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# Does Virtuality Increase Social Capital within an Organization?

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**Abstract**

*The purpose of this article is to examine the relationship between virtuality and social capital. Does virtuality decrease the strength of individuals' social ties? Or does virtuality increase social capital by expanding the range of individuals' social networks? To address these questions, first, we identify the properties of virtuality, whose definition still varies in a variety of research settings and at a variety of units of analysis. Second, we develop a conceptual framework that explores the links between virtuality and social capital. By combining the concept of weak ties from social network research and the notion of virtuality from the IS literature, we suggest a new perspective on virtual work: more virtuality leads to more social capital when the bridging relationships based on weak ties are maximized.*

**Keywords:** Virtuality, Social capital, Social capital conduits, Bridging relationship

## 1. Introduction

With the development of technology and distributed systems, diverse forms of virtual work are becoming more common and demanding. Business paradigms are moving toward emphasizing flexibility with more virtual structure (DeSanctis and Monge 1999). Now, the word "virtual" has become a dominant buzzword. Most business organizations have attempted to virtualize their structure by organizing a variety of forms of virtual work, such as telecommuting, distributed teams, virtual teams, virtual communities, and virtual corporation. In this context, we raise the first research question: "What are the common features of virtuality?"

Although virtual work has received a great deal of attention academically as well as practically, most of the previous literatures have been primarily descriptive and focused mainly on the effectiveness of such structures. As a result, little attention has been directed toward understanding their potential to influence social capital embedded within an individual's social networks, although many researchers emphasize the individual's social interaction in a virtual environment. Given this situation, we raise the second research question: "How does virtuality affect a person's social relationships?" More specifically, "Does virtuality increase individual social capital or decrease it?"

To address these research questions, first, we define the concept of virtuality more precisely based on extensive previous literature, including virtual team, virtual community, and virtual organization. We then make the critical link between virtuality and individuals' social relationships, and explore how virtuality increases social capital within an organization.

Our research has two theoretical contributions. First, given the lack of a widely accepted definition of virtuality, we advance a multidimensional concept of virtuality. The second main contribution is to link virtuality and social capital. By combining the concept of weak ties from social network research and the notion of virtuality, we suggest a new perspective on virtual work: more virtuality leads to more social capital within an organization when the bridging relationships based on weak ties are maximized.

## 2. Literature Review

### 2.1 Dimensions of Virtuality

The word "virtual" is applied to various situations, with a variety of meanings (Watson-Manheim et al. 2002; Chudoba et al. 2005). Many researchers have asserted the importance of a common definition of virtuality. Griffith et al. (2003) suggests three dimensions that determine virtuality – physical distance, time spent apart on tasks, and the level of technology support. Watson-Manheim et al. (2005) added workplace mobility and a variety of practices to the dimension of virtuality. Currently, boundary complexity is considered as one of the distinct features of virtuality (Lee et al. 2007).

While these conceptualizations of virtuality are a step in the right direction, they do not completely capture the evolving virtual working environment (partly because researchers have limited their view of virtuality to discrete units of analysis). We believe that measuring and clarifying virtuality is a high priority for further research development.

After a comprehensive review of prior research on a variety of virtual works, we categorized three critical dimensions of virtuality: (1) technological support, (2) personal factors, and (3) group characteristics. Based on this categorization, we more specifically delineated sub-dimensions of virtuality.

First, technological support refers to the extent to which an organization has technological infrastructures to support employees' virtual interaction. In this category, we specified sub-dimensions of virtuality including electronic connectivity and diversity of collaboration tools. Second, personal factors refer to the individual's disposition toward and perception of the virtual working environment. This implies that the sense of virtuality (i.e., virtual status and situational environment) is not same to everyone who belongs to a same organizational unit, regardless of the level of technical infrastructures. Accordingly, specified sub-dimensions of virtuality include reliance on electronic communication and boundary complexity. Third, group characteristics refer to the manner in which the work group is organized. The way of organizing a work group (as an organizational unit) influences an individual's virtuality, since work group structure limits or facilitates the virtual interaction of individuals. Within this category, we specified sub-dimensions of virtuality including group dispersion and flexibility of group composition.

### 2.2 Social Capital

Social capital is "the sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghosal, 1998). Most social capital models encompass both network configuration and resources within one category of social capital (e.g., Nahapiet and Ghoshal 1998; Adler and Kwon 2002). Alternatively, a network perspective regards social ties as the

foundation for social capital. It distinguishes the resources flowing through relationship conduits from the configuration of the conduits themselves (e.g., Oh et al. 2006). Employing Oh et al.'s framework, we identify structural dimensions of social capital as dual conduits that consist of two different social network structures: (1) closure relationships based on strong social ties, and (2) bridging relationships based on weak social ties. Closure relationships represent a strong, close, dense, and cohesive network. In contrast, bridging relationships represent weak ties, a sparse network, and a network rich in structural holes.

Further, we categorize social capital resources along two dimensions: information resources and relational resources. First, information resources refer to those that make it possible both to access relevant and diverse information as well as to gain access to information in a timely manner. Second, relational resources refer to the kind of personal relationships people have developed with each other through a history of interactions. Thus, relational resources include identification, trust, and norms.
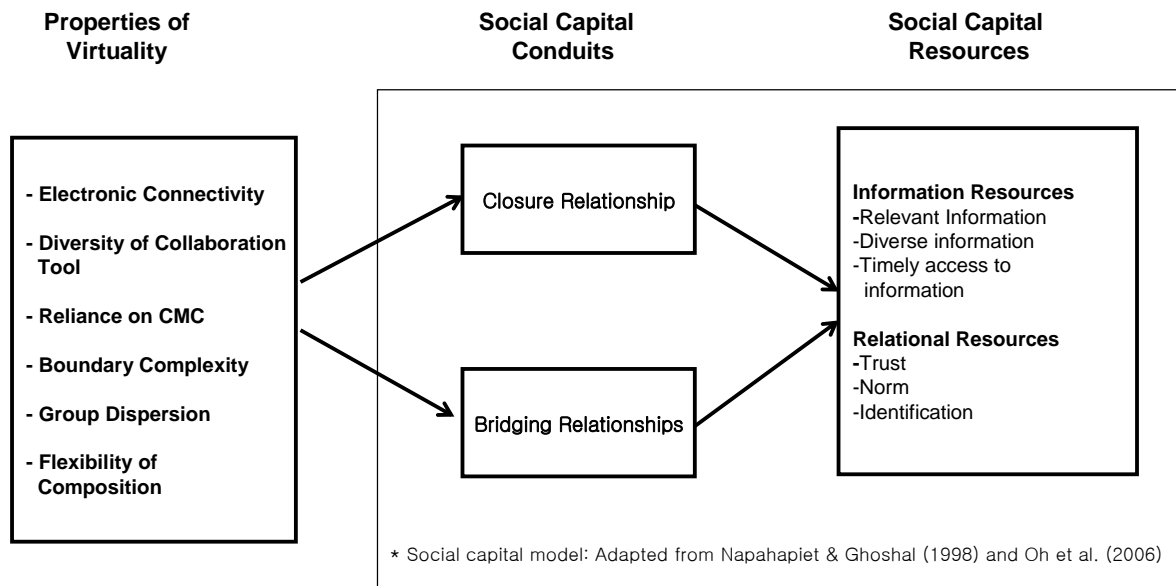
## 3. Theoretical Framework



**Figure 1: Conceptual Framework**

Figure 1 illustrates the conceptual framework we propose. Our study focuses on the individual level. The properties of virtuality proposed in this study are likely to be measured at the level of individual, team, or group; however, we measure each item of all constructs at the level of individual in this study because the purpose of this research is to examine the influence of virtual environment on individual's social network structure.

### 3.1 Effect of bridging relationships on social capital

The bridging relationship is similar to the concept of the "structural hole" (Burt 1992), meaning the gap between disconnected people. Structural holes broker the flow of information between people like an insulator in an electric circuit. Thus, a form of bridging relationship occurs when ties are weak. Such weak ties are conducive both to the discovery of new information and to the accessibility to diverse information. This discussion implies that

more bridging relationships based on weak ties lead to more nonredundant sources of information: Nonredundant contacts offer information that is more additive than overlapping.
*Proposition 1a: The level of bridging relationships positively affects the level of information resources.*

Granovetter (1983) discusses a number of studies in which larger organizations need to integrate subgroups with strong internal ties. In each case, even weak ties between the subunits added considerably to the degree of integration of the larger aggregate. Thus, such weak ties can lead to a higher level of generalized trust, norms, and identification.
*Proposition 1b: The level of bridging relationships will positively associate with the level of relational resources,*

### 3.2 Effect of closure relationships on social capital

Closure relationships refers to a strong-closure social network that represent one in which individuals are connected by strong, dense, positive, multiplex, and reciprocated relationship ties. The dense, strong-closure relationship benefits from greater information sharing and has less of a tendency to engage in social loafing. In particular, previous social network research suggests that strong ties are better for transferring tacit knowledge.
*Proposition 2a: The level of closure relationships will positively associate with the information resources.*

Traditionally, closure relationships were considered to provide a group with greater cooperation and greater conformity to agreed-upon norms. Strong social norms and trust are associated with a high degree of closure of the social network (Adler and Kwon 2002). Given this, relational resources such as trust, norms, and identification increase when networks are dense (i.e., consisting of a large proportion of strong, direct ties between members).
*Proposition 2b: The level of closure relationships conduits will positively associate with the relational resources.*

However, contrary to previous studies suggesting simple positive linear relationships between the closure relationships and social capital resources, Oh et al.(2006) argued that excessive group closure may negatively affect group social capital resources. This is due to the increasing task interdependency, complexity, and need for more intra-group interactions. Further, such complexity and interdependency lead to the recent tenet that the effect of closure relationship within a group is decreasing in modern society.
*Proposition 2c: The influence of closure relationships will be weaker on social capital than that of bridging relationships*

### 3.3 Effect of virtuality on social capital conduits

It is known that a virtual environment that is mediated by technology is oriented toward instrumental relationships rather than closed strong ties: Group members are distant and their interactions are limited in terms of physical proximity. Technology-mediated interactions, through their ability to enable rapid switching from one relationship to another, are more capable of addressing sparser networks. Thus, the higher degree of virtuality generally leads to an increase in weaker relational links between individuals and a decrease in closure relationships between individuals. This discussion casts the same light on some of the arguments of social network theorists; more development of the communications system leads to an increase in the weak ties in a social network. The theoretical underpinning for the

relationship between each property of virtuality and the type of social capital conduit will be provided in this section.

**Electronic Connectivity** refers to the extent to which the individual has direct or indirect links with other members through electronic communication systems. Specifically, electronic connectivity is defined as the extent to which technological infrastructures support the individual's communications, tasks, and social interactions without the constraints of temporal, physical, organizational boundaries. The level of electronic connectivity can be measured by (1) ease of searching contact point, (2) synchronous feedback function, and (3) lateral/hierarchical linkage (Desanctis and Monge 1999). Electronic connectivity provides individuals more opportunities to communicate with anybody in an online network regardless of time and place restrictions. While technology-mediated communication may limit close interaction between individuals, well-connected electronic networks build a broad range of social networks far outside local area.
*Proposition 3a: The level of electronic connectivity is negatively associated with the level of closure relationships.*
*Proposition 3b: The level of electronic connectivity is positively associated with the level of bridging relationships.*

**Diversity of Collaboration Tools** refers to the degree to which individuals work in virtual workspace with diverse collaboration tools such as video/audio conferencing, group decision support systems, or electronic storage systems. These collaboration tools allow individuals to get together easily in virtual space as well as to facilitate communication and social interaction. Many scholars depict the task effectiveness of collaboration tools in terms of overcoming human cognitive limitations and inducing a group consensus; nevertheless, the lack of social presence, social context cues, and reduced media richness hinder communication richness and emotional closeness between people.
*Proposition 4: The level of diversity of collaboration tool is negatively associated with the level of closure relationships.*

**Reliance on Electronic Communication** can be captured by personal preference, attitude, and time spent on electronic communication rather than face-to face meeting. Simply having technological infrastructure is not enough for virtuality; instead, it is made by personal disposition to rely on electronic communication. While Griffith et al. (2003) suggest the portion of time spent apart on tasks as one of the virtuality dimensions at the group level, we consider that the degree of group virtuality can vary along with the individual's choice on the communication medium. For example, if the members of a co-located work group prefer to communicate via computer-based media, the group virtuality can be considered to be high. Media theorists claim that computer-mediated communication (CMC) is task-oriented but not suitable for emotional expression since it limits close social interaction ties.
*Proposition 5: The level of physical/temporal dispersion is negatively associated with the level of closure relationships.*

**Boundary Complexity** refers to the degree to which individuals experience multi-teaming and multi-memberships. If individual has well-defined boundaries, he or she faces a well-defined and consistent normative environment within which the individual can establish coherent social relationships (Podolny and Boron 1997). In contrast, more a virtual work structure replete with a variety of boundaries adversely affects the individual's level of closure relationships (even as the individual could span the range of social ties with multi-memberships or multi-teaming). Therefore, we can infer that as individuals have more

boundaries, they are likely to obtain more diverse and bridging relationships based on weak ties.

*Proposition 6a: The level of boundary complexity is negatively associated with the level of closure relationships.*

*Proposition 6b: The level of boundary complexity is positively associated with the level of bridging relationships.*

**Group Dispersion** refers to the degree to which people work in groups that have people distributed over different geographical areas and time zones. Research suggests that physical/temporal closeness is of great importance to social interaction: The closer one is physically to another, the greater the chance to strengthen social ties (Latane 1996). From the other perspective, physical/temporal distance sometimes makes it more likely that individuals will have different social networks outside of the group: Members run into different people in the hallway, see different people at meetings, and communicate socially with different people (Cummings 2000; Maznevski and Chudoba 2000). This leads to an increase in the extent to which group members have more nonredundant and broad social ties, thus fostering intergroup interactions.

*Proposition 7a: The level of group dispersion is negatively associated with the level of closure relationships.*

*Proposition 7b: The level of group dispersion is positively associated with the level of bridging relationships.*

**Flexibility of Composition** refers to the degree to which teams or groups are assembled and disband with ease. Groups exist with a very specific goal and sometimes have a needed base. Thus, such flexibility frequently leads to network temporality. These flexibility and temporality factors hinder close, strong, and reciprocal interaction, ultimately leading to a broad range of weak ties.

*Proposition 8a: The level of workplace mobility is positively associated with the level of bridging relationships.*

*Proposition 8b: The level of workplace mobility is negatively associated with the level of closure relationships.*

## 4. Research Implications

Our proposed theoretical framework recognizes virtuality as a key construct to influence individuals' social relationship structures. Informed by prior relevant literature and based on previous empirical findings from sociology, our framework proposes social relationship conduits, namely closure relationships and bridging relationships, as important mediators. It is not our aim to argue which type of social relationship is more important or prominent, rather we set out to describe how organizational structure influences individuals' social relationships and social capital. The framework provides a new perspective for empirical research to test the effects of virtuality on social capital at the level of the organization. Next steps in this line of research will include a survey study across numerous organizations that are attempting to virtualize their structure with varying levels of the individual, team, and organization.

## 5. Conclusion

In conclusion, while IS managers who lead virtual collaboration need to be forewarned that the virtual structure of organizations increases various managerial risks—such as

communicational depersonalization, boundary spanning, and employee loyalty—understanding how to achieve new value by increasing virtuality and managing individuals' social relationships is an imperative for IS managers and communication system developers. This research contributes to the IS literature by introducing important theoretical constructs, such as virtuality, social capital conduits, and social capital resources; developing a theoretical framework for future empirical research that will reveal the interplay among virtual work environments, individuals' social relationships, and social capital that generates value within organizations. Our primary purpose in this research is to shift the research attention to a higher level of technology-mediated interaction. According to this view, the real power of virtuality is realized when bridging relationships based on weak ties are maximized.

## Reference

Adler, P. and Kwon, S. "Social Capital: Prospects for a New Concept," *Academy of Management Review* (27:1), 2002, pp. 17-40.

Burt, R. S. *Structural Holes: The Social Structure of Competition*, Cambridge, Harvard University Press, MA, 1992.

Burt, R. S. *Brokerage and Closure: An Introduction to Social Capital*, Oxford University Press, New York, 2005.

Chudoba, K. M., Wynn, E., Lu, M., and Manheim, M. B. "How virtual are we? Measuring Virtuality and Understanding its Impact in a Global Organization," *Information Systems Journal (15),* 2005, pp. 279-306.

Cummings, J. N. "Work Groups, Structural Diversity, and Knowledge Sharing in a Global Organization," *Management Science* (50:3), pp. 352-364.

DeSanctis, G., and Monge, P. "Introduction to the Special Issue: Communication Process for Virtual Organizations," *Organization Science* (10:6), 1999, pp. 693-703.

Granovetter, M. "The Strength of Weak Ties: A Network Theory Revisited," Sociology Theory (1), 1983, pp. 201-233.

Griffith, T., Sawyer, J. E., and Neal, M. "Virtualness and Knowledge in Teams: Managing the Love Triangle of Organizations, Individuals, and Information Technology," *MIS Quarterly* (27:2), 2003, pp. 265-287.

Latana, B. "Dynamic Social Impact: The Creation of Culture by Communication," *Journal of Communication* (46:4), 1996, pp. 13-25.

Lee, G. W., DeLone, W., and Espinosa, J. A. "Ambidexterity and Global IS Project Success: A theoretical Model," *Proceedings of the 40$^{th}$ Hawaii International Conference on System Sciences,* 2007.

Nahapiet, J., and Ghoshal, S. "Social Capital, Intellectual Capital, and the Organizational Advantage," *Academy of Management Review* (23), 1998, pp. 242-266.

Maznevski, M. L., and Chudoba, K. M. "Bridging Space Over Time: Global Virtual Team Dynamics and Effectiveness," *Organization Science* (11:5), pp. 473-492.

Oh, H., Labianca, G., and Chung, M., "A Multilevel Model of Group Social Capital," *Academy of Management* (31:2), 2006, pp. 569-582.

Podolny, J. M., and Baron, N. "Resources and Relationships: Social Networks and Mobility in the workplace" *American Sociology Review* (62:5), 1997, pp. 673-693.

Watson-Manheim, M. B., Chudoba, K. M., and Crowston, K. "Discontinuities and Continuities: a New Way to Understand Virtual Work," *Information Technology & People* (25:3), 2002, pp. 191-209.