



Working smarter and greener: Collaborative knowledge sharing in virtual global project teams



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ABSTRACT

The purpose of this study is to explore how to facilitate the sharing of high-quality knowledge in a virtual global project team context. The most obvious finding from this study is that we can develop social interaction building up trust and share knowledge through online technology platforms without offline social interaction.

The design and methodology are case studies of four Scandinavian virtual global project teams with a total of 42 team members. The survey is a longitude study in 2014–16 based upon 168 individual reports and 16 in-depth top leader interviews.

Working smarter means using technology platforms for developing trust and knowledge collaboration to deliver business solutions and innovations. Working smarter mean to work in a global project team where the collaboration results develop the team into a high-performance team. Working more intelligent is sharing knowledge to improve innovation and collective and individual competence growth. Understanding that investment in top technology solutions are inexpensive compared to the results delivered by professional human resources.

Working greener means to let the team members be aware of green solutions and innovations. Working greener means to travel less using the possibilities given by social technology platforms. The four teams reduced the number of trips by 50–70%. The result is less airline pollution, less stress, and more professional work.

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1. Introduction

High-quality knowledge is a critical resource for competitive advantages in virtual global project teams and relates to the extent to which the comprehension and awareness of relationships, logics, innovative ideas, and circumstances in the project are fit for use, easy to adapt, valuable and relevant to the context. Patti Smith in “Just Kids” (Smith, 2010) describes it as knocking on heavens door when she and Robert Mapplethorpe moved into Chelsea hotel in 1970. “The Chelsea hotel network made anything possible. Everything changed” (2010:94). Today they would have also used several global social online networks. The purpose of this study is to look into how the strength of professional and social interaction ties between members of a virtual team affects the quality of work related knowledge shared in these ties. The purpose is also to research the importance of how new technology platforms

are contributing to the development and sharing of high-quality knowledge.

The corporate technology platforms have opened new possibilities for new gateways and new highways in creating professional and social ties between team members. The sharing economy in services like Airbnb and Uber is not a sharing economy, but a transaction economy enabled by technology platforms (Thompson, 1967) where people meet for the first time through these platforms allowing them to buy and sell services. What is going on in a virtual team is also very much a kind of transaction economy also enabled by new technology creating corporate results and social relationships. The objective is to look into what ties are essential for knowledge sharing of high-quality knowledge either the knowledge is contextual, actionable or intrinsic. The aim is also to consider how new technology platforms might facilitate virtual teamwork. We want to research at what extent we at all need face-to-face meetings in the future.

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2. Literature review: definitions and research context

2.1. Knowledge sharing and relationships

This paper adopts the view that information transforms into knowledge by being combined with experience, context, interpretation, and reflection. Subsequently, knowledge represents action and development and is characterized as both dynamic and personal (Nonaka, 1994) as well as subjective and of a socially constructed nature (Alveson and Kärreman, 2001). From this socio-cultural perspective, we argue that knowledge is constructed and negotiated through social interaction (Newell, Robertson, Scarbrough, & Swan, 2009). Granovetter (1973) and Hansen (1999) found that even weak social ties had importance for sharing knowledge.

2.2. The importance of knowledge quality

Some project teams do not have the expertise available that is required to solve tasks efficiently. The advantages to taking into consideration the *quality of knowledge* are many, as a high level of knowledge quality will help a team perform better, develop innovative products and processes, increase sales and reduce costs (Yoo, Vonderembse, & Ragu-Nathan, 2011). Accordingly, although knowledge is a valuable resource, its practical use will to a large degree depend on its quality (Yu, Kim, & Kim, 2007). Yoo et al. (2011) define three dimensions of knowledge quality; intrinsic-, contextual- and actionable knowledge quality, which is separated conceptually, however, used interactively at work. We define *intrinsic knowledge quality* as the extent to which the knowledge has merit associated with accuracy, reliability and the timeliness of the knowledge (Yoo et al., 2011). Moreover, *contextual knowledge quality* refers to the extent to which the knowledge is used within a professional function and context. The dimension is related to the appropriateness, relevance and value by taking into account and understanding the environment in which a task operates (Yoo et al., 2011). Moreover, a sufficient understanding of the context will increase efficient use of the knowledge (Poston and Speier, 2005). However, as knowledge is about action, it must be used to some extent (Nonaka & Takeuchi, 1995). Therefore *actionable knowledge quality* refers to the degree to which the knowledge experience is adaptable, expandable and easily applied to tasks (Yoo et al., 2011). And to manifest its usefulness and profitability, the knowledge should be converted into action (Davenport & Prusak, 1998). Nonaka and Takeuchi (1995) together with Nonaka and Teece (2001) looked at knowledge quality as the critical success factor. The improvements related to distributed teams and networks were stressed by Jarvenpaa and Majchrzak (2008), Cascio (2000) and Anderson (2008). Von Krogh (1998) related success in knowledge management to team performance. To sum up with Katzenbach and Smiths definition of a high-performance team: “A small number of people with complementary skills who are committed to a common purpose, knowledge sharing, performance goals, and approach for which they hold themselves mutually accountable” (Katzenbach & Smith 2015: 45).

2.3. Social interaction ties

While communication technologies can serve as a platform to facilitate the process of sharing knowledge in virtual teams, it is network relationships that act as the actual bonds that help team members overcome geographic constraints (Yuan & Gay, 2006). A fundamental proposition in social capital theory is that the types and strength of relationships between actors in a network will identify an individual's likelihood to come in contact with someone who have the relevant and desired knowledge, and who also is willing

to share it (Nahapiet & Ghoshal, 1998). The substance of any relationship consists of the particular interaction that goes on between the individuals, and its strength is dependent upon the volume and the intensity of the interaction (Azarian, 2010). Moreover, we might say that at the most basic level, a relationship establishes a tie between two actors (Wasserman & Faust, 1999). Each relationship and actor represent an information channel (Anderson, 2008). Hence social interaction relations are channels of information and resource flow that will reduce the amount of time and investment to gather information (Nahapiet & Ghoshal, 1998). Hence, social interaction ties usually develop among members with the same resources and interests hence will facilitate knowledge sharing among them (Chen, 2007).

3. Merging theories: towards propositions

Pettersen (2015) concluded her literature review and her empirically based Ph. D. conclusion that online technology platforms to work need offline face-to-face platforms to share knowledge of higher quality. This finding has been the state-of-the-art conclusion since the cognitive authorities Paisley (1971) and Crane (1971) concluded that it was the case beyond any social psychological, information science and network relationships research doubt. Olaisen (1984) found that the combination of cognitive and affective needs in information seeking behavior might be more triggered by a technological platform than a face-to-face platform.

Proposition 1. *Members of a virtual team that is connected by Close Relationship through ties online and offline face-to-face platforms will share knowledge of higher quality, than team members that are only connected by Close Relationship ties online.*

Trust increases the degree of knowledge exchange (Tsai & Ghoshal, 1998), and make these transactions less costly (Zaheer, McEvily, & Perrone, 1998). Trust also make it more likely that the knowledge receiver will make use of available expertise (Levin, Cross, & Abrams, 2004). Trust in virtual teams affects the quality and quantity of knowledge sharing (Rosen, Furst, & Blackburn, 2007). Trust influences the sharing of knowledge through reducing ambiguity experienced by virtual team members who do not have a shared social history to help them interpret each other's behavior (Jarvenpaa, Shaw, & Staples, 2004). Developing trust in virtual teams is crucial, but also challenging as trust is found only to evolve in some form of physical contact (Handy, 1995). When the levels of trust are higher, people are more likely to share useful knowledge (Andrews & Delahay, 2000; Tsai & Ghoshal, 1998), and more willing to listen to and absorb and use it (Mayer, Davis & Schoorman, 1995). For these reasons we argue that:

Proposition 2. *Members of a virtual team that is connected by strong Interpersonal Trust ties will share knowledge of higher quality than team members with weaker Interpersonal Trust ties.*

As previously mentioned, the first dimension of interpersonal trust applies to an individual's perceptions of relevant expertise that other persons hold. Accordingly, if you do not find a person qualified or confident in his competence, it is challenging to trust the knowledge he is giving you on a particular topic (Abrams et al., 2003). For these reasons we argue that:

Proposition 2. *a. Members of a virtual team that is connected by Competence-based Trust ties will share knowledge of higher quality, than team members that were not related by Competence-based Trust ties.*

As the definition states, benevolence-based trust involves accepting a state of vulnerability, but in situations where trust is lacking, exposing oneself will include a high risk of losing face or hurting one's self-esteem and in this way prevent team members

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