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Knowledge sharing is a social action involving the collective behavior of a group of people. However, prior research on knowledge predominately focused on individual behavior. Furthermore, previous studies did not capture the multiple facets of this group behavior. In this research, we propose and justify a framework for the explanation of knowledge sharing in organization context as a social action, integrating multiple theories, i.e., social capital theory, institutional theory, and adaptive technology structuration theory. A series of propositions are proposed and discussed.

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Knowledge sharing is a social action involving the collective behavior of a group of people. However, prior research on knowledge predominately focused on individual behavior. Furthermore, previous studies did not capture the multiple facets of this group behavior. In this research, we propose and justify a framework for the explanation of knowledge sharing in organization context as a social action, integrating multiple theories, i.e., social capital theory, institutional theory, and adaptive technology structuration theory. A series of propositions are proposed and discussed.

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1. INTRODUCTION

Knowledge is increasingly recognized as the foundation for firms to gain competitive edges. Effectively managing knowledge that essentially resides in employees becomes one of the most important challenges for organizational practitioners. To activate the knowledge movement direct across individuals and indirect through the repository which functions as a intermediation, it is crucial to involve individuals in knowledge-sharing behavior (Bock et al., 2005). The clan system that highlights the work group structure is therefore pervasively used in organizations, especially in the knowledge-intensive ones (e.g., software development, consulting firms). With the granted autonomy within an organizational structure, the group

setting allows knowledge sharing to take place through rich communications. The interaction among group members ensures that even sticky knowledge can easily be transmitted and absorbed within a group (Turner and Makhija, 2006).

The clan system is expected to enhance the sharing of talents and ideas across different composition parts, yet it still inevitably encounters collective knowledge sharing barriers. Individuals in a group may regard other members in a competitive way, therefore they tend to hoard their uniquely possessed knowledge at the expense of sharing and/or share knowledge everyone has known rather than those unknown (Wittenbaum et al., 1999). They may also look guardedly at the knowledge offered by others and be unwilling to learn (Davenport and Prusak, 1998). The lack of knowledge sharing within a group would result in the ineffectiveness even disbandment of the work group. In order to suit proper managerial practices to the case, senior managers and group leaders are pondering the factors that potentially influence the within-group knowledge sharing, further the underlying mechanisms that properly interpret it.

2. RESEARCH GAPS

Regarding knowledge sharing as a social action in a certain community, prior scholars often rely on social capital and social exchange theories to explain the individuals' collective behavior. For instances, Wasko and Faraj (2005) reveal that the individuals' social capital determines their contribution to the electronic community of interests in social context, whereas Kankanhalli et al (2005) suggest the anticipated costs and benefits of social exchange influence the individual knowledge contribution to the electronic knowledge repository in organizations. Also, some research depends on the theory of reasoned action and demonstrates individuals' attitudes toward sharing and subjective norms influence their intentions of knowledge sharing in organizations (Bock et al., 2005). Although these studies

provide good understanding on why individuals would contribute knowledge to a certain virtual community or organizational repository, they simply account for the individual motivations of knowledge sharing, either the calculative benefits (e.g., benefit and cost) or social benefits (e.g., reciprocity). The group-level knowledge sharing involving a cluster of people in organizations is much more complex and remains as a black-box.

What determine the occurrence of knowledge sharing within a group? How do the group members share their knowledge with each other to deal with the group task? The extant research has mainly documented knowledge sharing at the individual level (e.g.,Wasko and Faraj, 2005, Kankanhalli et al., 2005, Bock et al., 2005) and organizational level (e.g.,Malhotra et al., 2005), but the group-level knowledge sharing is absent in literature. Furthermore, knowledge sharing should not be as simple as conceptualized in prior research – knowledge contribution. Rather, knowledge sharing within a group is more interactive, providing knowledge to and receiving knowledge from others directly and/or indirectly (Hansen, 1999, Hansen et al., 2005, Cumming, 2004). Thus, there is a necessity to go deep to gouge knowledge sharing at a group level in organizational context.

Is the social capital theory sufficient to explain knowledge sharing within a group? Most prior studies concentrate on the social relationships and knowledge sharing, while seldom research has taken into account the effects of formal structures of work groups on knowledge sharing among their components. Although the emerging informal structure from social interactions is constructive for knowledge sharing among individuals, social capital is not an umbrella and other contingencies need to be taken into account for knowledge sharing (Adler and Kwon, 2002). We need to distinguish the prescribed institutional structure from the emerging social structure, and further look at the influence of the formal structure of institutions, work group structure in particular, on knowledge sharing. From the socialist view, the structure of a work group is a series of ongoings, events, and event cycles between the

component parts, which in turn forms the basis for the eventual emergence of collective constructs and subsequently influences individual and collective actions (Morgeson and Hofmann, 1999). From the institutionalism perspective, work groups nested in an organization have various but formal structures, being smaller rationalized systems. The prescribed structures of work groups directly influence the knowledge sharing in the parties within the boundary. According to the structuration theory (Giddens, 1979), although the social construction and institutional system are different mechanisms to foster knowledge sharing in a collective structure, their impacts are complementary rather than exclusive. Social capital theory demonstrates how individual connections configure the social networks that in turn provide resources and opportunities to their actions, while the institutionalism shows how institutional structures reshape individual choices for future actions (Adler and Kwon, 2002).

What is role of those IT artifacts for knowledge sharing? How those IT artifacts support and enhance knowledge sharing within a group? The prevalence of IT in general and Knowledge management (KM) technologies in particular is increasing in organizations. They are designed for managing knowledge and enabling knowledge sharing. Although some studies have examined the determinants of individual's knowledge contribution to an electronic repository or virtual community (e.g.,Kankanhalli et al., 2005, Wasko and Faraj, 2005), they takes the technologies as a context, therefore the effect of IT artifacts is under estimated. Such research is insufficient to explain why and how the technologies work on knowledge sharing, especially when a group of people interactively use the technologies.

3. CONTRIBUTIONS

To fill up the above research gaps, this study aims to provide a better understanding of intra-group knowledge sharing in organization context. Relying on the structuration theory

and its derivative theories, this study integrates the social, institutional and adapted technological structures to explain the group-level knowledge sharing in organizational context. This research entails theoretical and practical contributions. Theoretically, this study provides a comprehensive framework to explain the relationships between the abstract structures and knowledge sharing, and how these structures work on knowledge sharing within a group. It demonstrates bottom-up process how the individual characteristics, behaviors, and perceptions underlie and shape the group level outcomes, i.e., knowledge sharing. Similarly, it also illuminates top-down process how the group and organizational context surrounding individuals affects their knowledge sharing behavior. After validated empirically, this framework has the potential to provide a new insight on knowledge sharing for the academics that engage in knowledge management and group design, and provide managerial guidelines for group leaders and senior managers to better design and manage the clan system in which group members effectively share the task-relevant knowledge as well.

4. THEORETICAL FOUNDATIONS

Knowledge sharing in this study is defined as provision and receipt of work related knowledge in a group (Hansen, 1999, Hansen et al., 2005, Cumming, 2004). Knowledge sharing occurs among a group of actors though their direct and indirect communications and other kinds of interactions (Bock et al., 2005). Focusing on intra-group knowledge sharing, this study is drawn upon structuration theory as an overarching.

Giddens' structuration theory is an integrative meta-theory, which accommodates both subjective and objective dimensions of a social reality (Giddens, 1984, Giddens, 1979). The subjectivist deems social systems as the result of meaningful individual actors' behavior, while the objectivist focuses on the institutional aspects of social systems that constrain individual actions (Bhaskar, 1978). In Giddens' view of social systems, both are equally

important. Relying on this duel-core rationale, the determinative forces of knowledge sharing within a group derive from two bases -- the emerging social structure and the prescribed institutional structure. In the social realm, group members' interactions form the social structure of the group, i.e., the group-level social capital, which influences the overall knowledge sharing within the group. In the institutional realm, the work group, which is a rationalized system nested in an organization, can utilize the prescribed structure to control, encourage and regulate individual members' actions, knowledge sharing behavior in particular.

Moreover, Perlow et al. (2004) develop a nested model of structuration, in which individual action and pattern of interaction mutually reinforce each other, and further organizational structures mutually reinforce with the group structures and the broader institutional context appears to shape and be shaped what goes on within organizations (Barley and Tolbert, 1997). Accordingly, the prescribed pattern of interaction in a group is more likely to directly influence its members' actions, whereas organizational structures and broader institutional structures have an indirect impact on group members' actions. With the underpinning of structuration theory, I argue that knowledge sharing shapes a social construction and is simultaneously influenced by the prescribed group structure that is determined by the organization. Therefore, this study fosters the synthesis and synergy of individual actions and the surrounding contexts in a nested structure shown in figure 1.

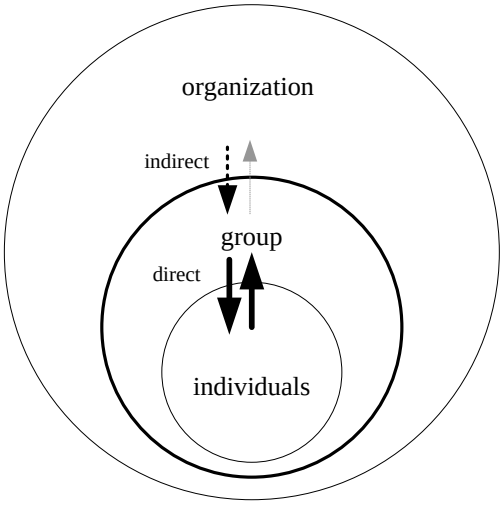

Figure 1. Nested structure *(adapted from Perlow et al., 2004)*

Nahapiet and Gohshal (1998) present social capital for understanding the knowledge sharing in organizations. They suggest that the sharing of knowledge is facilitated when (1) there are structural links between individuals (structural capital); (2) individuals have the cognitive capability to understand and apply knowledge (cognitive capital); and (3) individuals' relationship have strong and positive characteristics (relational capital). Social capital initially appeared in community research, highlighting the central importance of the networks of strong cross-person relationships developed over time. Such a network structure provides the basis for trust, cooperation, and collective action in community (Jacobs, 1965). A work group is a typical community of practice which consists of a tightly knit group of members engaged in a shared practice who know each other, work together, continually negotiate, communicate, and coordinate with each other (Wenger, 1998, Lave and Wenger, 1991), and it is therefore appropriate to rely on social capital theory to explain knowledge sharing in work groups. The configuration of group members' social ties within a group represents the extent to which the members connect to the persons who can convey the needed knowledge. Specifically, in a configuration with dense, cohesive internal relationships, the individuals sanction against self-serving behavior groups and the group has the more bounded solidarity (Coleman, 1990,

Uzzi, 1997). The group compositions are the resources (e.g., expertise to group work and tenure) to form the cognitive structure, which is the base of developing the shared understanding among the compositions (Reagans et al., 2004, Wasko and Faraj, 2005). The cognitive capital allows each member to give respect to others' knowledge and to make efforts in meaningful exchange of knowledge. The relational capital, encompassing individuals' trust and commitment to the group, makes individuals treat others in a positive mode and emotionally support one another (Kankanhalli et al., 2005, Wasko and Faraj, 2005). All in all, the emerging social structure cultivates a desirable environment for group members to provide their knowledge to others as well as offers opportunity for them to receive knowledge from others.

According to the institutional aspect in Giddens' structuration (Giddens, 1979, Giddens, 1984), the work group itself is a smaller system, nested in a broader institutional context, i.e., organization. The structure of a work group, predefined by the organization, influences the behaviors of individuals within in three ways: (1) via domination, the prescribed group structure monitors the asymmetric knowledge resulting from interdependence. (2) via signification, the prescribed group structure yields interpretive schemes. Individuals view these signals and interpretations, either from the group leader or from other groups or top-management, as cognitive guides to understand how they should behave with respect to knowledge sharing. (3) via legitimization, the prescribed group structure regulates individuals' actions and behaviors. Being aware of the distinct clan climate, the composition parts justify where their knowledge sharing are validated so that they can avoid being the target of sanctions. Further, Orlikowaki et al (1995) argue that organizations and the nested work groups can manipulate the three institutional structures and thereby influence, guide, motivate, or alter individual actions. These actions are so called metastructuring actions, because they either reinforce the existing institutional structures or alter those structures to

create conditions more conducive to knowledge sharing (Chatterjee et al., 2002). More specific, this study identifies task interdependence and goal interdependence as constitutes for structures of dominance (Van der Vegt et al., 2003); championship, and signals of knowledge sharing from top-management and other groups as constitutes for structures of signification (Markham and Griffin, 1998, Teo et al., 2003); and clan climate characterized by openness and cooperation as the constitute for structures of legitimation that facilitates within-group knowledge sharing (Bock et al., 2005, Constant et al., 1994).

As information technologies (IT) become an important component in organizations, structuration theory has been applied in IS research (Orlikowski and Robey, 1991, Chatterjee et al., 2002, DeSanctis and Poole, 1994, Salisbury et al., 2002, Chin et al., 1997). Specifically, the adaptive structuration theory (AST) -- one derivative of Giddens' structuration theory – deliberates that the interplay between two structural potential, i.e., the structures of advanced IT and users' internal structures, fosters the appropriation of technologies (DeSanctis and Poole, 1994). Appropriations are not automatically determined by technology designers, rather by the interaction between the users and technologies. Such a structuration process creates the so called structures-in-use that may differ between groups of users even though the structural potential is constant for them. The theory of technologies appropriations asserts that technologies succeeding in supporting and facilitating the related group processes results from the proper use of technologies rather than technological infrastructures themselves, nor the mere usage of the technologies. As a consequence of structuration between persons and technologies, the discrepant structures-in-use in groups leads them to different outcomes.

As a particular stream of advanced IT, KM technologies are designed for organizing both tacit and explicit knowledge among individuals, facilitating their direct and indirect communications, and thereby enhancing their knowledge sharing (Alavi and Leidner, 2001). A common KM infrastructure is suggested to adopted in an organizational wide for cross

groups synergy and the cooperate performance (Tanriverdi, 2005, Tanriverdi, 2006). Yet, according to AST, it is challenging for organizations to create and maintain a common structures-in-use of KM infrastructure among different groups that have their specific internal systems. In stead, the degree of the adopted KM technologies' appropriations in work groups makes knowledge sharing in this group different from one another. The appropriations of KM technologies emerge as the internal structures of groups interplay with technological structures. The work group needs to properly utilize the adopted KM technologies to achieve a higher level of knowledge sharing. The desired knowledge sharing would be enhanced when KM technologies' appropriations take on the following properties: (1) instrumental use of KM technologies are faithful to the KM spirit; (2) instrumental uses of KM technologies are consensus within a group; (3) attitudes toward the use of KM technologies are displayed as comfort and respect, e.g., perceived usefulness and ease of use (DeSanctis and Poole, 1994, Chin et al., 1997, Salisbury et al., 2002).

Taking the above three facets together, structuration theory contributes to the theoretical integration of social and institutional theories, in which the social structure and institutional structures are produced and reproduced by the mutual reinforcement between individuals' interactions and institutions' metastructuring. Its derivative theory in IS, i.e., adaptive structuration theory, sheds sight on the interactions between a cluster of persons and technologies. By integrating the social, institutional and technological aspects in a structuration lens, this study develops the research framework to investigate intra-group knowledge sharing, as shown in Figure 2.

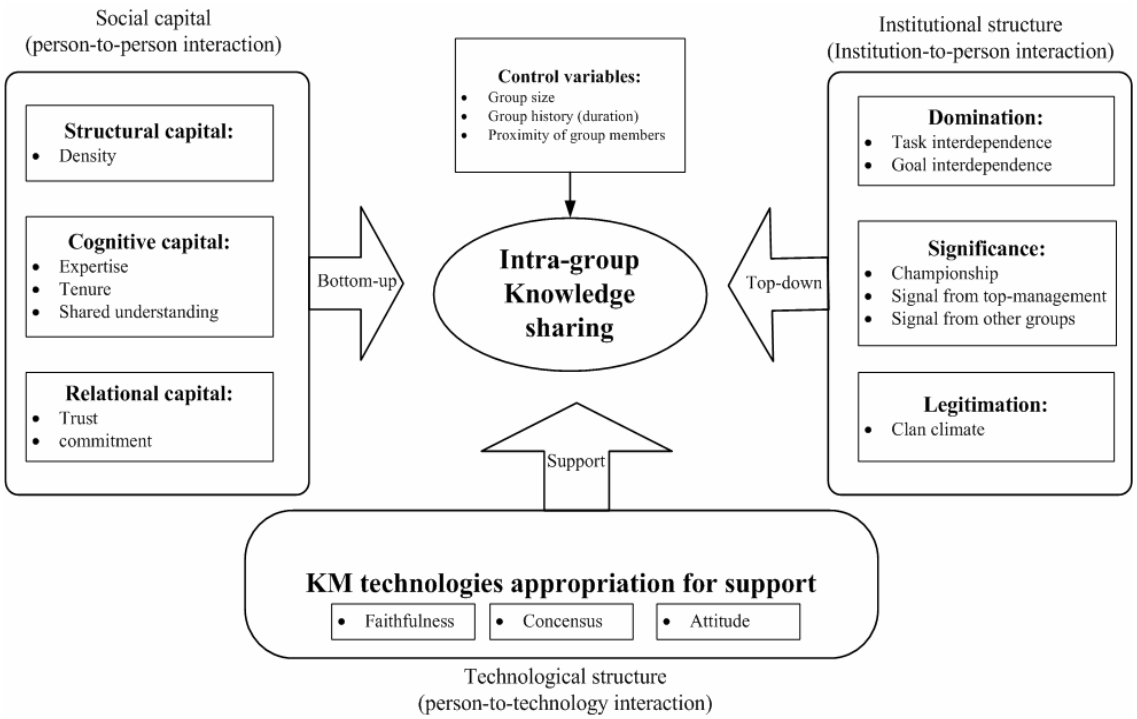

Figure 2. Research Framework

5. CONCEPTUALIZATION AND PROPOSITIONS

5.1 Knowledge Sharing

Knowledge sharing refers to the provision and receipt of work related knowledge in a group where the individuals involved are completing tasks together. (Hansen, 1999, Hansen et al., 2005, Cumming, 2004).This conceptualization is different from the knowledge contribution that has been often regarded as the equivalence of knowledge sharing (Wasko and Faraj, 2005, Kankanhalli et al., 2005). Knowledge sharing involves not only contributing one's own knowledge but also seeking and receiving others' knowledge. The intra-group knowledge sharing embodies the interactions among individuals involved in a group, and therefore better depicts the knowledge flow within the group. The group level of knowledge sharing is the aggregation of individuals' knowledge sharing behavior.

5.2 Social Capitals and Knowledge Sharing

Social capital is broadly described by researchers as a set of resources embedded in relationships of individuals, groups, or organizations (Burt, 1992, Coleman, 1990, Nahapiet and Ghoshal, 1998, Adler and Kwon, 2002). In organization studies, the concept of social capital, which is proved to be a powerful factor for explaining actors' collective actions, is gaining currency. Empirically, social capital has been demonstrated to be able to motivate individuals to contribute their knowledge to social communities (Wasko and Faraj, 2005) or organizations (Kankanhalli et al., 2005), to facilitate intra-organizational resource exchange and production innovation (Tsai, 2002, Tsai, 2001), and to strengthen inter-organizational relationships and learning (Uzzi, 1997).

Social capitals provides the conditions necessary for knowledge sharing and transfer to occur (Nahapiet and Ghoshal, 1998). As a multi-dimensional construct, social capital is constituted by three components, including 1) structural capital, which manifests the overall pattern of connections between actors; 2) cognitive capital, which refers to the shared vision and understanding emerging in the collectivity; 3) relational capital, which encompasses trusting relationships among network actors (Nahapiet and Ghoshal, 1998, Tsai and Ghoshal, 1998).

5.2.1 Structural Capital

The structural capital is shaped by the pattern of connections among network actors. Network density, defined as proportion of possible linkages that are actually occurs within groups, describes the general cohesion of groups (Wasserman and Faust, 1994). Two forms of network structure determined by its density have been identified in prior literature: closure network with a high level of density and bridging network with many structural holes that implies a low level of density (Burt, 1992, Burt, 2004, Coleman, 1990). Closure view of social capital focuses on the internal relations within a collectivity, and stresses the group's cohesion and the pursuit of collective goals (Coleman, 1990), where as bridging view of

social capital argues that a sparse pattern of network structure with many structure holes greatly facilitates the focal actors' knowledge seeking and acquisition (McEvily and Zaheer, 1999). In spite of a long debate on two types of network, recent researchers come to agree that effective work groups favor the cohesive internal network and a large range of external network with many structural holes (Reagans and McEvily, 2003, Reagans and Zuckerman, 2001, Reagans et al., 2004, Oh et al., 2004). Therefore, we believe that the closure network that emphasizes on the internal cohesiveness of a group for collective actions facilitate individuals involved in a group to share knowledge with each other.

A closure relationship is a network with high density, in which each member has a tie with each other member. Through the closure mechanism, group members connected by strong ties benefits from embedded and dense networks in their closed group (Coleman, 1990). The anticipated benefits include instrumental benefits such as the more bounded solidarity, stronger reciprocity norms, greater trust, and sanctions against self-serving behaviors, and expressive benefits such as emotional or affective support from other internal members (Oh et al., 2004). Therefore, social capital in a closure group diminishes the probability of opportunism, reduces the need for costly monitoring and results in such benefits for the whole group (Uzzi, 1997). In contrast, an intra-group network rich in structure holes, presenting a fractured group, inhibits internal coordination and the team's capacity for collective actions (Leana and Van Buren, 1999, Reagans et al., 2004). Intra-group social capital that flows through closure conduits emphasizes that group members are willing to subsume their interests under those of the group as a whole. Moreover, with a dense network structure within, group members are more likely to have willingness and motivations to invest time, energy, and efforts in sharing knowledge (Reagans and McEvily, 2003), and therefore the overall knowledge sharing within group are enhanced. Accordingly, this leads to the proposition as follows,

Proposition1: The structural capital of a group will influence the intra-group knowledge sharing. The higher level of density of a group network, the better intra-group knowledge sharing.

5.2.2 Cognitive Capital

Cognitive capital refers to the resources providing possible shared interpretations and meanings within a collective (Nahapiet and Ghoshal, 1998). The group compositions such expertise and tenure are the resources forming cognitive capital. Further, engaging in a meaningful exchange of knowledge requires at least some level of shared understanding between actors involved.

Expertise, tenure and knowledge sharing. At an individual level, cognitive capital consists of both individual expertise and experience with applying the expertise. Previous studies demonstrate that individuals with higher levels of expertise are more likely to share useful advice on the intended work, conversely, individuals with inadequate expertise are less likely to share knowledge (Constant et al., 1996, Wasko and Faraj, 2005). The mastery of apply expertise takes experience, therefore individuals with longer tenure in an organization are likely to better understand applying their expertise to the group work, and are better able to share knowledge with others. Aggregating individuals' expertise and tenure into a group level, the group has a higher level of cognitive capital, therefore the intra-group knowledge sharing is enhanced.

Shared understanding and knowledge sharing. Shared understanding represents the extent to which the work values, philosophy, problem-solving approaches, and prior work experience of a group are similar (Ko et al., 2005). The shared understanding is important to the intra-group knowledge sharing. It is a cumulated cognitive capital, which is developed through individuals' interaction over time and learning the skills and specialized knowledge.

With such a developed shared understanding, the individuals involved in group are more likely to reach a common goal of joint working, and are therefore induced to share their knowledge. But a lack of shared understanding, the individuals in a group tend to disagree what to do, how and why, which damage the relationship of a group and impedes the knowledge sharing. Thus, these lead to the proposition as follows,

Proposition2: The cognitive capital is expected to enhance the intra-group knowledge sharing. The expertise and tenure aggregated from the individuals involved in a group to the group will have positive relationships the intra-group knowledge sharing. The shared understanding developed in the group will also have a positive influence on the intra-group knowledge sharing.

5.2.3 Relational Capital

Despite the impacts of communication pattern and cognitive pattern in a group, relational capital, being the affective nature of relationship among the individuals involved, largely motives their knowledge sharing behavior. (Nahapiet and Ghoshal, 1998). Relational capital is nurtured when group members trust with each other, develop shared identity and further commit to the collective.

Trust and knowledge sharing. Trust is the belief that the intended action of others would be appropriate from one's point of view. It indicates a willingness of people to be vulnerable to others due to beliefs in their good intent and concern, competence and capability, and reliability (Mishra, 1996, Mayer et al., 1995). Generalized trust is an impersonal form of trust that does not rest with a specific individual but rest on the behavior that generalized to a social unit as a whole (Putnam, 1993). In this study, the generalized trust refers to the belief in the good intent, competence, and reliability of group members with respect to their knowledge sharing and contributing to the work group. Generalize trust has been viewed as a

key factor that provides a context for cooperation and effective knowledge sharing (Tsai and Ghoshal, 1998). When generalized trust is strong, the effort required for knowledge sharing may not be salient to knowledge contributors, because they believe that knowledge shared is not likely to be misused by other group members (Davenport and Prusak, 1998). Many studies have documented that the positive trusting relationship in a dyad or a group can minimize opportunism behavior, thereby facilitates the group members' knowledge sharing (Riggins and Mukhopadhyay, 1994, Ring and Van de Ven, 1992, Ring, 1994, Tyler and Kramer, 1996). On the contrary, arduous relationship without trust to others has been demonstrated as a critical barrier of knowledge sharing and transfer (Szulanski, 1996, Ko et al., 2005). Thus, a trusting relationship within a group provides a positive environment for individuals involved in the same group to share knowledge.

Commitment and knowledge sharing. Commitment represents a duty or obligation to engage in future action (Coleman, 1990). Commitment can accrue to a collective, though it is often described as direct expectations development within particular relationships of actors (Wasko and Faraj, 2005). In particular, individuals' commitment to their work group conveys a sense of responsibility to help other members on the basis of collective team identification (Van der Vegt and Bunderson, 2005). As the actional counterpart of trust, commitment represents, to a large extent, the members' willingness to provide their knowledge to others as well as receive the knowledge offered by others. Prior studies have demonstrated that individuals' sense of obligation to a collective motivates their knowledge sharing behavior (Wasko and Faraj, 2005, Constant et al., 1996). The aggregation of each member' commitment to the team promotes the overall intra-group knowledge sharing. These lead to the proposition as follows,

Proposition3: The relational capital of a group is expected to enhance the intra-group knowledge sharing. The general trusting relationship within a group and the commitment of individuals involved in this group will have positive influences on

the intra-group knowledge sharing.

5.3 Institutional Influences on Knowledge Sharing

According to structuration theory, management in a firm has a choice to manipulate the practices, therefore their managerial choices potentially affects the actors' behavior in work groups nesting in the firm (Orlikowski and Yates, 1994, Perlow et al., 2004). These meta-structuring actions either from the group itself or the broader institutional range, shape the way of domination, signification, and legitimation operationalized by the group and the firm.

5.3.1 Domination

In Giddens' structuration theory, domination depends upon the mobilization of two distinguishable types of resources – allocative resources for generating command over objects and authoritative resources for generating command over persons (Giddens, 1984). The domination way of structuration cannot be thought of only in terms of asymmetries of physical resource distribution, it also can be manipulated by designing tasks, goals or rewards systems for the individuals in a group. According to self categorization theory, the situational features have a powerful impact on the salience of interpersonal differences and their effects on persons' behavior. This implies that individual team members may differ in their reactions to the group, depending on how they perceive their work context. The literature on teams suggests that the task and goal interdependence of group work design, a metastructuring action, significantly influences the group processes and the group's pro-social behavior (Stewart and Barrick, , Wageman, 1995, Wageman and Baker, 1997). Johnson and Johnson (1989) highlight the benefits of high interdependent, stating its positive effects on interpersonal relations, communication, helping, knowledge sharing, and other forms of cooperation. Wageman (1995) further suggests that task and goal interdependence affect

different aspects of group functioning-- tasks influenced variables relate to cooperation, whereas goal influenced variables relate to effort.

Task interdependence and knowledge sharing Task interdependence refers to the degree to which an individual's task performance depends upon the efforts or skills of others (Wageman and Baker, 1997). Prior studies have documented the positive effect of task interdependence on individual's perceived responsibility for the task (Pearce and Gregersen, 1991), and the consequent collaborative behavior among the group members (Wageman and Baker, 1997, Wageman, 1995).Members of groups with higher level of task interdependence engage in more knowledge sharing than those in the groups with lower level of task interdependence. In a highly task interdependent group, the members engage in extensive learning from each other and develop a sense of collective responsibility for the task, exhibiting high-quality interpersonal interactions (Bliese and Halverson, 1998). By contrast, at a low level of task interdependence, group members tend to work alone and independently hone their task related expertise, demonstrating an arduous interpersonal relationship which is one critical barrier of knowledge sharing within a group (Szulanski, 1996, Ko et al., 2005).

Goal interdependence and knowledge sharing. Goal interdependence refers to the extent to which an individual team member believes that his or her goals can be achieved only when the goals of other team members are also met (Van der Vegt and Janssen, 2003). The perceptions of goal interdependence are usually induced by providing team members with group goals, group feedbacks, and rewards for collective performance. The presence of a group goal and group feedback creates similar perceptions of goal interdependence and fosters the feeling of "community of fate" among individuals involved in a group, thereby motivates them to behave collectively (Besser, 1995). The presence of interdependent reward increases peer influences among the individuals involved, therefore elicits and reinforces the optimal level of their pro-social behavior in a group (Wageman and Baker, 1997).

Individuals from different groups are assumed to differentially experience the design of tasks and the design of goals and reward systems. Working under conditions of high task interdependence and goal interdependence, the individuals involved in the team will experience high-quality social processes and extensive mutual learning, use the knowledge and skills of interdependent members to solve problems. They also will be receptive to the knowledge and suggestions from interdependent others. In such a way, the dually directed knowledge sharing among the team members is enhanced by the incorporating task interdependence with goal interdependence. These lead to the proposition as follows,

Proposition4: The domination way of structuration is expected to enhance the intra-group knowledge sharing. In particular, the task interdependence and goal interdependence of a group will force the individuals in a group to share knowledge with others within the group.

5.3.2 Signification

Signification allows institutional structures to yield meaning and understanding through an interpretive system (Giddens, 1984). Drawn upon the signification structure, the management proactively signs the symbolic orders for individuals to understand how they should act. The individuals in a group can receive such a signal from their group leader, from the top management and other groups in the firm. Perceiving these signals related to knowledge sharing behavior, individuals would recognize the importance of sharing their own knowledge for superior performance. Through pulling individual cognitive system to adapt to the managerial practices, the signification way of meta-structuring promotes knowledge sharing within a group.

Championship and knowledge sharing. Championship is a metastructuring action because it defines institutional norms and values regarding how group members should engage in

knowledge sharing. The champions in a group can be the group leader or emerge informally within the group. They are innovative, risk-taking and make a contribution to the facing tasks by actively and enthusiastically promoting their progress (Tushman and Nadler, 1986, Howell and Shea, 2001, Higgins, 1990). Prior studies demonstrate that champions significantly influence the behavior of other people surrounding (Markham and Griffin, 1998, Gupta et al., 2006, Markham, 2000).

Group leader or other champions can advocate knowledge sharing and explicitly articulate visions and mandates for knowledge sharing. When they believe that knowledge sharing is necessary and will bring positive consequences to the group, their briefs serve as powerful signals to the members about the importance placed on knowledge sharing. As a consequence, group members will apply such a signal to engage in knowledge sharing. Furthermore, the champions' belief and participation in knowledge sharing can further legitimize the followers' willingness to share knowledge (DiMaggio and Powell, 1983).

Signals from Top management and knowledge sharing. Top management conformity represents values regarding how top-management engaging in knowledge sharing. Nesting in organizations, work groups are required to conform to the practices that are compatible with the policy of organizations. Teo et al. (2003) demonstrate that the subsidiaries will follow the behavior of their parent corporations due to the coercive pressures. With a similar affiliation, work groups also must follow the organizational practices. Hence, when the top management advocates the values of knowledge sharing, work groups are more likely to be exerted to do likewise.

Signals from other groups and knowledge sharing. An important source of signification for knowledge sharing is from other groups in the firm. The signals from other groups represent the values regarding how individuals in other groups/units are engaging in knowledge sharing.

Sociological research on threshold models suggests that decisions to engage in a particular behavior depend on the perceived number of similar other in the environment that have already done likewise (Krassa, 1988, Granovetter, 1978). If many work groups make efforts in knowledge sharing practices, it gives rise to that knowledge sharing being legitimated throughout a sector, the left groups would follow suit to avoid the embarrassment of being perceived as less responsive or legitimated (Goodstein, 1994, Fligstein, 1985, Teo et al., 2003). As the individuals involved in the group perceive the increasing extent of prevalence of knowledge sharing in other groups, they are also motivated to exchange their knowledge with others. Besides cue-taking from the collective action of similar others, work groups intend to imitate the behaviors of those who are perceived as successful (DiMaggio and Powell, 1983). Work groups can engage in or disengage from certain practices according to their perceived outcomes (Miner and Haunschild, 1995). Perceiving the successful groups leading in knowledge sharing, the individuals residing outside of those groups would mimic the behavior occurring in the successful ones. Accordingly, these lead to the proposition as follows,

Proposition5: The signification way of meta-structuring is expected to promote the intra-group knowledge sharing. In particular, the championship within a group, the signals from the top-management and other groups in the firm will influence the individuals' knowledge sharing behavior within a group.

5.3.3 Legitimation

Legitimation functions as norms to regulate individual actions. To be accountable for one's actions, institutions need to explicate the reasons for them (i.e., signification) as well as offer the normative grounds whereby they may be justified (i.e., legitimation) (Giddens, 1984). Legitimation validates individual actions as appropriate in a certain institutional context.

Norms articulate and sustain the prevailing structures of legitimation, and are therefore the most important component of structures of legitimation (Orlikowski and Robey, 1991). Here, norms are specified as the prevalence of norms that are intended to facilitate knowledge sharing in groups.

Clan climate and knowledge sharing. Norms consist of shared beliefs, rules and conventions about behaviors that people ordinarily do and behaviors that are right (Constant et al., 1994). Norms in a group govern the members' appropriate conduct, serving as another stream of institutional forces (Dennison, 1996). Individual members' beliefs about knowledge sharing, to a great extent, is acquired from or reinforced by the norms surrounding (Constant et al., 1994), as a consequence, they draw upon the normative regulations to reassure about the legitimacy with respect of knowledge sharing. When the group members assess a strong sense of norms characterized by openness with free-flowing information, tolerance with well-reasoned failure, and pro-social norms emphasizing on cooperation(Bock et al., 2005, Kankanhalli et al., 2005), they believe it is desirable to share knowledge within their groups. In contrast, if the norms of a group foster a sense of competition and secrecy, the members would like to withhold rather than share knowledge. Prior empirical studies have demonstrated that norms stressing on openness, tolerance and cooperation can enhance the individuals' positive attitudes toward knowledge sharing, and thereby increase their contributions to knowledge sharing (Constant et al., 1996, Kankanhalli et al., 2005, Bock et al., 2005, Jarvenpaa and Staples, 2000). Accordingly, this study hypothesizes that,

Proposition6: The legitimation way of structuration is expected to enhance the intra-group knowledge sharing. In particular, the clan climate of a group characterized as openness, tolerance, and cooperation will positively influence the individual knowledge sharing behavior within a group.

5.4 KMS Appropriations

KMS, constituted by a class of information technologies, are designed to make knowledge visible, mobilize knowledge flow, and thereby facilitate users to proactively seek and offer knowledge (Alavi and Leidner, 2001). KMS is often implemented at an organization wide, however, work groups nesting in the same organization take different outcomes from KMS in terms of knowledge sharing. The plausible explanation is that, according to the adaptive structuration theory (DeSanctis and Poole, 1994), the intended performance such knowledge sharing are enhanced by the structruration process between KMS and work groups (i.e., appropriations of KMS) rather than by the KMS infrastructures themselves nor the mere use of KMS. The structural features of KMS along with the group's internal social and institutional structures act as opportunities and constrains in which appropriation occurs, and thereby bring differential outcomes of KMS with respect to knowledge sharing. Three critical components of KMS appropriations have been identified, including faithfulness, consensus, and attitude toward KMS(DeSanctis and Poole, 1994, Salisbury et al., 2002, Chin et al., 1997).

Faithfulness of appropriation and knowledge sharing. Faithfulness of appropriation is defined as the extent to which the KMS is used in a manner consistent with its spirit and structural feature design (DeSanctis and Poole, 1994, Poole and DeSanctis, 1990). A faithful appropriation occurs when those using KMS follow the spirit of the technologies, while an unfaithful appropriation takes place when KMS is used in a manner inconsistent with its spirit. Initially, individual users may call for the explicit description of the particular KMS aims and the interpretation from occupationally-based experts, but the KMS spirit becomes internal and subjective over time. Thus, faithfulness of appropriation is not necessarily concerned with the precise duplication the procedures provide by KMS (Chin et al., 1997). Rather, it is concerned with the existence of a rationalized myth, representing the perceived relevance of

KMS to the users in question (Meyer and Rowan, 1991).whether the KMS is used in a manner consistent with its overall goals and objectives. Prior studies show that the faithfulness of appropriation of advanced technologies (e.g., EMS, GDSS) enhance the intended processes and outcomes (Chin et al., 1997, DeSanctis and Poole, 1994). With respect to KMS, accordingly, this study hypothesizes that,

Proposition7a: The faithfulness of KMS appropriation has a positive impact on the intra-group knowledge sharing.

Consensus of appropriation and knowledge sharing. Consensus of appropriation is defined as the extent to which group members agree on how to apply KMS to their work (Poole and DeSanctis, 1992, DeSanctis and Poole, 1994). Group members may choose to appropriate the features for different instrumental uses or purposes, and assign their intended purposes or meaning to technology as they use it. Consensus on appropriation can viewed as a social construction in which a particular group of users jointly develop and understand the methodology of use when they interact with the technologies(Lee, 1994). As KMS is employed in an organization, the consensus of KMS appropriation in each group may appear to be different, because each individual in a group will develop perceptions and opinions of this intervention (Fulk et al., 1990). Thus, whether or not the group will be able to negotiate an agreement as to how they should apply KMS collectively becomes a critical contingency influencing the outcomes of KMS in each group. Salisbury et al (2002) suggest the consensus of appropriation does influence the intended outcomes, using EMS (electronic meeting system) as a particular sample. Accordingly, this study hypothesizes that,

Proposition7b: The consensus of KMS appropriation has a positive impact on the intra-group knowledge sharing.

Attitudes toward KMS and knowledge sharing. Attitudes toward KMS display group

members' comfort, respect and challenge to KMS that determine their willingness to exert at using the particular technologies (DeSanctis and Poole, 1994). When groups are faced with novel technologies, the use of these technologies is influenced by attempts to make sense of them and their role in task activities (Weick, 1990). Further, the attitudes that individuals in groups develop toward technologies such as KMS can influence the outcomes of its use (Salisbury et al., 2002). Hence, in addition to faithfulness and consensus of KMS appropriation, attitudes are also viewed as an important influence on outcomes of KMS in terms of knowledge sharing (Sambamurthy and Chin, 1994, Salisbury et al., 2002, Chin et al., 1997, DeSanctis and Poole, 1994). It is widely accepted that attitudes towards technologies include the perceived usefulness and perceived ease of use according to technology acceptance model (TAM) (Davis, 1989). Consequently, the group members' aggregated perceived usefulness of KMS and perceived ease of use of KMS are modeled influence the knowledge sharing within the group. Accordingly, this study hypothesize that,

Proposition7c: The aggregated attitudes towards the KMS of the individuals involved in a group, including the perceived usefulness and ease of use of the KMS, is expected to enhance the intra-group knowledge sharing.

In additional, the features of groups, e.g., group size, duration and proximity, potentially affect the within group knowledge sharing, they are therefore considered as control variables. The brief definitions of the main constructs in our conceptual model are summarized in table 1.

6. CONCLUSION

In this study, knowledge sharing is justified as a social action in a group of people in

organization context. The sharing behavior includes the provision the task related knowledge to others as well as reception of such knowledge from other, shaping the interactions among a group of people. With the underpinning of Gidden's structuration theory, our conceptual model integrates social capital theory, institutional theory, and adaptive structuration theory to interpret the intra-group knowledge sharing behavior which is an aggregation from multiple individuals' sharing behavior.

On the theoretical side, this study provides a comprehensive framework to explain the knowledge sharing within a group in organizational context. On the practical side, our conceptual model provides new insights for the group leaders and senior managers on how to improve the knowledge sharing in a group. Our model notices the practitioners that they need to concern the sharing behavior from multiple aspects. In order to improve the intra-group knowledge sharing, they need to create a desirable environment to cultivate a positive communication patterns and trusting relationship among the individuals involved in a group. Also they can manipulate appropriate managerial practices to motivate those people to share their knowledge. As IT infrastructure is adopted in an organizational wide, the practitioners need to more concern with appropriation of those technologies and the group of people for the intended work.

In the future, we will empirically validate this conceptual framework.

Table 1. Definitions of Key constructs

Constructs	Definitions	References
Knowledge sharing	provision and receipt of explicit and tacit work-related knowledge within a group	(Hansen, 1999)
Density	the proportion of strong, direct ties between group members of all of the possible linkages among them	(Wasserman and Faust, 1994)
Expertise	the knowledge and skill domain in which members of a group/unit are specialized as a result of their work experience and education.	(Wasko and Faraj, 2005)
Tenure	individuals experiencing in a group	(Reagans et al., 2004)
Shared understanding	the extent to which the work values, philosophy, problem-solving approaches, and prior experience of a group of members are similar	(Ko et al., 2005)
Trust	the belief that the intended action of others would be appropriate form one's point of view	(Kankanhalli et al., 2005)
Commitment	one's sense of responsibility to engage in future actions on the basis of emotional significance that the group members attach to their membership in that group	(Van der Vegt and Bunderson, 2005, Wasko and Faraj, 2005)
Task interdependence	the degree to which an individual group member needs information, materials, and support from other group members within to be able to carry out his or her job	(Van der Vegt et al., 2003)
Goal interdependence	the degree to which group members are presented with group goals or provided with group feedback	(Van der Vegt et al., 2003)
Championship	the values regarding how group members within should engage in knowledge sharing	(Chatterjee et al., 2002)
Signal from Top-management	the values regarding how top-management engaging in knowledge sharing	(Teo et al., 2003)
Signal from other groups	the values regarding how individuals in other groups/units are engaging in knowledge sharing	(Teo et al., 2003)
Clan climate	shared beliefs, rules and conventions about behaviors that people ordinarily do and behavior that are right	(Bock et al., 2005, Kankanhalli et al., 2005)
Faithfulness	the extent to which the particular KM technologies is used in a manner consistent with its spirit and structural feature design.	(Chin et al., 1997)
Consensus	the extent to which group members agree on how apply KM technologies to their work	(Salisbury et al., 2002)
Attitudes	the degree to which the group member believes that using a particular KM technologies to share his/her knowledge would enhance his/her job and such a using would be free of effort	(Chin et al., 1997, Salisbury et al., 2002)

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