both types of research, that is how the relational models are influenced by and influence individual, organizational and knowledge

factors. For example, when knowledge is specific and uncodified, it is almost impossible to share it according to MP principles. Also the effort to acquire knowledge influences the relational model people will use for sharing this knowledge; ‘Low profile’ knowledge like knowing how to use the coffee machine is likely to take place according to CS, whereas an electronic presentation about a specific subject is more likely to take place according to EM or MP.

This section concludes with some remarks about the way data can be collected in practice. Table 4 describes the major steps one can follow when investigating knowledge sharing in organizational settings. An important issue is how a relational model can be mapped. Fiske argues that there is only one criterion for determining what kind of social relationship (if any) it is that people are engaged in: “The trick is to figure out what the devil *they* think they are up to”. Thus the unit of analysis, the locus of the social relationships, is cognitive (in the broad sense). The models are goals, ideals, criteria, rules or guidelines that, under certain circumstances, conceivably may not correspond closely to what any particular observer sees in the manifest action or its outcome. The standard for determining what kind of social relation is operative is not the concrete result of the action either in the short run or the long term; the standard is the conception each person has or what the relationship is (or ought to be). Consequently, different people may reckon that different relationships are in effect. Furthermore, so long as people believe that they are interacting with another person, they may apply the model and operate in a social mode even when no other person is really there.

Table 4 Practical steps for investigating the relational dimension behind knowledge sharing

1. Determine whether there is a social (or an asocial) relation between the actors under investigation. If so, describe how this relationship has developed over time. If not, explain why not and indicate the implications for the organization (position the relation in figure 1);
2. Indicate what (mix of) relational models are actually operative between these actors with respect to different types of knowledge sharing in different phases (select from table 2);
3. Specify the specific cultural implementation rules of these relational models with respect to knowledge sharing and indicate how these have changed over time;
4. Make a detailed description of how knowledge is (not) being shared. Give special attention to the three types of conflicts that can occur;
5. Compare the findings of the actual situation with any other situation, e.g. the dominant infoculture, the proposed or desired situation or the situation after implementing a new supporting technology or organizational structure;

8. Concluding remarks

The message of this paper is to emphasize the relational nature of knowledge sharing. Although individual and organizational factors and the nature of knowledge contribute to the understanding of knowledge sharing, much of its dynamics remains unexplained. One important reason for this is that current research about knowledge sharing has been guided largely by one model of social relations, whether this is for example one of altruism or one of rational cost-benefit analysis. By adopting the four relational models distinguished by the relation models theory of Fiske (communal sharing, authority ranking, equality matching and market pricing) new insights are obtained. It has been described how knowledge is being shared differently within each of the four relational models. Explanations are provided, for example, why it is so difficult to implement communities of practice within organizational settings based on market pricing, why people do not contribute to knowledge repositories and why it is so difficult to change the infoculture within organizational settings. The cultural implementation rules, determining when each relational model is applied and how each model is executed, play a central role in the way knowledge is being shared. Some of these implementation rules have been described in this paper, but much additional research is required to further specify these rules. The research model and the practical guidelines for investigating knowledge sharing presented here are just a start and need further refinement. We would like to invite researchers to join our search for the implications of different models of social relations for understanding knowledge sharing. It is our conviction that in order to really understand knowledge sharing, one needs to know according to what model knowledge is being shared. Consequently, one can better design technologies that support knowledge sharing and design the structure of organizational settings. On the other hand, by knowing the assumptions about the social relations underlying the technical and organizational infrastructure, one can better understand why knowledge is or is not being shared.

References

- Anderson, B., & O'Gorman, R. (1983). *Imagined communities: reflections on the origin and spread of nationalism*. London: Verso.
- Baalen, P. J. (2002). Kennis, transacties en infoculturen: de institutionalisering van kennis. In P. J. Baalen, M. Weggeman, & A. Witteveen (Eds.), *Kennis en management*. Schiedam: Scriptum.
- Berger, P. L., & Luckman, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Garden City, NY: Doubleday.
- Blackler, F., Crump, N., & McDonald, S. (1999). Managing experts and competing through innovation: an activity theoretical analysis. *Organization*, **6**, 5-31.
- Blau, P. (1964). *Exchange and power in social life*. New York: Wiley.
- Boer, N. I., Baalen, P. J. v., & Kumar, K. (2002). An activity theory approach for studying the situatedness of knowledge sharing, *HICSS Hawaii*.
- Boisot, M. H. (1995). *Information space; A framework for learning in organizations, institutions and culture*: Routledge.
- Buber, M. (1987 (1923)). *I and thou*. New York: Collier-Macmillan.
- Ciborra, C. U., & Patriotta, G. (1996). Groupware and teamwork in new product development: the case of a consumer goods multinational. In C. U. Ciborra (Ed.), *Groupware and teamwork*: John Wiley & Sons.
- Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, **37**, 12-24.
- Daft, R. L., & Lengel, R. H. (1984). Information richness: a new approach to managerial behavior and organizational design. *Research in Organizational Behavior*, **6**, 191-233.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge : how organizations manage what they know*. Boston: Harvard Business School Press.
- Durkheim, E. (1966 (1897)). *Suicide: a study in sociology*. New York: Free Press.
- Fiske, A. P. (1991). *Structure of social life: the four elementary forms of human relations*: The Free Press.
- Fiske, A. P. (1992). The four elementary forms of sociality: framework for a unified theory of social relations. *Psychological Review*, **99**, 689-723.
- Giddens, A. (1984). *The constitution of society*: University of California Press.
- Granovetter, M. S. (1982). The strength of weak ties: a network theory revisited. In P. V. Marsden, & N. Lin (Eds.), *Social structure and network analysis* (pp. 105-130). Beverly Hills: Sage.
- Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, 106-116.
- Krech, D., & Crutchfield, R. S. (1965). *Elements of psychology*. New York: Knopf.
- Lammers, C. J. (1964). Uiterlijke samenhang en bindingskracht van de organisatie, *Sociologie van de organisatie* (pp. 57). Leiden: Rijksuniversiteit Leiden.
- Leary, T. F. (1957). *Interpersonal diagnosis of personality: a functional theory and methodology for personality evaluation*. New York: Ronald Cress.
- Malinowski, B. (1961 (1922)). *Argonauts of the Weytern Pacific: An account of native enterprise and adventure in the archipelagoes of Melanesian New Guinea*. New York: Dutton.
- Mauss (1925). *The gift*.
- Orlikowski, W. J., Yates, J., Okamura, K., & Fujimoto, M. (1995). Shaping electronic communication: the metastructuring of technology in the context of use. *Organization Science*, **6**, 423-444.

- Orr, J. E. (1990). Sharing knowledge, celebrating identity: Community memory in a service culture. In D. Middleton, & D. Edwards (Eds.), *Collective remembering: memory in society* (pp. 169-189). London: Sage.
- Piaget, J. (1973 (1932)). *Le jugement moral chez l'enfant*. Paris: Presses Universitaires de France.
- Polanyi, K. (1957 (1944)). *The great transformation: the political and economic origins of our time*. New York: Rinehart.
- Polanyi, M. (1983 [orig. 1966]). *The tacit dimension*: Peter Smith.
- Salins, M. (1965). On the sociology of primitive exchange. In M. Banton (Ed.), *The relevance of models for social anthropology*. London: Tavistock.
- Tönnies, F. (1988 (1887)). *Community and society (Gemeinschaft und Gesellschaft)*: Transaction Books.
- Udy, S. H. (1959). *Organization of work: a comparative analysis of production among nonindustrial peoples*. New Haven, CT: Human Relations Area File Press.
- Weber, M. (1975 (1916)). The social psychology of the world religions. In H. H. Gerth, & C. W. Mills (Eds.), *From Max Weber: essays in sociology*. New York: Oxford University Press.
- Wenger, E. (1998). *Communities of practice; learning, meaning and identity*: Cambridge University Press.
- Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: the organizational frontier. *Harvard Business Review*, **78**, 139-145.
- Williamson, O. E. (1975). *Markets and hierarchies: analysis and antitrust implications*. New York: The Free Press.

APPENDIX 1 Knowledge sharing according to different models of social relations

	Communal Sharing	Authority Ranking	Equality Matching	Market Pricing
<i>How is knowledge being perceived?</i>	As a common resource, rather than as one's individual property. Knowledge is not 'marked'.	As a means to display one's superiority; 'Knowledge is power'.	As a means of exchange for other knowledge.	As a commodity which has a value and can be traded.
<i>What are the implications of this perception for the knowledge sharing process?</i>	Knowledge is freely shared among people belonging to the same group; 'What's mine is yours'.	By sharing knowledge one can demonstrate one's nobility and largesse. The higher a person's rank, the better access to better knowledge.	The knowledge sharing process becomes dependent on similar knowledge sharing processes from the past and/ or in the future.	The knowledge sharing process becomes dependent on the value of the knowledge.
<i>Why is knowledge being shared? (push vs. pull)</i>	Because one thinks that someone else might need it; because someone asks for it; Intimacy motivation.	Because it is requested by someone in a higher rank; because the superior has to share it. Power motivation.	Because someone else has shared something similar before; because one expects something in return. Desire for equality.	Because one receives a compensation for it (not something similar). Achievement motivation.
<i>When might knowledge not being shared even though it is desirable?</i>	When one is not capable of sharing it or when the desirability is unknown.	When it can change the balance of power negatively.	When nothing similar can be shared in return within a reasonable time span.	When the perceived compensation is not high enough.
<i>What are hidden motives for (not) sharing knowledge?</i>	No hidden motives.	'Negative' knowledge is withheld; window dressing. Knowledge overload may originate from largesse and sweet-talk.	By sharing knowledge with someone, one can morally obliged this person to share something in return.	By sharing knowledge below the market value, one might create moral commitment.
<i>How are problems resulting from knowledge sharing being solved?</i>	By seeking consensus.	By authoritative fiat.	By one-person, one vote.	By rational cost benefit analysis.
<i>By who is knowledge being shared?</i>	By kinship, minimal groups, national identities (knowledge is not being shared with outsiders obviously).	By people with different hierarchical positions (ranks).	By people at the same horizontal or vertical position in the division of labor.	By the people who receive and provide the compensation.
<i>With what emotion is knowledge being shared?</i>	It goes without saying, based on idealism.	Mostly not spontaneous but based on sense of duty.	Unproblematic as long as the time span between the return is not too long.	Unproblematic as long as the compensation is appropriate.
<i>What moment is knowledge being shared?</i>	Any time when needed.	Immediately when the superior requests it and otherwise when he has time.	When there is a (potential) mismatch in sharing.	When the compensation is high enough.
<i>How is knowledge being shared?</i>	Divers ways, but in a personal way.	Divers ways (brief and short).	In a similar way as before or as expected in future.	In a way it is demanded.
<i>Examples of knowledge that is typically being shared</i>	In principle everything.	Factual knowledge.	Personal background stories.	Functional expertise.