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Role of knowledge conversion and social networks in team performance

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ABSTRACT

This study aims to find out how different processes of knowledge management and patterns of social networking affect team performance. Our data on teams originate from a sample of different organizations from a variety of both public and private industries in Finland (76 teams; 499 employees). One of the main deficiencies in the current literature on knowledge and networks is that they tend to concentrate on specific types of teams in a single organization context. Our aim was to put the team phenomenon into an everyday context by analysing the interplay of knowledge creation and social networks in teams which function on a permanent basis in a variety of industry contexts. Both knowledge creation and social networking contributed to performance, but the results showed that whereas team members see the knowledge conversion processes as central to performance, top management emphasize the importance of social networks in value creation. In our examination, lively interaction between team members, combined with team leaders' intra-organizational networks, contributed to team performance.

1. Introduction

Knowledge and social networks play an ever increasing role in creating the performance of 21st century organizations. They signify a change from the smokepipe industry to the nurturing of intangible assets, and from the management of established hierarchies to the self-organization of independent teams (Chen, 2004; Grant, 1996; Matusik & Hill, 1998; Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2003; Nonaka, 1994; Spender & Grant, 1996). Knowledge creation provides an organization with an intangible resource that enhances its ability to adapt to a changing environment (i.e. Nonaka, von Krogh, & Voelpel, 2006), and is difficult to duplicate (Coakes, Coakes, & Rosenberg, 2008). The essence of knowledge creation and management is especially important in team-based organizations (see for example Cohen & Ledford, 1994; Kirkman & Shapiro, 1997, 2001; Ancona & Bresman, 2007). A team gathers together a certain amount of employees who have interdependent tasks but a shared responsibility for team level outcomes (Cohen & Bailey, 1997; Guzzo & Dickson, 1996; Hackman, 1987). Sharing knowledge is one of the key aspects of effective teamwork: to accomplish their mission, teams must integrate, synthesize, and share information throughout a performance episode (Salas, Cooke, & Rosen, 2008).

One of the main deficiencies in the current literature on knowledge and networks is that it tends to concentrate on specific kinds of teams in a single organization context. According to recent reviews on teams and networks (Henttonen, 2010), corporate R&D, project organizations, innovative teams, students, and laboratory experiments constitute the substance of most knowledge and network-related studies. There is no academic reason for this: the omnipresence of knowledge work in a networked context creates interest in studying the everyday duties performed on an ongoing basis in a variety of industries.

Our aim is to put the team phenomenon into an everyday context by analysing the interplay of knowledge creation and social networks in the performance of teams which function on a permanent basis. According to reviews of team studies, future directions in the research area should include the assessment of interdependency among team members (Paris, Salas, & Cannon-Bowers, 2000), the institutional factors of teams (Cohen & Bailey, 1997; Guzzo & Dickson, 1996), and the different types of teams (Stock, 2004). This study aims to address some of the inadequacies identified by previous team research. The social network analysis employed in this study enables assessment of interdependence among team members as well as their contacts to the host organization, and teams studied here originate from a sample of different organizations from a variety of industries, both public and private.

The study aims to find out how different processes of knowledge management and patterns of social networking affect team performance. The data consist of 76 teams (499 employees) from both the private and public sectors. First, the theories concerning knowledge management and networking in team settings are introduced. Then

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we describe the study setting and methodology. In the empirical part of our inquiry we contrast the knowledge-based and network-based explanations of team performance. To provide further validity to our examination, we included performance indices evaluated by both team members and the top management of the organizations (see Delarue, van Hootegem, Procter, & Burridge, 2008, for a review). In the concluding section, we assess the findings in relation to the practical developments of organizing work, as well as in the theoretical context of knowledge creation and networks.

2. Processes of knowledge creation

Organizational knowledge creation is defined by Nonaka et al. (2006, p. 1179) as "the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting with an organizations' knowledge system. In this sense, knowledge creation and codification is an important part of a firm's strategy" (e.g. Bierly & Chakrabarti, 1996). Successful firms can consistently manage and integrate knowledge assets into operational activities to fulfil their objectives and achieve superior performance (Dröge, Claycomb, & Germain, 2003; Teece, 1998). Knowledge creation takes place within an organization's structure, and is the application of both formal and semiformal means of dividing and co-ordinating work. Current discussion on organization structure emphasizes the reduction of both the vertical and horizontal division of labour. A common feature of new organizational forms is that they rely heavily on horizontal work teams, which often consist of employees with different specializations. Teams can (Ashkenas, Ulrich, Jick, & Kerr, 1995) and do gain advantages (Choi, 2002) by crossing boundaries, and make decisions as well as perform administrative duties. The buffering activity of middle management is ensured by the increased use of information technology, computers in particular. Individual employees perform their duties in a quasi-autonomous fashion, but are both required and able to communicate directly with the central authority.

Knowledge creation and codification processes do not necessarily lead to performance improvement or value creation (Alavi & Leidner, 2001): value is created only when knowledge is shared throughout an organization and applied exactly where it is needed (Grant, 1996). Therefore, firms' competitive advantages depend not only on knowledge creation but more importantly on knowledge diffusion and application (Dröge et al., 2003; Grant, 1996; Spender, 1996). Some prior studies have highlighted the importance of social interaction among organizational units in dealing with knowledge exchange (e.g. Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Tsai, 2002). Nahapiet and Ghoshal (1998) indicated that while much knowledge may be written down or stored formally, other knowledge is stored informally through the collective memories of individuals. Hence they proposed that organizational knowledge be created through the combination and communication of individual learning among co-workers. This makes the social relationships among organizational members (Bartol & Shrivastava, 2002; Levin & Cross, 2004; Singh, 2005) and units (Hansen, 1999; Ibarra, 1993; Kogut & Zander, 1992; Tsai, 2002) an important forum for sharing individuals' knowledge.

Our theoretical view on knowledge is based on organizational knowledge-based theory, which aims to point out the dynamism of knowledge production by examining knowledge creation through the interaction of its explicit and tacit elements (Nonaka, 1991). By doing this, knowledge-based theory aims at complementing the static view of "knowledge assets" utilized by former theories of the knowledge-based view (e.g. Grant, 1996), and the theory of dynamic capabilities (e.g. Teece, Pisano, & Shuen, 1997).

In the knowledge-based theory, tacit and explicit knowledge are 'mutually complementary' in that they dynamically interact with each other in creative activities by individuals and groups. Knowledge that can be uttered, formulated in sentences, and captured in drawings is *explicit*. It is universal and accessible through consciousness. Knowledge tied to the senses, tactile experiences, movement skills, intuition, unarticulated mental models, or implicit rules of thumb, is *tacit*. Tacit knowledge is rooted in action, procedures, routines, commitment, ideals, values, and emotions. The concept of *knowledge conversion* explains how tacit and explicit knowledge interact along the continuum. It refers to two elements (Nonaka, 1994; Nonaka & von Krogh, 2009). First, personal subjective knowledge can be socially justified and brought together with other's knowledge so that the knowledge keeps expanding (Massey & Montoya-Weiss, 2006). Second, knowledge adopts alternating forms so as to mutually enhance tacit and explicit elements. In this process, knowledge is shared, and new knowledge is created (Nonaka, 1991, 1994; Nonaka & Takeuchi, 1995). The conversion occurs in four processes: socialization, externalization, combination and internalization (the SECI model) (Nonaka, 1991; Nonaka & Takeuchi, 1995).

Socialization (tacit to tacit) facilitates the exchange of tacit knowledge via joint activities: being together, living in the same environment, sharing experiences, brainstorming and transferring ideas to other people. Through this process, a team forms 'group tacit knowledge' (Erden, von Krogh, & Nonaka, 2008), which is critical for task completion and group performance. Team members are sometimes reluctant to share their tacit knowledge with others; this is due to the potential risk of losing the advantages that withholding important information creates (Osterloh & Frey, 2000). In the socio-psychological tradition, organizational socialization has been defined as "the process by which an individual comes to appreciate the values, abilities, expected behaviours, and social knowledge essential for assuming an organizational role and for participating as an organizational member" (Louis, 1980, 229–230).

The process of *Externalization* (tacit to explicit) includes the translation of tacit knowledge into comprehensible forms that can be understood by others (Nonaka & Konno, 1998). This process can be supported by two key factors. First, the articulation of tacit knowledge transfers the "invisible" ideas and images into "visual" forms, such as words and concepts. The formal development of operational systems; reflection and the sharing of mental models, are typical externalization activities. The second factor of externalization involves translating the tacit knowledge of different interest groups, like customers and experts, into understandable forms. In the group context, this is partly the work that crosses group boundaries.

Combination (explicit to explicit) involves the amalgamation of existing data and information to create more shareable forms, and the integration of explicit knowledge into the firm's knowledge base, "the systemization of knowledge" (Nonaka & Konno, 1998). Blumenberg, Wagner, and Beimborn (2009) argue that the transfer processes of explicit knowledge consist of two parts: transferring content such as communication standards, service level agreements and training, and transferring structures that define the sender and receiver in a relationship. In the knowledge management spiral, the process of combination presents the transformation of knowledge via IT systems. Antonelli (1997), however, argues that IT technology is a limited tool for transferring explicit knowledge.

Internalization (explicit to tacit) is analogous to 'learning by doing'. It generates fresh tacit knowledge, thus renewing the spiral. People talk and think about the explicit knowledge embodied in documents, manuals, computer systems, etc.; gain experience, recognize gaps in their know-how; and broaden, extend and reframe their tacit knowledge.

Johannessen, Olaisen, and Olsen (2001) argue that the entire knowledge base has to be emphasized if a firm wishes to