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# ORGANIZATIONAL INFORMAL STRUCTURE INFLUENCE ON PROJECT SUCCESS: SOCIAL CAPITAL APPROACH

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## Abstract

*Knowledge sharing and organizational citizenship behavior (OCB) among project team members are crucial for project success. The IS project team is a temporary organization and has to produce outcomes in a limited time. we investigate how internal and external social capital (SoC) influence knowledge sharing and OCB within a team and how OCB and knowledge sharing affect project success. We also analyze the relationships between the three social capital dimensions. Our investigation will be analyzed using multi-level approach, which can make up for shortcomings of single-level analysis. This research adds to the current body of knowledge by examining the facilitation of knowledge sharing in the organization through informal interaction and citizenship. A statistical testing has not been complete. We will explore both HLM6 and MPLUS for multiple structural equation modeling and introduce a comparative analysis of each set of results. We expect the results of the research can provide project managers with insights on how to encourage project team members to share their knowledge and build teamwork more efficiently.*

**Keywords:** *Project success, Oranizational Citizenship Behavior, OCB, Knowledge Sharing, Social Capital.*

# 1 INTRODUCTION

As organizations increasingly rely on information systems (IS) for strategic and operational reasons, the role of IS has become essential in the business environment. Despite the importance of IS, IS project teams have experienced cost and time overrun. The dissatisfaction with the performance of IS projects is widespread (The\_Standish\_Group 2009). Differencing from construction or engineering projects, IS projects produce intangible outcomes and are knowledge-intensive work requiring diverse expertise such as business knowledge, processes, emerging IT techniques or skills (Pee, et al. 2010). Prior research has suggested positive relationships between knowledge –sharing (KS) and project performance (van den Hooff & Ridder 2004; Yu, et al. 2010). However, encouraging KS is still problematic as professionals are reluctant to share their knowledge and expertise. Social, culture, and technical attributes of organizational settings, which can encourage knowledge transfer, have been one of the major research topics since the introduction of knowledge management in an organization (Alavi & Leidner 2001). However, few studies have examined the social antecedents of knowledge sharing in the context of IS project success.

KS is equated with knowledge transferring (e.g. Huber 1991). Knowledge transferring is defined as communication of knowledge and transmission of knowledge (Ko, et al. 2005). KS depends on the attributes of the sender, receiver, and channel (Pee, et al. 2010) such as sender's expertise (Joshi & Sarker 2007), receiver's absorptive capacity (Ko, et al. 2005), and channel's richness (Lind & Zmud 1991). Prior research on the three elements showed mixed results (e.g. Joshi & Sarker 2007; Ko, et al. 2005). Previous research also shows the effects of intrinsic motivations (Ko, et al. 2005; Wasko & Faraj 2005) and social relationships (Ko, et al. 2005) on knowledge transmission. Individual expertise cannot transform to a group's or an organizational knowledge without socialization (Brock, et al. 2005). Arduous relationships are negatively related to communication and interaction, while interaction is positively affected by mutual trust and shared understanding (Ko, et al. 2005). Factors such as trust, shared understanding and socializing are part of the informal structure of an organization and are often described as the dimensions of social capital (SoC). The concept of "SoC" has been examined as an increasingly essential factor of group formations (Huysman & Wulf 2004; Oh, et al. 2004; Reagans, et al. 2004). Research studies have noted that high levels of SoC are related to group cohesiveness, eventually supporting collective behavior (Adler & Kwon 2002; Yli-Renko, et al. 2001). SoC highlights the informal relationships between team members and their willingness to share knowledge based on relationships with others rather than on formal organizational structure. Using SoC lens, this study sheds light on the underlying process affecting individual and group KS, and subsequently team performance. While KS is affected by intrinsic motivation (Ko, et al. 2005; Wasko & Faraj 2005), extrinsic motivation failed to show significant impact on knowledge transfer (Ko, et al. 2005). Team members are intrinsically motivated when their satisfaction lies in the content of the activity itself (e.g., enjoying helping) (Ko, et al. 2005; Wasko & Faraj 2005). In this study, we use OCB as a manifestation of a team member's innate behavior. Several researchers studied the antecedents of knowledge sharing in IS project context (Joshi & Sarker 2007; Ko, et al. 2005; Pee, et al. 2010). These studies mostly focused on the relationship between IT professionals and business professionals (Joshi & Sarker 2007; Pee, et al. 2010). These relationships are often contractual in nature (Joshi & Sarker 2007; Pee, et al. 2010). However, IS projects involve various stakeholders such as business analysts, system designers, hardware designers, programmers, and IT consultants. In addition, IS projects require substantial teamwork and collaboration among team members, which are often depend on social relations. Therefore, while prior research mainly dealt with contractual associations, this research extends the boundary of social relationship to include formal and informal connections.

SoC has been studied at various levels from individual to country (Zaheer, et al. 2010). Aggregating SoC of individuals may affect higher level's performance such as a team's performance (Oh, et al. 2006). The combination of SoC at different levels may affect individual behavior or higher level's performance (Yu, et al. 2010). However, few SoC related studies have conducted multi-level analysis. Our goal is to understand the effect of SoC on knowledge sharing and OCB among team members,

and the relationships between sharing knowledge, OCB, and project success. Moreover, we examine the relationships among the three dimensions of SoC empirically. We thus extend the social capital theory by examining the facilitation of knowledge sharing in the organization through informal interaction and citizenship behavior at two levels, individuals and groups.

## 2 THEORETICAL FOUNDATION

### 2.1 Social Capital Theory

SoC is defined as the set of social resources embedded in the network of relationships and composed of three dimensions underlying both internal and external ties (Nahapiet and Ghoshal 1998): Structural dimension refers to the information channels that connect individuals and units, relational dimension refers to the resources embedded in relationships, such as trust and reciprocity, between its members and cognitive dimension is defined as the shared meaning, and understanding that develops among members of the network as they interact. Several types of relationships exist within a project group and inter-groups. According to typology of conduits for group SoC (Oh, et al. 2006), We classify the relationships as depicted in Figure 1.

	Intragroup relationships	Intergroup relationships
Vertical differentiation	<ul style="list-style-type: none"> <li>Team Leader – Team member</li> </ul>	<ul style="list-style-type: none"> <li>Team leader in other teams – Team members</li> </ul>
Horizontal differentiation	<ul style="list-style-type: none"> <li>Team member– Team member</li> </ul>	<ul style="list-style-type: none"> <li>Team leader– Team leader in other teams</li> <li>Team member – Team member in other teams</li> </ul>

Figure 1. Social relationship in a project

At the beginning of a project, team members may not know each other. Over time, they become familiar with other members. They might share the project's context, and task-related knowledge using common language. Additionally, they can trust their team members or other teams through internal and external interaction.

### 2.2 Organizational Citizenship Behavior

The term “organizational citizenship behavior” (OCB) was proposed by Bateman and Organ (1983) and was denoted as organizationally beneficial behavior and gestures which cannot be enforced on the basis of formal role obligations (Bateman & Organ 1983). Graham(1991) separates citizen behavior into the behavior from in-role job performance and the behavior from extra-role job performance. For example, when a system designer participates in additional upkeep activities, which are not required, her behavior can be considered as a citizenship behavior. OCB is conceptualized as a broader concept which includes all positive organizational behavior of organizational members (Graham 1991; L Van Dyne, et al. 1994).

### 2.3 Level of Analysis

Social capital assumes social relationships or social networks among individuals. The levels of network analysis are classified as dyad, ego, and the entire network (Zaheer, et al. 2010). The dyadic level refers to a dyadic tie, which focuses on the nature of the relationship between two linked actors. Prior studies at the ego level have concentrated on the position of an ego, who is a focal actor, and the effects of the ego's connections, for example, actor's performance or carrier success. Recent studies at

the network level have examined the effects of complete networks on the characteristics of the entire network or individual firms (Zaheer, et al. 2010).

In organizational research, two types of levels exist: level of measurement and level of analysis (Rousseau 1985). The level of measurement means the unit to which the data are directly assigned and the latter means the unit to which the data are assigned for hypothesis testing and analysis (Rousseau 1985). Accordingly, the levels of analysis of social capital studies vary from individual to society and might include multi- or mixed-level (Ali-Hassan, et al. 2010) (see Table 1). A typology of mixed-level models includes composition, cross-level, and multi-level (Rousseau 1985). Composition models specify the relationships among nondependent variables at different levels. Cross-level models specify the causal relationships among independent and dependent variables at different levels. The third one is the multi-level model, which identifies relationships among variables applying at two or more levels. Studies on social capital with multi-level approach are relatively new although the need for examining mixed-level organizational phenomena have been recognized (Belanger 2009).

In this research, the levels of network analysis are both dyad and ego since the study deals with structural and relational dimensions of social capital. In addition, the multi-level model is used in terms of the level of analysis. The constructs, which are from three dimensions of social capital, are at the individual level. Organizational citizenship behavior is also at the individual level in the causal relationship between internal social capital and organizational citizenship behavior within a team. On the other hand, the relationship between perception of project success and real project success is cross-level as the project success is at the team level and the perceived project success is at the individual level. Thus, the proposed research model is mixed-level.

Level of analysis	Levels of network analysis	
	Dyad	Ego
Individual	(Hatzakis, et al. 2005; Moran 2005; Seibert, et al. 2001; Sherif, et al. 2006)	(Ali-Hassan, et al. 2010; Seibert, et al. 2001; Sherif, et al. 2006; Yang & Farn 2007)
Group or Team	(Hatzakis, et al. 2005; Newell, et al. 2004; Tsai & Ghoshal 1998)	(Balkundi & Harrison 2006; Chang & Wong 2008; Kang & Kim 2009; Newell, et al. 2004; Robert, et al. 2008; Wang, et al. 2006)
Organization	(Chou, et al. 2006; Tiwana 2008)	(Honig, et al. 2006; Hsieh & Tsai 2007; Ingram & Roberts 2000; Lin, et al. 2006; Nahapiet & Ghoshal 1998)
Multi or Cross level	(Arling and Subramani 2005; Patnayakuni et al. 2006; Ali-Hassan, et al. 2010)	(Yu, et al. 2010)

Table 1. Two types of level of analysis

### 3 HYPOTHESES DEVELOPMENT

Conventional indicators of project success are cost, time and scope. Project Management Body Of Knowledge (PMBOK)'s model uses the terms "on time, in budget, to scope" (PMI 2004). Project management (PM) success can be distinguished from project success (Cooke-Davies 2002). The latter is determined by measuring against overall objectives of a project whereas the former is determined by measuring against performance of cost, schedule, and quality (Cooke-Davies 2002; Thomas & Fernandez 2008).

In this research, cost, schedule, and customer satisfaction are used as measures of project success because the study deals with individual project teams, and thus cannot measure successful organizational strategy implementation. In addition, project success is investigated with two constructs: the perception of project success and "real" project success. The first measures team members' perceptions of their project status and the second is the result of project status based on

formal reports and users' surveys. Team members may feel that they have done their work efficiently and effectively while reviewing their work status. Also, team members' perception of project success may encourage their real performance. Therefore, we suggest the following hypothesis:

*H1: Team member's perception of project success has a positive effect on the project success. [Cross level]*

Prior research has shown that OCB has direct influence on an organization's performance (Podsakoff, et al. 2000; Yen, et al. 2008). In IS project, team members' OCB can contribute to the completion of a project on schedule and in budget since OCB is indicative of positive organizational behavior of organizational members. Helping behavior allows co-workers to become more productive and enhance team spirit. Exhibiting sportsmanship may enhance the ability to adapt to changes. Additionally, team members, who engage in civic virtue, actively participate in team meetings and can provide valuable suggestions for improving team's performance. Therefore, we propose the following hypothesis:

*H2: OCB of a team member has a positive effect on the perception of project success.*

Knowledge sharing is one of the critical practices leading to IS project success (van den Hooff and Ridder 2004; Yu, et al. 2010) since IS projects are knowledge-intensive and beyond the ability of one team member. The project team operates in rapidly changing business environment. An increase in knowledge sharing between teams could help face these changes (Liao, et al. 2009). Additionally, the team's capability is enhanced when the experts within the team share their knowledge, skills and know-how. Therefore, we hypothesized that:

*H3: The intention to share knowledge has a positive effect on the perception of project success.*

OCB can encourage an individual to attend non-required meeting (Organ 1988). Through voluntary participation, team members are likely to exchange work-related information and help each other (Bolino, et al. 2002; Organ 1988). Therefore, the following hypothesis is proposed:

*H4: The OCB of a team member is positively associated with the member's intention to share knowledge within the same team.*

People can trust others because of the other's integrity, goodwill, and ability (Chiu, et al. 2006). When people trust colleagues from other teams, they can access knowledge of colleagues, which can be helpful for their own team. They, however, will not share the obtained knowledge within a team without the intention to help the team or to solve team's issues. Shared vision also has been thought to play an important role in employees' bonding (Kouzes & Posner 1989; Pfeffer 1996). A shared vision refers to the collective goals or common understanding of the firm's vision or project's goals (Nahapiet & Ghoshal 1998; Tsai & Ghoshal 1998). The sub-team's interests often conflict though the sub-teams of a project work together. Thus team member's direct contribution to his team such as knowledge sharing can be affected by the degree of participation in his team's activity. Thus, we hypothesize that:

*H5: The relationship between the extent to which a team member trusts members from other teams and the intention to share knowledge is mediated by OCB.*

*H6: The relationship between the extent to which a team member shares a vision of the firm and the intention to share knowledge is mediated by OCB.*

Prior research examined the relationship between trust and OCB and showed that trusting individuals are more likely to engage in OCB (Brower, et al. 2009; Dirks & Ferrin 2001; Linn van Dyne 2000). According to Brower, et al (2009), trust in the manager or in subordinates is positively related to individual OCB. Thus, we hypothesize that:

*H7: The extent to which a project team member trusts other members is positively associated with the member's OCB.*

According to Rousseau et al.(1998), people, who trust others, have confidence in others and can cooperate with others (Mayer, et al. 1995). Prior research (Dirks & Ferrin 2001) provides substantial evidence that trust facilitates the exchange of knowledge. For example, people are willing to give others useful information in trusting relationships (Levin & Cross 2004; Tsai & Ghoshal 1998). Main positive effects of trust on communication are shown in various forms: the communication targets (e.g. superiors, subordinates, or co-workers), the degree of communication openness within a group, and the quality or quantity of shared information (Dirks & Ferrin 2001). Based on this prior evidence, we suggest the following hypothesis:

*H8: The extent to which a project team member trusts his team members is positively associated with the intention to share knowledge within the team.*

Prior research has investigated the relationships between norms within a collectivity and pro-social behavior (van den Hooff & Ridder 2004; Wasko & Faraj 2005) and collaboration (Kankanhalli, et al. 2005; Sherif, et al. 2006). However, the results of these studies are mixed. In the context of IS projects, these norms might have positive effect on team members' OCB such as openness to conflicting views and intention to share knowledge within their team. Thus, we hypothesize that:

*H9a: The extent to which a project team member believes that other members share cooperative norms is positively associated with the member's OCB*

*H9b: The extent to which a project team member believes that other members share cooperative norms is positively associated with the member's intention to share knowledge.*

Shared mental model has been used as a manifestation of SoC cognitive dimension. It represents members in a network with similar knowledge structures (Robert, et al. 2008). A recent meta-analysis of Team Mental Models (TMMs) shows positive relationships between TMMs and various team processes (Mohammed, et al. 2010) such as back-up behavior (Marks, et al. 2002), coordination (Marks, et al. 2002; Mathieu, et al. 2000), and communication (Mathieu, et al. 2000). Assisting teammates and coordinating represent OCB. In addition, the coordination and communication processes support exchanging information and knowledge. Therefore, we hypothesize that:

*H10a: The extent to which a project team member shares a mental model with his team members is positively associated with the member's OCB.*

*H10b: The extent to which a project team member shares a mental model with his team members is positively associated with the member's intention to share knowledge within the team.*

Prior studies recognized three dimensions of SoC as defined by Nahapiet and Ghoshal(1998). However, only a few of them examined the relationships among the three dimensions (Tsai & Ghoshal 1998). While internal SoC relies on internal social networks that define the relationships among team members and a leader within a team, external SoC relies on extended social relationships, such as connections to other teams (Chang & Wong 2008). Prior studies have suggested that trust is developed from increased social interaction (Granovetter 1983). Furthermore, repeated and close interactions lead team members to know each other and develop share norms (e.g. cooperative norm) (Tsai & Ghoshal 1998). Therefore, we hypothesize that:

*H11a: The degree of interaction with other members within the same team is positively associated with the extent to which the member trusts other members within the same team.*

*H11b: The degree of interaction with other members within the same team is positively associated with the extent to which a project team member believes that other members share cooperative norm*

As the members' interaction increase in a social network, they may influence each other by adopting and realizing others knowledge. They may create new knowledge based on common interests. Team members may also internalize their leader's norm, values, and practices through interaction with a team leader (Tsai & Ghoshal 1998). Hence, we hypothesize that:

*H12: The degree of interaction with other members within the same team is positively associated with the extent to which the member shares mental model with other members within the same team.*

Previous studies on the external dimension of SoC have focused on the performance of an organization (e.g. product innovation and organization productivity) (Chang & Wong 2008; Ingram & Roberts 2000; Oh, et al. 2004). Team leader's external ties may have positive influence on his or her team's perceived trustworthiness and enforce value-sharing (Ingram & Roberts 2000). Other teams in the network of a team leader are more likely to trust his team. Social interactions with other teams increase opportunities to exchange information and share project goals. Therefore, the following hypotheses are suggested:

*H13: The degree of interaction with members in other teams is positively associated with the extent to which the member trusts those members.*

*H14: The degree of interaction with members in other teams is positively associated with the extent to which a team member shares a vision of his firm.*

The research model is shown in Figure 2.

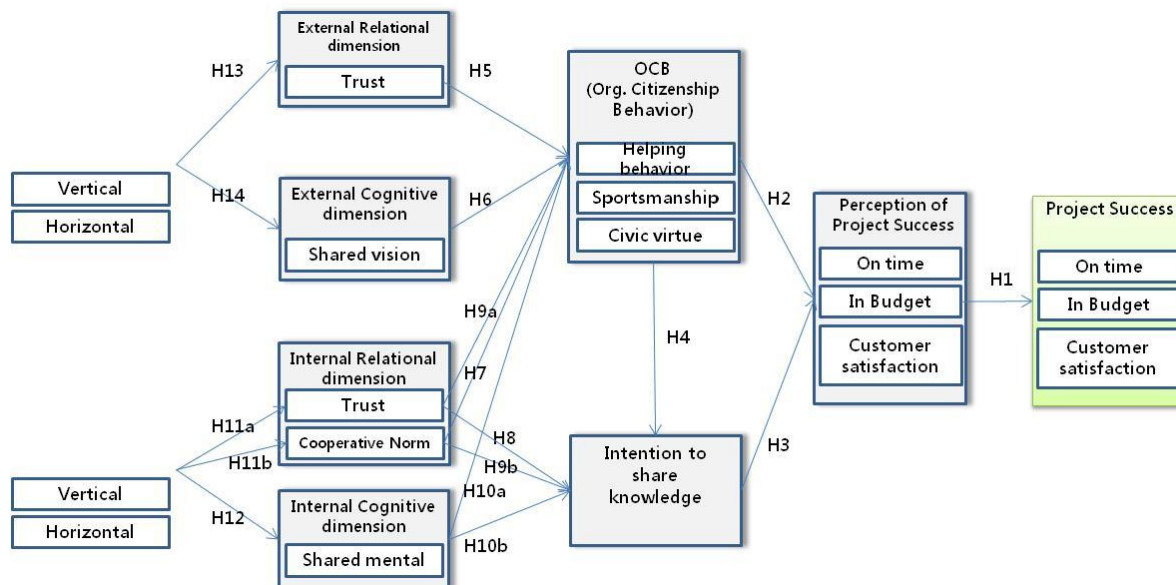


Figure 2. Research Model

## 4 PROPOSED METHODOLOGY

### 4.1 Measurement

Each construct will be measured using and adapting existing instruments as depicted in table 2. A pilot test for the instrument will be performed on a representative sample of the target population using conditions similar to those anticipated during actual data collection. Due to the research context, members of IS project teams will be targeted as the main respondents.



Construct	Measurement	Level
External social network (Degree of interaction)	Adopted ego-centric approach (Hansen, et al. 2005; Yu, et al. 2010)	Individual
Internal social network (Degree of interaction)	Adopted ego-centric approach(Hansen, et al. 2005; Yu, et al. 2010)	Individual
External Trust	The degree centrality of the inter-team trusting networks (Tsai & Ghoshal 1998)	Individual
Shared vision	The level of shared vision in the different teams (Tsai & Ghoshal 1998)	Individual
Trust	The level of trusting other members in the same team (Jarvenpaa, et al. 2004)	Individual
Cooperative Norm	Individuals' willingness to value diversity, the openness to critical thought, and teamwork spirits (Kankanhalli, et al. 2005)	Individual
Shared mental	Rated each attribute of the mental model in team process and expertise and measured mental model centrality and convergence (Mathieu, et al. 2000)	Individual
OCB	A second order construct with three dimensions which are helping behavior, sportsmanship, and civic virtue (Yen, et al. 2008)	Individual
Intention to share knowledge	Individuals' willingness to share knowledge (Bock, et al. 2005)	Individual
Perception of project success	Individuals' perception of the project's status against team's targeted schedule, man-hour and customer satisfaction	Individual
Project success	Measured in terms of "on time", "within man-hours", and customer satisfaction based on formal documents(e.g. closure reports or survey of user's satisfaction)	Team

Table 2. Operationalization of Constructs

## 4.2 Analysis

I will adopt a multilevel modelling technique. The multilevel analysis has several advantages comparing to single-level analysis: (1) the research model can be specified at its correct hierarchical levels, (2) the variability in an outcome can be estimated better, and (3) the analysis can provide flexibility of the model's range (Heck & Thomas 2009). We will use the Hierarchical Linear Modeling (HLM6) or MPLUS to conduct multiple structural equation model approach. Due to the novelty of multi-dimension analysis in MIS research, we will explore both tools and introduce a comparative analysis of each set of results.

## 4.3 Plan for completion

Task	Schedule
Preparing survey questionnaire in English	3 <sup>rd</sup> week of May 2011
Preparing survey questionnaire in Korean by using forward and backward translations	4 <sup>th</sup> week of May 2011
Performing a pilot test on a representative sample	1 <sup>st</sup> - 2 <sup>nd</sup> week of June 2011
Analysis of pilot data	3 <sup>rd</sup> - 4 <sup>th</sup> week of June 2011
Refining model, measurements and questionnaire	After doctoral consortium
Full data collection from members of IS project teams	August – September 2011
Conducting a multi-level statistical analysis	October 2011
Finalize writing	November – December 2011
Proof reading, editing, formatting	December 2011 – January 2012

Table 3. Schedule of completion

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